No. 871,866. PATENTED NOV. 26, 1907.

B. Z. FRIEDMAN.

HAIR SPRING LOCATOR.

APPLICATION FILED OCT. 7, 1902.

Fig. 1

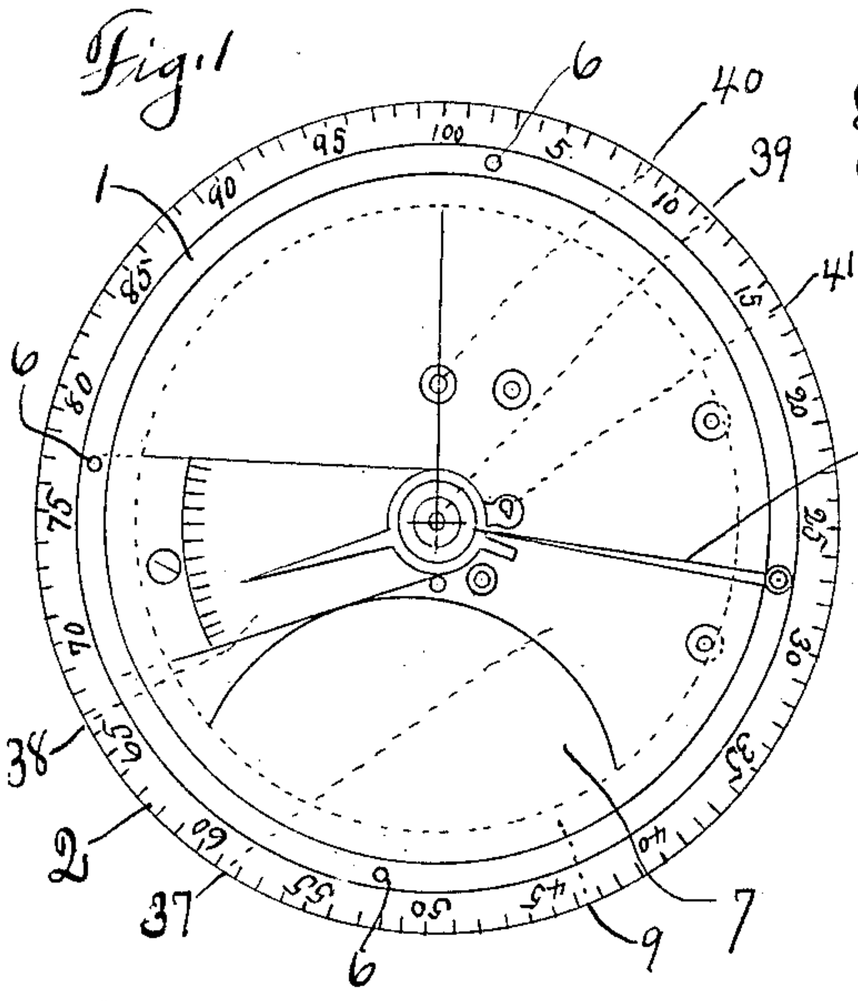


