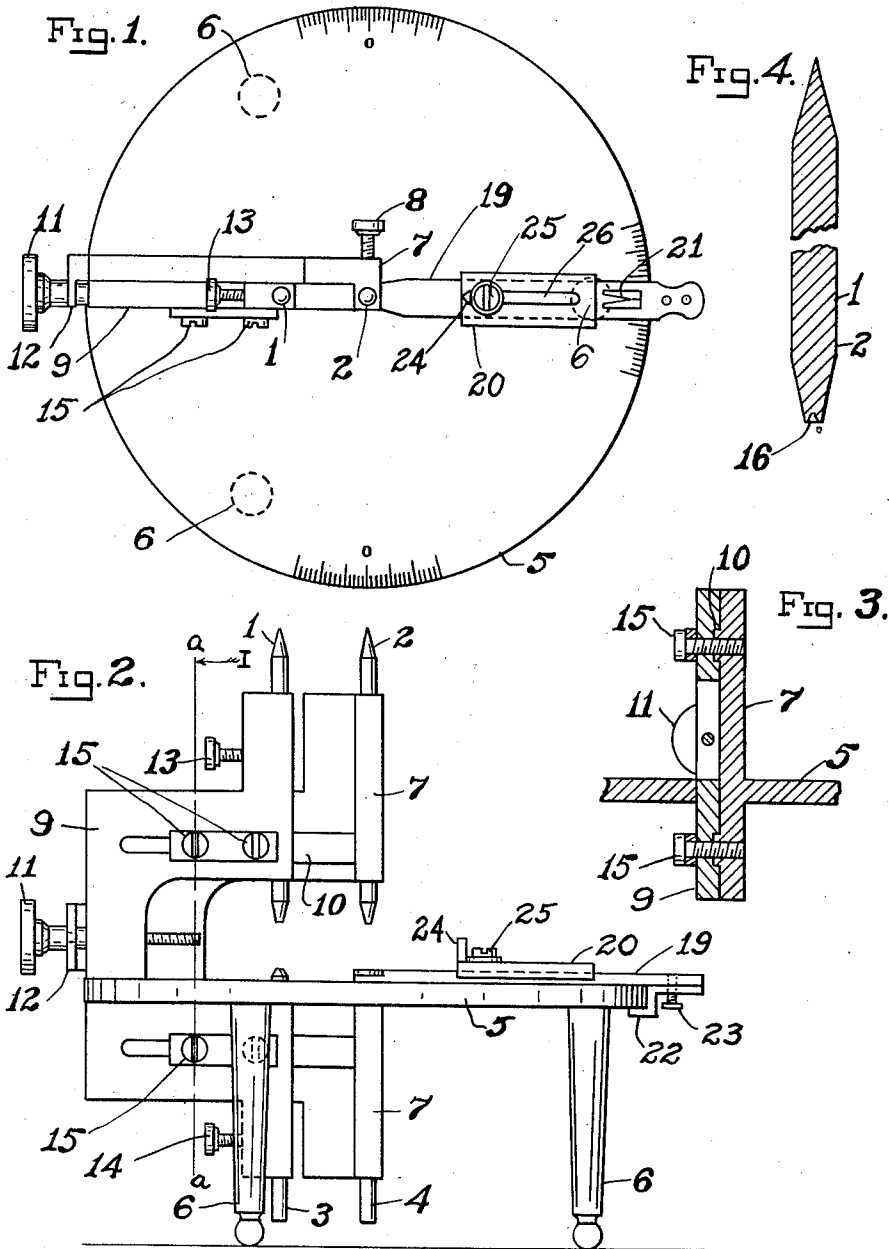


B. H. GREEN.
 PALLET STONE SETTING TOOL.
 APPLICATION FILED OCT. 19, 1912.

1,063,534.

Patented June 3, 1913.

2 SHEETS-SHEET 1.



WITNESSES:

Wm Henry Stiemann
Robert H. Jones

INVENTOR:

