WATCHES

THE PAUL M. CHAMBERLAIN COLLECTION AT THE ART INSTITUTE OF CHICAGO

1921

LENT BY THE
CHAMBERLAIN
MEMORIAL
MUSEUM

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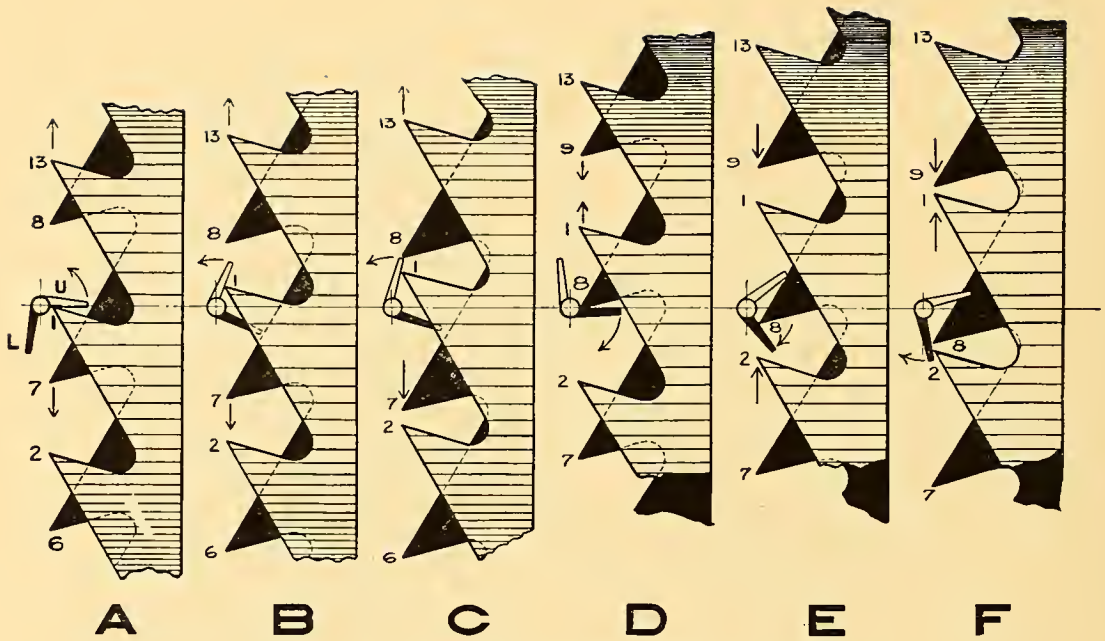
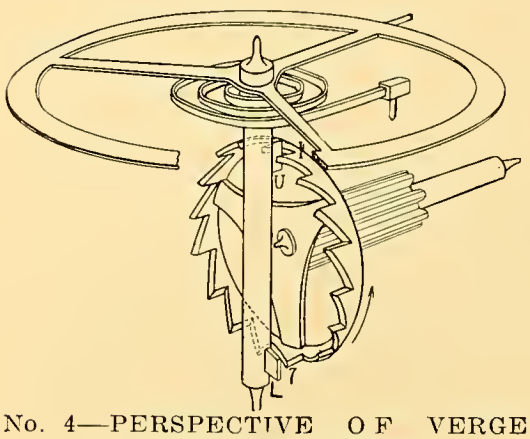
No. 83—REPEATER BY DORWES



No. 4—ACTION OF VERGE AS ROTATED BY ESCAPE WHEEL



No. 4—PERSPECTIVE OF VERGE AND ESCAPE WHEEL

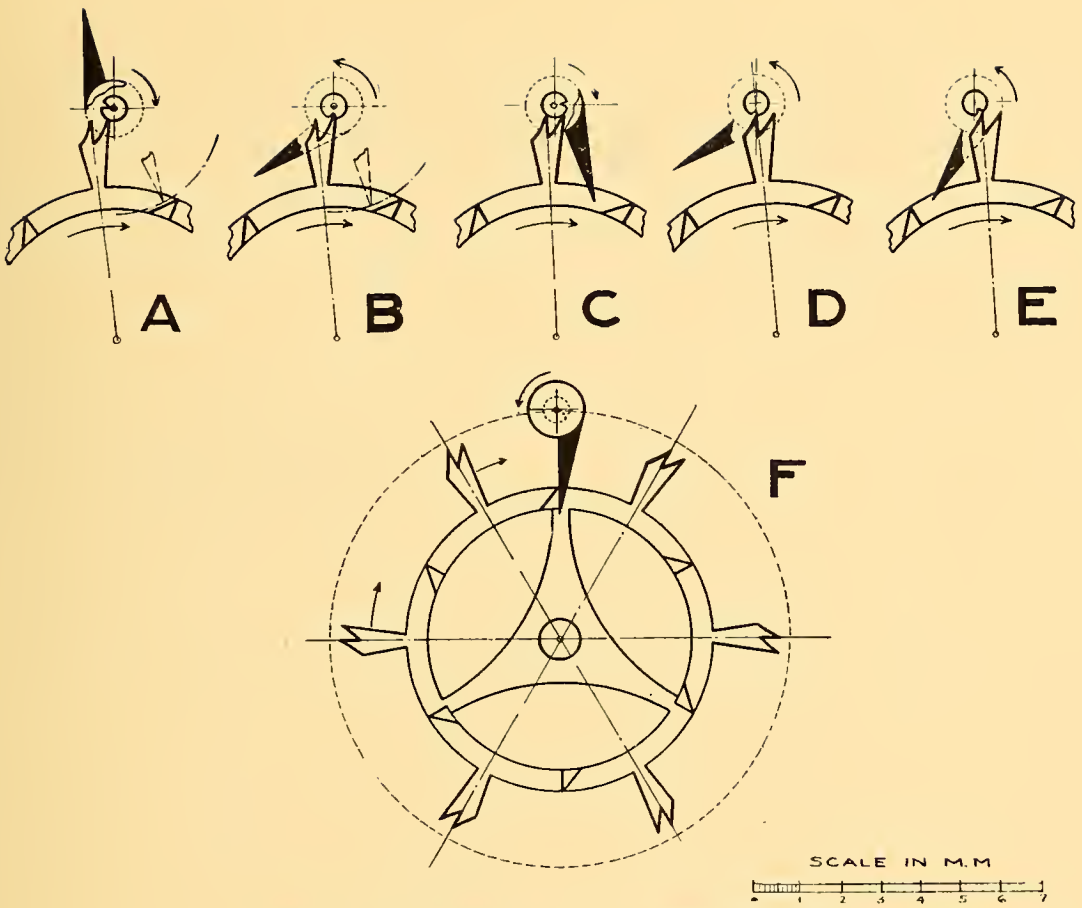
FOREWORD.

PORTABLE timepieces were made as early as 1515 in Nuremberg by Peter Henlein and probably somewhat earlier in France. The earlier pieces were quite crude mechanisms with decorative casings. The improvement in the mechanisms or movements did not keep pace with the artistic expression of the cases. the latter reaching the heights of artistic beauty in painting and enameling and decoration between 1650 and 1750.

The introduction of watch making in England was somewhat prior to 1600, and the progress of the watch as a timekeeper owes more to that country than to any other from 1700 to 1800.

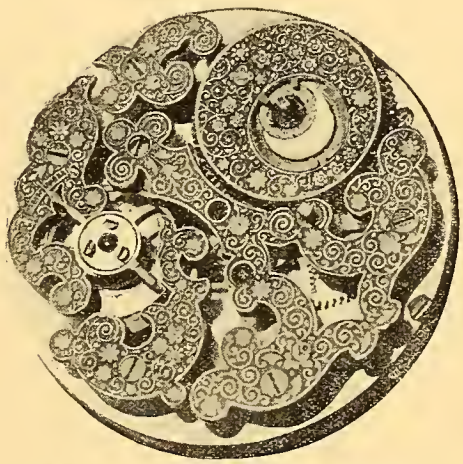
The earliest watches differed mechanically from clocks only in size and the substitution of the spiral spring for the driving weight. The clock began to approach accurate timekeeping with the invention of the pendulum about 1657 by the great Dutch physicist, Huyghens, and the watch with the introduction of the balance spring by the great English physicist, Robert Hooke, about 1660. The gradual addition of improvements to the watch to overcome apparently insuperable difficulties is a wonderful story of achievement, till today it is the mechanical marvel ne plus ultra. The tracing of the growth of this marvel has been primarily the object of collecting the examples herein briefly described.

For the information of the layman, it may be well to point out that the watch movement consists of a motor or storage battery, the mainspring, the train of geared wheels large and small, (the latter called pinions) and the escapement which retards or regulates the speed at which the mainspring runs down after winding. To go into a little harmless technology, the first wheel or barrel contains the mainspring,



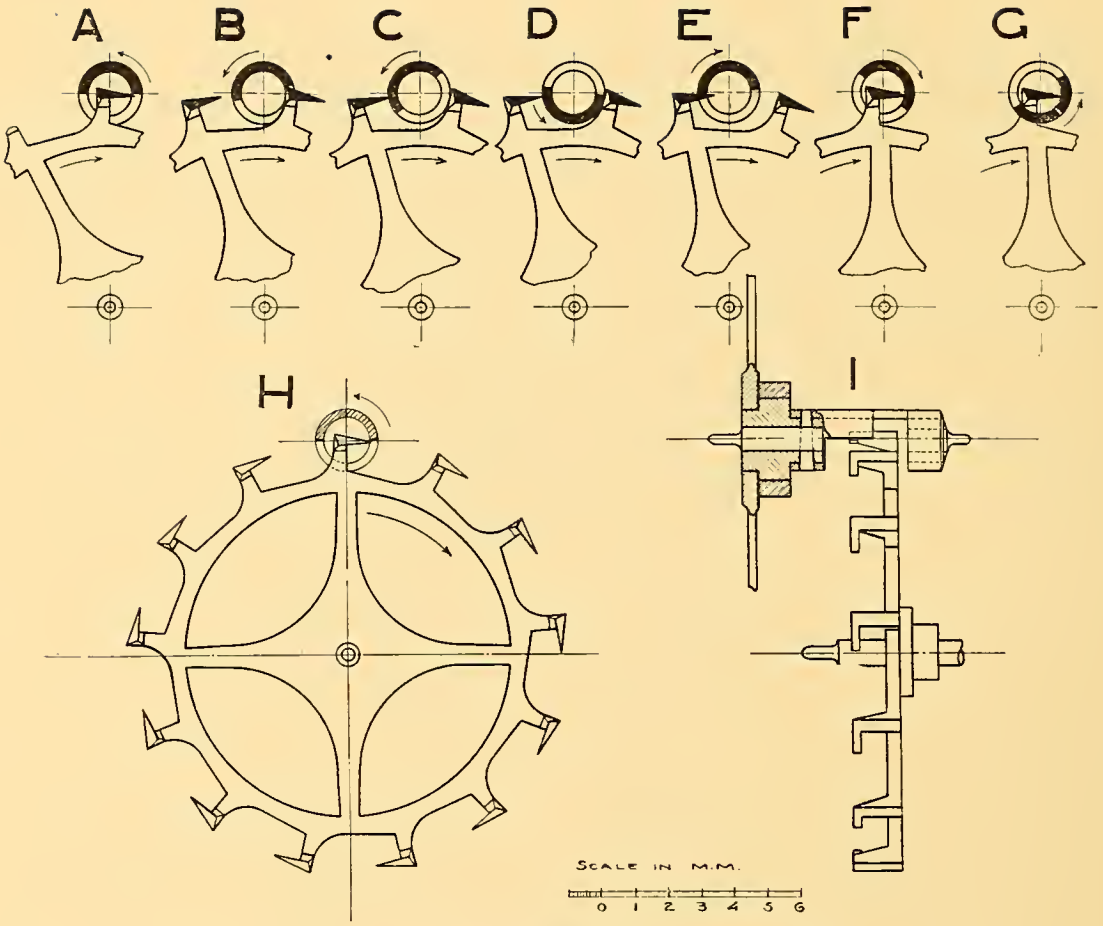
No. 5—ACTION OF CHINESE DUPLEX

the second wheel carries the minute hand, the third wheel has no function but to increase the ratio of the train, the fourth wheel carries the seconds hand, and then comes the escape wheel, which can move only as fast as the escapement or soul of the watch will allow. It is here that the great miracle has been wrought with enormous outlay of thought and experiment continuing now over two hundred years. The pendulum of the watch is the balance wheel, which turns first in one direction and then returns, each time winding up and unwinding the balance spring, which is so delicate that it frequently is called the hairspring. The desideratum of the perfect watch is that the balance shall vibrate with absolute uniformity of time unaffected by position, temperature or strength of winding. The swing is greatest after winding, but the time of swing must be the same at all times.



No. 5—CHINESE DUPLEX

The train of wheels in the older watches were held between two plates, known as the top plate and the pillar plate, the latter being adjacent to the dial and carrying



No. 10—ACTION OF CYLINDER AS ROTATED BY ESCAPE WHEEL

pillars which held the plates the proper distance apart. The balance wheel or balance was placed above the top plate, its top pivot being carried by a cock which was the subject of great adornment, and its lower pivot by a cock under the top plate, called the potence. The second wheel of the train, usually the center wheel, carries the minute hand on its arbor. Between the pillar plate and the dial is a reducing train of two wheels with two pinions, known as the motion wheels, which reduces the speed of the wheel which carries the hour hand. To reduce the thickness of the watch, a portion of the top plate was cut away, and the top pivot of the balance was held by a cock attached to the pillar plate. This arrangement was known as "three-quarter plate." Another change was displacing the top plate entirely by bridges or cocks, each carrying one or more bearings or jewels for pivots.

The earliest form of escapement was the verge and it was still made as late as 1870. It was always influenced by the force of the spring. Very early in the history of watch making there was devised a conical wheel called a "fusee" on which was wound a cord or chain, the other end of which was wound around the spring barrel. When the spring was wound up the chain pulled on the small diameter of the fusee and as the force of the spring became less the pull was on increasingly larger diameters of the fusee thus equalizing to some extent the power on the train. The escapement was however not a reliable timekeper. In the period from 1730 to 1765, great advancement was made in escapements, Tompion, Graham, Mudge, Earn-

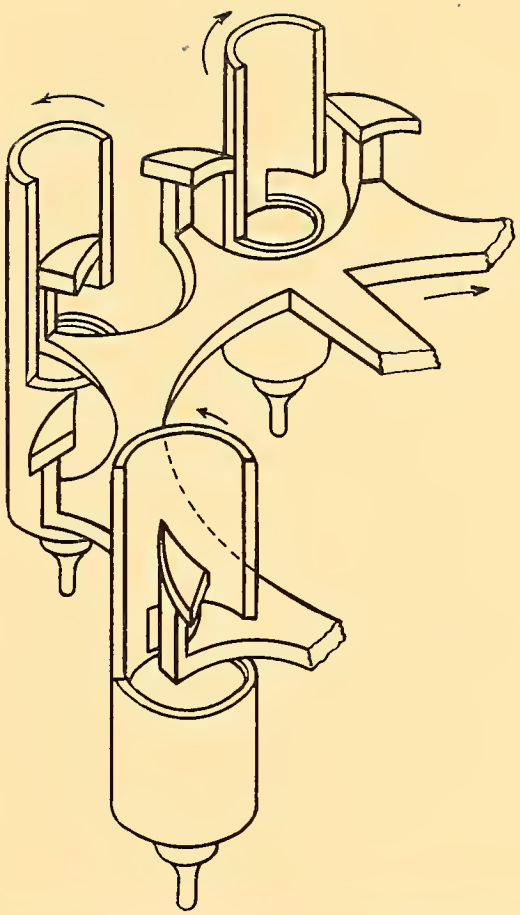
shaw and Arnold in England brought out the cylinder, chronometer, duplex and lever, and across the channel Le Roy, Lepine, Hauteville, Dutertre, Berthoud and Breguet worked along similar lines. The credit as in most inventions cannot be ascribed definitely as so frequently quite as much depends on the successful working out of the experiment as on the conception. The duplex had much success and favor in England, though originating in France, while the cylinder, originating in England, was more popular in France and Switzerland. The chronometer escapement, because of its freedom from the variable influence of the driving pressure, was very attractive to experimenters everywhere, but finally gave way to the detached lever for fine watches, though still retained for marine timepieces. The past hundred years has seen advance largely in eliminating unsound hypotheses and perfecting methods and machinery to make at lower cost that which formerly required more personal skill. Methods of multiple manufacture have had greatest growth in America, where, strange to say, little has been developed horologically.

The period covered by examples in this collection is from about 1700 to 1880. The aim of the collector has been to show primarily the evolution of the watch as a timekeeper. There are however a considerable number showing the elaborate ornamentation of cases in enamel, tortoise shell, repousse, pierced and lacquer work.

The student of horology will take pleasure in examining examples by such masters as Breguet, Arnold, Lepine, LeRoy, Mudge, Graham, Frodsham, Jurgensen, etc.; the development from the heavy, bulky watch of 1700 to the thin, wafer-like movement of about 1820, and the return to sensible proportions of later date.

The experiments shown in balance springs begin with the small numbered spiral, extending through the cylindrical spring of Houriet, the combined spiral and cylinder of Hammersley, the wide sweep over coil of Frodsham, the double spring of some unknown experimenter and the modern Breguet over coil, with Philip's terminals.

In escapements may be found those which have had considerable vogue, such as verge, cylinder, duplex, rack lever, chronometer,

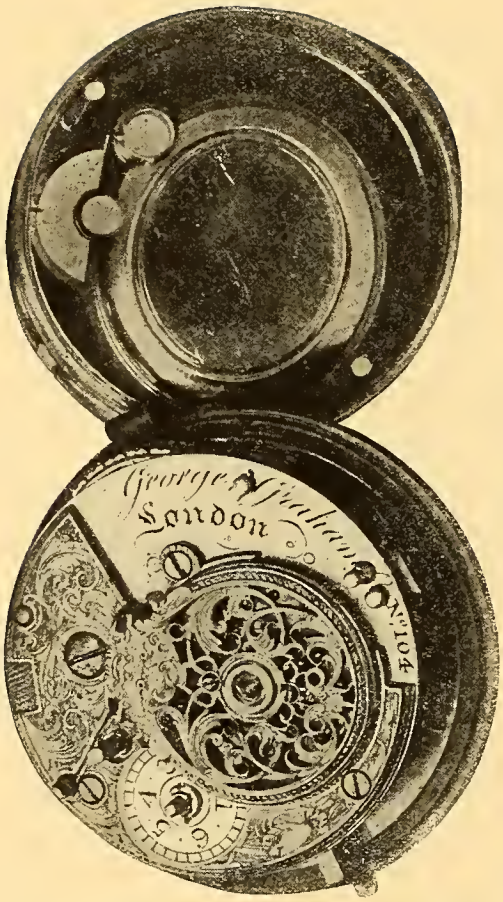


No. 10—PERSPECTIVE CYLINDER AND ESCAPE WHEEL

detached lever, and many others unfamiliar even to most watchmakers. One example marked Breguet, and another by Arnold, have cylinders made most exquisitely of ruby or sapphire.

In devices for winding, intervening between the key wind and the stem wind, may be seen the pump or lever wind, the perpetual wind on the pedometer principle, depending on the motion of the body, the watch which winds by closing the case, and one in which the winding is effected by pulling out the stem.

In the examples of American make may be counted some forty different firms or factories, beginning with Jacob Custer, who made watches of his own design and patent in Norristown, Pa., as early as 1843. Striking watches, repeaters, calendars, musical watches, mystery watches and other curi-



No. 10—CYLINDER BY GRAHAM

osities of the watchmakers' art too numerous to mention, may be seen.

All together, there are in excess of two hundred and ninety pieces, some of interest in their entirety and others for some special feature not always apparent without examination.

The following collections have examples of makers represented by the numbering appended, referring to descriptions given herewith:

George H. Abbot, Groton, Mass....98
Edwin P. Baker, referred to by Britten 4-55
Ralph Bernal Collection, auctioned in London in 1855.....62
British Museum, London.....26-81-151
Imperial Collection, Hermitage Gallery, Petrograd, Russia.....26-151
Franklin Dennison Collection, Birmingham, England 1-10-33-37-52-59-69-85-151
Dr. Tad Estreicher, Fribourg. Switzerland 37
Moyer Fleisher Collection, Memorial Hall, Philadelphia.....4-55-122-124-153
Dunn-Gardner Collection, auctioned 1902 in London.....150
Guildhall Museum, London.....26-64-81-122
Hearn Collection, Metropolitan Museum, New York.....122
Hawkins Collection, auctioned 1895 in London 56
Martin Heckscher Collection, Vienna.32
Robert Hoe Collection, auctioned in New York in 1901.....122
Jefferson D. Jenkins Collection, Decatur, Ill. 26-32
South Kensington, Museum, London.12-33-62-98-115-149
L. O. Liljigren Collection, Chicago..23-75
Carl Marfels Collection, Berlin.....32-37-59-150
Bloomfield- Moore Collection, Memorial Hall, Philadelphia 52-69-85-122
J. Pierpont Morgan Collection at Metropolitan Museum 93-123
Rev. H. L. Nelthropp Collection at Guildhall Museum, London.....4-16-22-33-37-52-55-63-69-85-116-122-123-127-151
F. G. Hilton Price Collection, sold to J. Pierpont Morgan.....10-26-33-95-151-153
J. T. and T. R. Proctor Collections, Utica, N. Y.....1-10-26-33-52-69-85-93-122-151-153
Major R. H. Raymond Smythies, London 12
Lord Wallace Collection, British Museum 81-151
Willard H. Wheeler, Collection, Brooklyn, N. Y.....10-32-33-52-69-85-93-123

No. 1—Verge, carved pillars, pierced balance cock with ruby cap jewel, foot of cock and scroll chased, but not pierced, fusee with inside ratchet, screw adjusted potence and counter potence. Movement engraved "Ge. Prior London." No engraved number, but pillar plate is stamped 02756. There was a George Prior in business 1765 to 1810.

No. 2—Verge, carved pillars, cock foot and scroll pierced and carved, carved locking bar spring, outside ratchet fusee, worm gear set-up. Plate engraved "T. Betson, London, No. 1438." Made probably about 1780.

No. 3—Verge, turned pillars, chased foot and scroll and pierced balance guard, inside ratchet for fusee wheel, ratchet set-up for spring arbor, diamond end stone, beautiful workmanship. Made by "Des Granges, Late Louis Recordon, London, No. 8971." Des Granges was at 3 Cockspur St., 1816-42.

No. 4—Verge originally, but later converted to detached lever, general description similar to No. 3. Plate engraved "James McCabe, London, No. 4896." McCabe came from Belfast and was in London from 1778 to 1811. His best watches were "James McCabe," second grade "McCabe" and third grade "Beatson."

No. 5—Called frequently "Chinese Duplex," perhaps because they appealed to the oriental eye and market. They were made largely in Fleurier, Switzerland, though many of them bear English names on the dial. The escapement, invented by Ch. Ed. Jacot of Chaux-de-Fonds, is a form of duplex giving four swings to the second, the center seconds hand jumping a second division during fourth swing. Period of about 1840-60.

No. 6—Skeleton plate with initials worked in the scroll. Bottom plate stamped W6326. Workmanship fair, probably French or Swiss.

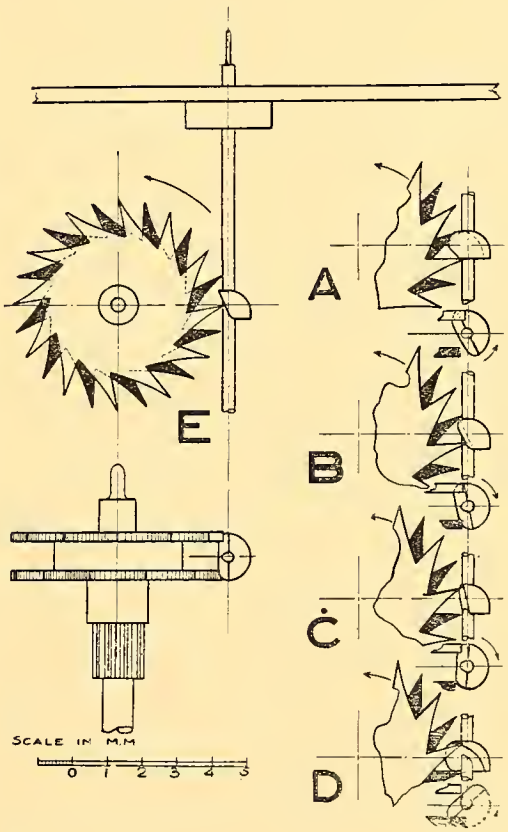
No. 7.—Early example of dust band held in place with screws. Escapement verge with calendar dial. Maker: "Borle, a la Chaux-de-Fond." No. 2946. Made probably about 1840.

No. 8—Applied pierced scroll work over entire top plate. Initials worked in scroll of bridge. Pillars carved or filed, which would usually indicate an earlier period than the rest of the work; may have been made as late as 1840.

No. 9—Verge, carved pillars, solid foot balance cock, worm screw set-up for spring arbor. "Jas. Cowan, Edinburgh, No. 486." Cowan was apprenticed in 1744 and later spent some time with Le Roy in Paris. Watch made probably between 1750 and 1760. The workmanship is very good and bears the marks of individuality.

No. 10—Cylinder, carved pillars, solid foot balance cock, worm screw set-up for spring arbor. Dust cap. "George Graham, London, No. 104." Graham is usually accorded the credit of perfecting the cylinder escapement, although the substitution of steel scape wheel for the brass scape of the English was probably of Swiss origin. Graham succeeded his patron, Thomas Tompion, in 1713, and the example of his work here shown may have been made as late as 1725, after the expiration of the patents of Booth, Houghton and Tompion, but a watch by him, bearing the

No. 11—DEBAUFRE ESCAPEMENT



No. 11—ACTION OF DEBAUFRE ESCAPEMENT

No. 12—CYLINDER BY GRIGNION

number 445, noted by Britten, is assigned to 1714.

No. 11—Club footed verge, turned pillars, plain top plate, friction regulator as patented by Bosley in 1755, carved bridge, exposed spring with no fusee and modification of Debaufre's escapement. "Thos. Houghton, Chorley No. 395." There was a James Houghton in business at Ormskirk, a neighboring town to Chorley, from 1800 to 1820, maker of this same form of escapement.

No. 12—Cylinder movement engraved "Thos. Grignion, Covent Garden, London, No. 1432." Grignion was born 1713, and died 1784. His son ascribed to him the honor of perfecting the cylinder escapement in 1740. The Gardner, Dennison and South Kensington Collections each have an example of Grignion's work.

No. 13—Verge, deep set, carved and pierced balance cock, pierced foot and scrolls, lock spring nib originally projected through dial, which had also calendar circle. The escapement is the same as was used on the first watches about 1500. The fusee or conical winding wheel introduced about 1525 by Jacob Zech, of Prague, the chain substituted for the catgut by Gruet of Geneva in 1590, the balance spring invented by Hooke in 1658, and generally used by 1700, the form of regulator by Tompion about 1660, the minute hand about 1687, brings the watch to about this example made by "Sabourin, London," about 1700.