Fig. 2

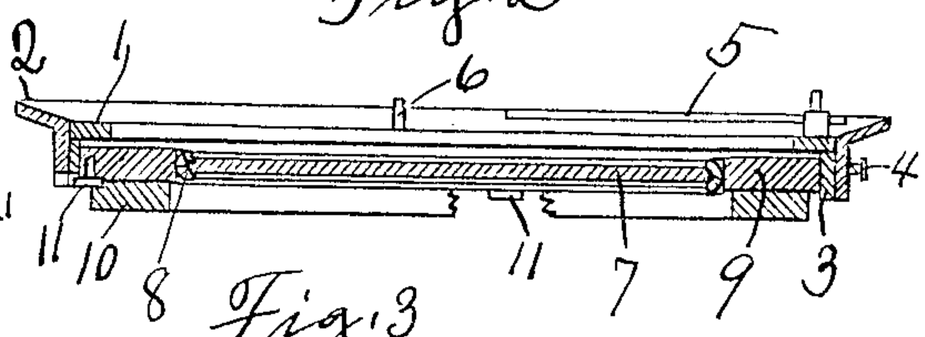


Fig. 3

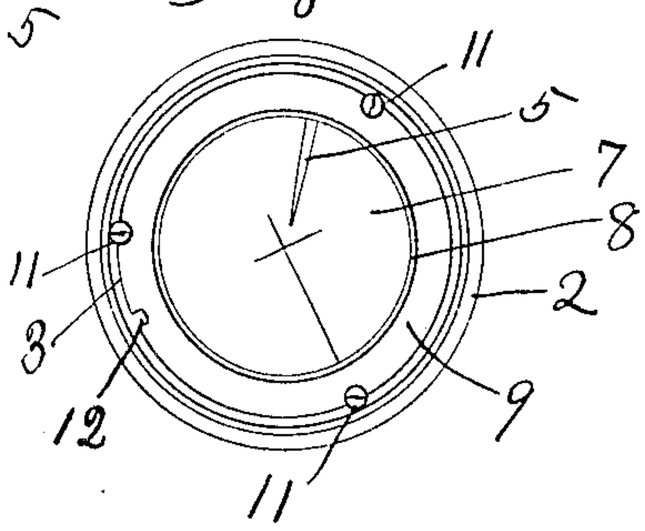


Fig. 4

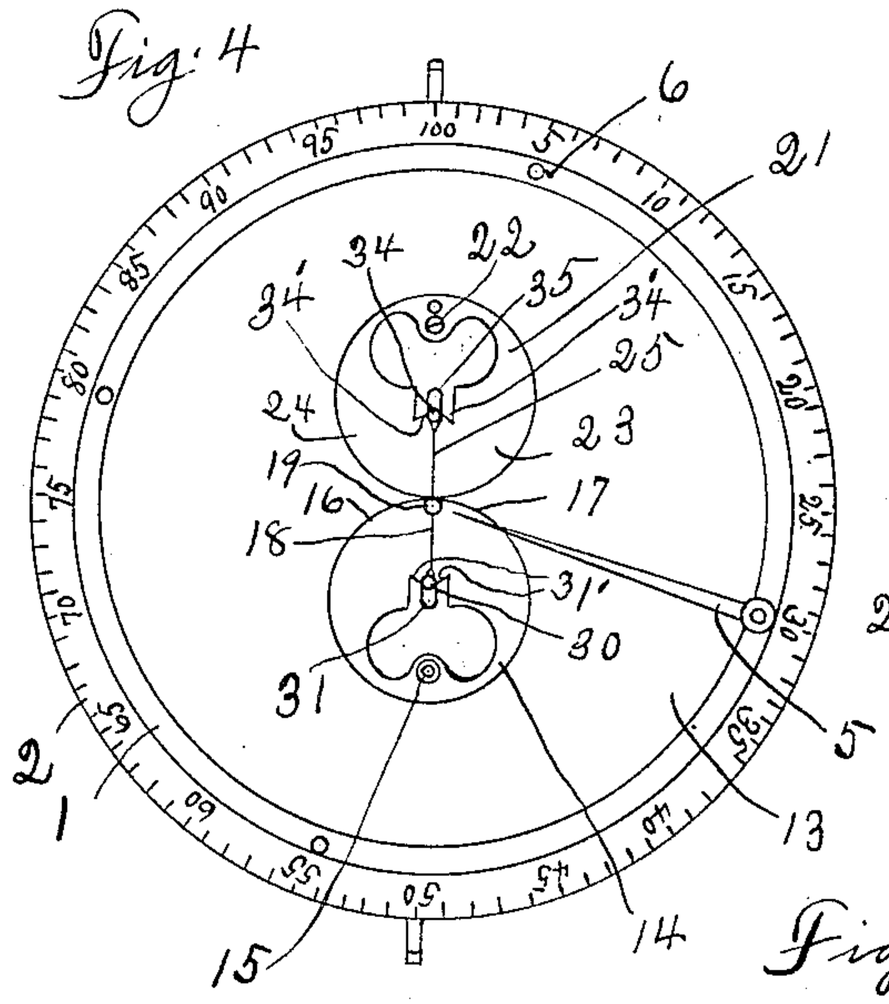