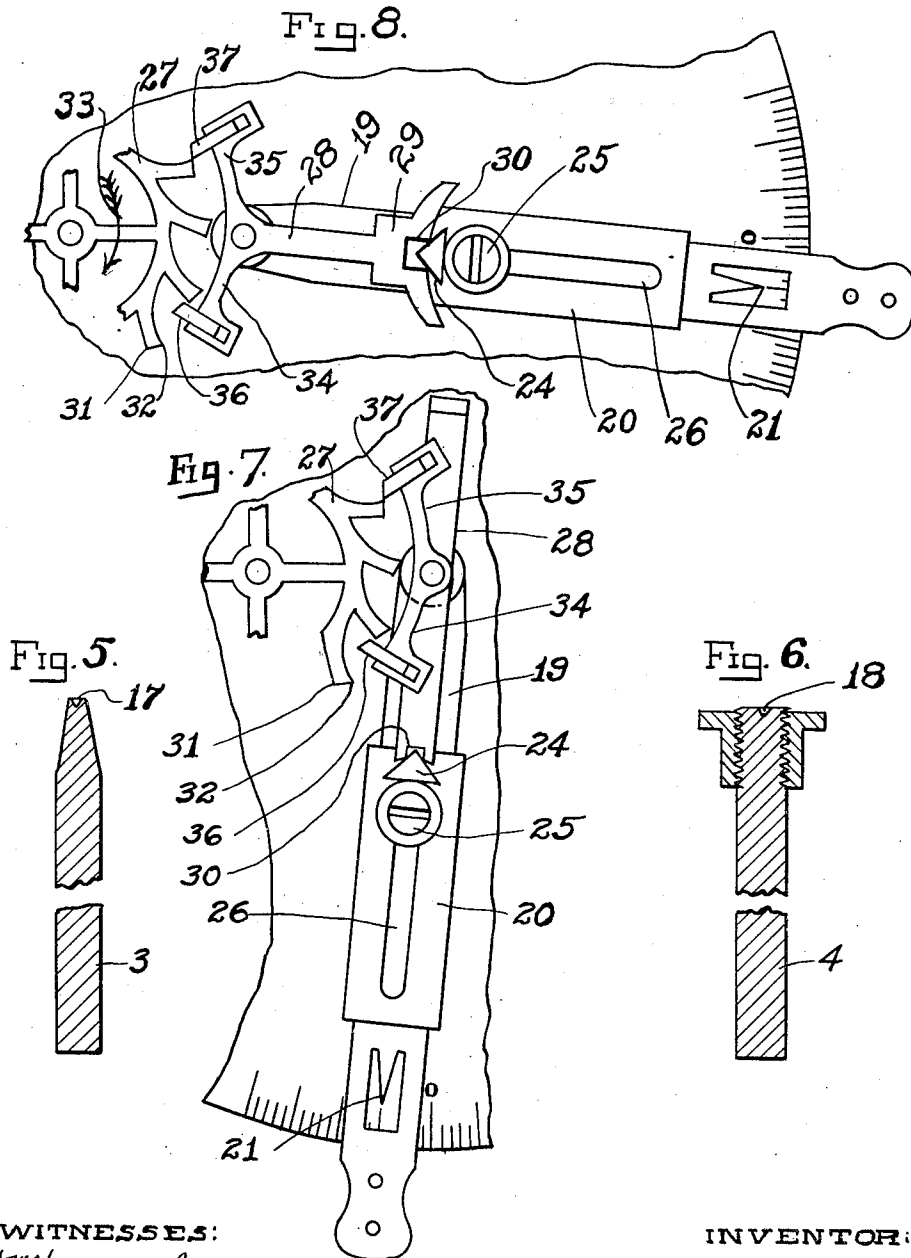
Benjamin H. Green
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UNITED STATES PATENT OFFICE.

BENJAMIN H. GREEN, OF KANSAS CITY, MISSOURI.

PALLET-STONE-SETTING TOOL.

1,063,534.

Specification of Letters Patent.

Patented June 3, 1913.

Application filed October 19, 1912. Serial No. 726,678.

To all whom it may concern:

Be it known that I, BENJAMIN H. GREEN, a citizen of the United States, residing at Kansas City, in the county of Jackson and State of Missouri, have invented certain new and useful Improvements in Pallet-Stone-Setting Tools, of which the following is a full, clear, and exact description, such as will enable others skilled in the art to which it appertains to make and use the same.

The invention relates to a pallet stone setting tool for watch making and repairing and seeks to provide a simple and effective form of tool to receive the escapement of a watch and the escape wheel whereby the stones may be accurately adjusted.

Pallet stones are mounted in the escapement of a watch to engage the teeth of the escape wheel, and upon the accuracy of the setting of these stones depends largely the reliability of the time piece.

The teeth of the escape wheel are of equal length from the center of the shaft upon which the wheel is mounted, and the distance which the pallet stones extend toward the center of the escape wheel bears a fixed relation to the distance between the shaft centers of the lever and wheel. It is essential that the shafts of the wheel and lever occupy relative positions in the tool as in the watch, and that means be provided to throw the lever in each direction from central position, a determined distance so that the tooth of the escape wheel may be forced by the pallet stone and accurately adjust the depth that it will engage the tooth of the wheel when in operation.

