

(No Model.)

2 Sheets—Sheet 1.

P. G. RUSSELL,
HAND FOR TIME PIECES.

No. 290,116.

Patented Dec. 11, 1883.

Fig. 1.

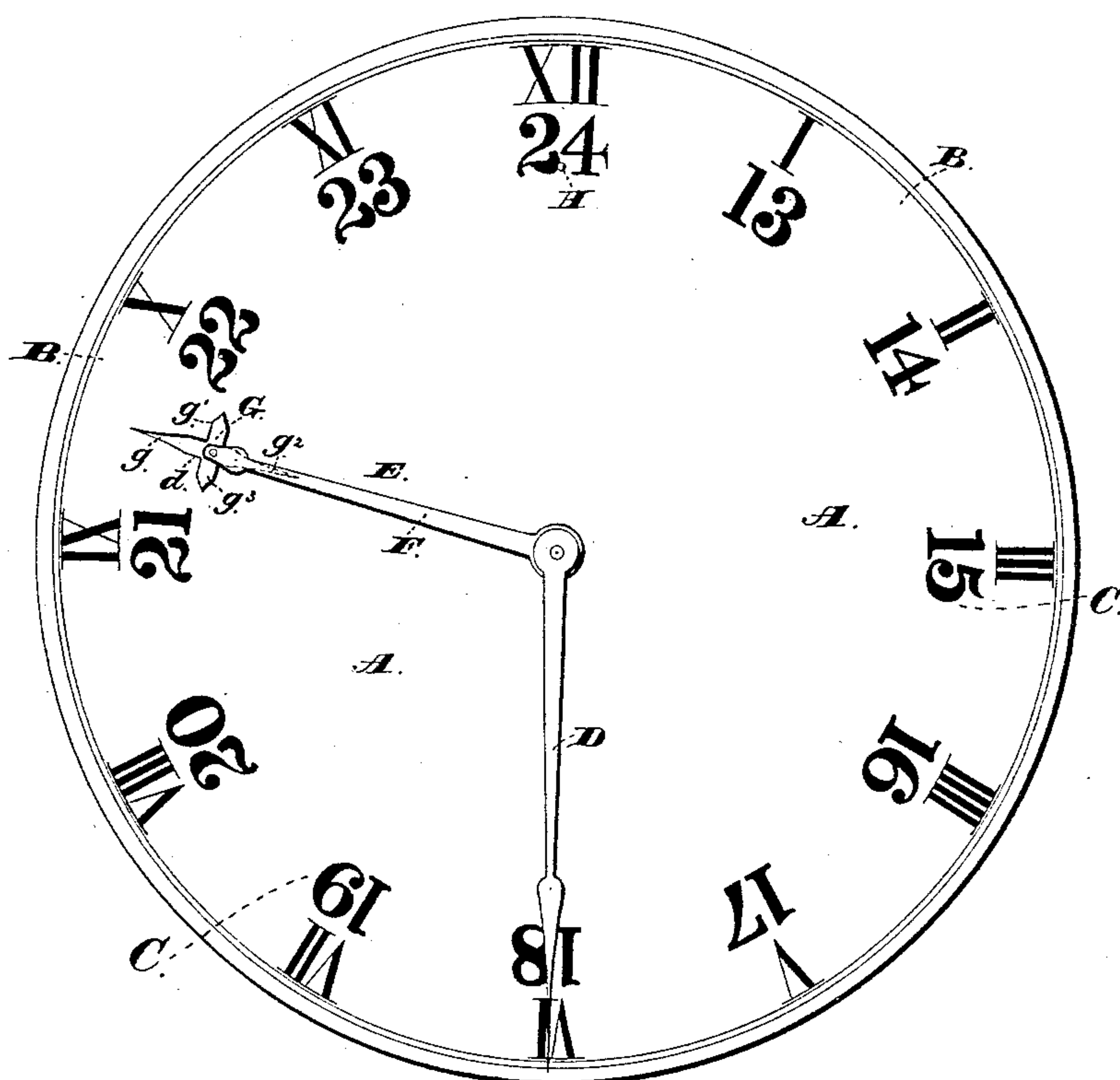
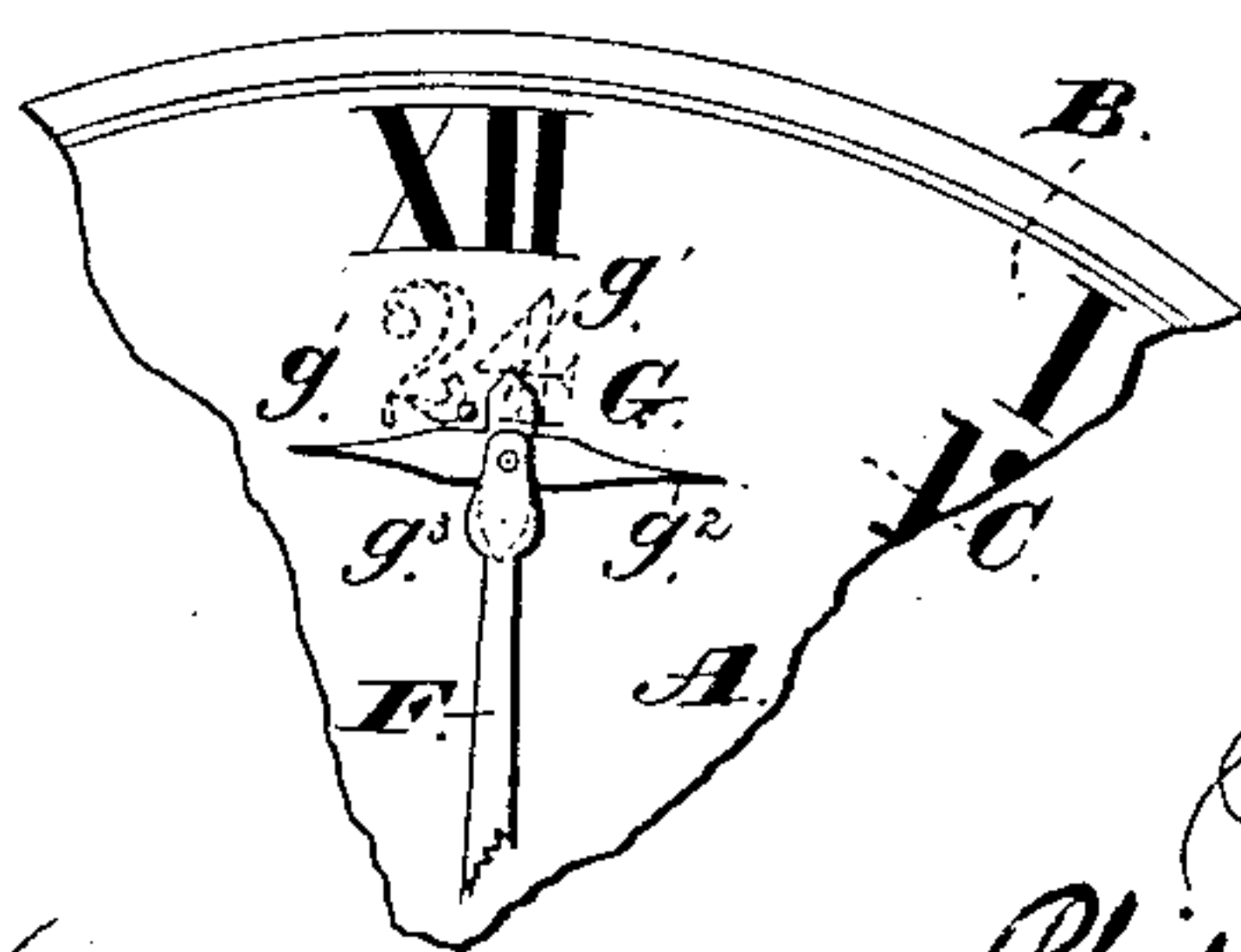