Fig. 5

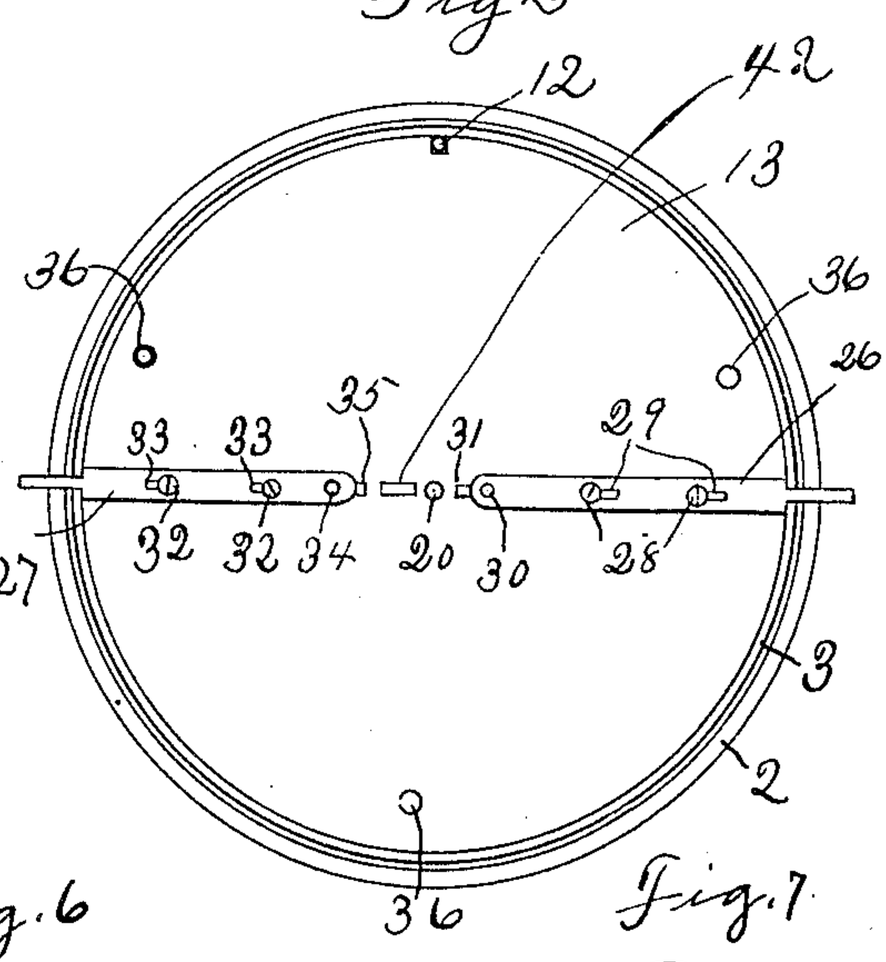


Fig. 6

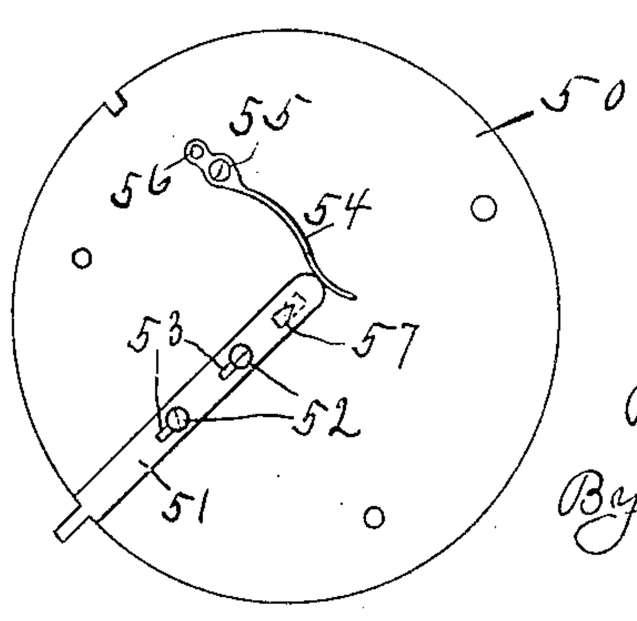
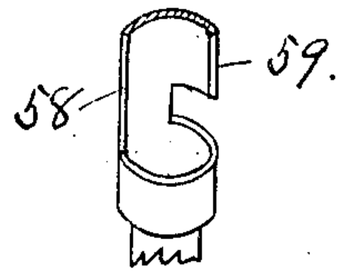