The present invention seeks to provide an improved tool to receive the escape wheel and escapement in the same relative position with reference to each other as that occupied in the watch, and a lever with a corresponding dial so arranged that the escapement may be set accurately in predetermined positions and a tooth of the wheel turned by the pallet stones to set them in the proper location in the escapement. It is customary to set pallet stones by measurement and guess, which is very unsatisfactory, often failing to produce a perfect adjustment and requiring great skill and unreasonable time to obtain ordinary results, but by providing a graduated tool and placing the wheel and escapement in

operative position therein, ordinary skill will produce a perfect adjustment with a great saving of time.

A further object of the invention is to make the tool not only adjustable but to receive both radially projecting and side lever escapements so that any escapement and wheel now in use, may be readily placed in the tool and a perfect and almost instant result obtained.

With these and other objects in view the invention consists of the features of construction, combinations and arrangements of parts hereinafter set forth, illustrated in the accompanying drawings and more particularly pointed out in the claims appended.

In the drawings: Figure 1, is a plan view of the improved tool. Fig. 2, is an elevation of the device. Fig. 3, is a vertical cross-section of the tool on an enlarged scale on line *a-a* of Fig. 2 looking in the direction of arrow I. Fig. 4, is a vertical cross-section on a still larger scale with a portion broken away to save room, of the upper bearing shafts 1 and 2. Fig. 5, is a vertical cross-section on the same scale as Fig. 4, with a portion broken away, of the lower bearing shaft 3. Fig. 6, is a vertical cross-section on the same scale as Figs. 4 and 5, with a portion broken away, of the lower shaft 4. Fig. 7, is a fragmentary view of the device on the same scale as Figs. 4, 5 and 6, with a portion of an escape wheel and a side lever escapement mounted therein. Fig. 8, is a fragmentary view of the device on the same scale as Figs. 4, 5, 6 and 7, with a portion of an escape wheel and a straight lever escapement mounted therein.

The platen 5 is preferably mounted on legs 6 and has rigid therewith the housings 7, which contain slidably fitted shaft 2, and shaft 4. Shaft 2 is held in the desired position by thumb screw 8 while shaft 4 remains in the position shown and may be secured in any desired manner, a tight fit being sufficient. Housing 9 is fitted to slide on slides 10 of housing 7 and supports shafts 1 and 3, and may be adjusted by the thumb screw 11, to move shafts 1 and 3 closer to or farther from shafts 2 and 4. The thumb screw 11 is shouldered in the bracket portion 12 of housing 7, and screw threaded in the housing 9. Shafts 1 and 3 are fitted to slide

in housing 9 and are held in the desired slidable position by thumb screws 13 and 14 respectively. The shafts 1 and 2 are pointed at their outer ends as shown and may be inserted in the jewels of a watch movement, or the distance from point to point measured, to assist in adjusting the shafts 1 and 3 to the desired distance from shafts 2 and 4, and screws 15 are provided to secure housing 9 rigidly to housing 7 when the shafts are so adjusted.

Shafts 1 and 2 are duplicate and cupped at their inner ends as shown at 16, Fig. 4, shaft 3, as shown at 17, Fig. 5, and shaft 4 as shown at 18, Fig. 6, for the purpose of receiving the ends of the shafts of an escape wheel and an escapement. The lever 19 rests on the platen 5, is provided with the pointer 21, lock clamp 22 locked by screw 23, is revolvably fitted to shaft 4 and is preferably arranged to swing through an arc of not less than 190 degrees. Block 20 is slidably fitted to lever 19, is slotted as shown at 26, and is provided with pin 24, and locked in the desired position by screw 25. The platen 5 has a line marked 0 in the plane of the centers of shafts 1 and 2 and shafts 3 and 4 and when pointer 21 is on this line the center of the pin 24 is in line with the shafts. There is also a line at right angles to the above described line on either side of the platen 5, also marked 0, and this line when registering with pointer 21 indicates when the lever 19 is at right angles to a plane through the centers of shafts 1, 2, and 3, 4. On each side of these zero marks the platen 5 is graduated preferably in degrees of a circle. The object of this will appear from the fact that escapements usually swing 5 degrees each way from central position.

In Fig. 8 is illustrated in plan view a fragment of the platen 5, and a plan of the lever 19 set 5 degrees from 0 or the center line, also a fragment in plan view of an escape wheel 27, and of an escapement 28, having a radially projecting arm 29, which is notched at 30 as usual to contact with the parts carried by the balance wheel shaft of a watch.

As the escapements and escape wheels illustrated in Figs. 7 and 8 are no part of the present invention, they are shown only in one view, and this only to assist in describing the use of the improved tool.

The escape wheel 27 is of the usual form and construction having teeth with beveled ends which are shorter at the front corner 31, than at the rear corner 32, this with reference to the travel of the teeth as indicated by arrow 33.

The escapement 28 is of the usual form and construction and is provided with arms 34 and 35 to receive the pallet stones 36 and 37 respectively. The pallet stones 36 and 37 are usually held in the arms 34 and 35 with

shellac or wax and before final adjustment they are allowed to stand out farther from the arms than when in working adjustment.