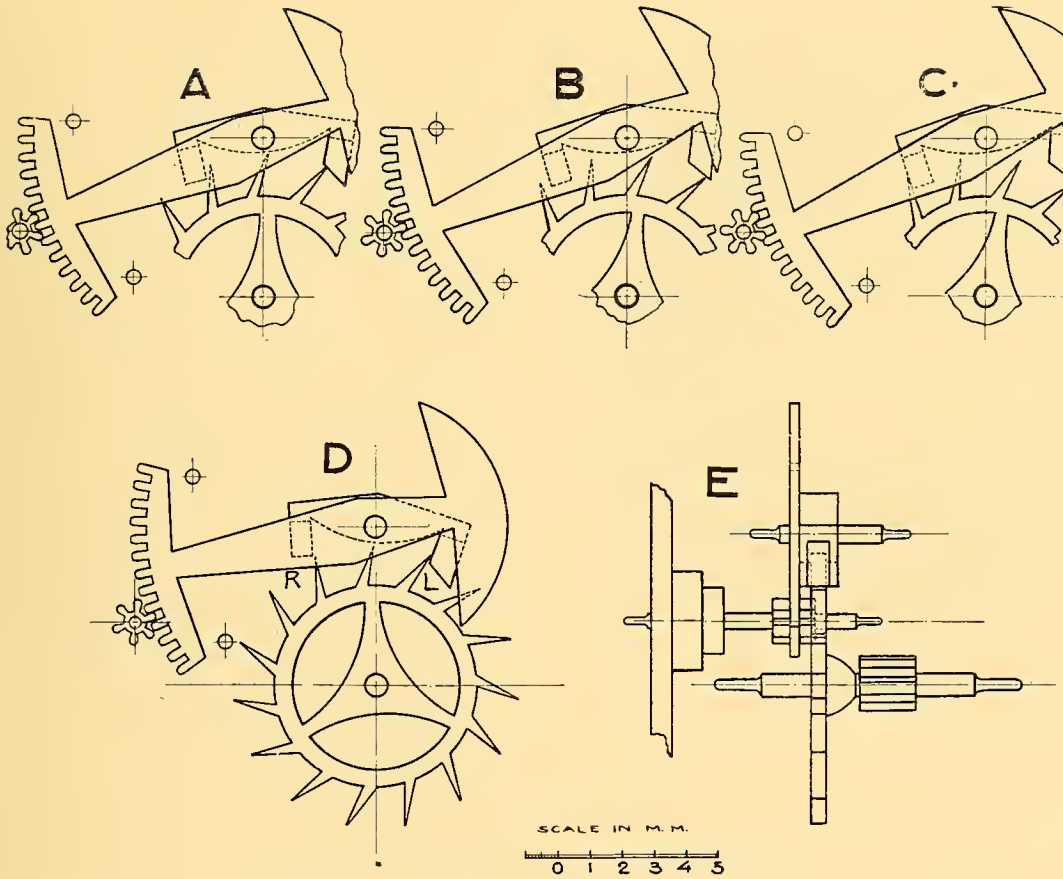
No. 14—Cylinder, brass scape, solid balance cock, ratchet set-up for spring arbor, Harrison maintaining spring, steel balance, Bosley regulator, turned pillars, dust cap, end cap jewel of rose diamond, a fine piece of work by "Mackenzie, London, No. 568," made about 1800. Escapement perfected by Graham about 1725.

No. 15—Duplex, similar in general description to No. 2 but with escapement invented and developed by J. B. Dutertre, of Paris, 1750-1780, Thomas Tyrer, of Clerkenwell, 1782. This example was made by "David Morice, Fenchurch St., London, No. 4264," about 1800.

No. 16—Rack lever, similar in general description to 14 and 15, but with escapement claimed by John Hautefeuille of Paris, in 1722, and patented in England by Peter Litherland in 1791, the anchor part of the escapement having been invented by Robert Hooke in 1675. This example was made by "Litherland, Davies & Co., Liverpool, No. 7992," about 1816. Many of these watches were sold in the United States.

No. 17—Chronometer. The invention of this escapement is attributed to Julien Le Roy of Paris 1765, Thomas Earnshaw in 1803, John Arnold 1772. Arnold patented the helical spring in 1775, and the detent in 1782, invented simultaneously by Earnshaw, whose form is used at the present day. This example was made about 1860 by "Joseph Sewill, 61 South Castle St., Liverpool, No. 23159."

No. 18—Detached lever. The invention of this escapement is quite universally accorded to Thomas Mudge, who succeeded George Graham in 1751, and devised the detached lever, it being an evolution of the rack lever, all but two teeth of the rack being removed and all but one of the pinion, with the addition of the safety



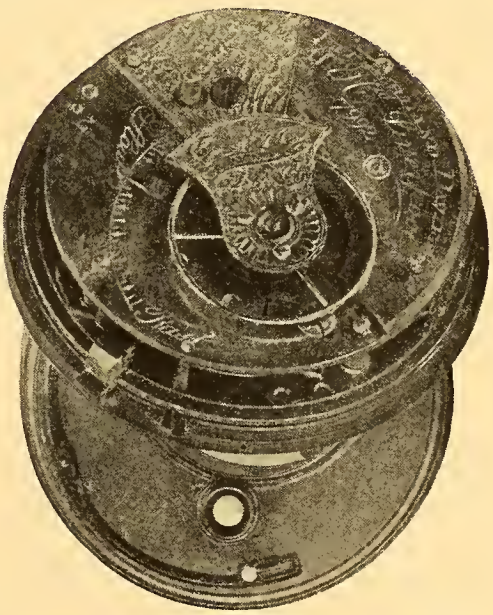
No. 16—ACTION OF RACK AND LEVER

roller. This example was made by "Jos'h Johnson, Liverpool, No. 7549," about 1825.

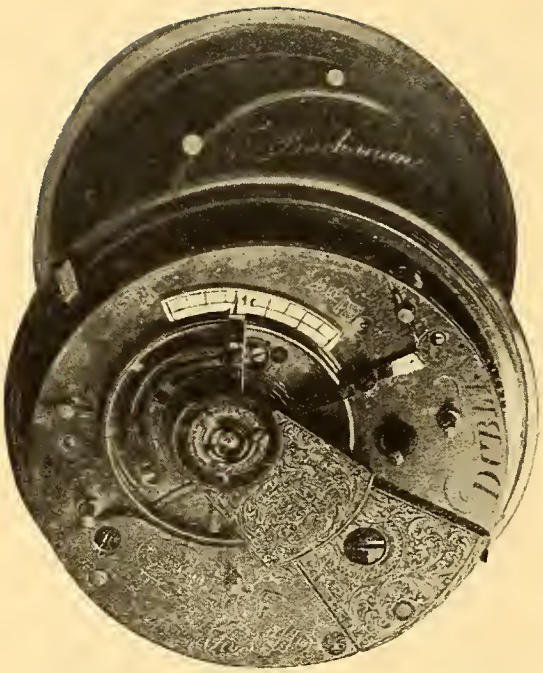
No. 19—Movement with duplex escapement made by "Thomas Buchanan, Dublin, No. 1655." This is a splendid example of the highest perfection of the duplex escapement. The compensation is effected by a curb, which, of bimetal construction, moves the regulator pins in and out with change of temperature. This watch was within a few years giving excellent service for a railroad man. The movement was made about 1820.

No. 20—Verge escapement by "Finer & Nowland, London, No. 3644." This firm was at 5 Hatton Garden, 1800-5, and 48 High Holborn, 1808-23.

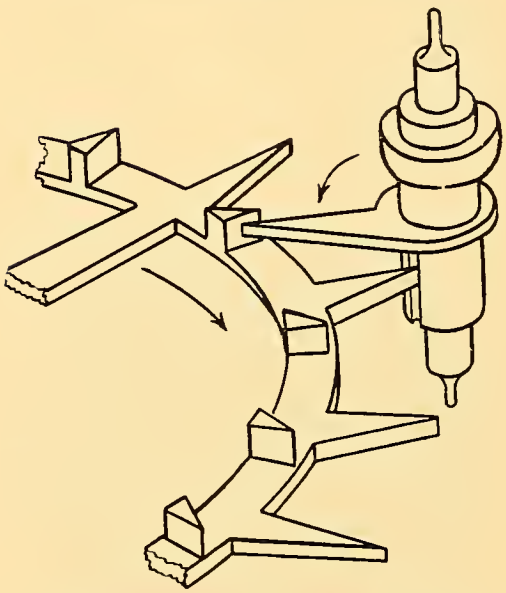
No. 21—A very early lever escapement by "Thos. Hamlet, London, No. 4138." Thomas Hamlet was in partnership with Francis Lambert in 1800. Given by Britten, 1795-1832, 1 and 2 Princes St., Soho, maker



No. 16—RACK AND LEVER BY LITHERLAND



No. 19—DUPLEX BY BUCHANAN



No. 19—PERSPECTIVE OF DUPLEX

of a gold horizontal watch for the Duke of Sussex.

No. 22—Very beautiful quarter repeater with ruby or sapphire cylinder by "Barrauds, Cornhill, London, No. $\frac{2}{7738}$." Barraud & Sons were at 85 Cornhill, 1813-1836.

No. 23—Verge, continental form of balance bridge with crown and monogram of Gustavus III. worked into scroll of bridge, regulator similar to tnat patented in England by Bosley in 1755, marked "Sent" and "Fort" inside ratchet for fusee wheel and ratchet set-up. Made by "Eric Wellenius, Norrkoping, No. 294," about 1774.

No. 24—Verge, converted to detached lever. Bridge has worked into scroll initials C. E. O., regulator the continental form of that devised by Barrow, marked "F" and "S." Plate engraved "Carl Er. Orbin, Stockholm, No. 563."

No. 25—Verge escapement marked "Vellerius" (Scandinavian). Top and pillar plate milled on edge.

No. 26—Cylinder, steel escape and going barrel, modern regulator planted on balance cock marked "S" and "G." Plate engraved "H. L. Montandon, Kiobenhavn."

No. 27—Sweep second and quarter second hands, driven by separate mainspring, compensated balance, 27 jewels. "Jules Emmery, Sagne."

No. 28—Sweep second and fifth second hands, driven by separate mainspring. The compensation for heat and cold is effected by a "curb" which, under change of temperature, moves the balance spring pins closer or further apart, a device used by Harrison on his prize timekeeper. There is also on the balance bridge a "parachute," an invention of Breguet's, being a spring to carry end jewels of balance staff so that sudden shocks may not break pivots.

No. 29—Sweep second and fly back, stem wind. Plate engraved "Agassiz, No 32942."

No. 30—Sweep second and fly back, stem wind, made by American Watch Co., Waltham. Plate engraved "Woerds Patents-Patented Oct. 3, 1876, and Sept. 28, 1880. Patented in England Aug. 6, 1880. Pat. Pinion, No. 1583425."

No. 31—Verge, inside ratchet on fusee wheel, turned pillars, rather plain balance bridge, end jewel, winding post supported by cock, potence and counter potence screw adjusted, plate engraved (fictitiously) "Breguet a Paris." Breguet was one of the most celebrated watchmakers the world has known. Was born 1747, and died 1823.

No. 32—"Dutertre a Paris." Small verge, diameter of a quarter of a dollar. Jean Baptiste Dutertre, Paris, 1750-80, is given credit for the invention of the Duplex Escapement. This movement may have been made by him or his sons.

No. 33—"Romilly a Paris," 1714-96. Beautiful steel hour hand, top plate skeleton. His place of business was in the Place Dauphine. He advocated 8-day watches, also watches with cylinder escapements and very large balances to vibrate seconds, also equation watches.

No. 34—Verge engraved (fictitiously) "Lepine a Paris." Jean Antoine Lepine was born in 1720 and died in 1814. He was watchmaker to Louis XV. and in 1770 introduced bars for carrying the upper pivots of a watch train instead of a top plate, dispensed with the fusee, used the cylinder escapement and a mainspring barrel arbor supported at one end only.

No. 35—English lever by "Wm. Cooper, Liverpool."

No. 36—"Quartier au Locle." Carved edges on top plate. Patent lever. Oriental cock.

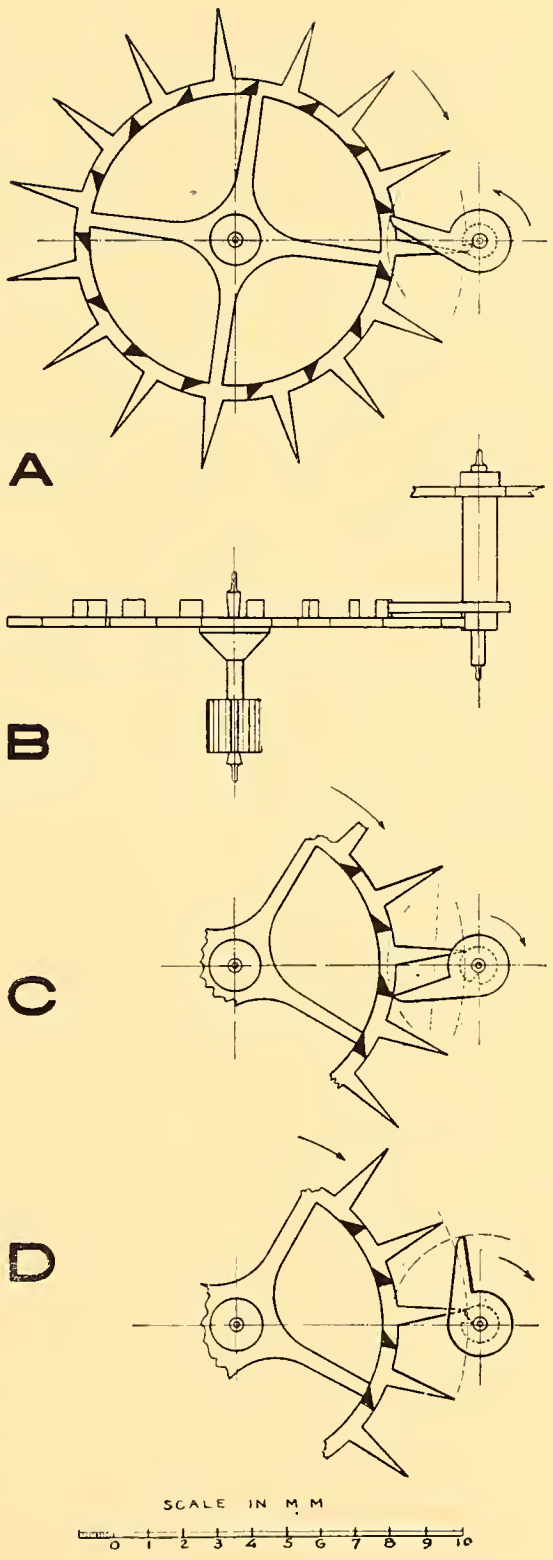
No. 37—Cylinder, dust cap, steel scape, calendar dial, engraved "Eardley Norton, London, No. 5518," diameter, 24 lignes, thickness without minute arbor, 5/8 inch. Eardley Norton was at 49 St. John St., Clerkenwell, 1760-94.

No. 38—Very small verge movement, about the diameter of a 25-cent piece.

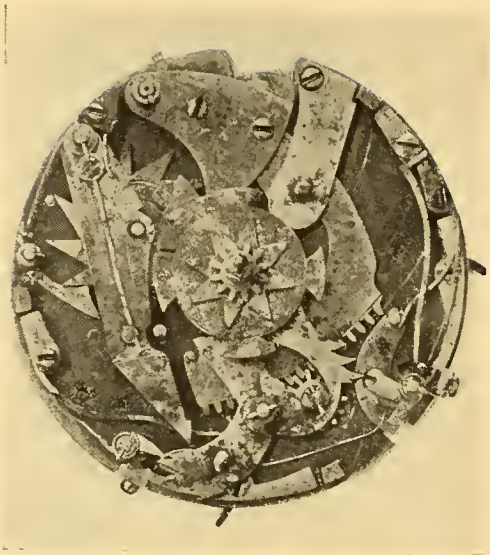
No. 39—Verge, Bosley regulator, ratchet set-up, inside ratchet for fusee wheel, diamond end stone, plate engraved "G. Robinson, London, No. 1900." There was a G Robinson in London in 1806.

No. 40—Verge, pierced foot and scroll, carved pillars, carved locking spring, outside ratchet on fusee wheel, dial painted with shipping scene, probably made for Dutch market; had originally worm gear set-up, but replaced with ratchet, a not uncommon change seen on watches used in Holland. Plate engraved "Rich. Holyer, London, No. 6182." Made probably before 1780.

No. 41—Verge, solid cock, ruby end stone. Bosley regulator, turned pillars, inside ratchet in fusee wheel, ratchet set up for spring arbor. Plate engraved "W. J. Upjohn, St. Johns Square, London," no



No. 19—ACTION OF DUPLEX



No. 43—REPEATER BY DEPUTTER

number. Upjohn was at this address 1815-20.

No. 42—Verge, very similar to No. 3. Plate engraved "Thos. Savage, London." There was a Thomas Savage at 3 Red Lion St., 1816-40.

No. 43—Verge movement, quarter hour repeater, silver composition bell; wide "brass edge"; locking bar nib originally projected through dial, which had calendar circle. Elaborately carved and pierced work on balance cock and scroll. Repeating mechanism is wound with rack operated from pendant. Dust cap engraved "De Putter, Amsterdam, 1721." The early repeaters, invented by Barlow and by Quare about 1686, were made with rack winding which gave considerable trouble, and later a chain was used. The chain was later abandoned for a rack of improved construction.

No. 44—Verge, quarter repeater, striking on three gongs, repeating motion actuated by chain from pendant. This example bears the name (falsely) "Breguet a Paris" in almost microscopic letters on dial below figure 6. With slight variation this model is found from a variety of localities in France and Switzerland. Breguet completed a watch in 1802 which cost 30,000 francs.

No. 45—Verge, striking hour and half hour automatically and also arranged to repeat the hour by slight pressure on the pendant, striking mechanism being actuated by separate mainspring, which has the modern safety stop work. Made in France or Switzerland, probably about 1800.

No. 46—Verge by "Benjm. Maude, No. 3800, London." Benjamin Maude was at 53 St. Martin's-le-Grand from 1770 to 1794.

No. 47—Lever, seventeen jewels, compensation curb, radial cocks, suspended barrel, silver dial with applied numerals. French or Swiss of about 1830.

No. 48—Chronometer, uncut bimetal balance, parallel type of bars or bridges, sixteen jewels, pivoted detent held to position by straight spring pressing on flattened side of pivot arbor. Probably of Swiss make about 1860.

No. 49—Cylinder, full plate, six jewels, silver balance, modern regulator, steel scape planted visible below balance and supported with cock running from edge of plate opposite balance cock. Artistic design. Probably French or Swiss of about 1850.

No. 50—Duplex, steel balance with poising screws, eleven jewels, half plate and three bridges, modern regulator. French or Swiss make of about 1850.

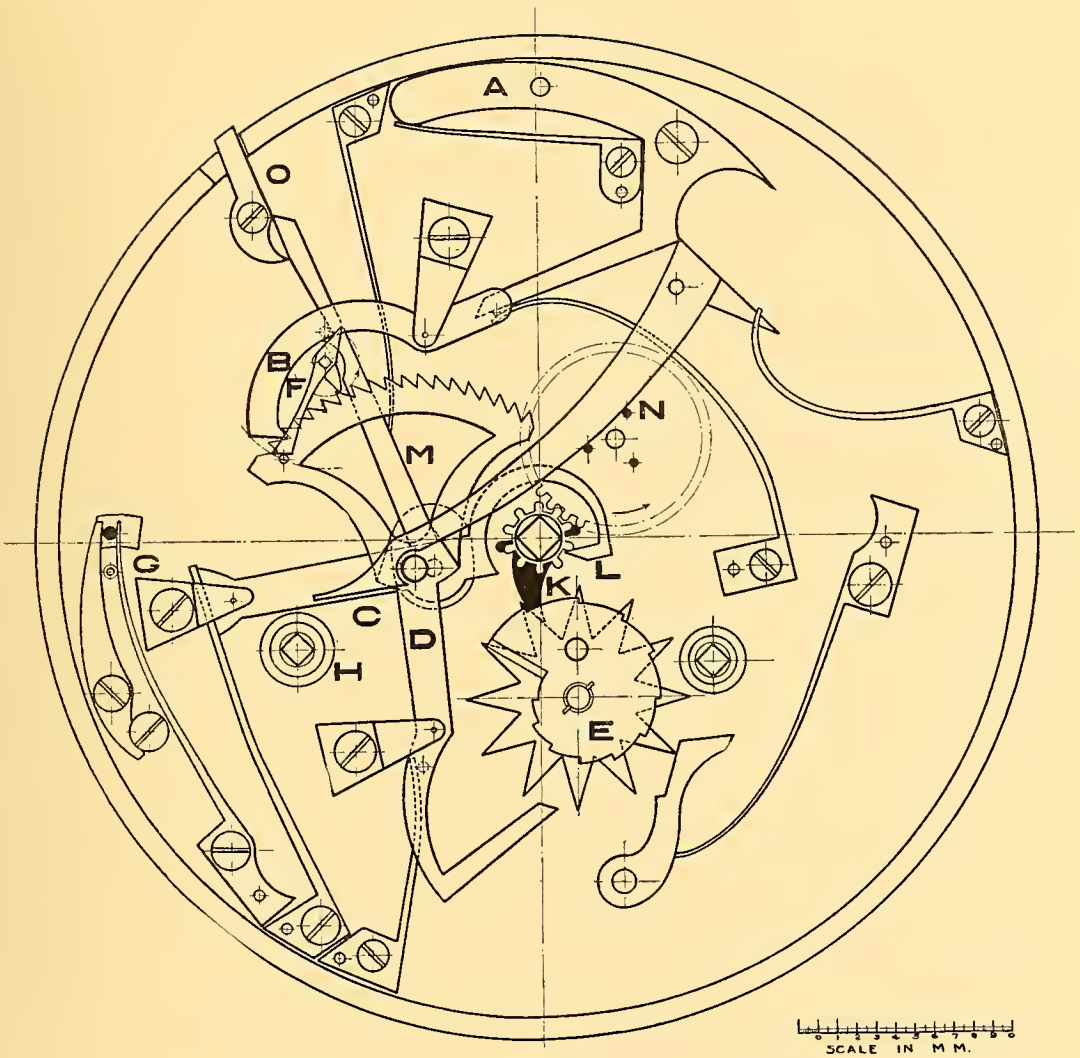
No. 51—Musical watch. "Vaucher Freres," about 1780.

No. 52—Alarm watch movement by "Julien LeRoy, a Paris, No. 1020." This is of interest as exhibiting a striking escapement which did away with the repeater train previously used to govern the speed, an improvement attributed to LeRoy, who was born 1686 and died in 1759.

No. 53—French calendar. Small hour dial at bottom with quarter seconds 15-30-45. Small dial at top with days of month. Abbreviated days of the week (French) on large circumference of dial.

No. 54—Small hour dial. Sweep second dial. Virgule escapement. Maker's name not on movement. Virgule escapement invented about 1750 by Andreas Charles Caron, later known as Beaumarchais, author of "Le Barbier de Seville." Dial has center sweep with hour dial below center.

No. 55—Verge originally but later converted to detached lever, general description similar to No. 3. Plate engraved "James McCabe, London, No. 4896." McCabe came from Belfast and was in London from 1778 to 1811. His best watches were "James McCabe," second-grade "McCabe" and third-grade "Beatson."



No. 45—AUTOMATIC STRIKING WATCH

No. 56—English lever by "R. F. Cowderoy, 27 Charington St., New Road, London, No. 3355." Very beautifully made.

No. 57—Cylinder by Jeffreys & Flam, No. 60617, Salisbury Square, London. Escape wheel is brass and regulator similar to modern practice.

No. 58—"Thos. G. Cathro. No. 266, Quebec." Lever escapement with very wide ruby impulse jewel, evidently with the idea of unlocking at mid swing of balance.

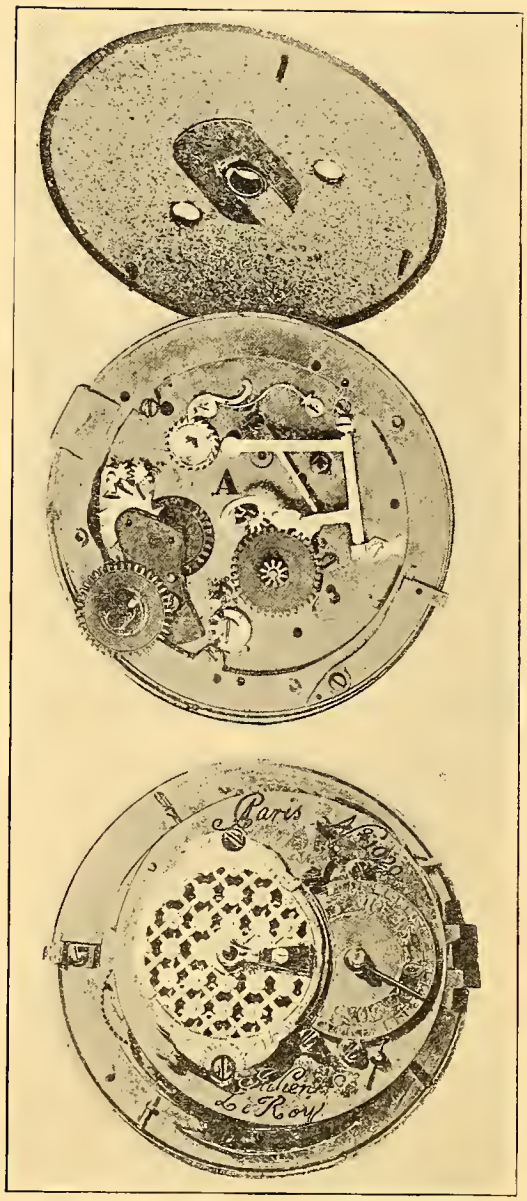
No. 59—"Vuillamy. London." Three generations of Vuillamy were in Pall Mall; Justin, in partnership with Benj. Gray, whose daughter he married; Benjamin, his son, and Benjamin Lewis, his grandson, born 1780, died 1854: a very eminent maker.

No. 60—Quarter hour repeater of thin model. Cylinder is made of ruby. Design suggests the influence of Breguet and has his temperature kirb and parachute.

No. 61—Swiss repeater marked falsely "Breguet."

No. 62—Constantine a Geneve. Very thin model cylinder escapement and graceful bridges, struck from a common center outside the movement. Made about 1800.

No. 63—Ruby cylinder and going barrel by "John R. Arnold, London, No. 3784." John Roger Arnold was the son of the

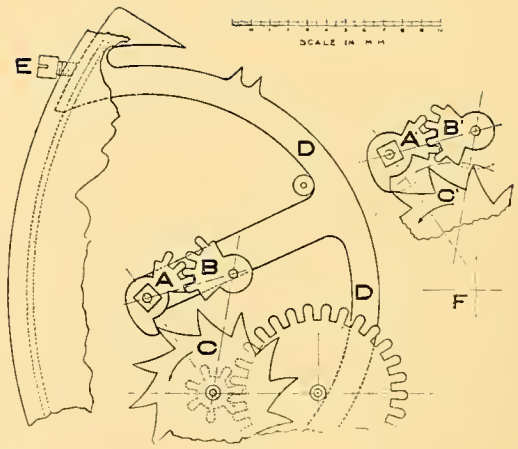


No. 52—ALARM BY LEROY

famous John Arnold and succeeded his father. He was in partnership with Edward John Dent at 84 Strand, 1830-40, and alone in 1842. He was succeeded by Chas. Frodsham.

No. 64—Lever escapement by "Arnold-Frodsham, No. 7254. 84 Strand, London."

No. 65—English lever 1 7/16" diameter. Top plate engraved "Dent Watchmaker to the Queen, No. 33405, 61 Strand and 34 Royal Exchange, London." Edward John



No. 52—ACTION OF LEROY ALARM

Dent, born 1790, died 1853. He was most famous, perhaps, for making the clock of the Houses of Parliament, designed by Denison (Lord Grimthorpe). He carried on very valuable experiments on the effect of heat on balance springs. He made many fine chronometers.

No. 66—"Patek Phillipe." One of the earliest stem-wind models. Invented by Adrien Phillipe in 1843.

No. 67—"K. W. Samelius, Stockholm." This watch or clockhand, one of the earliest of the mystery watches was made by Knute Wilhelm Samelius born 1836 at St. Anna, Sweden. This piece which shows the seconds, minutes, hours, days of the week, days of the month, year and leap year, revolves on a pin set out from a glass dial and has no apparent means of driving. The lower part of the hand as shown in the figure contains a cylinder movement which changes its centre of gravity so nicely that the changing centre of gravity of the hand as a whole turns the hand to the proper hour and the calendar part is actuated by a counterweight in the upper part. This was exhibited in the Stockholm Exposition of 1866 and was disarranged by a man by the name of Linderrooth who undertook to show its workings to the king, who desired to see "what made it go." As a result Samelius was given a traveling scholarship with a nine year's residence in England to study horological matters and bring the knowledge back to Sweden. Mr. Samelius moved to Chicago and died in 1881.