Fig. 7



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UNITED STATES PATENT OFFICE.

BERNHARD ZADOC FRIEDMAN, OF FORT WORTH, TEXAS, ASSIGNOR TO ISAAC BLACKMAN, OF FORT WORTH, TEXAS.

HAIR-SPRING LOCATOR.

No. 871,866. Specification of Letters Patent. Patented Nov. 26, 1907.

Application filed October 7, 1902. Serial No. 126,266.

To all whom it may concern:

Be it known that I, BERNHARD ZADOC FRIEDMAN, a citizen of the United States, residing at Fort Worth, Texas, have invented a Hair-Spring Locator, of which the following is a specification.

This invention relates to a tool or instrument for setting the hair spring of watches and particularly tools for locating the seat for the hair spring stud. The practice in setting the hair spring of watches has been to locate the seat of the hair spring by trial.

I have invented a tool by which the location of the hair spring seat to the right of the roller jewel may be accurately and positively measured.

Th invention will be fully described in the following description and the invention will be more particularly pointed out in the claims.

Reference is had to the accompanying drawings which form a part of this application and specification.

Figure 1 is a face or plan view of the frame and the annulus which carries the indicator mounted in the frame. Fig. 2 is a vertical section of the same. Fig. 3 is an inverted view of the instrument shown in Fig. 1 on a reduced scale. Fig. 4 is a face or plan view of the frame and the annulus carrying the indicator and the locator mounted in the frame. Fig. 5 is an inverted view of the instrument shown in Fig. 4. Fig. 6 illustrates a variation of the spring and slide bar. Fig. 7 is an enlarged view of an escapement cylinder.

Similar characters of reference are used to indicate the same parts throughout the several views.

I have provided a circular frame 2 with an annulus 1 set therein. The frame 2 is provided with a ring 3 secured on the inside of the frame 2 by means of screws 4. The ring 3 constitutes the seat for the annulus 1. The annulus 1 carries the indicator 5 and the annulus is further provided with lugs 6 by which the annulus may be slid or turned in the frame 2. A scale of 100 divisions is made on the frame 2. The annulus 1 is permanently mounted in frame 2. The frame 2 is adapted to carry the mechanism for locating the seat of the hair spring stud and also to carry the mechanism for setting the hair spring stud.

The means for locating or finding the seat of the hair spring stud of watches consists of the indicator 5 and a glass disk 7 mounted in a ring 8 which is mounted in an annular frame 9. The ring 8 may be soldered in the annular frame 9. A cross is marked on the glass disk 7, as shown in Figs. 1 and 3. The cross is simply a cut in the underside of the glass. A leather ring 10 is glued to the frame 9 to prevent the frame from slipping on the watch movement or scratching the movement. The frame 9 has screws inserted therein to prevent the seat locator from coming in contact with the annulus 1. Notches are made in the lower rim of the frame 2 and in the ring 3 for the heads of screws 11. The heads of the screws 11 catch in these notches and thus prevent the frame 9 from coming in frictional contact with the annulus 1. A lug 12 is formed on or attached to the inside of ring 3 and a notch is made in the frame 9 for the lug 12. This lug is simply a guide for putting the seat locator in the frame 2,—it being necessary to place the seat locator in the same position in the frame whenever used. The glass disk by means of its cross aids the indicator 5 in finding the seat of the hair spring stud.