To use the improved tool the escape wheel 27 is mounted between shafts 1 and 3 with the ends of the escape wheel shaft, which is not illustrated because of well known construction, closely fitting in the cups 16 and 17, but free to revolve. The escapement 28 is then mounted with the ends of the escapement shaft, the illustration of which is also omitted because of well known construction, closely fitting in cup 16 of shaft 2 and cup 18 of shaft 4. The block 20 is then set with pin 24 closely fitting in notch 30 of the arm 29 and locked by screw 25. In this position the arm 29 of the escapement 28 is parallel with arm 19 which is illustrated in Fig. 8, 5 degrees from the center line 0. The wax holding pallet stone 37 is now warmed, which is usually effected by the application of a wire, this being no part of the invention, and one tooth of the wheel 27 is forced past the stone 37 and when the parts have reached the position shown in Fig. 8, the stone has been moved by the tooth to accurate working adjustment. It is obvious that if arm 19 be now set 5 degrees in the opposite direction from the center line 0 and the operation repeated with reference to stone 36, both stones will be accurately set in the escapement 28. It will also be understood that the side lever escapement illustrated in Fig. 7 may be treated in the same manner, with the arm 19 thrown 5 degrees each way from the right angle line 0.

The improved tool will easily accommodate escape wheels and escapements of different sizes and the pallet stones of escapements having other than 10 degrees travel may also be accurately set from the graduated dial of the platen 5. It is obvious that numerous changes may be made in the details set forth without departure from the invention.

Having described my invention, what I claim as new and desire to secure by Letters Patent, is:—

1. In a pallet stone setting tool for watch making and repairing the combination of a graduated platen, a housing rigid with said platen and provided with bearings to receive the shaft of the escapement, a housing mounted on said first mentioned housing and provided with bearings to receive the shaft of an escape wheel, a lever constructed to swing partially around the center of said escapement shaft and an adjustable pin mounted on said lever and constructed to engage centrally the end of the lever portion of said escapement, whereby the pallet stones may be set by the manipulation of said lever and the turning of said escape wheel.

2. In a pallet stone setting tool for watch making and repairing, the combination of

a disk shaped platen supported by legs, a housing rigid with said platen and provided with a lower shaft extending upward through and centrally located in said platen, said housing provided with an upper shaft adjustable vertically and suspended above said platen, means to lock said shaft in position, cup points in the nearest ends of said shafts to receive the escapement shaft of a watch, means to hold the escape wheel of a watch in a fixed relative position to said escapement, and means to rigidly hold said escapement in predeterminable position, so that the pallet stones may be set by turning said wheel.

3. In a pallet stone setting tool for watch making and repairing, the combination of means comprising a platen a swing lever and bearings adjustably mounted in a housing and constructed to hold an escapement in locked positions, slides on said housing, a housing slidably mounted on said slides and provided with a screw to effect sliding adjustment, screws to rigidly hold said adjustment, and adjustable bearings to hold the escape wheel of a watch whereby by turning said wheel the pallet stones are accurately fixed in working adjustment.

4. In a pallet stone setting tool for watch making and repairing, the combination of a stationary housing rigidly constructed with a disk shaped platen, a slidable housing slidably mounted on said stationary housing, a screw to slide said slidable housing, screws to lock said slidable housing, shafts mounted in said housings and having cup points to receive the escape wheel shaft and the escapement shaft of a watch, a swinging lever on said platen provided with a locking clamp

a pin to centrally engage the lever end of said escapement and a pointer to indicate the position of said lever on said platen, and an index on said platen whereby the position of said lever may be accurately determined.

5. In a pallet stone setting tool for watch making and repairing, the combination of a platen having a dial, means mounted on said platen to hold the escape wheel and escapement of a watch in operative position, a lever mounted on said platen and provided with means to engage the end of said escapement, and a pointer on said lever to determine the position of said escapement by registration with said dial.

6. In a pallet stone setting tool for watch making and repairing, the combination of bearings to hold the escape wheel, bearings to hold the escapement, means to adjust the position of said bearings, and adjustable means constructed to hold the escapement rigidly in a position that will accurately set the pallet stones in said escapement by turning the said escape wheel.

7. In a pallet stone setting tool for watch making and repairing the combination of bearings mounted to receive the shafts of the escape wheel and the escapement, and means constructed to hold the escapement in predeterminable positions so that when the teeth of said wheel are turned past said stones the said stones are set in operative position.

In testimony whereof I affix my signature in the presence of two witnesses.

BENJAMIN H. GREEN.

Witnesses:

HARRY A. BERGH,
LEO H. LUDWIG.