No. 68—Verge, Boslev regulator, marked "A" and "R"" carved bridge, screw adjusted potence and counter potence. Plate engraved "T. Brandt, Kiobenhavn, No. 101."

No. 69—LeRoy a Paris. Julien, 1686-1759. He devised a form of repeating mechanism much used in French watches and substituted springs for the bell in use before. Rope engine turned gold single case.

No. 70—Verge by "Johanes List, Augsburg." Made about 1780. Very graceful gold case.

No. 71—Cylinder of Lepine type, ⅛ inch thick, excluding minute arbor. Made probably about 1810.

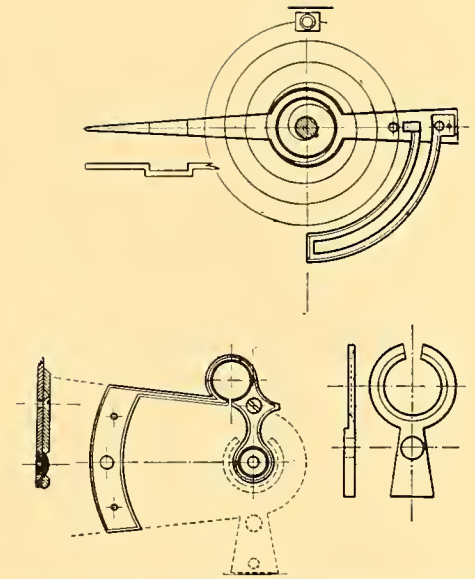
No. 72—Single silver case. Verge lever, carved bridge, plate also carved, by "Jas. Shilling, Boughton."

No. 73—Verge, silver single-case, with "shutter" over winding hole, broad gilt rim around dial studded with five-sided pyramids, which decoration also encircles crystal, upper plate of movement covered with florid but coarsely carved and pierced scroll, pillars turned and knurled, potence and counter potence screw adjusted. This example was probably made in Switzerland about 1800.

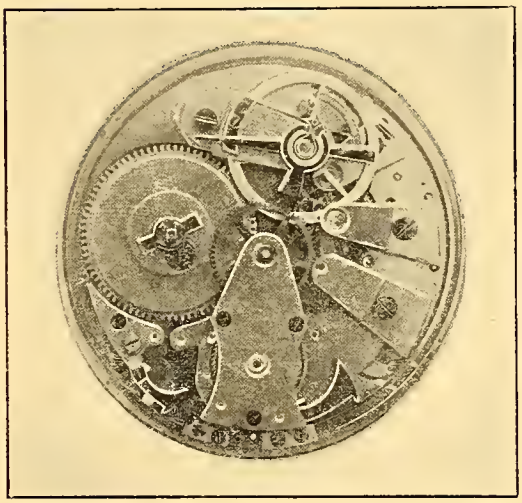
No. 74—Verge, single silver case, pillars carved pentagonal, bridge carved, potence and counter potence screw adjusted, plate engraved "Gudin a Paris." There was a Jacques Jerome Gudin in Paris 1769.

No. 75—A silver pair case watch by "Isc. Larpent & Jurgensen a Kiobenhavn, 853." Joergen Jurgensen, who died in 1811, was the first of three generations of a family of celebrated Danish watchmakers. Dr. Ernest Basserman Jordan, in the preface to a watch sale in Munich in 1912, says that Joergen Jurgensen, with Larpent, formed in 1780 at Roeskelde a watch factory where over 1,500 good watches were manufactured. In Kopenhagen was a selling store which in 1801 was acquired by his celebrated son Urban. The cases are severely plain and very nicely fitted. The dial is enamel. The movement resembles English work of about 1770. The escapement is a verge and the pillars square moulded. Later watches bearing these names and with cylinder escapement resemble French or Swiss design and workmanship.

No. 76—Cylinder, quarter repeater and alarm, silver open face case. Alarm striking on same bell as repeater is driven by separate mainspring which has same safety stop work as modern watch. Spring dust cap engraved "Froidevaux a Berne," made probably about 1800.



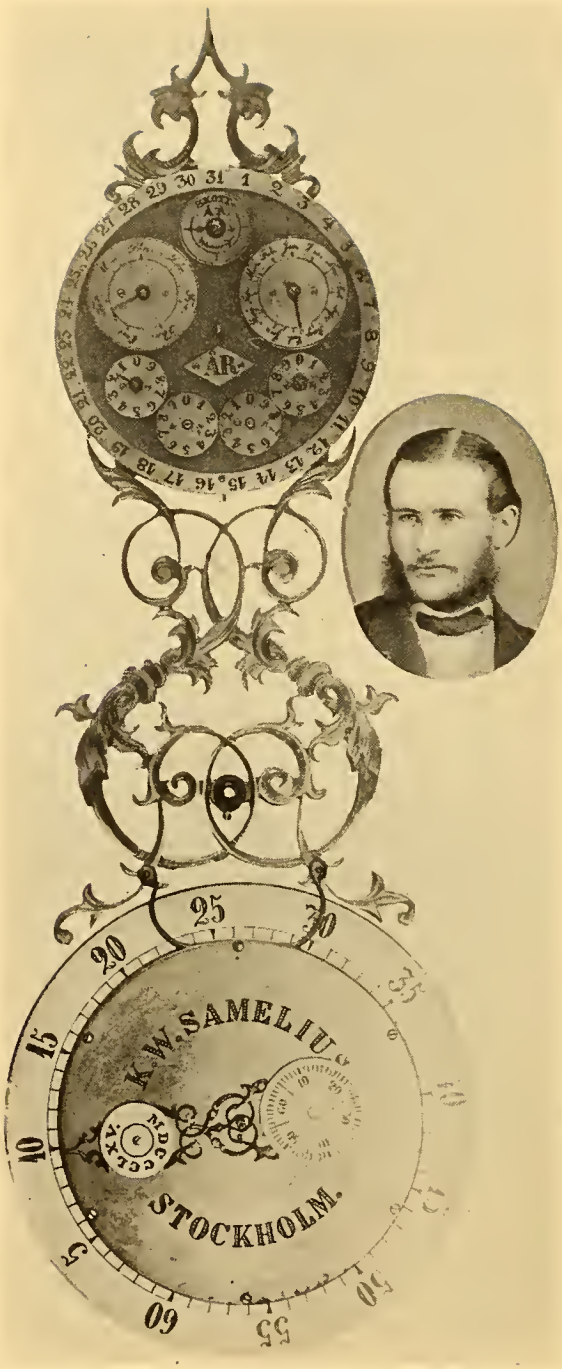
No. 60—HARRISON COMPENSATION KIRB



No. 60—RUBY CYLINDER REPEATER

No. 77—Baccuet, London, about 1690. Silver dial. Plain inside case. Repousse outside case.

No. 78—English lever, silver pair case, steel balance with brass rim outside of steel, compensated for heat and cold, with "curb" acting on balance spring pins, plate



No. 67—MYSTERY WATCH

engraved "Wm. Robinson, Liverpool. Patent No. 4510." This example made about 1830.

No. 79—Night and day watch by "Jno. Parker, Lindfield, No. 1912." The upper part of the dial has a semi-circular opening through which the sun points to each of the twelve hours and is succeeded by the moon, both outlined in gilt on a blue background which revolves underneath the dial, taking the place of the hour hand. The minute hand revolves as in the usual watch. The escapement is a verge and was made according to the hall mark in 1813.

No. 80—Silver pair case, verge, by "Tho. Arnold, London." Britten states that this maker was apprenticed in 1687 to Nat. Chamberlaine, junior, and admitted to the Clockmakers' Company in 1703. A quaint notice in the London *Gazette* of January 22-25, 1676-77, probably refers to this instructor of Arnold's. "These are to give notice that Nathaniel Chamberlin, Watchmaker (who hath lived several years at Chelmsford, in Essex), for the beter accommodation of his friends and customers, hath, at the request of divers of them, taken a Chamber at Mr. John Rust's in Angel Court, in Lombard St., where he doth intend, God willing, to attend the last Fortnight in every Term, for the mending his own Work, and accommodating all persons that shall have occasion for New."

It may be surmised that this piece was made for a presentation piece. The outer case is carved with deep bas relief and in the center depicts what probably represents William III. at the Battle of the Boyne. There remains sufficient of an inscription to presume that it was "Gulielmus III. D.G. MAG. B. F. ETH, REX" or expanded, "Gulielmus III. Dei Gratia Magnae Britanniae, Franciae et Hiberniae Rex." Willian the Third ruled alone between 1694 and 1702.

Near the pendant is a figure carrying a bugle and trampling implements of war. On the right and left and below are three shields which had coats of arms surmounted by crests and below streamers on which were mottoes. The arms, crests and mottoes are unfortunately too worn to decipher. The style of carving is extremely effective and stands out very nobly in comparison with the repousse work, which a little later was very popular.

The bow is of a graceful design in brass and is seen infrequently in watches just succeeding the period when the bow was simply a ring loose through the pendant.

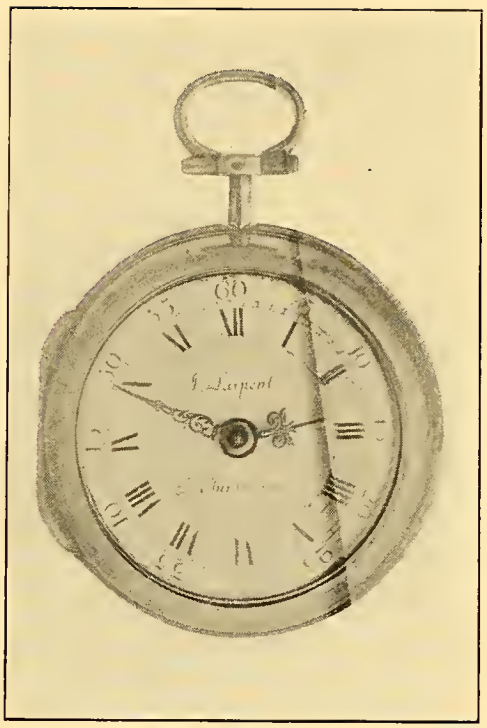
The inner case is plain with opening in back for winding. The bezel is split at the joint to enable the crystal to be inserted. The movement is very well made for the period—and in good condition. The pillars are of the lily type, well executed, and the teeth of the wheels very accurately filed. The potence post is riveted into the top plate and the spring set up is the tangent screw form. The arbor of the main wheel is solid with it and journals at the top in the winding square, which is solid with the fusee, a very substantial arrangement. The dial is enamel and is probably one of the earliest, though it may have been especially made at a later date. The dial feet fit perfectly the original holes in the brass ring.

No. 81—Verge, quarter repeater, striking on bell, open face, calendar circle, gold case, perforated with small holes to allow sound to escape; spring dust cap, movement exquisitely made, third and fourth wheels, repeating train and balance staff, end capped with steel cocks inset with brass bearing spots; repeater arranged with "dumb piece" so that vibration can be felt in silence. Scroll on bridge has worked into the design "L. D. B. & Fils," but movement and dial engraved "Nottnagel Montmollin & Comp.," possibly the sellers. Made about 1800. Examples of Du Bois et Fils are in the Guildhall, Wallace and Fleisher Collections.

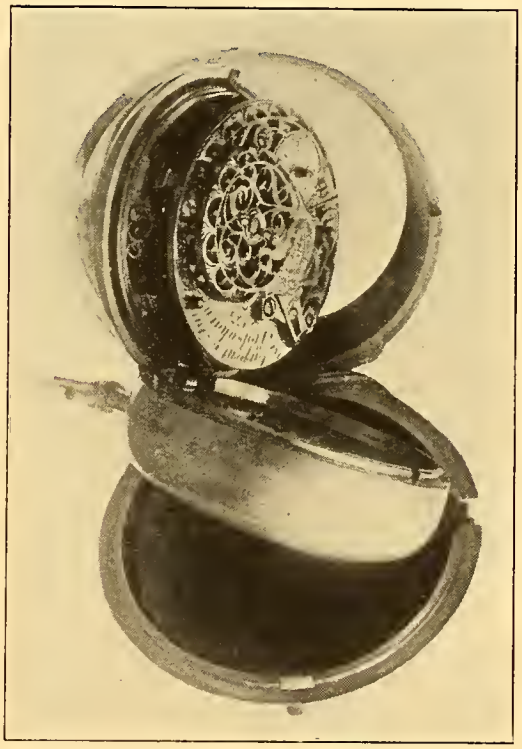
No. 82—Cylinder, cap engraved "Lepine, cylinder escapement, No. 15904, six holes jeweled." Made about 1820.

No. 83—Verge watch engraved "Dorwes, London." half-quarter repeater cased with plain silver outer case, beautifully chased repousse middle case, "Diana and the Chase," and pierced engraved inner case. Made about 1760, perhaps in Amsterdam for the English trade.

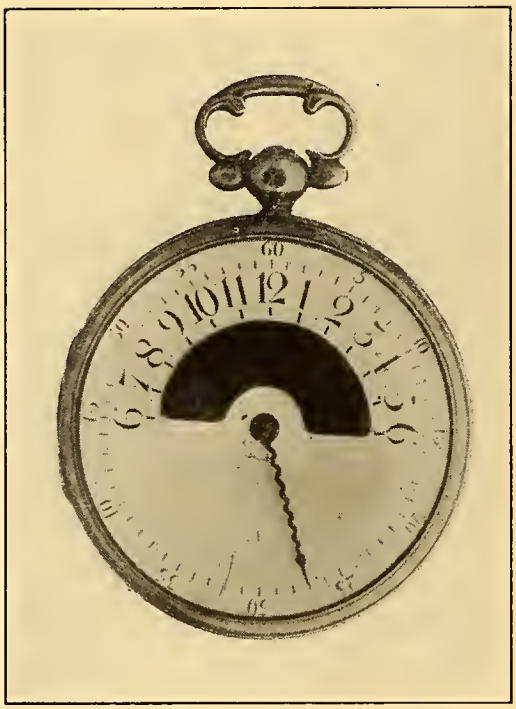
No. 84—A large watch by Gille Martinot having but one hand, metal dial with enamel plaques for the hours, and the case covered with tortoise shell. Gille Martinot was one of a family who held a long succession as French Court horologists. Gilbert, 1572; Denis, 1611; Zacherie and Balthazar, 1637; Gille, 1661; Jean, 1686; Louis Henry, 1688; Henri, 1670; Jerome, 1695; Jacques, 1718; Jean, 1727; Claude, 1729. Gille was the brother of Jean and father of Henri. The court horologist had lodging at the Louvre



No. 75—VERGE BY JURGENSEN



No. 75—VERGE BY JURGENSEN



No. 79—NIGHT AND DAY WATCH BY JOHN PARKER

in apartments reserved for distinguished artists, dined in the castle at the table of the Gentlemen of the Chamber, had the right of entry to the King's presence along with the distinguished members of his household and the one on duty assisted in preparing the King for the day by selecting and winding up his watch. The salary received was 395 livres quarterly.

No. 85—Verge, half-quarter repeater striking on bell, outer silver case covered with a lacquer resembling tortoise shell, inner case beautifully chased and pierced for the emission of sound, potence and counter potence not screw adjusted, plate engraved "LeRoy a Paris, No. 356." This is probably the celebrated Julien LeRoy, 1686-1756, who invented the gong which superseded the bell for repeaters. Examples of "LeRoy" are found in Moore, Dennison, Munich, Proctor and Wheeler collections, and examples marked Jullienne or Jln LeRoy are in Wheeler, Garnier, Hearn, Boston Fine Arts, Dennison, Wallace and Morgan collections.

No. 86—Lever escapement with two mainsprings to run eight days, by "James Murdock, London."

No. 87—Verge, quarter repeater, open face, silver case, dial removed to show repeating mechanism. No name on movement, but made probably in Switzerland about 1800.

No. 88—Combination, duplex, lever and chronometer by an unknown maker. The escape wheel resembles the Chinese Duplex; the impulse is given direct to the balance, and the locking and unlocking is taken care of by anchor and fork. The final escape takes place once a second. Mr. James Arthur has an example like this with "Rodin et Cie" engraved on the case cap.

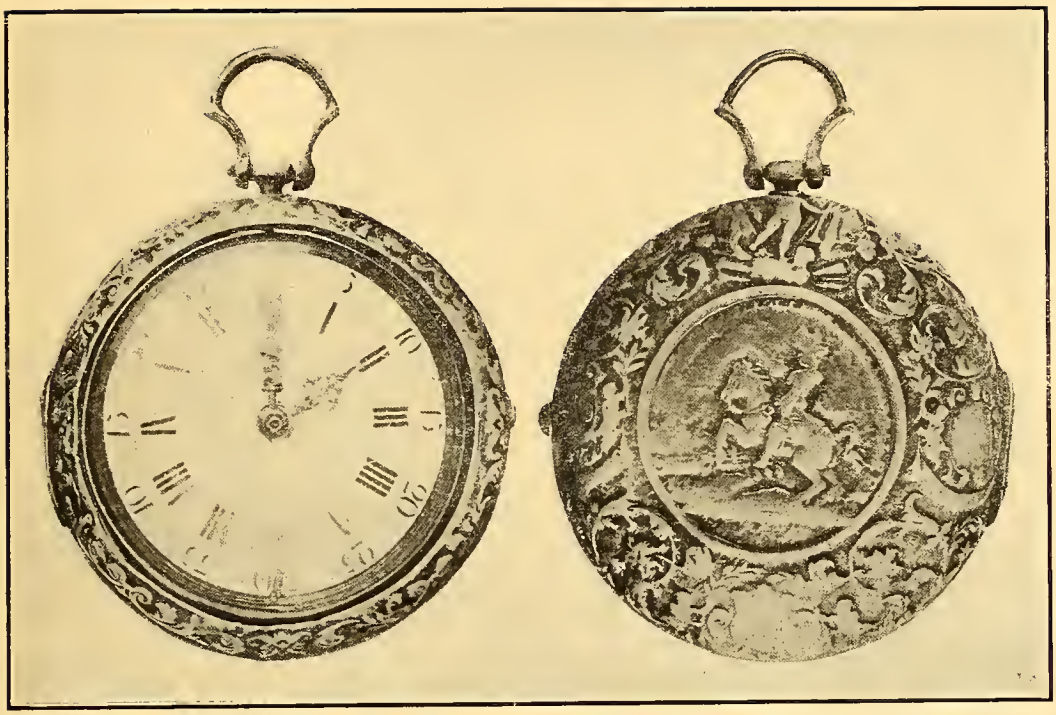
No. 89—Peculiar escapement. Movement engraved "Patent Union Chronometer, 2636." This is a combination of a lever and chronometer made by Charles Grant Kelvey and William Holland of Rock Ferry, Birkenhead, under a patent granted them in 1859, being a "simplification" of one granted previously to George Morton.

No. 90—Dead beat verge, silver single case, silver balance, Bosley regulator, going barrel, ruby end stone, screw adjusted potence and counter potence, movement engraved "Olivier Quartier, Locle en Suisse, Fecit." The escapement is a variation by Paul Garnier on those of Debaufre and Sully. Example made about 1850.

No. 91—Verge, silver pair case, outer case chased repousse a jour, pillars carved rectangular, outside ratchet on fusee, bridge and scroll pierced and carved, plate engraved "Tarts, London (No.) 10673." Britten gives the period of 1755-90 for watches engraved Tarts.

No. 92—Verge, probably Swiss, about 1840, bridge carved with deep cut and good floral scroll. Handsome Arabic dial and gold hands. Case of low carat-gold, very red, stamped 1169 and PP. Pendant thin and wide after English model.

No. 93—Verge, silver pair case, solid bezel, locking bar nib projects through enamel dial, finely carved steel hands, pillars carved rectangular, bridge and scroll pierced and carved, outside ratchet on fusee wheel, worm gear set-up, potence screwed to plate, plate engraved "Martineau, London." This example was made probably about 1760. There was a Joseph Martineau 1850-70, and another one, 1790-94.



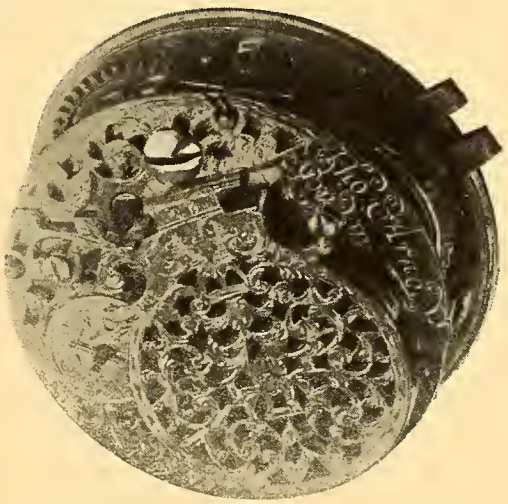
No. 80—VERGE BY THOMAS ARNOLD

No. 94—Verge watch by "Samson Leekey, London, 9139." This has silver pair cases, the outer one being repousse. The hall mark gives date of 1805. The balance guard has two feet, unusual in English work, the set-up is ratchet and pawl under the dial. The locking nib extends from under the dial and the spring and screws are ornamented, a curious assemblage of different periods.

No. 95—Filled case, very beautiful example. Inner case engraved "L'Epine. Detached lever, 13 jewels. No. 69444."

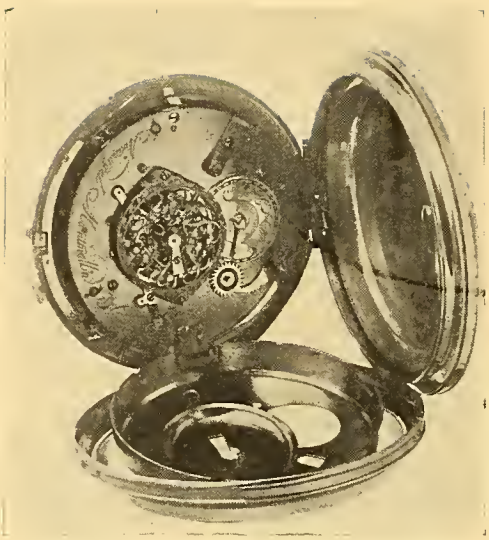
No. 96—Plain quarter hour repeater with verge movement; silver case stamped F. M. C. in lozenge and the numbers 38976 and 2696. The style of case (excepting bow and pendant), dial and hands are after Breguet. The movement resembles early 19th Century Swiss work. The dial is a beautiful example of die work in invitation of engine turning. The numerals are wax filled.

No. 97—Decimal dial movement. This is a Swiss or French verge, without signature, but probably made about 1820. After the French Revolution there were many attempts to introduce the decimal system into time reckoning. The dial is divided on the



No. 80—VERGE BY THOMAS ARNOLD

right into five parts, each subdivided by ten divisions, the left side divided into twelve parts. The hour hand extends in both directions so that the time can be read decimally or duodecimally. The minute hand (missing in the photograph) revolves once an hour and apparently is to be disregarded in reading decimally, though the calculation can be made if desired.



No. 81—VERGE, PROBABLY BY DUBOIS & FILS

No. 84—VERGE BY GILLE MARTINOT

No. 98—Karrusel by B. Bonniksen, London, No. 57062. The entire escapement, balance escape wheel and lever are planted in a karrusel or cage which revolves once in 52.5 minutes to overcome or average position errors. The watch is cased in gold and corresponds in diameter to a 16 size American movement, but is somewhat thicker. The general scheme is the same as that of Breguets Tourbillon of 1801.

B. Bonniksen was of Danish birth, and was at one time instructor in the British Horological Institute. His watches were made in Coventry. A watch by Brockbank, Atkins & Moore, made under Bonniksen's patent, is in the Nelthropp collection in the Guildhall Library, London. This watch was described in detail in January, 1919, issue of the *American Jeweler*.

No. 99—Rack lever, silver case, second hand rotates four times per minute, being planted on scape wheel, which has 30 teeth, there being no fourth wheel. Plate is engraved "M. I. Tobias & Co., Liverpool, 3453. Patent." This example was made 1815.

No. 100—Verge movement and quarter hour repeater by "W. Tomlinson, London, 2239." This is a beautiful piece of mechanism. The repeating part is very like Graham's work, has a rack and stationary star wheel with a teeter-like "all or nothing piece" probably that attributed to Matthew Stogden.

William Tomlinson was admitted to the Clockmakers' Company in 1699 and was Master in 1733.

No. 101—Silver-cased verge. Shows one of the forefathers of the stem wind. The bow is tipped back and the top part of the pendant is pulled out several times, the chain being wound around a shive wheel which contains a light spiral spring within it (somewhat after the fashion of a pocket spring tape measure) which draws it back. As it is pulled out the ratchet winds up the fusee. This was made by "Andrew Crawshaw, Rotherham, No. 12262," who was in business 1810-42.

No. 102—Case winding silver watch. The cut shows the mechanism of a winding effected by the closing of the case. A rack is attached by appropriate linkage to a bell crank pivoted on the pin of the case joint. The setting is accomplished through the

pendant. The dial and two bridges are removed in the photograph. This example is a lever movement, very beautifully made, engraved "Robert Theurer & Fils, Chaux-de-Fonds, Brevets, S. G. D. G., Ancre 370." Made about 1860.

No. 103—Pedometer watch engraved "Loehr Patent, No. 479." The cut shows the movement of a watch which is wound by the movement of the body. A counterweight is pivoted at the end of a lever which, as it moves up and down, works a pawl against a ratchet wheel geared to the winding post. This device was used by Louis Recordon, London, in 1780; A. L. Breguet, Paris, in 1783, and by many others since. The winding is quite practicable, but the bumping of the counterweight is not conducive to the finest performance of the adjustments.

No. 104—Virgule escapement by "Jaqs Oltramare a Bordeaux." This watch has a sweep, jump second hand and independent train. Two-hour circles record, one the regular time and the other only when the sweep second runs. The virgule, so-called from the resemblance to the punctuation mark called a comma in English, is usually attributed to Caron.

No. 105—Verge, silver pair case, calendar dial, carved pillars, inside fusee wheel ratchet, screw adjusted potence and counter potence, silver cock, Bosley regulator, steel ornaments, silver spring cap with "transom," dial engraved "Fisher & Sons, London." There was a Daniel Fisher & Son, 1790-1804, but this example was probably made in Switzerland about 1800, judging from the workmanship and design.

No. 106—Verge movement engraved "Chevalier a Lonfleur. No. 109."

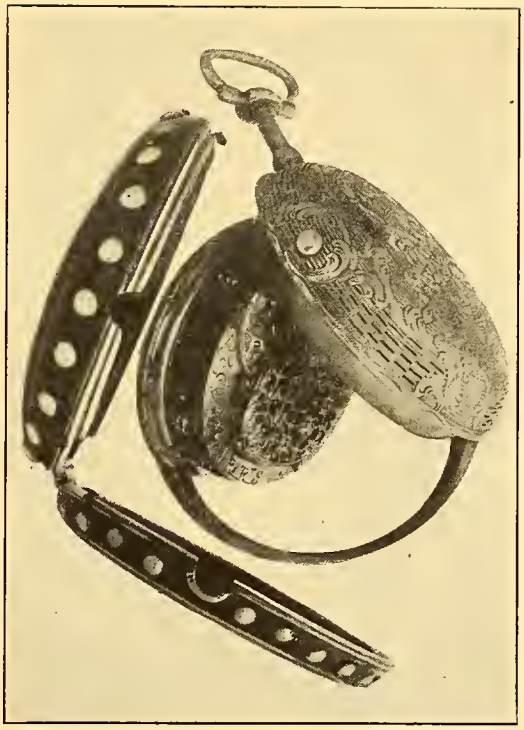
No. 107—Mysterious movement. "Brevet 22 V. I. 88." Silver case. Glass both sides. Glass dial. Train invisible is arranged near pendant.