The stud setter consists of a disk 13 with means mounted thereon for setting the hair spring of the balance wheel. The spring 14 is mounted on disk 13 by means of the rivet 15 or a screw. The spring has two jaws 16 and 17 which meet along the line 18 and has a circular opening for the blance staff,—the hole 19 formed in the spring registering with the hole 20 in disk 13. The spring 14 is for the purpose of holding the balance staff while the balance spring is being set. Another spring 21 is mounted on disk 13 by means of pin 22. This spring 21 has jaws 23 and 24, which meet or come together along the line 25. This spring 21 is for the purpose of holding the roller jewel while the hair spring is being set. The springs 14 and 21 are opened by means of bars 26 and 27 respectively. The bar 26 is attached to the underside of disk 13 by means of screws 28, and slots 29 are cut in the bar 26 so that the bar 26 may be shoved in. The bar 26 carries the pin 30 and a slot 31 is made in the disk 13. The pin 30 moves back and forth in slot 31. When the spring 14 is to be opened the bar 26 is pressed towards the center of disk 13. The pin 30 strikes the beveled surfaces 31′ of the spring 14 and thus

presses the jaws 16 and 17 open to receive the balance staff. The bar 27 is mounted on disk 13 by screws 32. The bar 27 moves on screw heads 32 by reason of slots 33 in the bar 27. The bar 27 carries a pin 34 which is for opening the jaws 23 and 24 of spring 21. The pin 34 strikes the beveled surfaces 34′ of the jaws 23 and 24 when the slide bar 27 is shoved in and thus opens the spring jaws. The slot 35 is made in disk 13 for the movement of pin 34. The spring jaws 23 and 24 are to be opened to receive the jewel pin or roller jewel to hold the same while the hair spring is being set. Notches are cut in the frame 2 and ring 3 for bars 26 and 27. A notch is cut in disk 13 for the lug 12 which serves as a guide for putting the stud locator in the frame 2. The disk 13 is provided with three legs 36 on the underside thereof which support the setting mechanism on the work bench to hold the setting mechanism up from the bench. A slot 42 is made in the disk 13 to prevent the breaking of the roller jewel of the watch,—this slot being made so that the roller jewel will not come in contact with anything except the spring jaws 23 and 24.

Fig. 1 shows the seat locator or finder mounted on a watch movement 37 to illustrate the use of the instrument. The watch movement 37 is seen through the glass disk 7. A hole 39 is seen in the balance cock for the pivot of the balance wheel of the watch. Another hole 40 is shown in the movement 37 for the pivot of the pallet staff (or arbor). The balance cock 38 is also seen through the glass disk 7. A seat 41 for the hair spring stud is shown in the balance cock.

The operation of locating or finding the seat and setting the hair spring with my improved instrument may be described as follows:—Insert the seat locator in the frame and put the same on top of the balance cock of the watch movement so that the cross of the locator will be over the pivot point of the balance staff and the long line over hole 40 for the pivot of the pallet arbor. Then turn the annulus until the indicator reaches directly over the hole 41 or seat in which the hair spring stud is to be located or inserted. This will show the number of divisions to the right or left which indicates the distance of the stud from the line from the balance pivot to hole 40. This may sometimes be at the 100th division. This shows how far to the right or left the hair spring stud must be away from the roller jewel when the hair spring is set. When this has been determined, take out the locating mechanism and put the stud setter in the frame. Press on the lever or slide bar 27 of the stud setter with the finger and open the spring 21 enough to receive the jewel pin. Also press on bar 26 and place the balance wheel and roller jewel staff in hole 19. Then relieve the pressure on the slide bar slowly so that the spring jaws 17 and 18 will close in on the balance staff without breaking the same. The balance wheel is then in position for setting the hair spring. The roller jewel is directly between the balance staff and the pallet arbor, so that an imaginary line drawn from the balance staff to the pallet arbor would divide the roller jewel in half and pass over the 100th division of the scale. Then place the hair spring of the balance staff. The balance staff projects above the balance wheel (as well as below) in such position that the hair spring stud will stand directly over the indicator,—the indicator having been previously set by means of the annulus 1. The hair spring collet is then pressed down on the balance staff, the balance wheel with the hair spring thus located is ready to be put in the watch. The spring 21 holds the roller jewel and the spring 14 holds the balance staff in the hole 19. The hole 19 is made small enough to engage the smallest balance staff and the spring arms will yield to engage any balance staff to the largest. The beat of the watch is thus determined and regulated by setting the hair spring properly.