Fig. 2.



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Fig. 3.

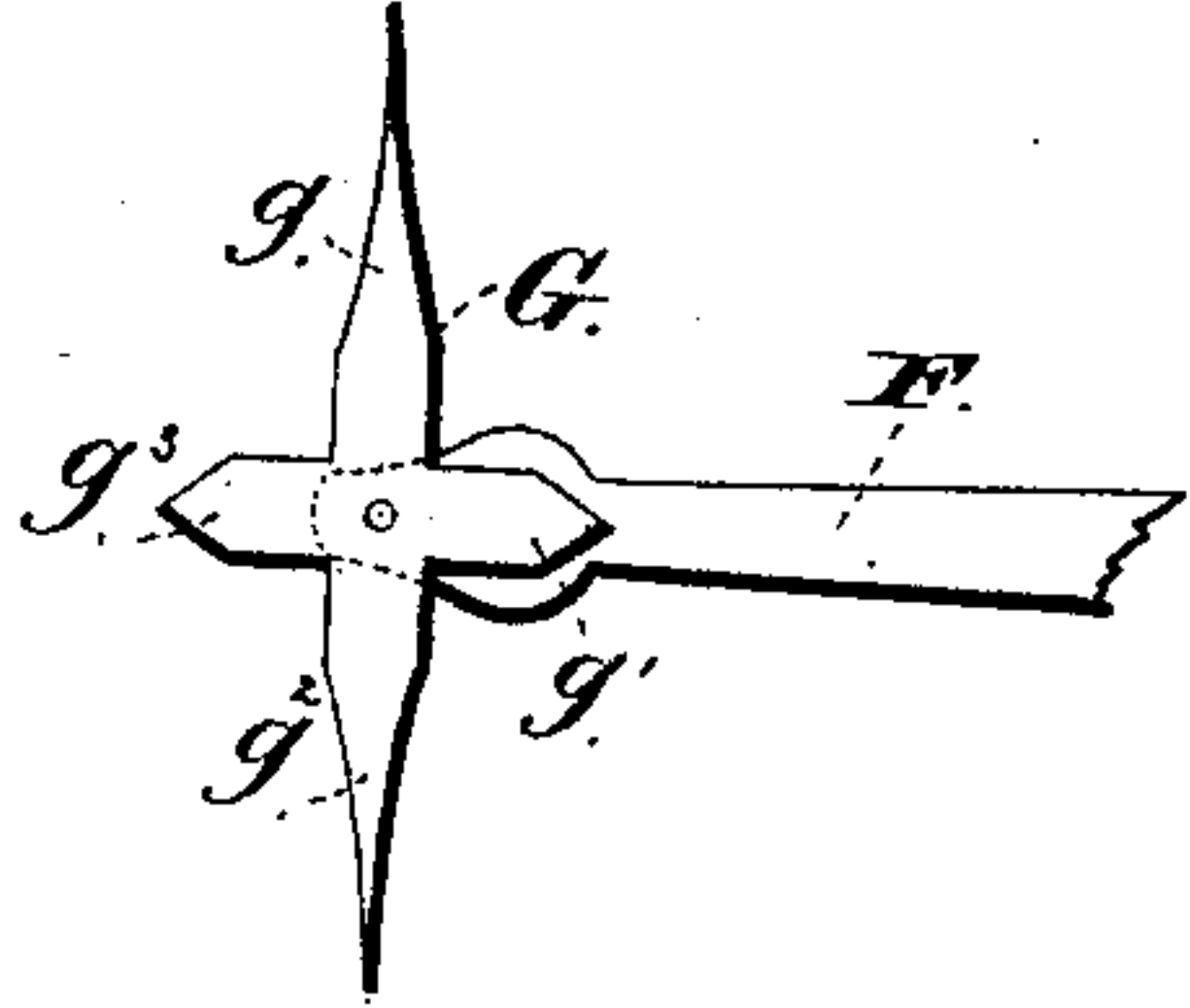


Fig. 4.