No. 108—"Auburndale, Mass. No. 1650." Horse timer with peculiar escapement.

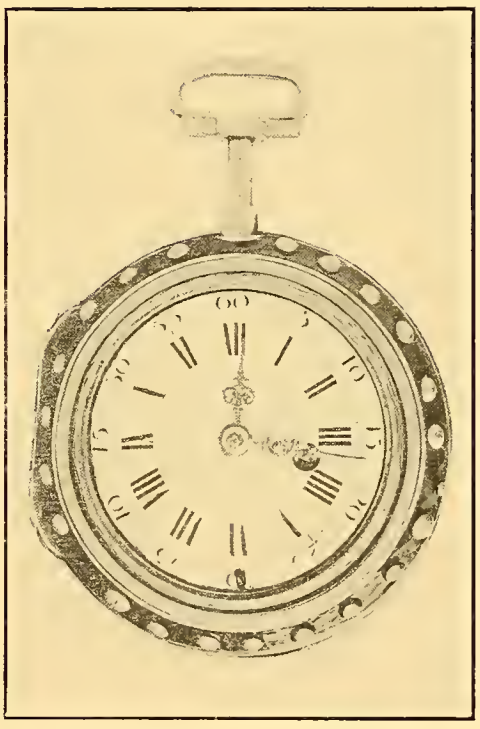
No. 109—Ja. Duncan. 1725. Chancery Lane, London. Silver pair case.

No. 110—Jno. Clayton, London. Silver pair case.

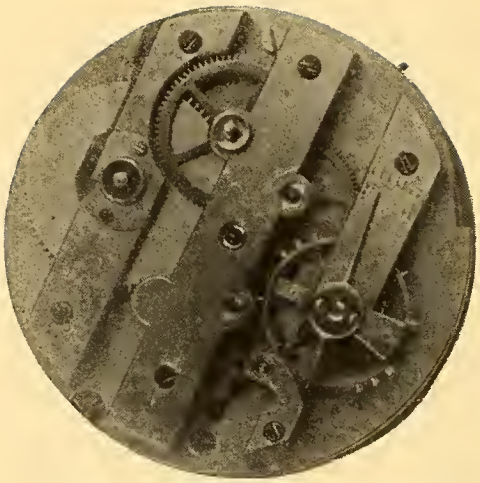
No. 111—Ruby cylinder, engraved "Breguet et Fils, No. 1766." This is of interest as showing a boldness of design worthy of the great maker, Abraham Breguet. The second, third and fourth



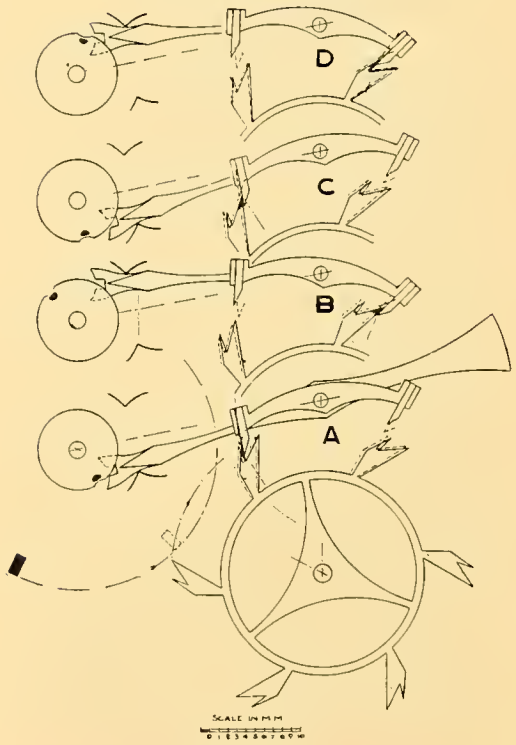
No. 85—REPEATER BY LEROY



No. 85—REPEATER BY LEROY



No. 88—DUPLEX-LEVER CHRONOMETER



No. 88—ACTION OF ESCAPEMENT

wheels are carried by a skeleton rectangular bridge, the barrel hung from the heavy pillar plate, the balance bridge open and light, and the lifting spring absolutely straight and plain, all giving the impression of simplicity and directness. The movement has been recased in silver with gold bezels in conformity with Breguet's design. It is of interest that the watch, without compensation and after having run about a hundred years, keeps time within two minutes a month. The dial does not have "Breguet" scratched under the figure 12, and there are some points of design and workmanship which raise doubts as to its authorship.

No. 112—Cylinder escapement, gold balance, thin model of about 1830. Gold case, open faced, stamped "J C" crown, and 2320; back engine turned. Edges pendant and ring very beautifully carved. Silver dial with Roman figures applied in same metal and ornamentation applied in quatre coleurs.

No. 113—Verge, silver pair case, outer case chased repousse, bezel split at joint, locking bar projecting through dial; thick movement with elaborate pierced carving on pillars, cock, foot and scroll; worm gear set-up; fusee with outside ratchet, potence riveted to plate. Plate engraved "Ferd. Zolling, Fr'furt, (No.) 461." This example was probably made soon after 1700.

No. 114—Le Pine a Paris.

No. 115—Verge, quarter repeater, similar to No. 87, but smaller and with rounded and hollow ball sliding over hollow pendant. Made by "Ld. Bordier, No. 4106," about 1800.

No. 116—Sapphire cylinder quarter hour repeater by "Barrauds, Cornhill, London 6591." This is an elegant example of the period. The escape wheel is of brass, as is also the balance. The design is simple and devoid of ornamentation. The repeating mechanism is after the French type with chain, but is finished in the English type in the grey. The dial is fastened by tapered screws from the brass ring passing through holes in the dial feet. This was probably Paul Philip Barraud, 1796-1813.

No. 117—Verge, white metal pair case, dial marked "Samson, London." Made about 1800.

No. 118—Verge, silver pair single case, skeleton upper plate, pentagonal carved pillars, inside ratchet fusee wheel, Bosley regulator, steel ornaments, screw adjusted potence and counter potence, spring dust cap. There is no name on the movement or dial, but the design is a copy of one of Lepine's earlier models, and is suggestive of the evolution of bars or bridges to replace the full plate.

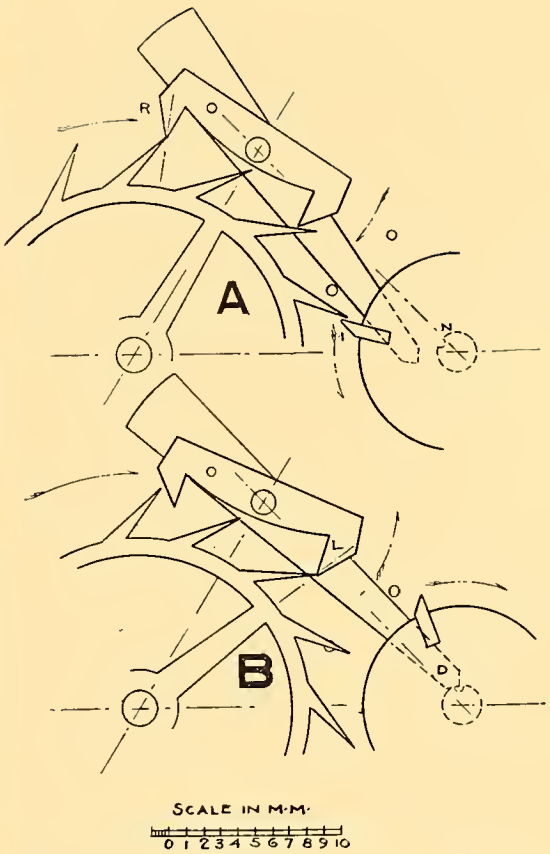
No. 119—Verge, quarter repeater, open face, with exposed repeating work and figure of Father Time and consort striking with hammers imitation bells when the hours and quarters are being actually sounded on gongs. No name on movement. Probably made in France or Switzerland about 1800.

No. 120—Verge, silver pair case, split bezel, brass ring around silver dial, which has sunk center with carved ornament and engraved "Nicod, London," opening through central part of dial shows day of the month; locking bar nib projects through dial; pillars carved rectangular; cock, foot and scroll pierced and carved; set-up ratchet between barrel and under plate; top plate engraved "Nicod, London." This example may have been made as late as 1750.

No. 121—Gold enamel watch by "Moricand & DeGranges, a Geneve, No. 61030." This has a small verge movement in a very thin case enameled front and back with most exquisite coloring in the champleve style displaying a butterfly. Made about 1800 and reputed formerly the property of the wife of Nicolai Michelli, a general of Garibaldi's army.

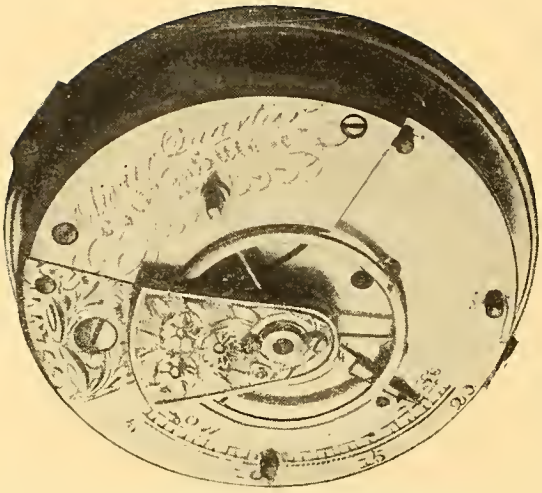
No. 122—A skeleton verge watch by "L'Epine, H'ger du Roy," gold case studded with small diamonds around the front and back bezels (many missing); hands and dial set with diamonds. Jean Antoine L'Epine was born 1720 and became court horologist to Louis XV. This watch, with its skeleton top plate, suggests the evolution of L'Epine's bridging which he is said to have brought out about 1770. He died in 1814, the business being continued by his grand nephew. This example was probably made between 1750 and 1760, and quite likely for some lady of the court.

No. 123—Cylinder by Thomas Mudge. This example is in most perfect condition, apparently as it left the hands of its famous maker in 1755. The dial is of enamel with an opening to show the alarm dial which is set by key through dial. The hands are exquisitely carved from steel and blued. The cases of silver are carved a jour, as seen in illustration. The inner case is hall marked with date letter "u." lion, head with crown and casemaker's initials TC. Both inner and outer case have seven leaf joints. The joint or hinge to the movement is attached to the "brass edge" carrying the

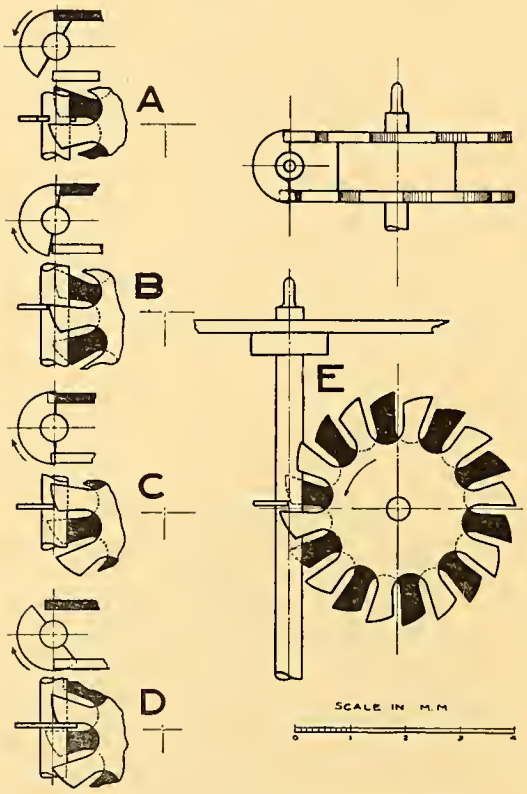


No. 89—ACTION OF ESCAPEMENT

No. 89—UNION CHRONOMETER



No. 90—GARNIER ESCAPEMENT BY QUARTIER



No. 90—ACTION OF ESCAPEMENT

dial. The movement is beautifully made. The escape wheel is of brass. A peculiar banking scheme used by Mudge is a pin put through the cylinder and projecting to bank against a pin standing out from the potence.

Thomas Mudge, born in 1715, was apprenticed to and succeeded Graham in 1751. About 1755 he entered into partnership with William Dutton, another apprentice of Graham. Mudge invented the lever escapement about 1765. Britten says that it appears that he constructed but two movements on this principle: one for Queen Charlotte, and the other for his patron, Count Bruhl, which performed remarkably well. In 1793 he received the remainder of 3,000 pounds as result of report of committee appointed by House of Commons on performance of chronometers sent in 1774 and 1779 in competition for the prize by the Board of Longitude, and a like amount was awarded Arnold and Earnshaw. He died in 1794.

No. 124—Silver pair cased verge by "J. Wilders, London, 14307," hall mark of 1780. This watch belonged to a Dutch sea captain and has his original fob and seals, keys and amulet inscribed "Das disch das wassar nicht ersauffe," which has been freely translated "May the waters not engulf you." The dial is of silver and has a very pretty overlay design in the center.

No. 125—Verge, single case, painted dial with two small circles, one for hours and minutes and the other for days of the month, the large circle with seconds and a center sweep hand. Maker unknown, probably Swiss make about 1820.

No. 126—Verge watch with worm and gear set-up. silver case, enamel dial, engraved "Chas. Cabrier, London, 3468." This was probably the third of this name, the first admitted to the C. C. Company in 1697, the second in 1726 and the third in 1756.

No. 127—Pocket chronometer by "Jno. R. Arnold, London, Invt et Fecit No. 1791." It has the involute escape wheel tooth and inner discharge, compensated balance, and barrel spring, all as invented by the father, John Arnold, who with Earnshaw is given credit for the design of the modern chronometer. It has been recased with the dome of glass to display the movement. Made about 1800.

No. 128—Tourbillon with chronometer escapement by "Girard Perregaux, La Chaux-de-Fonds." This is a beautiful specimen of Breguet's many inventions. It was formerly the property of Harvey D. Colvin, mayor of Chicago, 1873-6, and was in the

early eighties converted to a stem wind by some artist of great skill. The entire escapement revolves once a minute, to average the position errors. A detailed description appeared in the August, 1916, issue of *The American Jeweler*.

No. 129—"James Nardin, Locle." Pocket chronometer recased in silver. The pocket chronometers of James Nardin figured frequently in the prize pieces of observatory trials.

No. 130—Watch chronometer by "B. Lawley, London, 6034." This is an exquisitely made stem wind fusee movement, ¾ nickel plate and fitted with a balance spring composed of a flat spiral and cylinder with overcoil terminal, a form attributed by Saunier to Hammersley, probably the Jno. Hammersley of Clerkenwell, born 1819, died 1901.

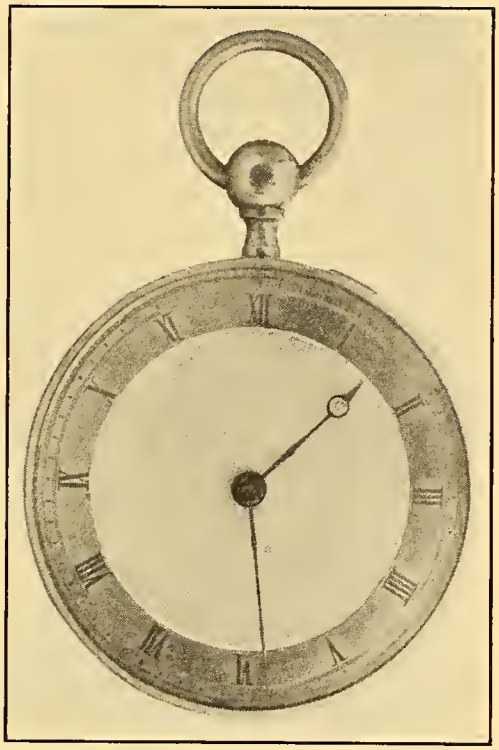
No. 131—Pocket chronometer cased in gold, engraved "Louis Eisenhard, Geneva, 1190." This watch was originally the property of Mr. Matson, the founder and predecessor of the present Spaulding & Co., Chicago and Paris. It was made key wind and later converted to stem wind by some very expert workman. The detent is of the bascule type and the balance spring is curious as being in two planes, the upper spiral having four turns and the lower spiral nine turns.

No. 132—"Chas. Frodsham, No. 05947, 84 Strand." A beautifully made lever movement with flat spiral balance spring, gold case engine turned. Charles Frodsham, born 1810 was son of William James, grandson of William (whose wife was granddaughter of John Harrison) and great grandson of William, born 1728, all eminent watchmakers. In 1842 Charles Frodsham succeeded John R. Arnold at 84 Strand.

No. 133—"Arnold-Chas. Frodsham, 84 Strand, London, No. 8629." Spring detent, pocket chronometer, made about 1845.

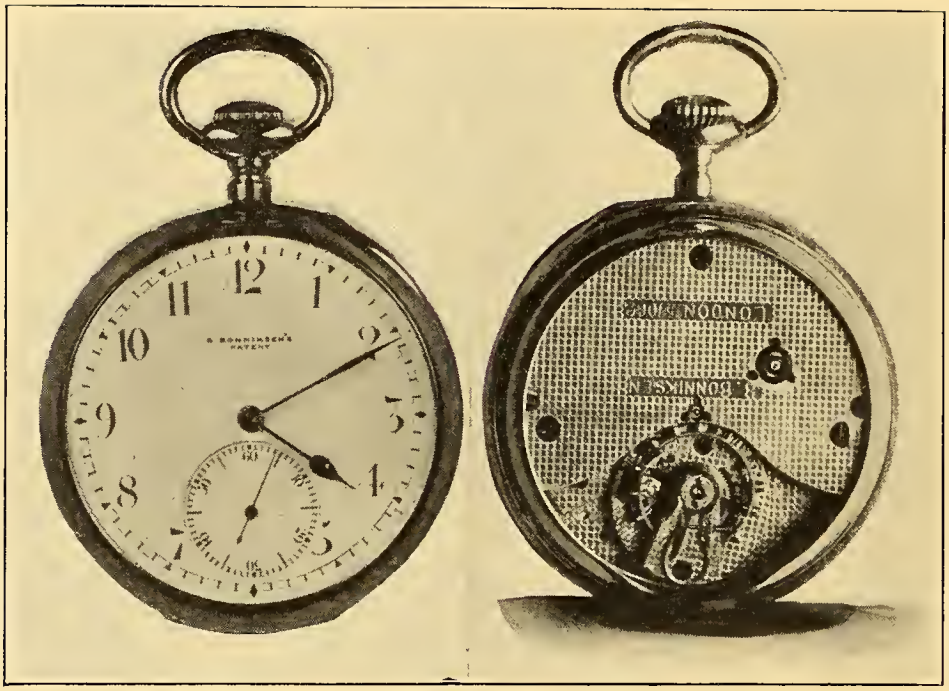
No. 134—"Chas. E. Jacot, Chaux-de-Fonds. Isochronal. Vibrations quarter seconds. Lever escapement. 28 ruby jewels. Compensated balance." Beautifully made. 1858 on dial.

No. 135—Key wind lever movement by "M. Grossman, Glashutte, No. 1790." Dresden, Saxony, 1826-85. Morris Grossman was the most celebrated German horologist, who lived for the most part in Saxony, 1826-85, though he spent a considerable time



No. 96—SILVER DIALED REPEATER

No. 97—DECIMAL AND DUODECIMAL DIAL



No. 98—KARRUSEL BY BONNIKSEN

in England and wrote his prize essay on the lever escapement in English.

No. 136—Verge, Swiss made. Inner silver case only, stamped MFLIFD and AUGSBURG. Wind in back. The pendant is cylindrical with ball also cylindrical. Very wide pendant bow equal to half diameter of case. The Roman figures are very heavy, the "four" being ¼" by ¼".

No. 137—Bascule detent chronometer by "Jules Jurgensen Kiobenhavn, No. 7168." This is a thin and small diameter, 19 ligne, and very well made, exhibiting the calibre favored by this famous maker. Jules Jurgensen was born at Locle 1808 and died 1877.

No. 138—"James Nardin. Locle, No. 9507." Lever escapement, very well made.

No. 139—"Automatic Watch Co. Pat. 1885." Silver gilt case. Lever escapement. The hours and minutes show through openings in the dial, each number jumping at the completion of the previous minute or hour.

No. 140—English lever, silver pair case, steel balance 30-tooth scape wheel, no fourth wheel, second hand planted on scape wheel. Plate engraved "Jos'h Johnson, Liverpool, 1502." Made about 1820.

No. 141—A watch engraved "Edw. Dormer London 6363," skeleton plate, verge escapement, and may have been designed from one of Lepine's. The back of the case, which is of brass gilt, has a crystal to display the movement and the winding is from the dial after the French style.

No. 142—English lever, silver case, dial has "wind up" circle compensated balance, 15 jewels, movement engraved "Tho's. Russell & Son, London & Liverpool, No. 61121." Cap engraved "By Appointment Makers to the Queen and H. R. H. Prince Alfred." This example made about 1830.

No. 143—Pocket chronometer by Girard Perregaux. This is fitted with a spherical balance spring, attributed to Jacques Frederic Houriet (1743-1830), Locle, a brother-in-law of Urban Jurgensen. On the center coil of the balance spring is pinned a finger which when the swing of the balance is too great interposes between a pin on the balance arm and two pins on the bridge, making a stop, this preventing over banking or tripping.

No. 144—Chinese Duplex, silver hunting case, dial marked "William Dixon, London," probably made at Fleurier, Switzerland, about 1850.

No. 145—"Arnold-Chas. Frodsham, 84 Strand. London, No. 8426." Lever escapement.

No. 146—"Jules Jurgensen. Copenhagen. No. 9408." Key wind, lever escapement.

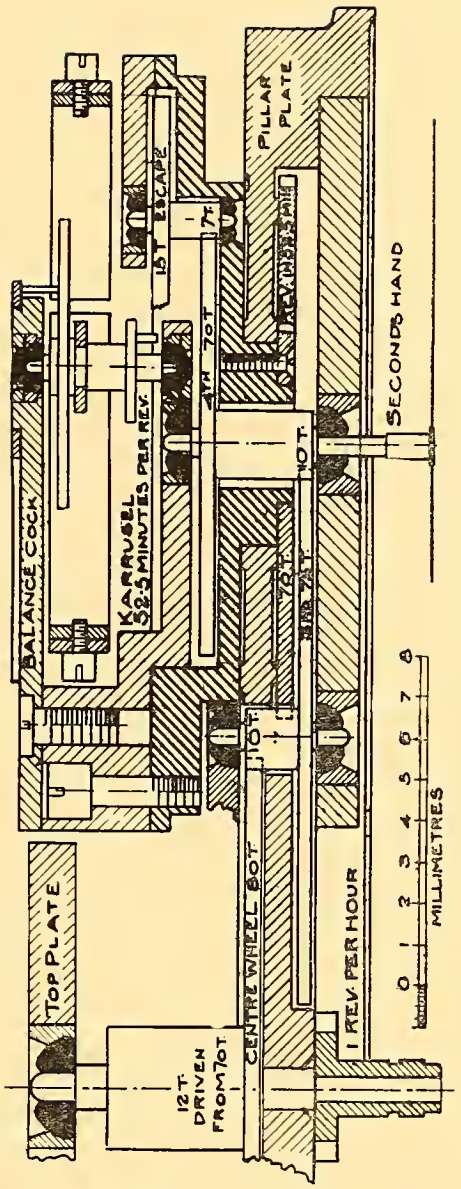
No. 147—"Dent, Chronometer Maker, London, No. 54870." This was originally a chronometer but converted to a lever escapement.

No. 148—Silver cased verge watch by "Parkinson and Frodsham, 4 Change Alley, No. 1745." Wm. Parkinson and William James Frodsham F. R. S., entered partnership in 1801, which continued till 1842 at No. 4 Change Alley.

No. 149—Quarter hour repeater by "Jacque De Bon a Paris No. 7762." Gold case engine turned with crest and coat of arms. Edges of case enameled with delicate floral design; the movement has cylinder escapement, sweep seconds hand and repeater striking on gong attached to case instead of the usual arrangement of attachment to the movement. On the edge of the "brass edge" of the movement is engraved "En 1783 fait pour M. Maurice De Brabeck, M. A." The balance cock has worked in the scroll De Bon. De Bon was "clock maker to the Duke of Orleans."

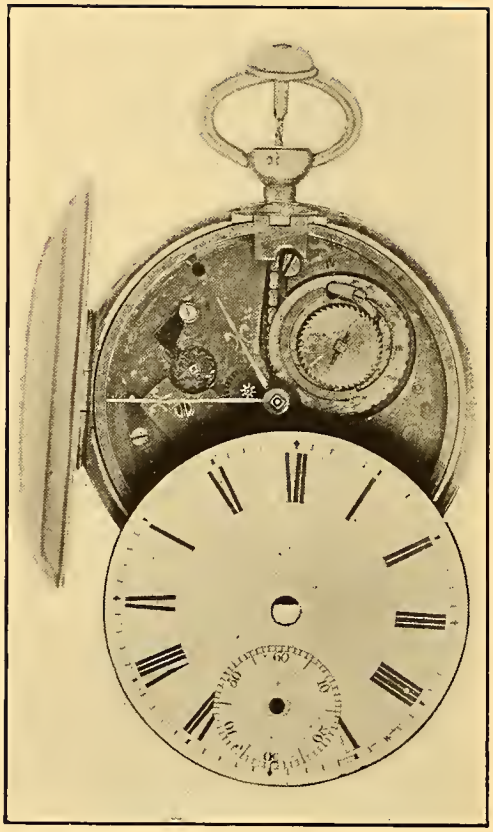
No. 150—A verge movement by "Will'm Anthony, London, 2185." This movement carries the back cap, case lock spring and lift spring and is very thin at the edge, suggestive of a case having a sharp edge and only one joint. William Anthony was at 55 Red Lion St., St. Johns Sq., Clerkenwell. He was born about 1764 and died in 1844, and was reputed to have been one of the most expert watchmakers of his day. A handsome watch by him was sold from the Dunn Gardner Collection in 1902 for 200 pounds.

No. 151—Verge with silver pair cases by Thomas Tompion. The outer case is 56 millimeters in diameter, the pillar plate is 41.5, 10.6 between plates and 26 from top of minute arbor to top of winding post. The joints are seven leaf and the movement hinge attached to "brass edge." The cases are not hall marked. The inner case is stamped 4289 and H. G., the casemaker's initials, and on the pendant knob C over 2. The winding hole appears to have originally had a "shutter" over it. The outer case was doubtless added later, having the case-



No. 98—ACTION OF KARRUSEL

maker's initials W. G. The dial had been replaced with an enamel one which has been removed and a replica by electro deposit from a Tompion in the Wheeler Collection put in its place. The locking bar had a pin projecting through dial, later removed to accommodate enamel dial. The movement is well made and the wheels probably were spaced with the circular file dividing engine contrived by Hooke about 1670. The regulator is the form devised by Tompion, the balance is brass and fitted



No. 101—PULL STEM WIND BY ANDREW CRASHAW

with a two coil spiral spring, covered by a handsome cock with wide base which Britten thinks he adopted after 1688. The potence post has a wide foot with a square post projecting through and riveted in the top plate. Tompion was probably the first to adopt this substantial construction, the former style having only a small ledge around the post through the top plate. Later two rivets were used instead of the one square and still later a screw and steady pins. The top plate is engraved with 4289 and the same number is stamped on pillar plate. Tompion was the first to number his movements, beginning it is thought by Britten about 1685. It is doubtful whether the numbers represented the actual number turned out. In advertisements for lost movements are found numbers 277 in 1682. 422, 458 and 0201 in 1691 and 3428 in 1704. It is not improbable that this movement with only two coils in balance spring was made previous to 1700.