In watches having a cylinder instead of a lever escapement the hair spring seat of the watch is located in the same manner as in those having the lever escapement. The spring and slide bar for holding the cylinder is constructed with slight differences. In Fig. 6 I show a disk 50 and a slide bar 51 mounted on the underside thereof by means of screws 52 and the bar 51 is movable on the screws 52 by having slots 53 cut therein. A spring 54 is attached to the disk 50 by means of screws 55 and a pin 56 holds the slide bar 51 in its normal position. The hole 57 in the slide bar 51 has an acute angle to receive the cylinder and press the same against the end wall of the slot in the disk 50,—the disk 50 having a slot rectangular in contour, similar to the slot 42 in disk 13, so that the entrance lip 58 and the exit lip 59 of the cylinder will be pressed against the end wall of the slot in the disk by the spring 54 by means of the bar 51. When the cylinder is to be placed in the disk and in the slide bar, press the slide bar in with the finger and insert the cylinder. A broken sectional view of a cylinder is shown in Fig. 7.

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

1. A tool for locating the seat of the hair spring stud of watches and for setting the stud in said seat comprising devices for finding the seat and a disk carrying means for holding the balance wheel of the watch, said finding devices determining and pointing to the location of said seat while said holding devices hold the balance staff of the watch.

2. A tool for locating the seat of the hair spring stud of watches and for setting the

stud in said seat comprising finding devices including an annulus carrying an indicator and a disk carrying means for holding the balance wheel of the watch, said indicator pointing to the location of said seat while said holding devices hold the balance-wheel staff of the watch.

3. A tool for setting the hair spring of watches comprising a frame having a scale thereon, a movable indicator for indicating the divisions of said scale and pointing to the seat of the hair spring stud, and means for setting the hair spring stud.

4. A tool for setting the hair spring of watches comprising a frame, and means for locating the seat of the hair spring stud, a disk to be mounted in said frame and means mounted on said disk for holding the balance wheel staff and for receiving and holding the jewel pin.

5. A tool for setting the hair spring of watches comprising a frame, an annulus mounted in and movable in said frame, an indicator mounted on said annulus, said frame having a scale thereon, and a hair spring stud setter, said setter being provided with means for holding the balance staff and roller plate and means for engaging and holding the roller jewel.

6. A tool for setting the hair spring of watches comprising a frame having a scale thereon, an indicator mounted in said frame, a setter for the hair spring stud, said setter having springs for receiving and holding the roller jewel, a spring for receiving and holding the balance staff, and means for operating said spring.

7. In a tool for setting the hair spring of watches provided with a frame having a scale thereon and an indicator mounted in said frame; a setter for placing the hair spring stud in said seat consisting of a disk to be mounted in said frame, a spring having arms and a hole at the junction of said arms mounted on said disk for receiving and holding the balance staff, and means for operating said springs.

8. In a tool for setting the hair spring of watches provided with a frame having a scale thereon and an indicator mounted in said frame; a setter mounted in said frame consisting of a disk, a spring having spring arms adapted to engage the roller jewel mounted on said disk, a spring having spring arms and a hole therein formed at the meeting of said spring arms mounted on said disk, and slide bars mounted on said disk and carrying pins adapted to open the arms of said springs, said disk having slots for said pins and a slot for the roller jewel and a hole for the balance staff.

In testimony whereof, I set my hand in the presence of two witnesses, this 21st day of March, 1902.

BERNHARD ZADOC FRIEDMAN.

Witnesses:

J. H. GREER,

F. L. JACCARD.