Thomas Tompion, "the father of English watch making," was born in 1638 and died 1713, being buried in Westminster Abbey. He was the leading watchmaker at the Court of Charles II, and everywhere welcomed as an artist of commanding ability. Throughout his career he was associated with some of the leading mathematicians and philosophers of his time. By adopting the inventions of Dr. Hooke and the Rev. Edward Barlow (Booth) he brought English watch making to a place where it led the world, both in workmanship and dependability.

No. 152—Three-Wheeled Chronometer Lever by Don J. Mozart. This watch was one of a few made by the Ann Arbor Watch Co. in 1868, and is inscribed on the top plate "Made expressly for Clarke Cornwell, stock holder of the Mozart Watch Co. at a cost of $2,500 under Don J. Mozart, Patent, Dec. 24, 1868, Mozart Watch Co., Ann Arbor, Mich., No. 7," and on the dust cap "Chronometer Escapement by Don J. Mozart, full jeweled, made for Clarke Cornwell, who is a chip of the Old Block, A. D. 1869."

The U. S. Patent No. 72528 improvement in Watches Dec. 24, 1867, gives residence of New York and is the one referred to as of 1868 on watch. The escapement has direct impulse in one direction and lever impulse in the other. The case is a gold filled G. W. Ladd and beautifully preserved.

Don J. Mozart was born in Italy in 1820 and died in Ann Arbor in 1877. He helped start the New York Watch Co. in Providence in 1864 which later moved to Springfield, Mass., and later to Canton, Ohio, as the Hampden Watch Co.

This watch was described in detail in Feb. 5, 1919, issue of THE JEWELERS' CIRCULAR.

No. 153—Ruby cylinder by "Breguet et Fils" on dial and "Breguet 2089" on inner cap and movement. Plain gold case stamped R 2089, 923, diamond shield enclosing G M and part of a crescent, cherub's head with figure 2, two stamps nearly obliterated in polishing, one appears to have been a head and the other a circle open on one side and the letter B in one side of enclosure. The inner cap is of metal gilded. The dial is fastened with one screw underneath the figure 12 and between screw and figure is Breguet's "trademark"

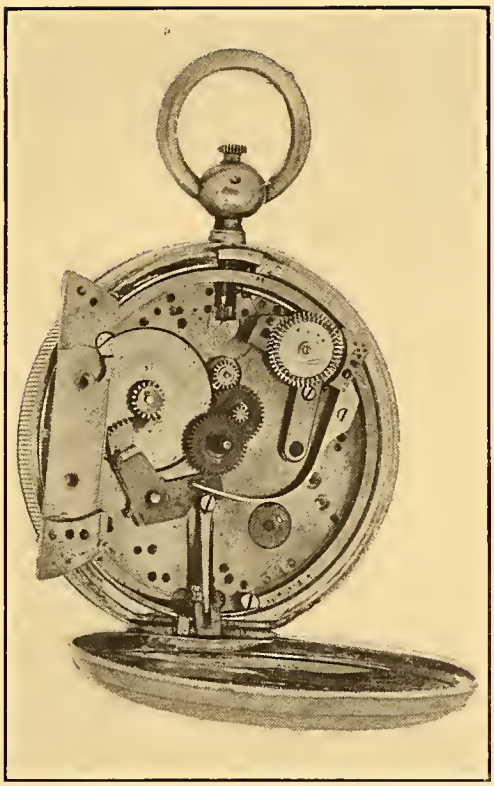
scratched by an automatic machine in the enamel in almost microscopic letters in script Breguet and the number of the movement. The balance is of brass and the balance spring has an 8 coils flat spiral. The regulator carries a heat compensator which moves one of the balance spring pins. The top pivot jewel is carried by a "parachute" to absorb any shock which might otherwise break the pivot. The lower pivot is carried by a steel potence projecting into the cylinder which is of ruby and hangs down below pivot. The third, fourth and escape wheels are below pillar plate making possible the symmetrical disposition of the barrel, center wheel and balance. The workmanship is beautiful and the proportions of the entire watch are very elegant. Made about 1810.

Abraham Louis Breguet was born at Neuchatel, Switzerland, in 1747, his parents being of French origin. He settled in Paris in early manhood where he died in 1823, being succeeded by his son Louis Antoine, who retired in 1833 and was followed by his son Louis. The house is still in existence. Among his many inventions is the overcoil spring which is employed in all good watches of the present day.

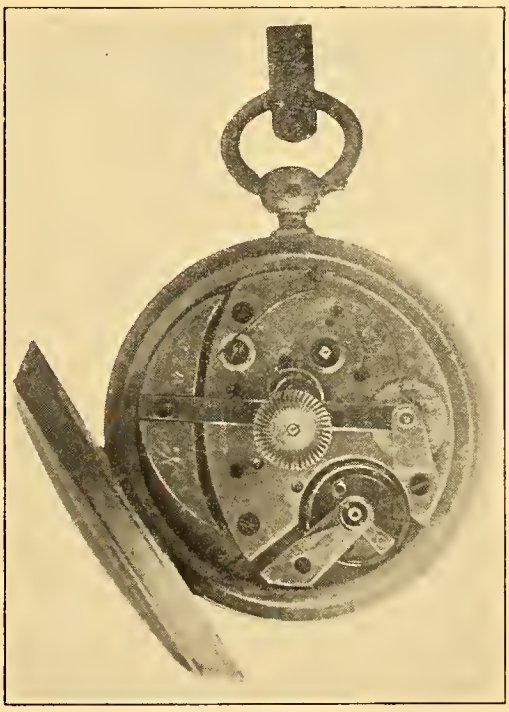
No. 154—Center sweep second beating seconds, by Joseph Jeunet, Meadville, Pa., under U. S. Patent No. 21425, 1858. Mr. Jeunet came to America in 1854 and settled near what is now known as Frenchtown, near Meadville, Pa., to become a farmer, but devoted his leisure hours to the trade he had learned from his uncles who were watchmakers at Foncine le Bas in the Department of the Jura of France.

The idea he had in mind and which is set forth in his patent was to lessen the effect of sudden jars and jolts by having the usual balance wheel made with teeth engaging a pinion on a further balance which rotates several times in one direction and then in the other, the first balance carrying the balance spring. Several watches were made for Mr. Jeunet at Morey in the Jura but did not achieve the desired superiority among railroad men to whom they were sold at Meadville by a Mr. Jenks.

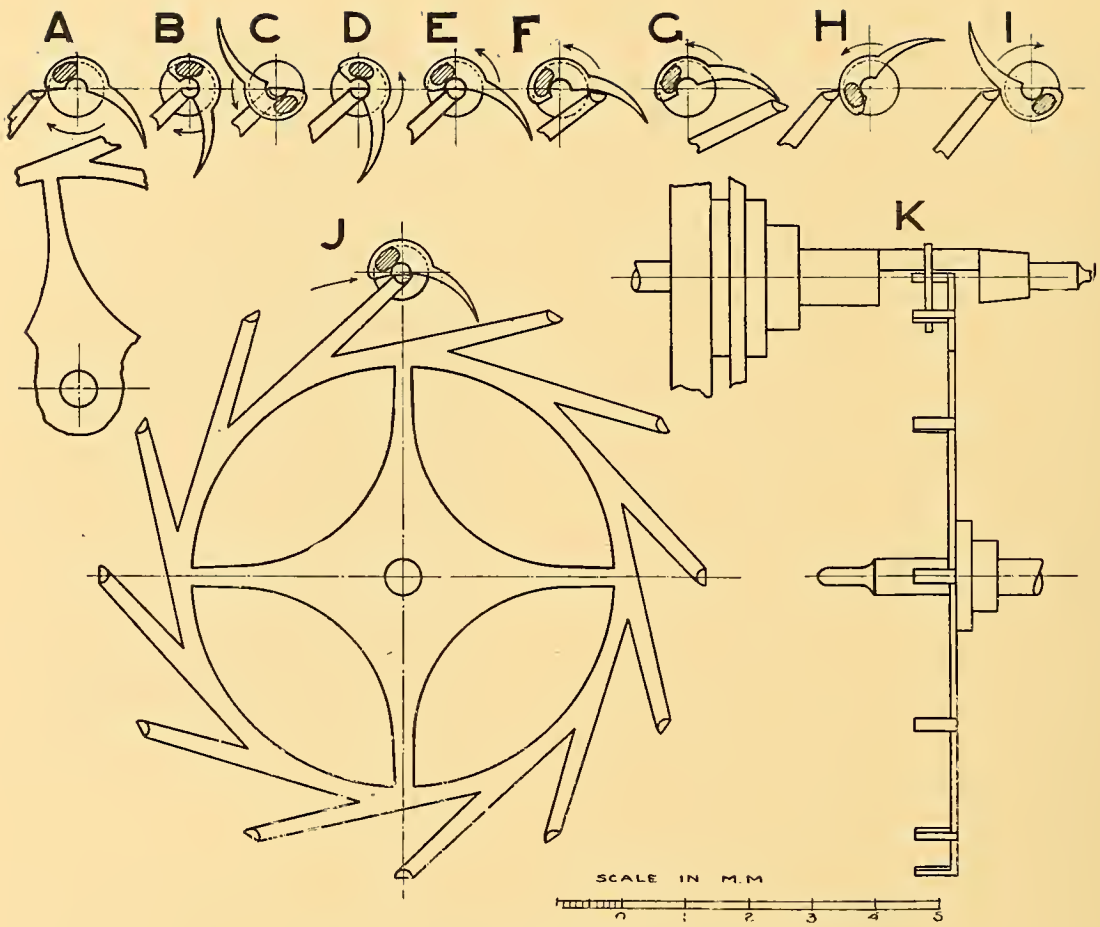
No. 155—Crank roller lever by "Edwd. Massey, No. 109." Edward Massey was born in 1770 and died in 1852. The example shown in half-tone was made about 1814. The modern de-



No. 102—CASE WIND BY ROBERT THEURER & FILS

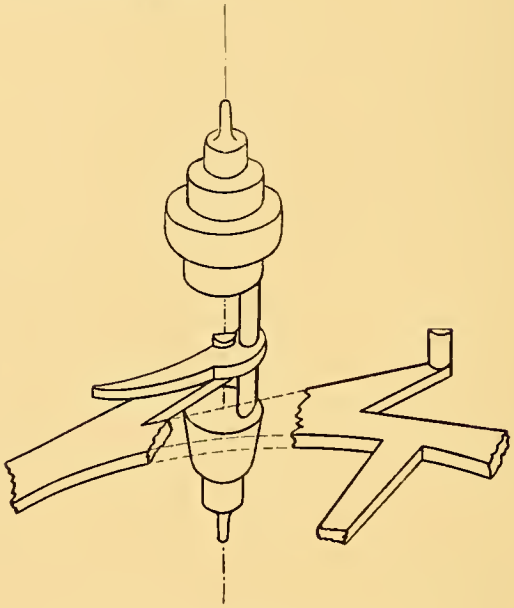


No. 103—PEDOMETER WIND BY LOEHR



No. 104—ACTION OF ESCAPEMENT

No. 104—VIRGULE BY OLTRAMARE



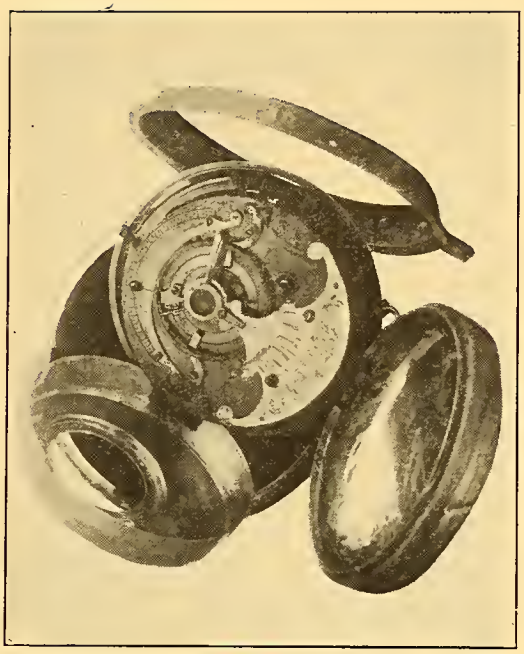
No. 104—PERSPECTIVE OF VIRGULE

tached lever, which unquestionably originated as shown in figure 155 A, by Thomas Mudge has been thought erroneously by many to have developed from the rack lever by cutting off all the teeth of the rack but two and all the teeth of the pinion but one. Massey's escapement, developed after Mudge, shown in line cut, would suggest this. Massey devised several schemes of winding by pumping action.

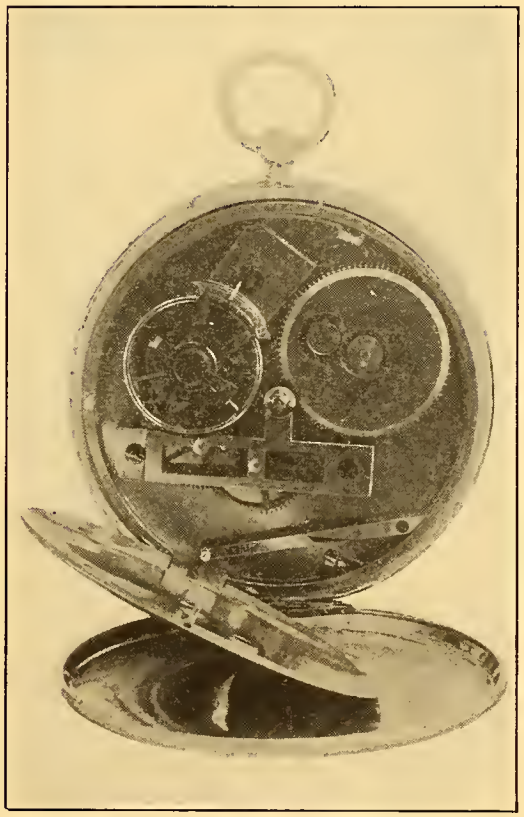
No. 156—Double escape-wheel detent escapement "C. Fasoldt, Albany, N. Y., No. 385, Pat. February 1, 1851—April 3, 1864—March 7, 1865." The movement has a very peculiar escapement shown in line drawing. The regulator is peculiar in that the curb pins describe some curve, not a circle, as when moved by the adjusting screw, not unlike what is known as the whip lash type. There are fourteen jewels and the workmanship is very good. C. Fasoldt was born in Thüringen near Leipsic, Germany, and came to America after the rebellion of '48. He was at Rome, N. Y. and later at Albany, where he started a watch factory about 1861, employing some 50 men, according to a statement of his son. He made also many tower clocks with gravity escapement, and micrometric gratings. He died in 1898.

No. 157—"Geo. P. Reed, Boston—Improved Pat. April 1868 No. 19." The example shown in half tone has escapement patented April 1868 shown in line drawing. It is essentially a pivoted detent chronometer with a continuous spring performing functions of gold spring and locking spring. This chronometer was the only one made on a manufacturing basis in this country, so far as known to the writer. Mr. Reed was born at Grafton, N. H. 1827. He served an apprenticeship to a watch maker in Concord, N. H. and in 1856 went to work for Dennison, Howard & Davis and about 1858 went with E. Howard who had returned to Roxbury. He remained with Mr. Howard till about 1868 when he opened a small factory in Malden where he made his pocket chronometer. He later moved to Melrose, where he died in 1908. He was quite prolific in patents—his most widely used patent No. 61867, granted in 1867, was the "whiplash" regulator. The maintaining spring barrel was patented in 1857 and used on all the early E. Howard watches.

No. 158—Lever escapement by "J. D. Custer, Norristown, Pa., U. S. A. Pat.



No. 105—VERGE BY FISHER & SONS



No. 111—RUBY CYLINDER BY BREGUET

No. 119—AUTOMATA REPEATER

Feby. 4th, 143." The patent is of record as No. 2,939. The movement is about a 14 size and has a gold dial which looks like English work of the period. The plates are quite thick and very nicely fire gilded. The winding and setting arbors are for a square key. The fusee has its top made in such a way that as the chain wraps into the end of the groove the top is pressed upwards and engages a pin in the top plate, thus making a safety stop. The escapement is a lever of rather crude workmanship. The balance and impulse pin are all jewelled, five in all, the pallets not being jeweled. Jacob D. Custer, born about 1809, the son of a millwright at Worcester, Montgomery Co., Pa., went to Norristown, Pa., about 1831 and commenced making high case clocks. Between 1840 and 1845 he made perhaps a dozen watches, movements and cases. He made also tower clocks for the Norristown Court-House and Merchants Eating House on Market Street, Philadelphia, and several hundred light propelling clocks for the U. S. Coast Survey. He was also the inventor of a bullet machine and was the builder of a steam boat. There was in use as late as 1885 a steam engine at the Stony Creek Saw Mill, which he made. He died in 1879.

No. 159—"Dennison Howard & Davis, Waltham No. 1276" made about 1855. Keywind, full plate, 15 jewels, ratchet tooth escape wheel, solid balance. See cut 158-25.

No. 160—"Samuel Curtis, Roxbury, No. 515." This was one of the earliest watches made by what is now the American Watch Company. The first hundred were engraved Warren Manufacturing Company and the next six or seven hundred bore the name, Samuel Curtis. The firm was first known as "The American Horologe Company" for about a year, then for another year "The Warren Manufacturing Company" and then the "Boston Watch Company." The first watches were put on the market in 1853. The factory was moved from Roxbury to Waltham in 1854, after which the movements were engraved "Dennison Howard & Davis." In 1857, the firm was known as "Tracy Baker & Co.," and within a year "Appleton Tracy Co." In the year 1859, the name was changed to the "American Watch Company" and, in 1885, to the "American Waltham Watch Co." The example shown in cut 159-46 is full plate, 18 size, has solid balance, 15 jewels and English type ratchet toothed escape wheel.

No. 161—"Crescent Garden, American Watch Company, Waltham, Mass. No. 813634" made about 1877. The movement shown in cut 159-27 has a patent pinion, 11 jewels and is 14 size.

No. 162—"A. W. Co., Waltham Woerd's patent. Patented Oct. 3, 1876, Sept. 28, 1880, Pat. pin., Pat. in England Aug. 6, 1880, No. 1809155." Made about 1881. The movement shown in cut 158-28 is stem wind, lever set, fly back chronograph and has 17 jewels.

No. 163—"Appleton Tracy & Co., Waltham, Mass." "Improved sporting watch, James Appleton, Jr., Waltham N. 13779." This watch made about 1858 is shown in cut 159-45, is key wind, has 15 jewels. The sweep hand rotates once in four seconds and the small hand jumps quarter seconds. There is a stop push pin which stops the whole movement.

No. 164—"American Watch Co., Waltham, Mass., No. 50041." This was made by the Nashua Watch Co., Nashua, N. H., which was sold in 1862 to the American Watch Co. The movements which had not been put on the market were finished at Waltham. The

Nashua project had on its staff a number of names well known to American Watch making, Stratton, Woerd, Blake, Moseley, Gerry, Moorehouse and Bingham. The movement shown in 158-26 is three-quarter plate, 20 size, has 17 jewels, club foot escape wheel, safety stop and is a very handsome piece of work and design.

No. 165—"Appleton Tracy & Co., Waltham, Mass." "American Watch Co. No. 32195." This was made about 1860, 18 size, has 15 jewels and is shown in cut 159-47.

No. 166—"Martyn Square, American Watch Co., Waltham, Mass. Pat. Pin. No. 1784390." This model was made about 1882, full plate, 18 size, expansion balance with timing screws, 11 jewels and dust band. See cut 159-48.

No. 167—"P. S. Bartlett, Waltham, Mass. No. 26444." "American Watch Co., Waltham, Mass." Full plate, 18 size, solid balance, 7 jewels, made about 1863. See cut 158-25.

No. 168"--Appleton Tracy & Co., Waltham, Mass. No. 5236." Made about 1857. Full plate, 18 size, gold balance and 15 jewels. See cut 158-25.

No. 169—"Home Watch Co., Boston, Mass. No. 649374." Made about 1872, model of about 1866. Full plate, 7 jewel, steel balance, keywind. Resembles cut 158-25.

No. 170—"American Watch Co., Waltham, Mass. Adjusted Pat. Pinion, No. 626454." Made about 1872, 18 size, 15 jewels, compensated balance with timing screws, key wind. Resembles cut 159-48.

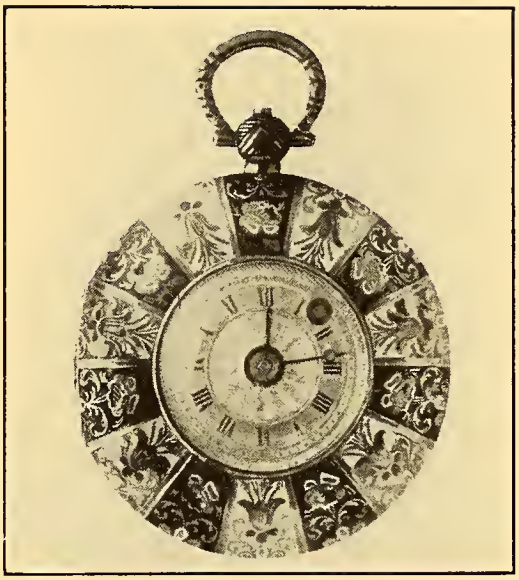
No. 171—"Broadway, A. W. Co., Waltham, Mass., No. 1064576." Made about 1878. Nickel balance, 7 jewels, key wind. Resembles cut 158-25.

No. 172—"Bond St., A. W. Co., Waltham, Mass., Safety Pinion No. 2937-191." 14 size, three-quarter plate, stem wind, compensated balance, 7 jewels. Made about 1886. Resembles cut 159-47.

No. 173—"Wm. Ellery, Boston, Mass., No. 47394." "A. W. Co." Made about 1861. Three-quarter plate key wind, steel balance, 15 jewels, very long lever. Resembles cut 159-47.

No. 174—"Wm. Ellery, Boston, Mass. No. 69420." Full plate, 18 size, 15 jewels. Made about 1874. Resembles cut 159-46.

No. 175—"Am. Watch Co., Waltham, Mass., Foggs Safety Pinion 18665, Woerds Pat. 1867, No. 410228." Three-quarter plate, 16 size, key wind, compensated balance, 15 jewels. Made about 1869.

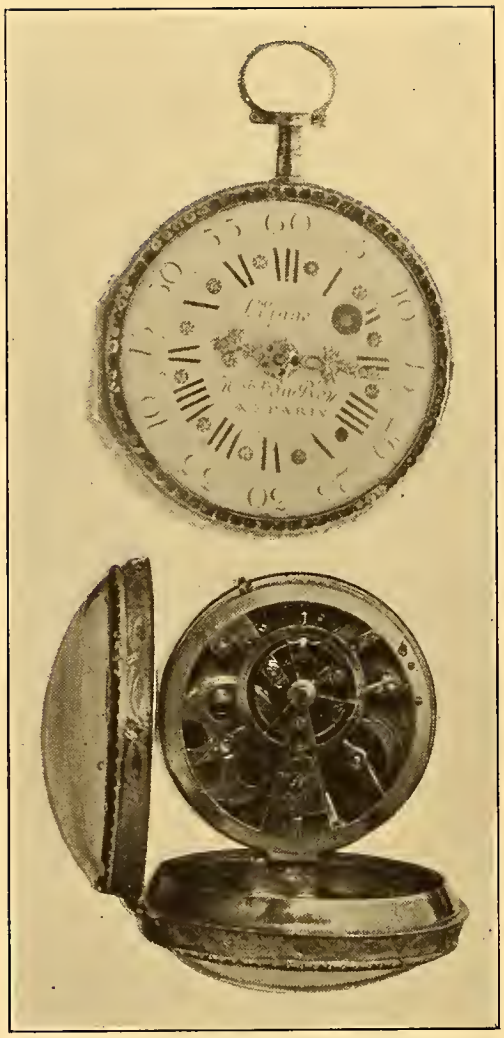


No. 121—CHAMPLEVE ENAMEL

No. 121—CHAMPLEVE ENAMEL

No. 176—"Appleton Tracy & Co., Waltham, Mass., No. 250519." "American Watch Co." 16 size, three quarter plate, compensated balance, 15 jewels, key wind. Made about 1866.

No. 177—"Adams St., Amer'n. Watch Co., Waltham, Mass., No. 563785."



No. 122—VERGE BY LEPINE

"American Watch Co." Three-quarter plate, 12 size, key wind, compensated balance, 15 jewels. Made about 1876.

No. 178—"Appleton Tracy & Co., Waltham, Mass. No. 75282." "American Watch Co." Three-quarter plate, 16 size, key wind; compensated balance, 15 jewels. Made about 1862.

No. 179—"Appleton Tracy & Co., Waltham, Mass., Foggs Patent 1865, No. 250081." "American Watch Co." Three-quarter plate, 20 size, key wind, compensated balance, 15 jewels. Resembles 158-26.

No. 180—"Crescent Garden, Amer'n. Watch Co., Waltham, Mass., Patent Pinion, No. 1061174." "American Watch Co." Three-quarter plate, 14 size, key wind, nickel balance, 7 jewels. Made about 1878. Resembles cut 159-27.

No. 181—"Hillside, Am. Watch Co., Waltham, Mass., Pat. Pinion, Woerds Patents, No. 1764049." "American Watch Co." Made about 1882. Three-quarter plate, stem wind, compensated balance with timing screws, 13 jewels, 14 size. Resembles cut 159-47.

No. 182—"Appleton Tracy & Co., Waltham, Mass. No. 45380." "American Watch C." 10 size, three-quarter plate, compensated balance, 15 jewels, key wind. Barrel turns when winding, carrying the outer end of main spring, the inner end of which drives annular arbor and main wheel which is separate from barrel. Resembles cut 159-47.

No. 183—"P. S. Bartlett, Waltham, Mass., Pat. 1858, No. 120241." "American Watch Co." 10 size and like preceeding but with gold balance. Made about 1878.

No. 184—"Appleton Tracy & Co., Waltham, Mass., Foggs Safety Pinion 1865, No. 485893." "American Watch Co." 10 size, three-quarter plate, key wind, compensation balance, 15 jewels. Made about 1869. Resembles cut 159-47.

No. 185—"Wm. Ellery, Waltham, Mass., Pat. Pinion, No. 936335." "American Watch Co." 10 size, three-quarter plate, key wind, 7 jewels, nickel balance. Made about 1877. Resembles cut 158-27.

No. 186—"Lady Washington, Waltham, Mass., Pat. Pinion, No. 13555-21." "A. W. Co., Waltham, Mass." 10 size, three-quarter plate, key wind, 7 jewels, nickel balance. Made about 1880. Resembles cut 159-47.

No. 187—"Royal, Amer. Watch Co., Safety Pinion, No. 4309855." "American Waltham W. Co." 18 size, three-quarter plate, stem wind, compensation balance, 15 jewels, heart cam regulator. Made about 1889.

No. 188—"Riverside, Amer'n. Watch Co. No. 870733." "Amer'n Watch Co." 10 size, three-quarter plate, key wind, 15 jewels, compensation balance. Made about 1877.

No. 189—"Seaside, Waltham, Mass. No. 2716869." "A. W. Co., Waltham." 10 size, three-quarter plate, stem wind, 7 jewel, uncut balance. Made about 1886.

No. 190—"Wm. Ellery, Waltham, Mass., No. 980104." "Am. W. Co." 10 size, three-quarter plate, key wind, compensation balance, 13 jewels. Made about 1877.

No. 123—ALARM WATCH BY THOS. MUDGE

No. 191—"H. Z. Culver, Elgin, Ill. Pat. No. 1800." Full plate, 18 size, key wind, 15 jewels, compensation balance. Made 1867. See cut 158-23. The Natn'l. Watch Co. of Chicago, Illinois was incorporated in 1864. In 1874, the name of the Company was changed to "The Elgin National Watch Co."

No. 192—"T. M. Avery, Elgin, No. 415726." "Elgin Natn'l Watch Co." Full plate, 18 size, nickel balance, 7 jewels, key wind. Made in 1876. See cut 158-24.

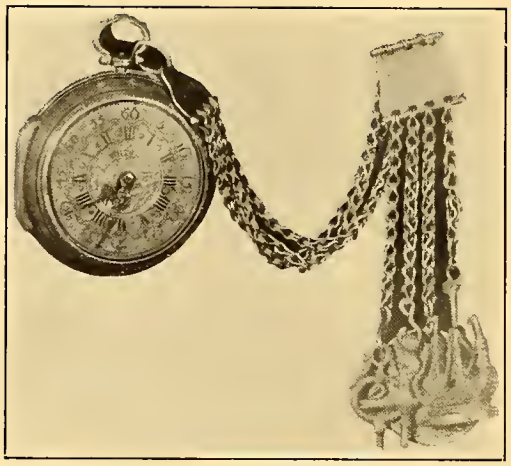
No. 193—"Francis Rubie. National Watch Co., Elgin. Patent Pinion. Moseley's Patent No. 50832." 10 size, three-quarter plate, compensated balance, 15 jewels, key wind. Made in 1878. See cut 158-22.

No. 194—"Dexter St., National Watch Co., Elgin, Patent Pinion, No. 201110." Three-quarter plate, 10 size, key wind, 7 jewels, compensated balance. Made in 1872. See cut 158-21.

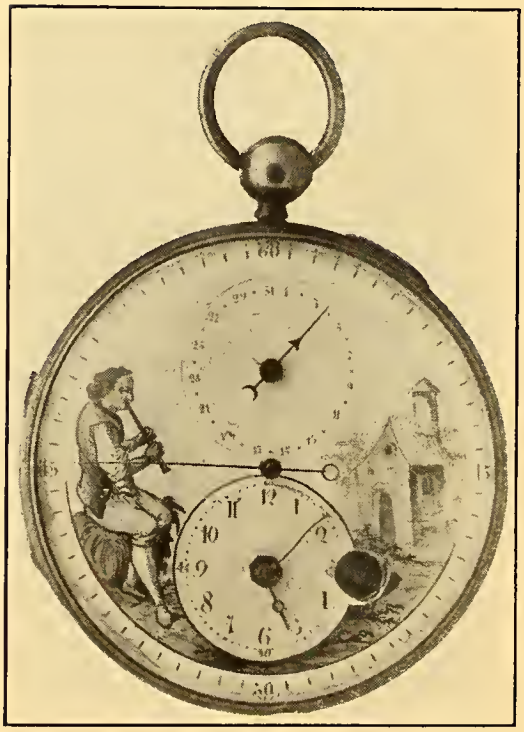
No. 195—"Lady Elgin, Elgin, Ill., Patent, Moseley Patent. No. 76705." Three-quarter plate, 10 size, 15 jewels, compensated balance. Made in 1871.

No. 196—"Gail Borden, Elgin, Patent Pinion, Patent, 186012." Key wind, 10 size, three-quarter plate, 15 jewels, compensated balance. Made about 1872. Resembles cut 158-21.

No. 197—"Atlas Watch Co., Chicago." No number. Made by Water-



No. 124—VERGE BY WILDERS



No. 125—PAINTED DIAL VERGE

bury Watch Co., about 1896. Three-quarter plate, 0 size, stem wind, 7 jewels, compensated balance.

No. 198—"Atlas Watch Co., Chicago, 7281720." Full plate, stem wind, 7 jewels, 16 size. Made by Elgin Watch Co., about 1896.

No. 199—"B. W. Raymond, Elgin, Ill., Adjusted, Pat. Pinion, 182786." "National Watch Co." Full plate, 18 size, key wind, compensated balance, 15 jewels. Made 1874. Resembles cut 158-23.

No. 200—"G. M. Wheeler, Elgin, Ill., Pat. Pinion, 6132." "National Watch Co." Full plate, 18 size, 15 jewels, key wind, compensated balance. Made 1873. Resembles cut 158-23.

No. 201—"H. H. Taylor, Elgin, Ill., Adjusted, Pat. Pinion, 37397." "Elgin Natn'l. Watch Co." Full plate, 18 size, 15 jewels, key wind, compensated balance. Made 1868. Resembles cut 158-23.

No. 202—"H. Z. Culver, Elgin, Ill., Patent, 2651." "National Watch Co." Full plate, 18 size, 15 jewels, key wind, compensated balance. Made 1867. Resembles cut 158-23.

No. 203—"Mat. Laflin, Elgin, Ill., 9264." "National Watch Co." Full plate, 18 size, key wind, 7 jewels, compensated balance. Made 1868. Resembles cut 158-23.

No. 204—"M. D. Ogden, Elgin, Pat. Pinion, 314868." "Elgin National Watch Co." Full plate, 18 size, key wind, compensated balance, 11 jewels. Made 1876. Resembles cut 158-23.

No. 205—"J. T. Ryerson, Elgin, Ill., Patent, 57881." "National Watch Co." Full plate, 18 size, key wind, nickel balance, 7 jewels. Made 1870. Resembles cut 158-24.

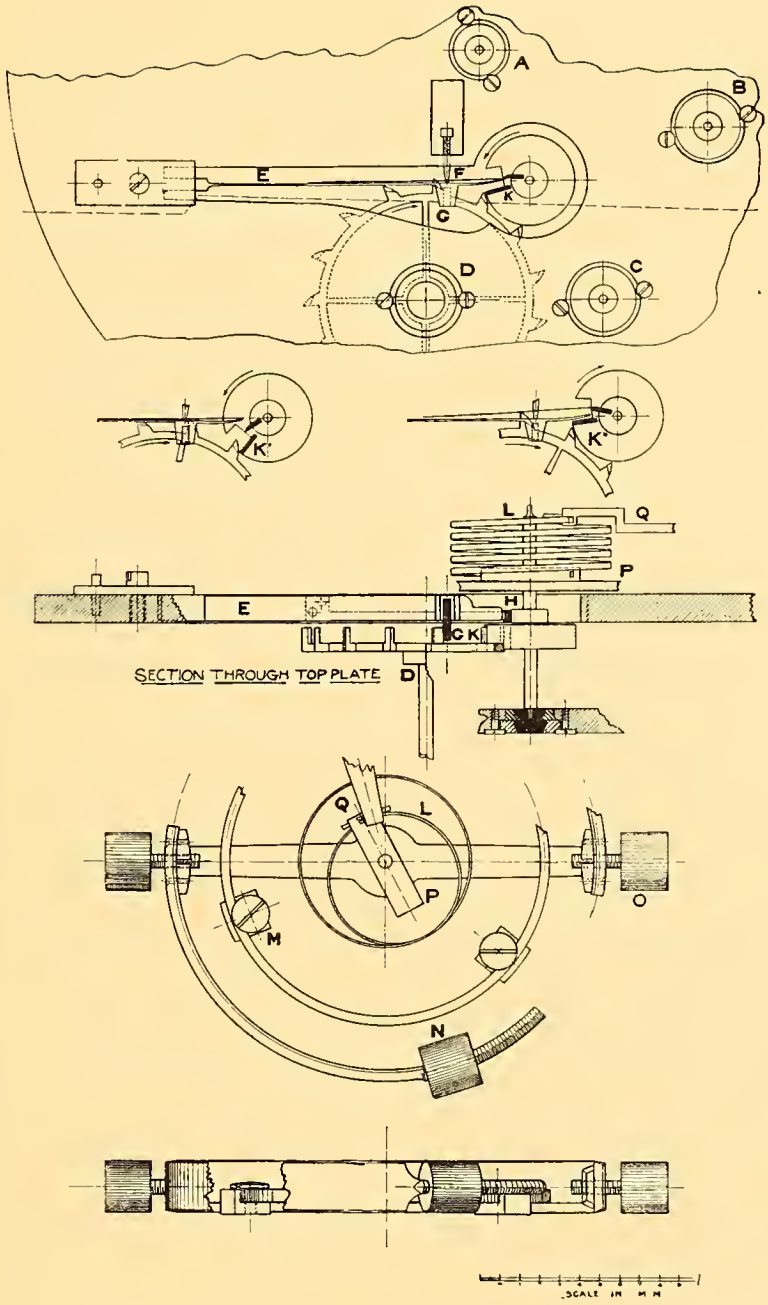
No. 206—"Chas. Fargo, Elgin, 1456-17." "National Watch Co." Full plate, key wind, 18 size, compensated balance, 7 jewels. Made 1872. Resembles cut 159-23.

No. 207—"Inter-Ocean, Elgin National Watch Co., 498141." "Elgin National Watch Co." Full plate, 18 size, key wind, nickel balance. Made 1877. Resembles cut 158-24.

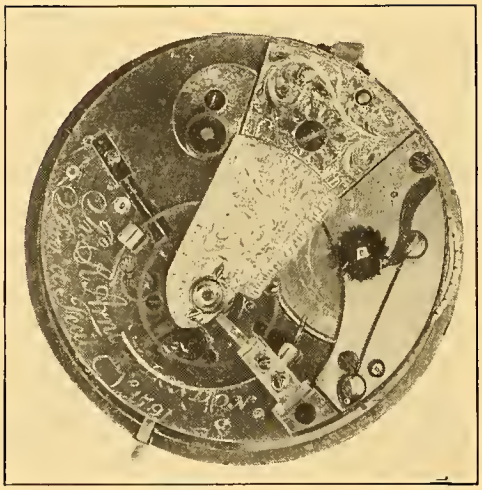
No. 208—"Leader, Elgin National Watch Co., 489479." "Elgin National Watch Co." Full plate, 18 size, key wind, nickel balance, 7 jewels. Made 1877. Resembles cut 158-24.

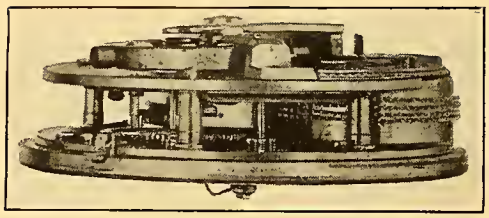
No. 209—"Elgin National Watch Co., Safety Pinion, 2046031." "Elgin National Watch Co." Three-quarter plate, 18 size, 7 jewels, compensated balance, stem wind, interchaneable wind for hunting or open face. Made 1882.

No. 210—"E. Howard & Co., Boston, Reeds Patent, Nov. 24, 1857. No. 375. Top plate made in two pieces, see cut 159-37, gold balance, left hand key wind. The size is 45 m.m. a trifle larger than 18 size, (44.86 m.m.) The escape wheel is made with club teeth and the

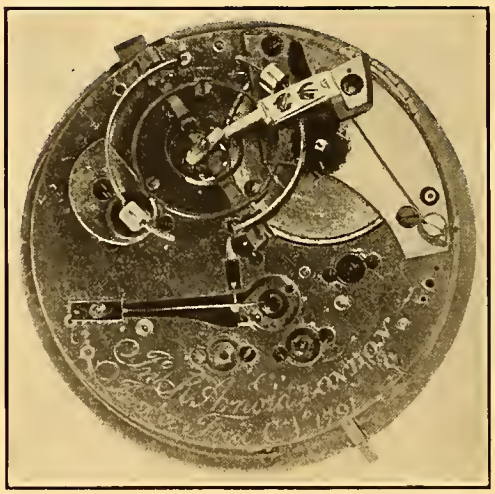


No. 127—DETAILS OF ARNOLD'S CHRONOMETER



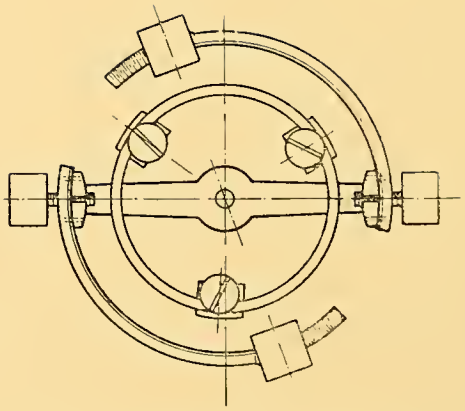


No. 127—ARNOLD'S CHRONOMETER



No. 127—COCK REMOVED TO SHOW DETENT AND BALANCE

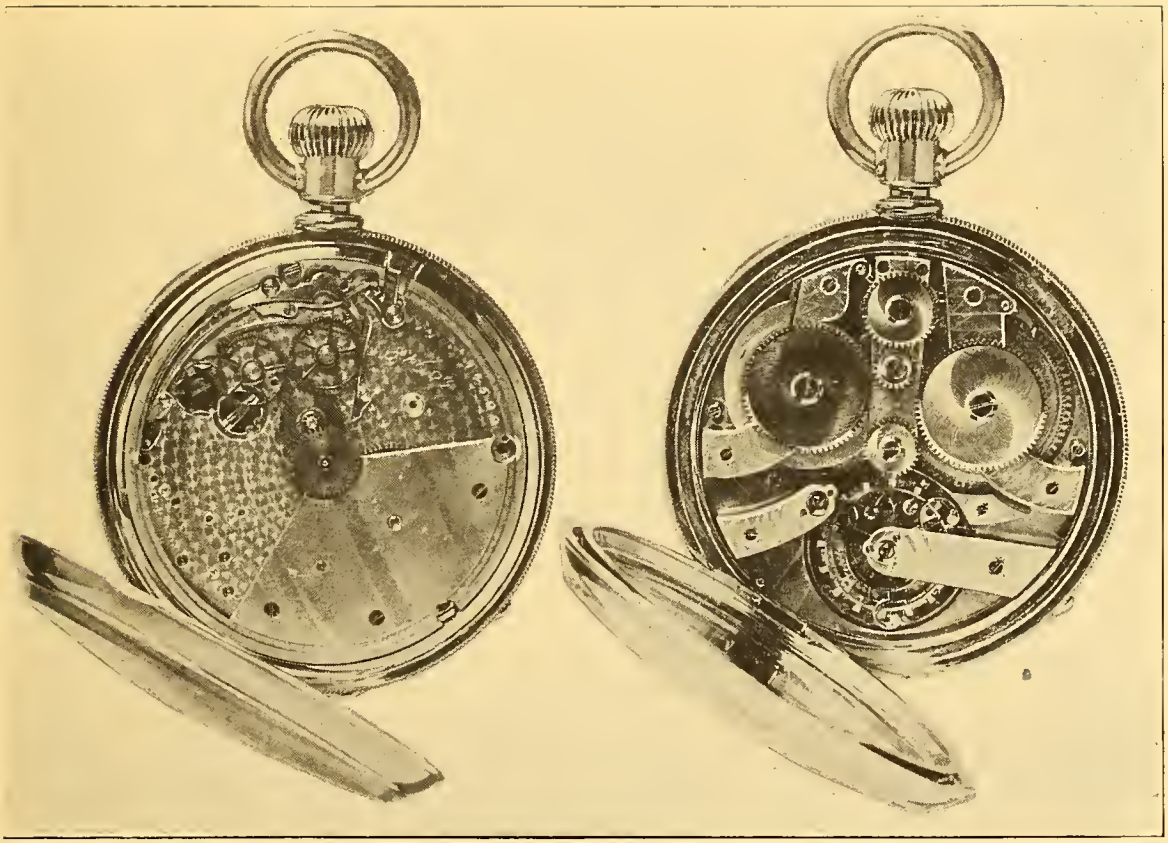
pallet stones are set vertical from the pallet fork which swings in a plane below the escape wheel. The main spring is chambered in the pillar plate and the outer end attached to it. The spring



No. 127—ARNOLD'S BALANCE

drives from the inner end on a collet acting through a maintaining device in the main wheel to deliver power to the train while the watch is being wound. This was the patent of George P. Reed, 17055 granted April 14, 1857, though the engraving on the watch gives it as November 24, 1857. The device prevented injury to the train in event of the main spring breaking and necessitating a left hand wind like the English watches which were largely used in this country at the time of its adoption. Edward Howard was born in Hingham, Mass., October 6, 1813. About 1842, he, with D. P. Davis, began a partnership for the manufacture of clocks of high grade. In 1849 they, with Aaron L. Dennison and Samuel Curtis, started the American Horloge Co. whose successor, the Boston Watch Co., became insolvent in 1857 and was sold to Royal E. Robbins. Mr. Howard returned to Roxbury in the clock business and soon began building the watch here described which may have been turned out in 1858 but probably a little later.

No. 211—"E. Howard & Co., Boston, Reeds Patent Nov. 24, 1857, No. 29-20." The plates differ somewhat from the preceeding, see cut 159-38. The balance is compensated and the escape wheel has less lifting face than on the preceeding. The escape wheel and lever are in the same plain, and the pallets are set as in Swiss practice. The regulator is very long, and of the various designs used in the Howard, the simplest and best. The balance is compensated and the screws without slots, but with drilled holes for friction driver, providing a very convenient place for removing weight without defacing the screw. Key wind and 15 jewels. Made about 1860.



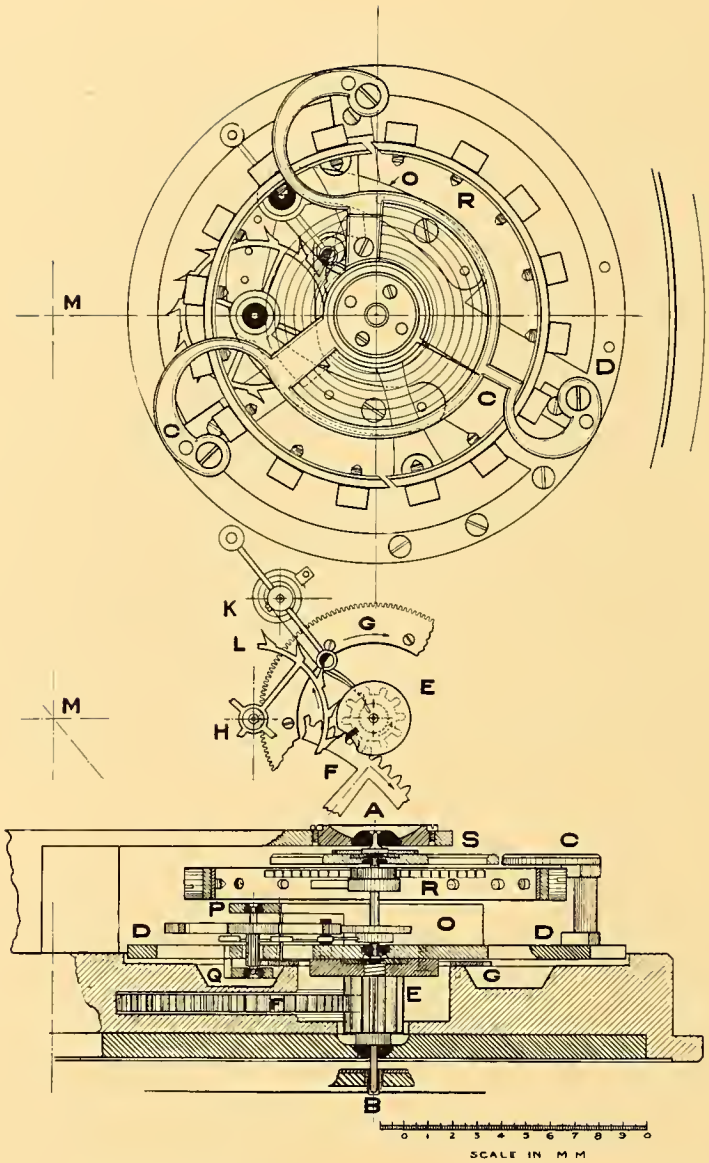
No. 128—GIRARD PERREGAUX TOURBILLON

No. 128—GIRARD PERREGAUX TOURBILLON

No. 212—"E. Howard & Co., Boston, 9075. Mershon's Patent April 26, 1859, Reeds Patent 1857." Three-quarter plate, 15 jewels, compensated balance, key wind. Escapement and balance similar to preceding. The Mershon regulator has a rack segment on the regulator proper in which engages a pin on the short arm of the index pointer which is journaled at the center of the watch, an early attempt to get a wide movement of index pointer for a small movement of curb pins. See cut 159-39. Made about 1862.

No. 213—"E. Howard & Co., Boston, 41666 N, Heat & Cold." Three-quarter plate, 15 jewels, stem wind, steel motor barrel, compensated balance with slotted screws, whip lash regulator of Reed's patent. Made about 1875. Size 45.4 m.m. nearly 19 size, (45.72 m.m.) See cut 159-40.

No. 214—"John L. King, Springfield, Mass., 5939." "New York Watch Co." Three-quarter plate, 18 size, key wind, 15 jewels, compensated balance, made about 1870. Resembles cut 158-6. The



No. 128—DETAILS OF TOURBILLON

New York Watch Company was the outgrowth of the Mozart Watch Company organized in 1864 in Providence, R. I. In 1866 under the new name the company moved to Springfield, Mass., under the superintendency of L. W. Cushing of Waltham who was succeeded by James H. Gerry who had been with the U. S. Watch Co., the Waltham Co., and the Nashua Co.

No. 215—"John Hancock, Springfield, Mass., 14747." "New York Watch Co." Full plate, 18 size, key wind, 7 jewel, steel balance. Resembles cut 158-8. Made about 1871.

No. 216—"Chas. E. Hayward, Patent Pinion, 54768." Full plate, key wind, 15 jewels, compensated balance, 18 size. Resembles cut 158-8.

No. 217—"H. G. Norton, Springfield, Mass., No. 6958." "New York Watch Co." Three-quarter plate, key wind, 17 jewels, compensated balance, 16 size. See cut 158-6. Made about 1870.

No. 218—"Chester Woolworth, 203-29, Springfield, Mass." "New York

Watch Co." Full plate, 18 size, 15 jewels, compensated balance. Made about 1871. Resembles cut 158-8.

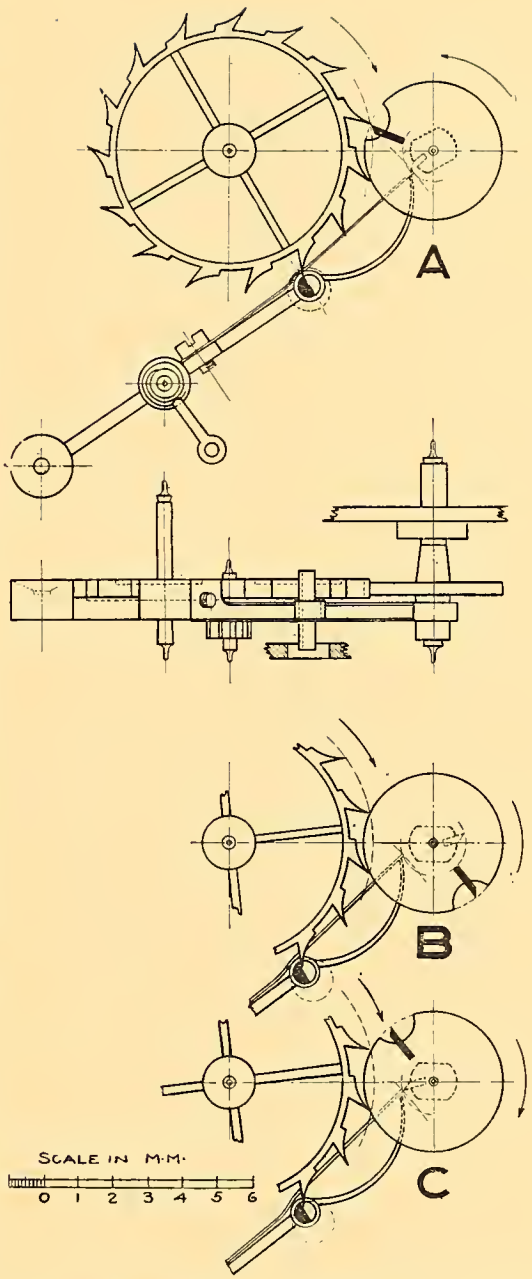
No. 219—"Tremont Watch Co., Boston, No. 6862." "Tremont Watch Co." Full plate, 18 size, 15 jewels, compensated balance. Made about 1865. See cut 159-52. Aaron L. Dennison born at Freeport, Me., 1862, was apprenticed to a watch-maker in Brunswick in 1830. After several years at his trade in Boston and New York, he interested Howard and Davis and Samuel Curtis, capitalist, in his dream of manufacturing watches on the interchangeable system and after a tour of inspection in Europe, began with his partners the making of watches in 1851, which were placed on the market in 1853. The company made an assignment in 1857 after which Dennison remained as Superintendent till December, 1862. In 1864 he interested A. O. Bigelow in starting the Tremont Watch Co. Mr. Dennison went to Zurich to make the trains and escapements to be fitted in Boston to the plates, barrels, and minor parts made there. The first movements were put on the market in the summer of 1865. The next year the company decided to build a factory at Melrose and make the watch complete. The new movement was called the Melrose. In 1868 the company ran short of money and discontinued. Mr. Dennison, who had withdrawn in 1866, sold for the stockholders, the Switzerland plant to the English Watch Co. in 1870.

No. 220—"Melrose Watch Co., Boston, No. 31381." Resembles 219 except that balance spring is pinned to projection of the cock.

No. 221—"U. S. Watch Co., Waltham, Mass., 46176." "U. S. Watch Co., Waltham." Full plate, stem wind, 18 size, 7 jewels, compensated balance. Made about 1888. See cut 159-29.

No. 222—"U. S. Watch Co., Waltham, Mass., Chas. V. Woerds Patent, 8455." "U. S. Watch Co., Waltham." Three-quarter plate, 16 size, stem wind, 7 jewels, compensated balance. The barrel is very wide making it necessary to raise center part of top plate to accomodate this center wheel. Made about 1887. See cut 159-31. The United States Watch Co. of Waltham was incorporated in 1884.

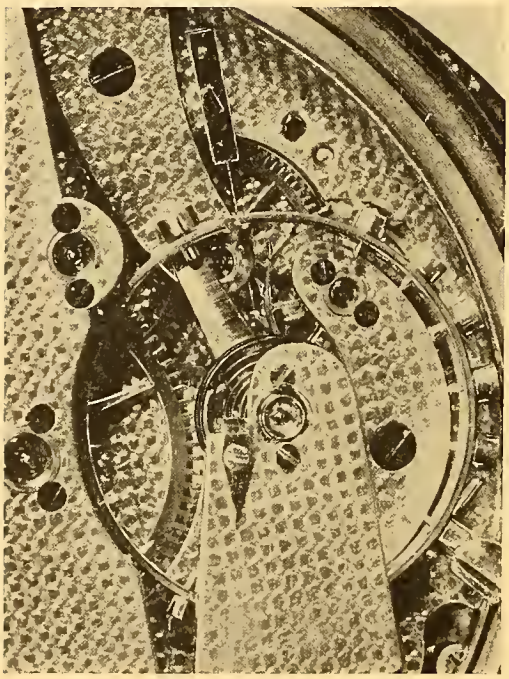
No. 223—"Currier, Springfield, Ill., Currier Patent, No. 425." "Springfield Watch Co." Full plate, 18 size, key wind, 15 jewels, compensated balance. Made 1872. See cut 158-20. The Illi-



No. 129—BASCULE DETENT BY NARDIN

nois Springfield Watch Company was organized in 1869. In 1879 the name was changed to the Springfield Illinois Watch Co. The first four superintendents, J. K. Bigelow, D. G. Currier, Otis Hoyt, and C. E. Mason were of those who had come west on five-year contracts with the Elgin Company when it was started.

No. 129—NARDIN CHRONOMETER



No. 130—CHRONOMETER WITH SPIRAL-HELICAL BALANCE SPRING

No. 224—"Mason, Springfield, Ill., No. 8030, Patent Pinion." "Illinois Springfield Watch Co." Full plate, 18 size, 7 jewels, compensated balance, key wind. Made about 1872. Resembles cut 158-20.

No. 225—"Interior, Springfield, Ill., No. 76450." Full plate, 18 size, 7 jewels, nickel balance. Resembles cut 158-20. Made about 1880.

No. 226—"Springfield, Ill. No. 149-148, W. & C." "W. & C." Full plate, 18 size, compensated balance, key wind, 15 jewels. Made about 1880. Resembles cut 158-20.

No. 227—"Columbia, Springfield, Ill., No. 165455." Resembes the preceeding, has dust cap. Made about 1880.

No. 228—"Columbia Watch Co., No. 133875, Springfield, Ill." Full plate, 18 size, key and stem wind. Resembles cut 158-20. Made abut 1880.

No. 229—"Bunn, Springfield, Ill., Chalmers, Pat. 12-19-82, Pat. Pinion, Adjusted '309190.' Illinois Watch Co." Full plate, 18 size, 15 jewels, compensated balance, stem and key wind, patent regulator. Made about 1882.

No. 230—"Illinois Watch Co., Springfield, Ill., 551187, Patent Pinion." Three-quarter plate with bridge for escape wheel, 8 size, 7 jewels, compensated balance. Made about 1884. See cut 159-44.

No. 231—"Illinois Watch Co., Springfield, Safety Pinion, 1162143." "Illinois." Three-quarters plate in two parts, six size, stem wind, 7 jewels.

No. 232—"Fayette Stratton, Marion, N. J., Giles Patent, March 13th, 66, 2736." United States Watch Co. Full plate, 18 size, key wind, compensated balance, 15 jewels. Made 1868. See cut 158-5. The United States Watch Co. was organized in 1864 and the first watches were put on the market in 1867. James H. Gerry was Superintendent, having brought a number of foremen from the American Watch Co., at Waltham. In 1872 the Company made an assignment. For about two years the factory was run under the name of the Marion Watch Co. Some of the machinery went to the Fredonia Watch Co., some to the Auburndale Watch Co. and some to the Fitchburg Watch Co.

No. 233—"G. A. Read, Marion, N. J., Pat. March 13th, '66, No. 127098." "United States Watch Co." Full plate, 18 size, key wind, imitation compensated balance. The Giles patent was a double crescent opening in the top plate to disclose the escapement action. Made about 1870. Resembles cut 158-5.

No. 234—"G. A. Read, Marion, N. J., Pat. Mch. 8, '70. No. 72074." "United States Watch Co." Three-quarter plate, 18 size, key wind, imitation compensated balance, 7 jewels. Made about 1870. See cut 158-4.

No. 235—"United States Watch Co., Marion, N. J., 76517, Pat. Mch. 8, '70." Similar to preceeding cut with 15 jewels and compensated balance. The regulator is a compound affair devised to give a very small motion to curb pins for movement of secondary index. Resembles cut 158-4.

No. 236—"Asa Fuller, Marion, N. J. No. 64069. Extra jewelled U. S. W. Co. (in monogram). Three-quarter plate, 12 size, key wind, 15 jewels, compensated balance and regulator like 236.

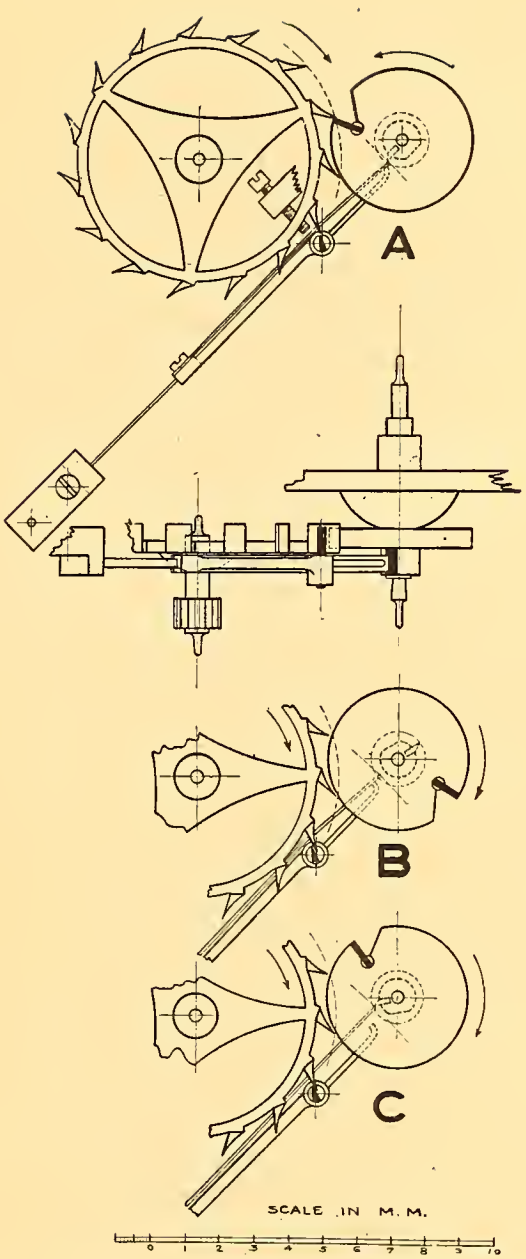
No. 237—"Chas. G. Knapp, Marion, N. J. 60147." Barrel arbor carried by bridge and third fourth and escape arbors by another, size 9, 15 jewels, key wind, compensated balance. The workmanship looks like Swiss.

No. 238—"Chas. G. Knapp, Marion, N. J., 60574." Similar in general design to 238 but stem wind with wolf teeth winding wheels.

No. 239—"Independent Watch Co., Fredonia, N. J., Safety Pinion 208938." Full plate, 18 size, key wind, 15 jewels, compensated balance. Made about 1880. The Independent Watch Co. of Fredonia was organized in 1880 by E. D. and C. M. Howard. These brothers had sold large numbers of watches on the installment plant. These watches were engraved Independent Watch Co. manufactured for them by several American Companies. They decided to make their own watches with machinery bought from assignees of defunct companies—some of it came from the "Cornell" factory and some from the Marion factory. Chas. S. Moseley was engaged as superintendent, who had been successively with the Waltham, Nashua and Elgin companies. In 1885 the plant was sold to the Peoria Watch Co.

No. 240—"Independent, Fredonia, N. Y. Improved No. 233712, Improved April 10, 1879, Sept. 15, 1880, Patent Pinion." Howard Bros., Fredonia, N. Y. Full plate, 18 size, 15 jewels, compensated balance. The curb pins of the regular project through a slot in the balance bridge. The plates and train resemble those of New York Watch Co. of Springfield, Mass.

No. 241—"Peoria Watch Co., 15 jewels, Anti-Magnetic Spg. Peoria, Ill., Safety Pinion, adjusted, 11276." "Peoria, Ill." Full plate, 18 size. The regulator lever engages a pin on a worm and screw element. See cut 138-9. The Peoria Watch Co. was incorporated in 1885 and the Fredonia plant brought to Peoria.



No. 133—SPRING DETENT CHRONOMETER

No. 242—"Edward Biven, Newark, N. J., Patent, 8535." "Newark Watch Co." Full plate, 18 size, compensated balance, 15 jewels. N. B. Sherwood in 1873 interested capital in New York for a watch factory which developed in 1864 to the Newark Watch Company. In 1870 the plant was sold to The Cornell Company at Grand Crossing, Ill.

No. 243—"E. S. Williams, Chicago, Ill., No. 16052." "Cornell Watch Co."

No. 133—FRODSHAM CHRONOMETER

No. 145—FRODSHAM LEVER

Full plate, 18 size, compensated balance, 7 jewels, key wind converted with Abbot device to stem wind. See cut 158-12. Paul Cornell with J. C. Adams organized the company in 1870 in Chicago with factory at Grand Crossing.

No. 244—"C. L. Kidder, San Francisco, 14937." "Cornell Watch Co." In 1874 Paul Cornell with W. C. Ralston of San Francisco bought the Grand Crossing plant and moved the machinery to San Francisco, where is was intended to utilize Chinese labor. The company was called the Cornell Watch Co., of San Francisco. Movement resembles 158-12.

No. 245—"California Watch Co., San Francisco, No. 25105." Similar to 244 but stem wind. In 1876 the California Watch Co. succeeded The Cornell Watch Co. of San Francisco, and built a factory at Berkeley. The plant was closed in 1876 and the machinery was sold to the Independent Watch Co. of Fredonia and the Rockford Watch Co.

No. 246—"Rockford Watch Co., Rockford, Ill., No. 5616, 15 jewels." Full plate, key wind, 18 size, 15 jewels, compensated balance. See cut 159-41. The Rockford Watch Co. was organized in 1874. The first watches were put on the market in 1876. The employees came largely from the Cornell Watch Co.'s factory at Grand Crossing.

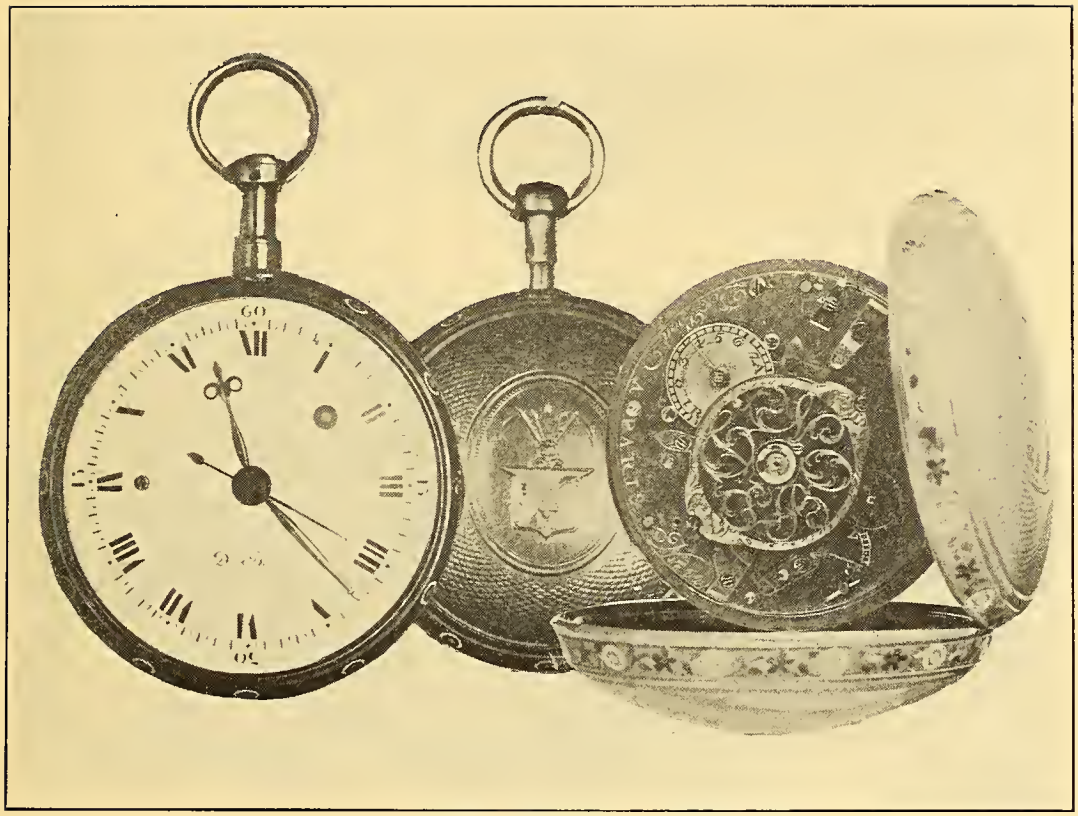
No. 247—"Rockford Watch Co., Rockford, Ill., 79288." "Rockford Watch Co., Illinois." Similar to 246 but with whip lash regulator.

No. 248—"R. W. Co., Rockford, Ill., Patent Pinion, No. 213622." "Rockford". Three-quarter plate, 6 size, stem wind, 15 jewels, compensated balance.

No. 249—"Auburndale Rotary, Mass. Pats. 1875-6-7, No. 177." A very ingenious attempt to make a rotating movement for a cheap watch. The entire train rotates differing from the tourbillon in which only the escapement and balance wheel rotate to equalize position errors. It was invented or designed by J. R. Hopkins and made by the Auburndale Watch Co. which was started in 1877. The pin escapement was faulty and the watch was not a success, was made to sell at $10.00 in nickel case. It is 18 size, stem wind, solid balance. See cut 158-2.

No. 250—"Auburndale Timer, Pat. applied for, 129." This was another design of Mr. Hopkins made to indicate quarter seconds, 18 size, key wind. The escapement was designed by J. H. Gerry. See cut 158-1.

No. 251—"Lincoln, Auburndale, 858." This is an 18 size, key wind, three-quarter plate movement, 7 jewel, imitation expansion balance. Was designed by Chauncey Hartwell who had been many years in the Waltham factory. See cut 158-3.



No. 149—SWEEP SECOND REPEATER
BY JACQUE DEBON

No. 252—"Aurora Watch Co., Aurora, Ill., Safety Pinion, No. 125380." "Aurora" Full plate, 18 size, 15 jewels, compensated balance. Made 1887. See cut 258-16. The Aurora Watch Co. was incorporated in 1883. The first three superintendents were Geo. F. Johnson, J. W. Hurd and Robert McIntosh.

No. 253—"Columbus Watch Co., Gruens Pat. Pinion, 892." "Ohio, Columbus Watch Co." Three-quarter plate, 15 jewels, Breguet spring, compensated balance, 15 size, stem wind. Made about 1883. Resembles cut 158-14. The Columbus Watch Co. was organized in 1882 succeeding the firm of Gruen and Savage who imported partially made Swiss movements and finished them in Columbus.

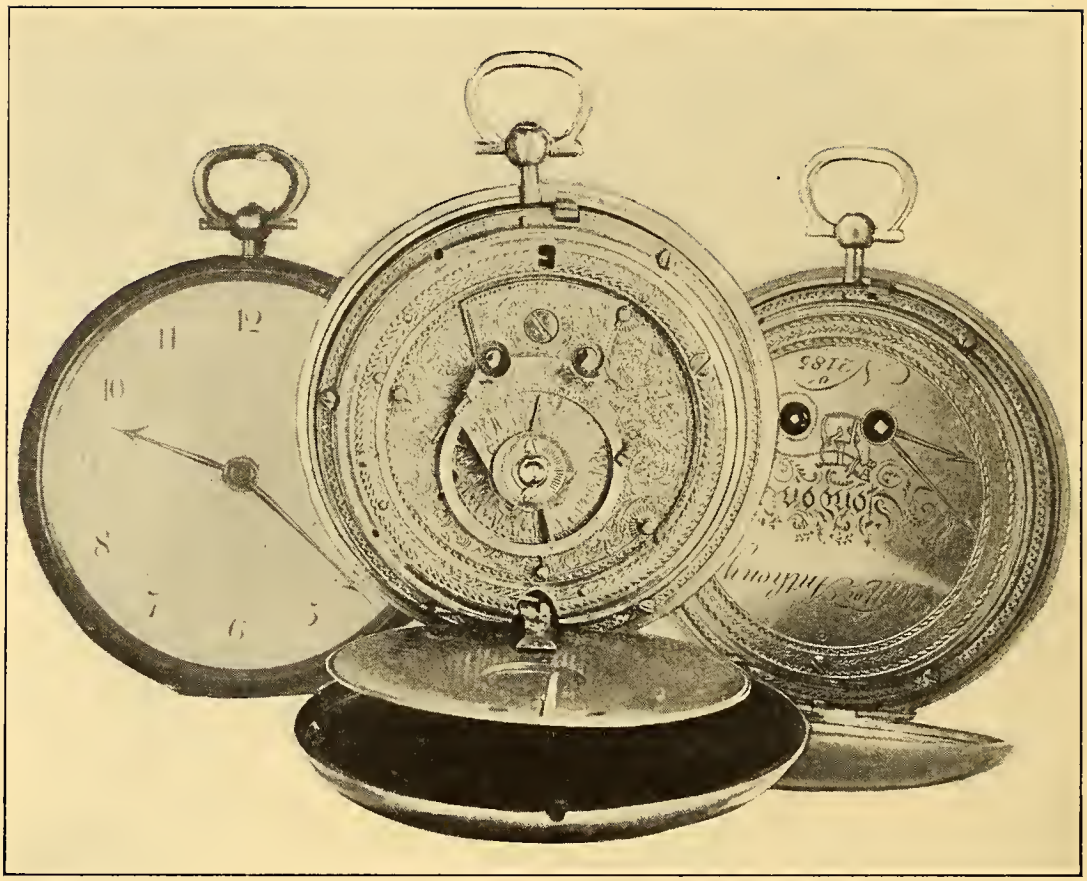
No. 254—"Columbus Watch Co., Gruens Pat. Pinion, No. 7067." Three-quarter plate, 15 jewels, compensated balance, stem wind, Breguet balance spring. See cut 158-14.

No. 255—"Columbus Watch Co., Columbus, Ohio, Safety Pinion, 165024." Three-quarter plate, 15 size, 15 jewels, flat balance spring, compensated balance, stem wind. The winding bridge is separate from the top plate. Made about 1886—See cut 158-13.

No. 256—"Columbus W. Mfg. Co., Columbus, O., Gruens Pat. Pinion, 125-22." "C. W. Co. C. O." (in monogram). Three-quarter plate, 7 size, 15 jewels, compensated balance, flat balance spring. Resembles cut 158-14.

No. 257—"Columbus Watch Co., Columbus, Ohio, Safety Pinion, 1250-64." "Columbus Watch Co., Columbus, Ohio. Full plate, 18 size, stem wind, compensated balance, flat balance spring, whip lash regulator, 15 jewels.

No. 258—"Chesire Watch Co., Patented, 87715." "C. W. C. O." (in monogram). Three-quarter plate with balance bridge on top plate, imitation expansion balance, 7 jewels, 21 size, pendant made part of movement to fit in one joint case. See cut 159-54. The Chesire Watch Co. was incorporated in 1883 at Chesire, Conn. The model was designed by D. A. Buck who designed



No. 150—VERGE BY WILLIAM ANTHONY

the Waterbury. The barrel turns on winding and is separate from main wheel which is driven from inner end of main spring.

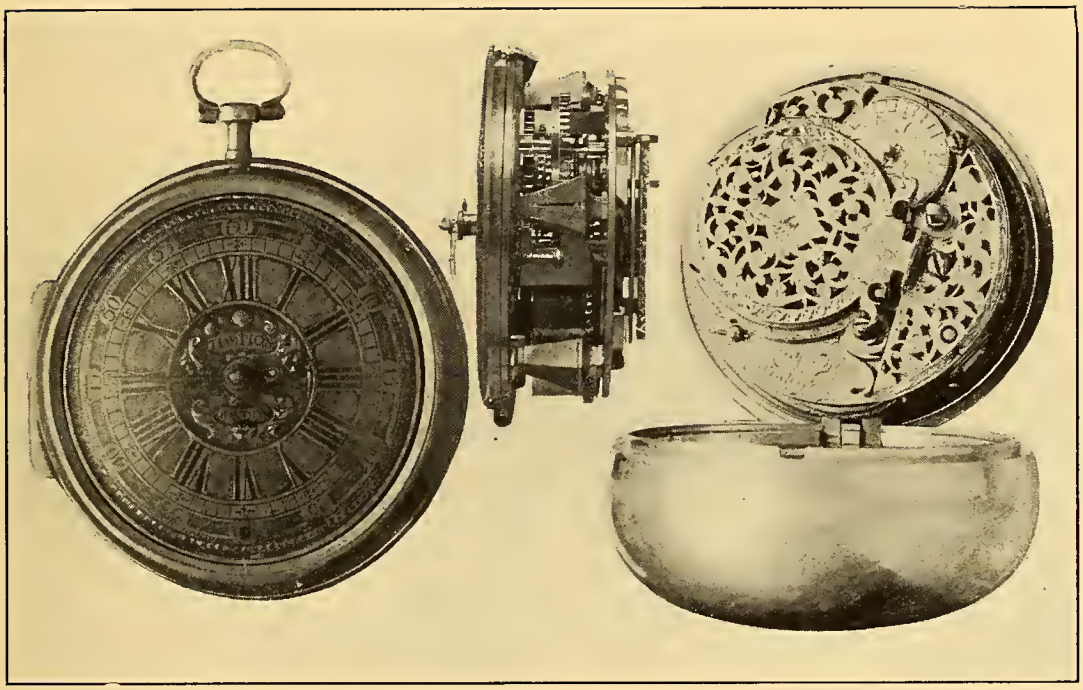
No. 259—"Appleton Watch Co., Appleton, Wis., 93237." "The Appleton Watch Co." Three-quarter plate, 17 size, 7 jewels. The train is the same as that in 258 and without doubt made with the same machinery. The plates are different and compressed to make a smaller watch. See cut 159-53.

No. 260—"Brooklyn Watch Co., No. 303608." "B. W. Co." 18 size, full plate, 15 jewels, compensated balance, stem wind. It has the appearance of the cheap Swiss imitations American movements. The writer was, however, informed by the late Edward Sweet that there was at one time a watch factory in Brooklyn.

No. 261—"Manhattan Watch Co. Patented United States & Great Britain, 105857." A cheap watch with four jewels, stamped plates, 18 size, nickel case probably made by same factory, paper dial, stem wind. See cut 159-35. Manhattan Watch Co. was organized in 1883.

No. 262—"New York Chronograph Watch Co., Patent, 171320." "M. W. Co." A cheaply made, 18 size watch, with a centre sweep which can be disengaged by a push piece throwing the engaging wheels out of the same plane. Several of the parts are duplicates of the preceeding watch by the Manhattan Watch Co. There is a patent of record No. 330905 December 9, '85, by Edmund Kuhn, Brooklyn, N. Y., assigned to the Manhattan Watch Co. for a sweep second device. See cut 159-32.

No. 263—"New York Chronograph Watch Co., New York, Safety pinion, 174593." "N. Y. Chronograph Watch Co." Three-quarter plate, split balance, sweep second, 16 size, 7 jewels in addition to three top plate jewels at third, four and scape wheel. Without doubt made by same factory as preceeding



No. 151—VERGE BY THOMAS TOMPION

two, but much better made and slightly gilded.

No. 264—"New Era, Lancaster, Pa., 79011." "Lancaster, Pa." Three-quarter plate, 18 size, 7 jewels, key wind. See cut 158-11. The Adams & Perry Watch Mfg. C. was incorporated at Lancaster, Pa., in 1874, re-organized in 1878 as Lancaster, Pa. Watch Co., Ltd., and again in 1879, Lancaster Watch Co. In 1886 it was bought by the Keystone Standard Watch Co. About 1892 it was re-organized with the Aurora Watch Co. as the Hamilton Watch Co.

No. 265—"West End, Lancaster, Pa., 48429." "Lancaster, Pa." Similar to preceeding but with 15 jewels.

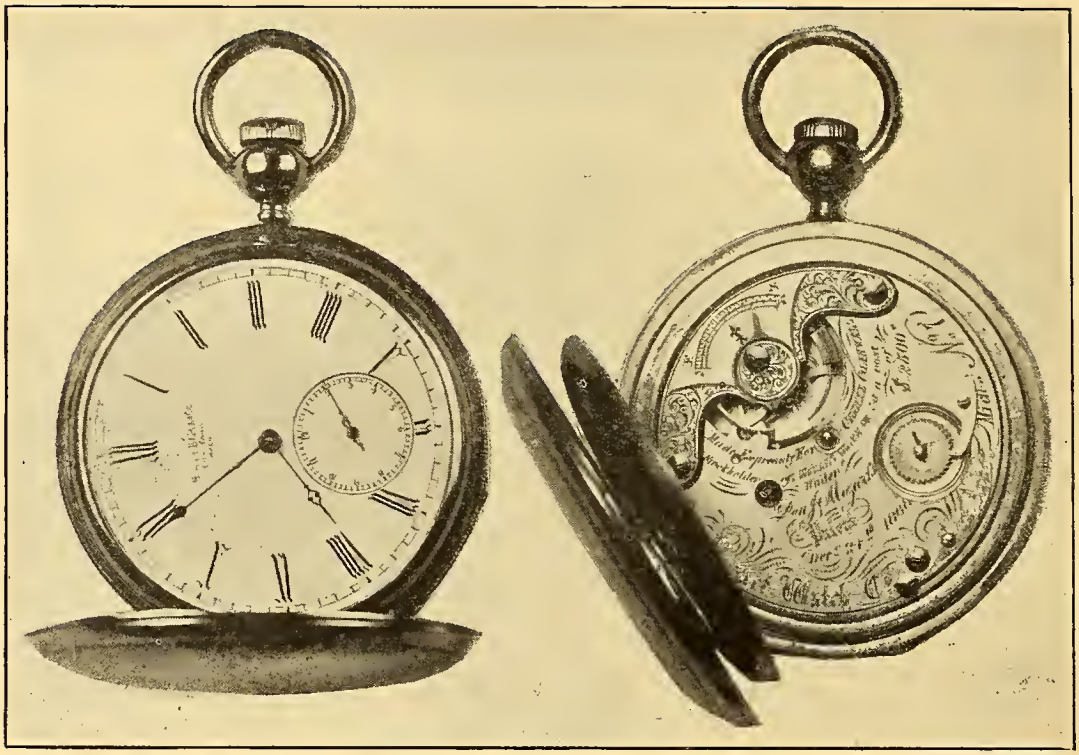
No. 266—"Keystone Watch Co., Pat. Dust Proof, Patent Pinion, Pat. S. W., Pat. Reg. 333487." "Keystone Watch Co." Three-quarter plate, 18 size, 15 jewels, stem wind, cut balance. There is a mica transom put over the balance wheel. The regulator is a screw adjusted device with independent adjustment of greater movement than the screw would compass. An advertisement in the Jewelers' Weekly of February, 1887, has the modest claim that "Our No. 15 Movement is the cheapest American Lever Stem-Wind made. It is fully equal for accurate time, durability, & C., to watches costing ten to twenty per cent more."

No. 267—"Keystone Watch Co., Safety Pinion, 272942." "K. W. Co." Three-quarter plate, 6 size, cut balance, 15 jewels, stem wind.

No. 268—"Keystone Watch Co. 213-369." "K. W. Co." Three-quarter plate, 7 jewels, stem wind. Similar to cut 158-11.

No. 269—"Seth Thomas, Thomaston, Conn., Adjusted Safety Pinion, 93994." "Seth Thomas." Plate carrying centre third, fourth and scape with separate bridge for barrel, compensated balance, 15 jewels, stem wind, 18 size. The Seth Thomas Co. began making watches in 1883 putting them first on the market in 1885.

No. 270—"Waterbury Watch, Patented in the United States, Great Britain, Canada, France, Germany, Austria, Russia, Spain, Sweden, Denmark, Belgium, Benedict & Burnham Mfg. Co., Manufacturers, Waterbury, Conn. U. S. A. This watch was designed by D. A. Buck to be retailed complete with case for three and one half dollars. This was a very remarkable product with duplex escapement revolving train, eight foot main spring, no jewels. The factory in 1887 had a capacity of fifteen hundred watches per day with an aver-



No. 152—MOZARTS THREE WHEELED CHRONOLEVER

age of five watches per employee. In 1898 the name was changed to the New England Watch Co. In 1914 the plant was bought by Robt. Ingersoll & Bro. of New York.

No. 271—"Kelley Watch Company, Chicago, Patented." This watch made about 1893 is an interesting exhibit of punch press work carrying out the general lines of traditional watch design. The size is about 16, stem wind and stem set, paper dial.

No. 272—"Hayward, Pat. Pinion, Springfield, Mass., 133482." "Hampden Watch Co." Similar to 216. The Hampden Watch Company was organized 1877 succeeding the New York Watch Co. H. J. Cain was superintendent for a number of years. In 1888 the factory was moved to Canton, Ohio.

No. 273—"P. H. Wheeler, Otay Watch Co., Otay, California. No. 30-500, Safety Pinion." Full plate, 18 size, 15 jewels, whiplash regulator. This example was in the original factory shipping box in a jeweler's safe in San Francisco at the time of the great fire. The Otay Watch Co. at Otay, California was started in the late eighties and went out of business about 1890, the machinery being moved to Osaki, Japan. The superintendent and promoter of the Otay enterprise was P. H. Wheeler from Elgin, Ill.

No. 274—"W. Palmer & Co., Roxbury, Mass., No. 68906." W. Palmer & Co., Roxbury, Mass. Full plate, 18 size, 15 jewels, diamond cap jewel, three arm, bimetal balance uncut. The plates and train resemble the early Boston Watch Company's. The dial is, however, fastened with locking screw and the case screw is under dial. Made about 1854.

No. 275—"Palmer Watch Co., Waltham, Mass. Palmer Patent stem wind, 1033." Three-quarter plate, 18 size, stem wind, 15 jewels. It is said that these watches were made by a man who conducted a watchmaker's school in Waltham about 1875. The plates and train have strong resemblance to those made by the American Watch Co. See cut 158-17.

No. 276—"Trenton Watch Co., Patented, 58970." Three-quarter plate with double support balance bridge, 18

size, uncut balance, four jewels, stem wind. See cut 158-18. The New Haven Watch Company was started in 1883 in New Haven, Conn., but in 1885 moved to Chambersburg near Trenton, N. J., and the name changed to The Trenton Watch Co. S. T. Byam was made superintendent. In 1908 the business and factory was bought by Robert H. Ingersoll & Brother.

No. 277—"Trenton Watch Co., U. S. A., Safety Pinion, 859455." "Trenton Watch Co." Three-quarter plate in two pieces, 12 size, cut balance, stem wind, 7 jewels. Made about 1886. See cut 158-19.

No. 278—"990839." "Trenton Watch Co., U. S. A." Three-quarter plate, stem wind, 7 jewels, uncut balance. Made about 1886.

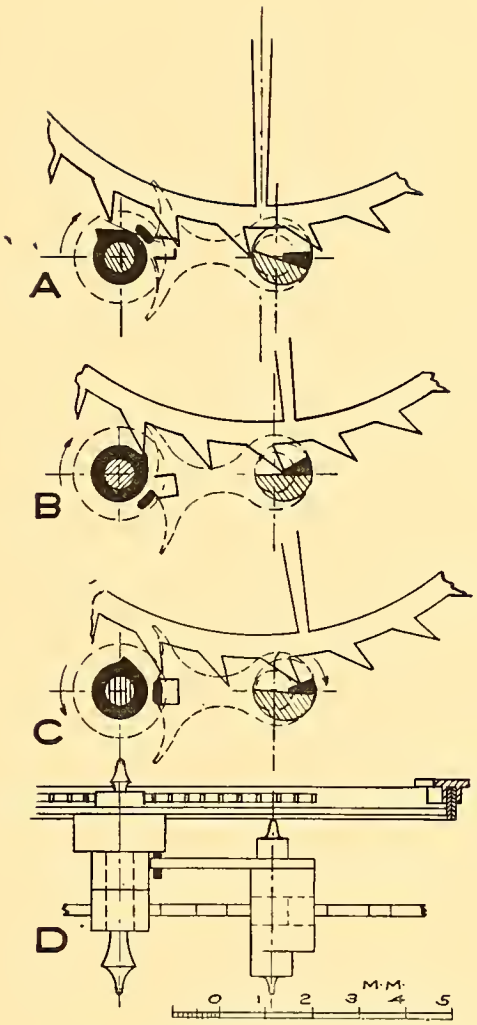
No. 279—"New York Standard Watch Co., 27020." Full plate cut away for balance, 4 jewels, uncut balance. The escapement was patented by Robert J. Clay, Jr., of Jersey City in 1886, No. 356189. The fourth wheel engages a worm which carries the escape wheel with pointed teeth which is set perpindicular to the anchor or lever. See figure 15956. The New York Standard Watch Co. turned out its first product in 1887.

No. 280—"New York Standard Watch Co., 34843." Similar in all respects to foregoing but with substitution of conventional lever escapement. The winding in these watches has an internally toothed circle which by slight deflection transmits motion from winding pinion to main spring or setting train.

No. 281—"New York Standard Watch Co., 1395227." New York Standard Watch Co., U. S. A." Three-quarter plate, 18 size, 7 jewels, stem wind, uncut balance. In this model the internal winding gear is replaced dith a rocker arm of conventional design. The cap jewel in the balance cock is held by spring friction a saw cut being made through the seat to give spring pressure on the friction.

No. 282—"The Trump, Waterbury, U. S. A., Series 1, W. W. Co. Trade Mark." An ingeniously designed watch for cheap manufacture. The duplex escapement as used in the original Waterbury is about the only feature retained. About 18 size for special case made by same makers.

No. 283"—Holley Watch Co., Jersey City, N. J. W. W. Co., Patented Duplex, Patents 1874, '78, '83, '84, '85, '86."



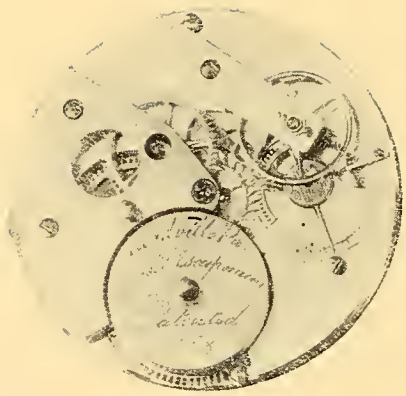
No. 152—ACTION OF MOZART'S ESCAPEMENT

"Holley Watch Co. About an 8 size similar in general construction to preceeding.

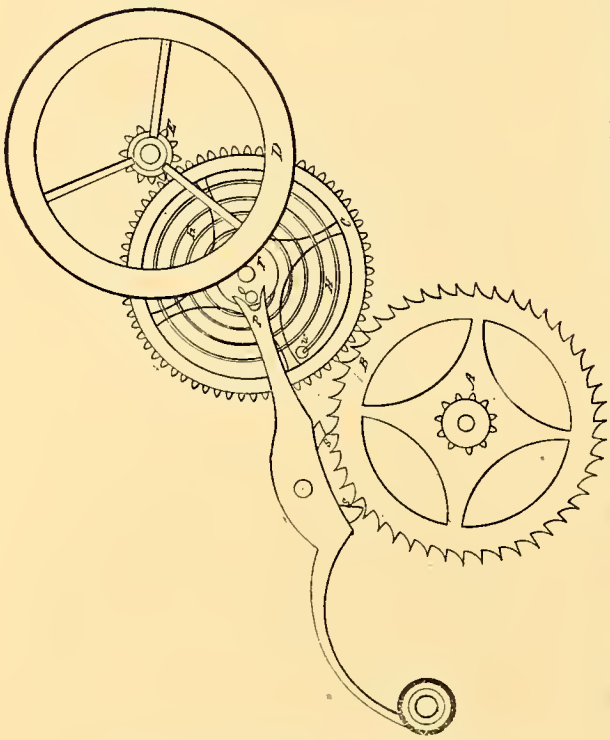
No. 284—"Waterbury, Trade Mark, U. S. A., Patented, 853467." About 14 size three-quarter plate duplex escapement like preceeding but with 12 jewels and more semblance to conventional design.

No. 285—"Knickerbocker Watch Co., New York." "K. W. Co." About an 18 size for special case similar in design to No. 283.

No. 286—"N. E. W. Co." A skeleton plate and dial making the entire train visible through crystals on front and back of watch. Duplex escapement like other Waterbury watches. The Waterbury Watch Co. of Connecticut was in-



No. 152—JEUNET'S SECONDS BEAT ESCAPEMENT



No. 154—ACTION OF JEUNET'S ESCAPEMENT

corporated in 1880 changed to New England Watch Company in 1898 and in 1912 failed, the plant being bought by Robert H. Ingersoll & Brother of New York City.

No. 287—"New York City Watch Co., Patent No. 526871." "Lever Winder." A stamped producet with much the general appearance of alarm clock finish. The wind is accomplished by moving the pendant back and forth giving a lever wind or as the English called it pump wind. See cut 159-34.

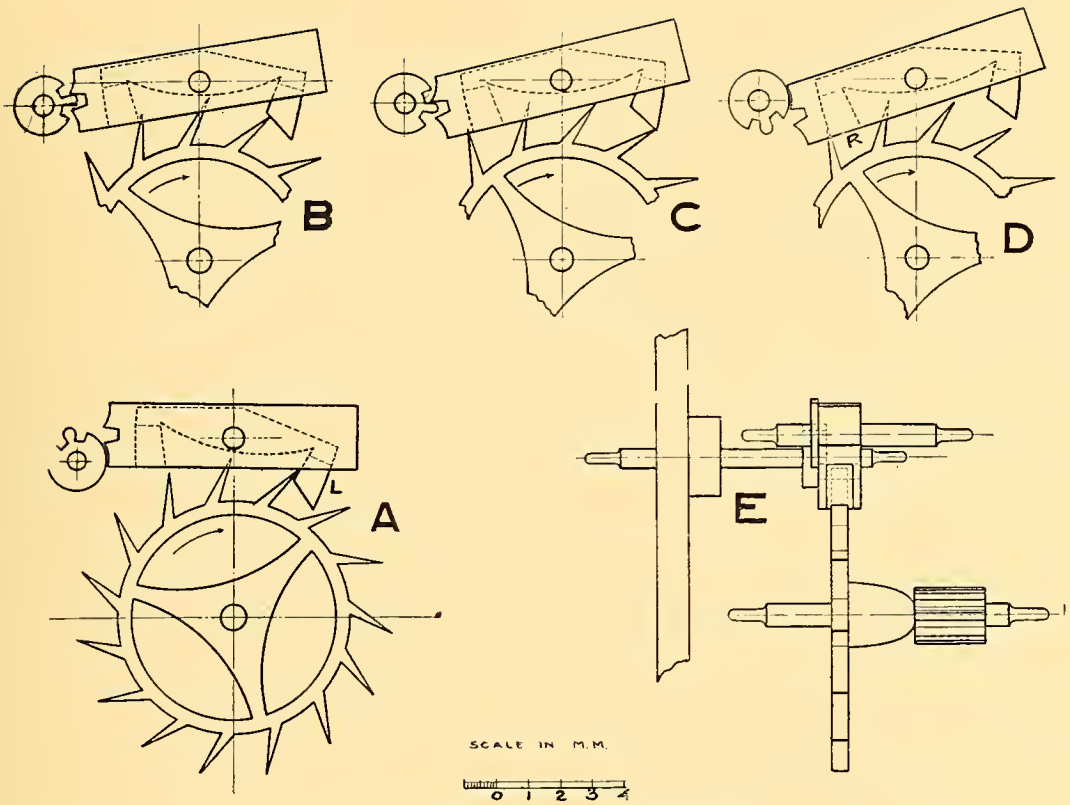
No. 288—"Robert H. Ingersoll & Brother." Stamped watch and case made first in 1892, by Waterbury Clock Company under contract for Robert H. Ingersoll & Brother of New York City. Sold first at one and one half dollars and later for one dollar. In 1908 the Ingersolls bought the factory and business of the Trenton Watch Company. In 1914 they bought the New England Watch Company which had been the Waterbury Watch Company of Connecticut.

No. 289—"Mfg. by the Ansonia Clock Co., New York, U. S. of America, Pat. April 17, 1888." A stamped product of the character of alarm clocks—stem wind and stem set by pressing crown in against a spring which holds it normally in winding position. See cut 159-33.

No. 290—"E. F. Bowman, Lancaster, Pa. No. 32." "E. F. Bowman." Three-quarter plate, 16 size, 21 jewels, stem wind compensated balance with timing screws. Breguet balance spring, no regulator and English type escape wheel. Ezra F. Bowman began making watches in 1880. W. H. Todd who had been formerly superintendent of the Lancaster Watch Co. made the model and in 1882 something over thirty watches were completed. In the summer of 1882 the machinery was sold out to the J. P. Stevens Watch Co.

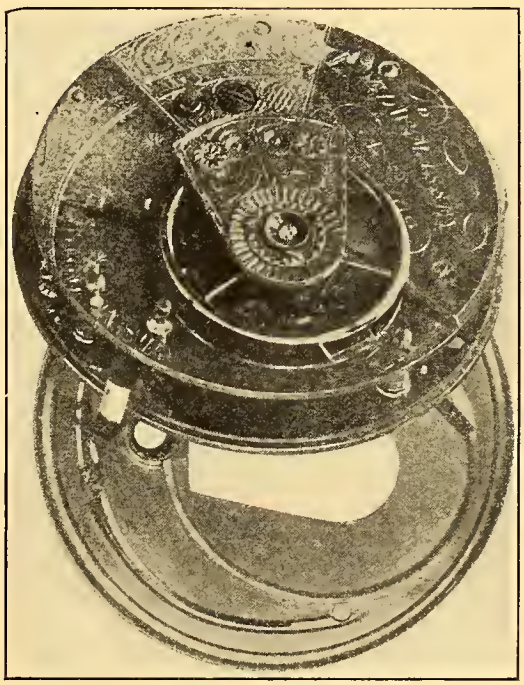
No. 291—"J. P. Stevens & Co., Atlanta, Ga., 130, Stevens Patent." "J. P. Stevens Watch Co., Atlanta, Ga." Three-quarter plate, 16 size, 15 jewels. The regulator is actuated by a spiral cut in a disc, enabling very minute movement. The escape wheel is club toothed. The watch resembles in several respects No. 290 having been designed by the same man and made with much of the same machinery, in 1884 C. L. Hoyt succeeded W. H. Todd as superintendent. The Stevens Brothers sold their interest in the company to the heirs of J. C. Freeman in 1885 and the new company, D. N. Freeman & Co. failed in 1887.

No. 292—"McIntyre." This watch was never put on the market. The example shown is one of several finished by C. E. DeLong who made the model and loaned by Edward R. Hills who bought out the other stockholders and owns the machinery which is said to be several steps in advance of anything before attempted in producing inter-



No. 155—ACTION OF MASSEY'S ESCAPEMENT

changeable parts. The watch is 16 size, bridge model, 21 jewels motor barrel, windup indicator and quite as exquisite as the best Swiss product.



No. 155—MOVEMENT BY MASSEY

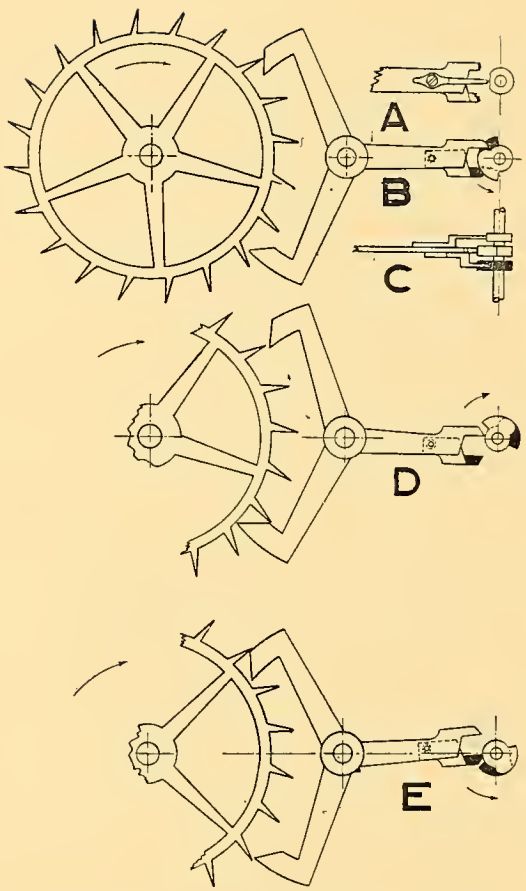
REFERENCES TO MAKERS

Agassiz—29, Wm. Anthony—150, Arnold Chas. Frodsham — 133—145, Arnold Fordsham—64, John R. Arnold—63—127, Thos. Arnold—80.

Baccuet—77, Barrauds—22—116, T. Betson—2, B. Bonniksen—98, Ld. Bordier—115, Borle—7, T. Brandt—68, Breguet—31—44—61—111—153, Thos. Buchanan—19.

Chas. Cabrier—126, Thos G. Cathro—58, Chevalier—106, Jno. Clayton—110, Constantine—62, Wm. Cooper—35, Jas. Cowan—9, R. F. Cowderoy—56, Andrew Crashaw—101.

Jacques DeBon--149, Dent—65—147, DePutter—43, DesGranges—3, Wm. Dixon—144, Ewd. Dormer—141, Dorwes—83, Ja. Duncan—109, Dutertre—32.



No. 155A—ACTION OF MUDGE'S LEVER

Louis Eisenhard—131, Jules Emmery—27.

Finer and Nowland—20, Fisher & Sons—105, Chas. Frodsham — 132, Froidevaux—76.

George Graham—10, Thos. Grignion —12, M. Grossman—135, Gudin—74. Girard Perregaux—128—143.

Thom. Hamlet—21, Rich. Holyer—40, Thos. Houghton—11.

Chas. E. Jacot—134, Jeffreys and Flam—57, Joseph Johnson—18—140.

Larpent & Jurgensen—75, B. Lawley—130, Samson Leekey—94, L'Epine —95—122, Lepine—34 — 114, Le-Roy—52—69—85, Litherland Davis & Co.—16, Johannes List—70, Loehr —103.

James McCabe—4—55, Mackenzie—14, Martineaux—93, Gille Martinot—84, Benj. Maude—46, H. L. Montandon—26, Moricand & DeGranges—121, David Morice—15, Thos. Mudge—123, Jame Murdock—86.

James Nardin—129—138, Nicod—120, Eardley Norton—37, Nottnagel Montmollin & Comp.—81.

Jaqs Oltramare—104, Carl Er. Orbin—24.

John Parker — 79, Parkinson & Frodsham—148, Patek Phillipe—66, George Prior—1.

Quartier—36, Oliver Quartier—90.

Robinson—39, Wm. Robinson—78, Rodin et Cie—88, Romilly—33, Thos. Russell—142.

Sabourin—13, Samelius—67, Samson—117, Thom. Savage—42, Joseph Sewill—17, Jas. Shilling—72.

Tarts—91, Robert Theurer & Fils—102, M. I. Tobias—99, Thos Tompion —151, W. Tomlinson—100.

W. J. Upjohn—41.

Vaucher Freres—51, Vellerius—25, Vuillamy—59.

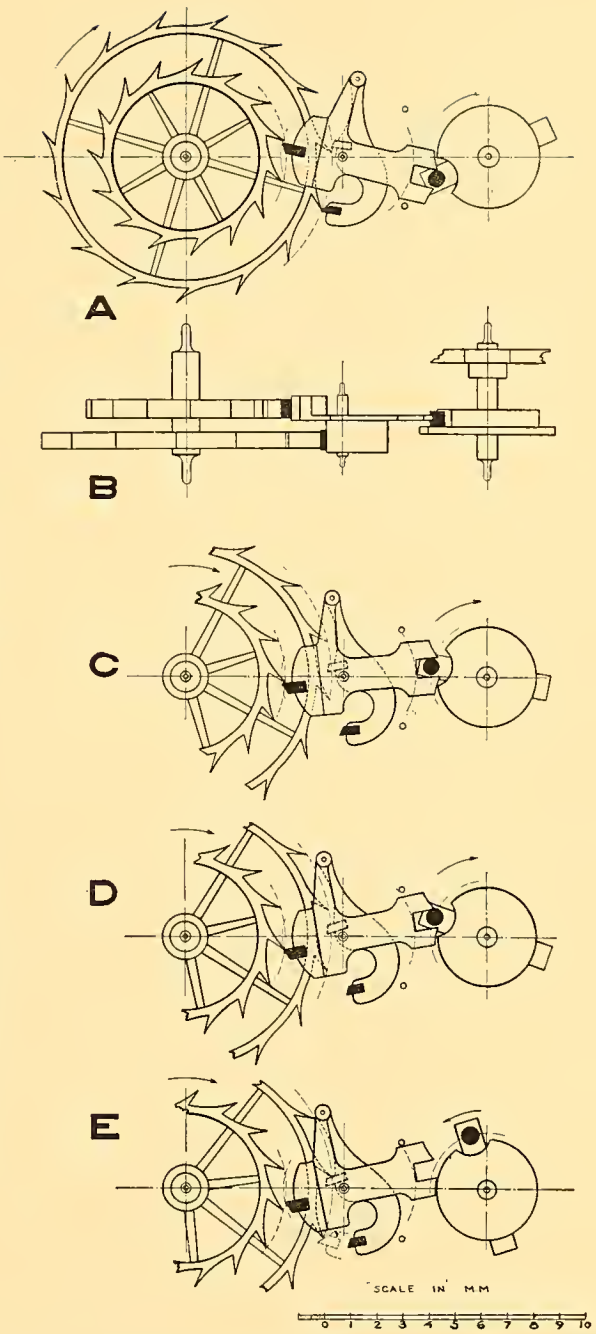
Eric Wallerius—23, J. Wilders—124.

Ferd. Zolling—113.

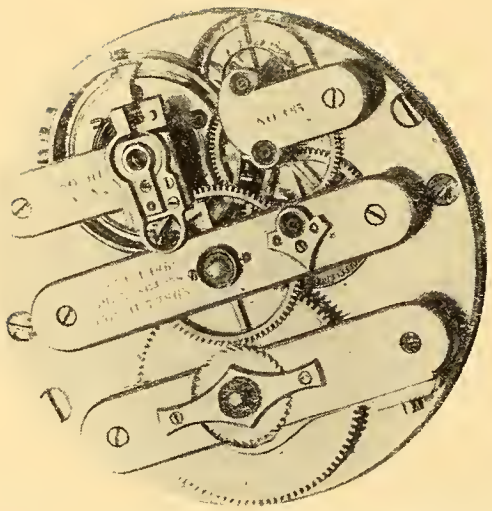
WATCHES MADE IN THE UNITED STATES

American Waltham Watch Company, 159 to 190 inclusive.
Ann Arbor Watch Company, 152.
Ansonia Clock Company of America, 289.
Appleton Watch Company, 259.
Auburndale Watch Company, 249, 250, 251.
Aurora Watch Company, 252.
E. F. Bowman Watch, 290.
Brooklyn Watch Company, 260.
California Watch Company, 245.
Chesire Watch Company, 258.
Columbus Watch Company, 253 to 257 inclusive.
Cornell Watch Company, 243, 244.
J. D. Custer Watch, 158.
Elgin National Watch Company, 191 to 209 inclusive.
C. Fasoldt Watch, 156.
Fredonia Watch Company, 239, 240.
Hampden Watch Company, 272.
E. Howard Watch and Clock Company, 210 to 213 inclusive.
Illinois Watch Company, 223 to 231 inclusive.
Robert H. Ingersoll & Brother, 288.
Jeunet Watch, 154.
Kelly Watch Company, 271.
Keystone Watch Company, 266, 267, 268.

REFERENCES TO—VARIOUS ESCAPEMENTS, ETC



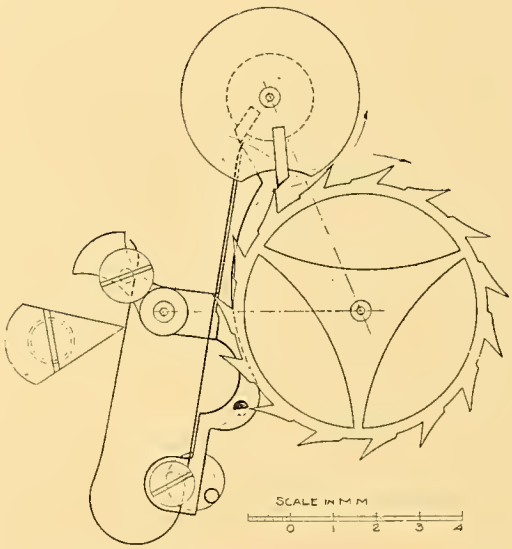
No. 156—ACTION OF FASOLDT'S ESCAPEMENT



No. 156—DOUBLE ESCAPE WHEEL CHRONOMETER BY FASOLDT

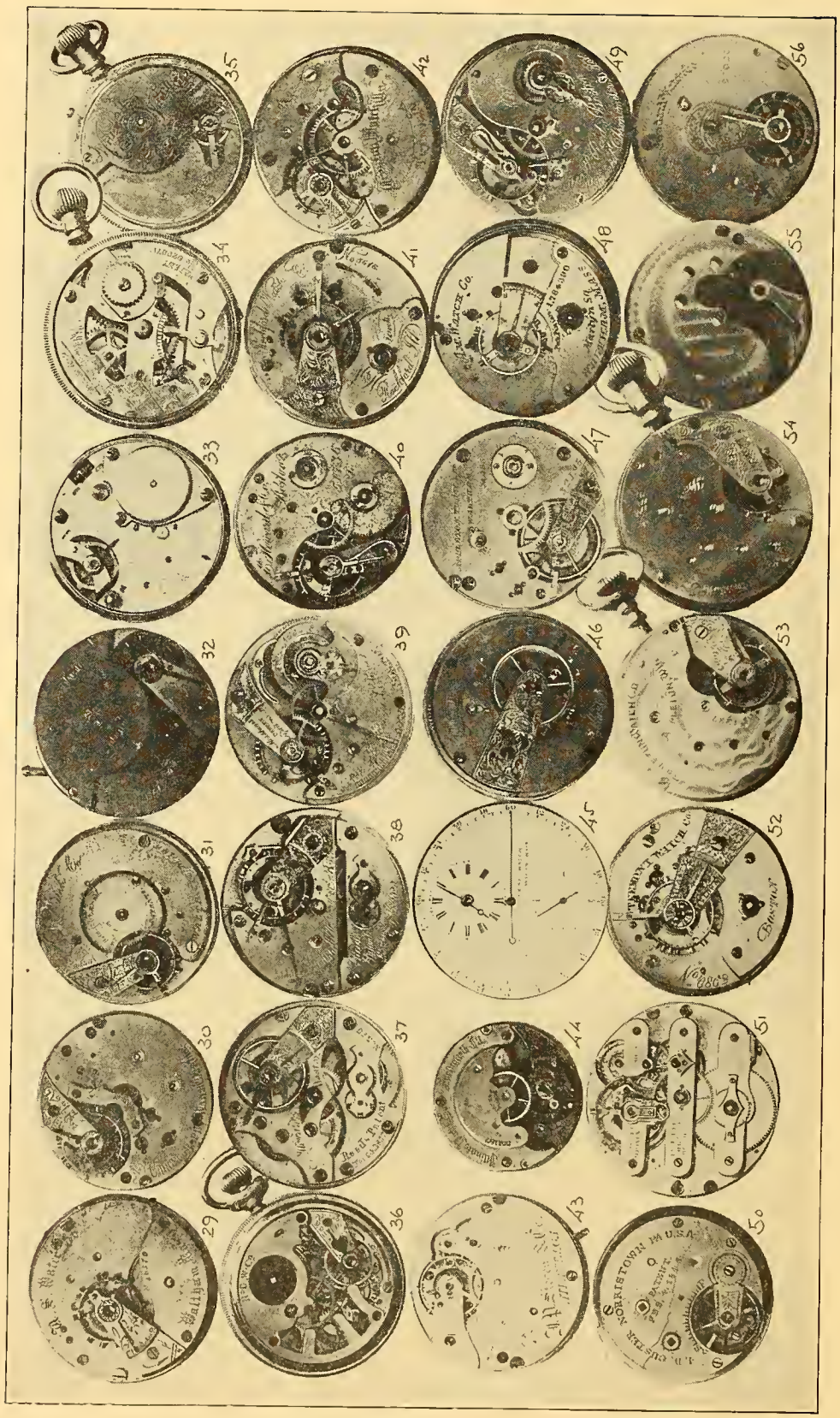
No. 157—REEDS CHRONOMETER

Calendar—53—57.
8 Day Lever—86.
Knickerbocker Watch Co., 285.
Lancaster Watch Company, 204, 265.
Manhattan Watch Company, 261.
8 Day Verge—
Independent Sweep Second—27.
Flyback—29—30.
Musical—51.
Decimal Dial—97.
Self Winding—102—103.
Pull Wind—51.
Pump Wind—287.
Transparent—107.
Automata Repeater—119.
Jump Figures—139.



No. 157—ACTION OF REED'S CHRONOMETER

No. 158—AMERICAN MOVEMENTS



No. 159—AMERICAN MOVEMENTS