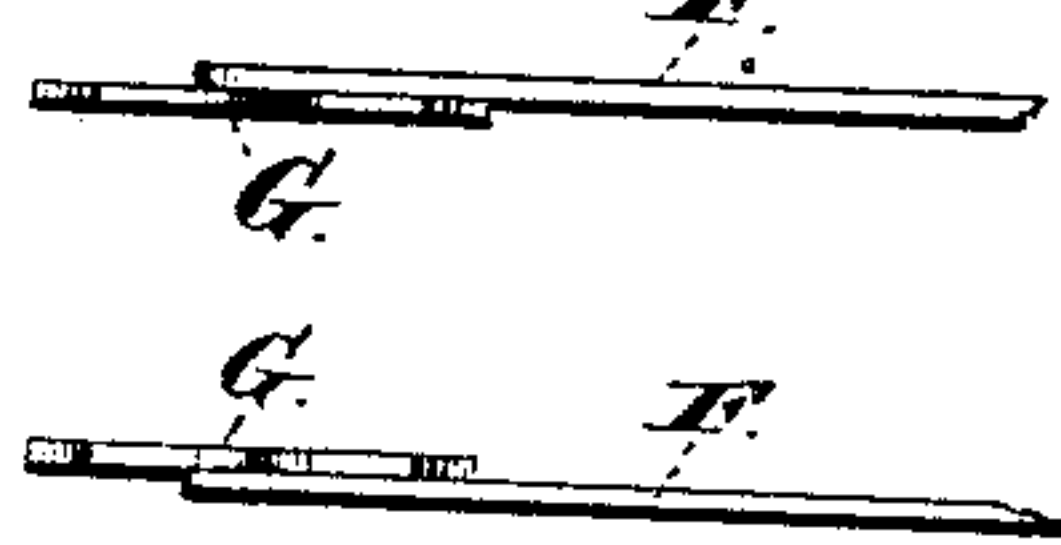


Fig. 5.

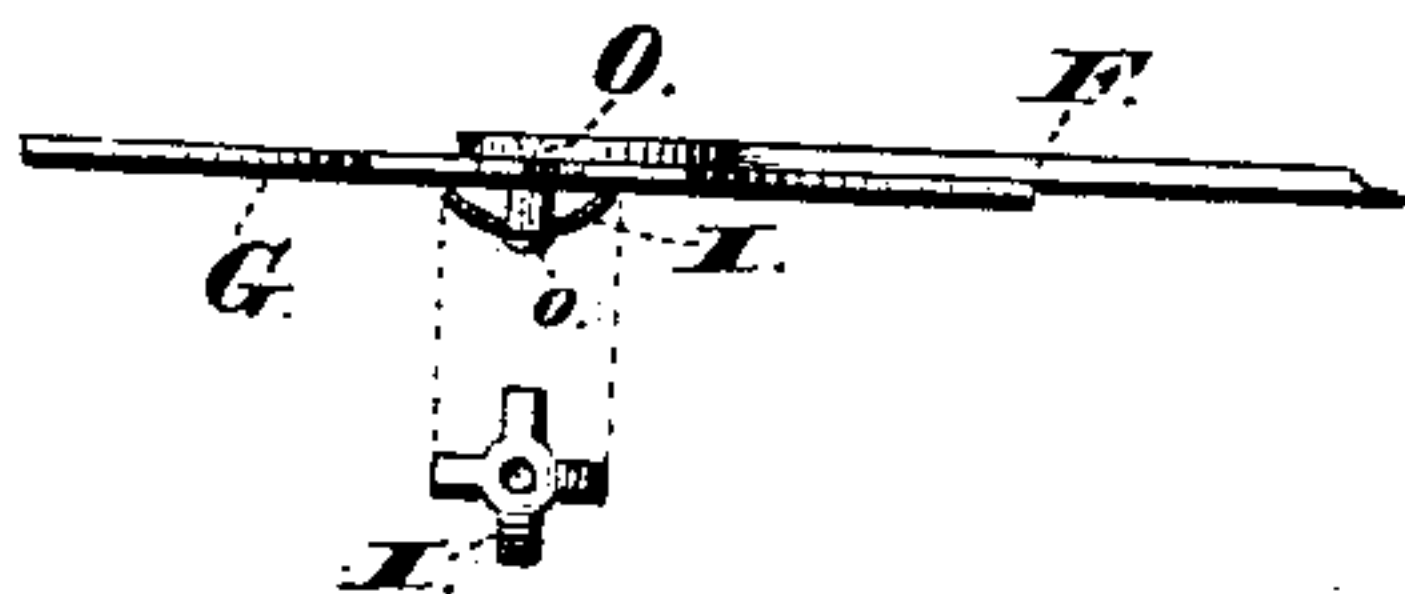


Fig. 6.

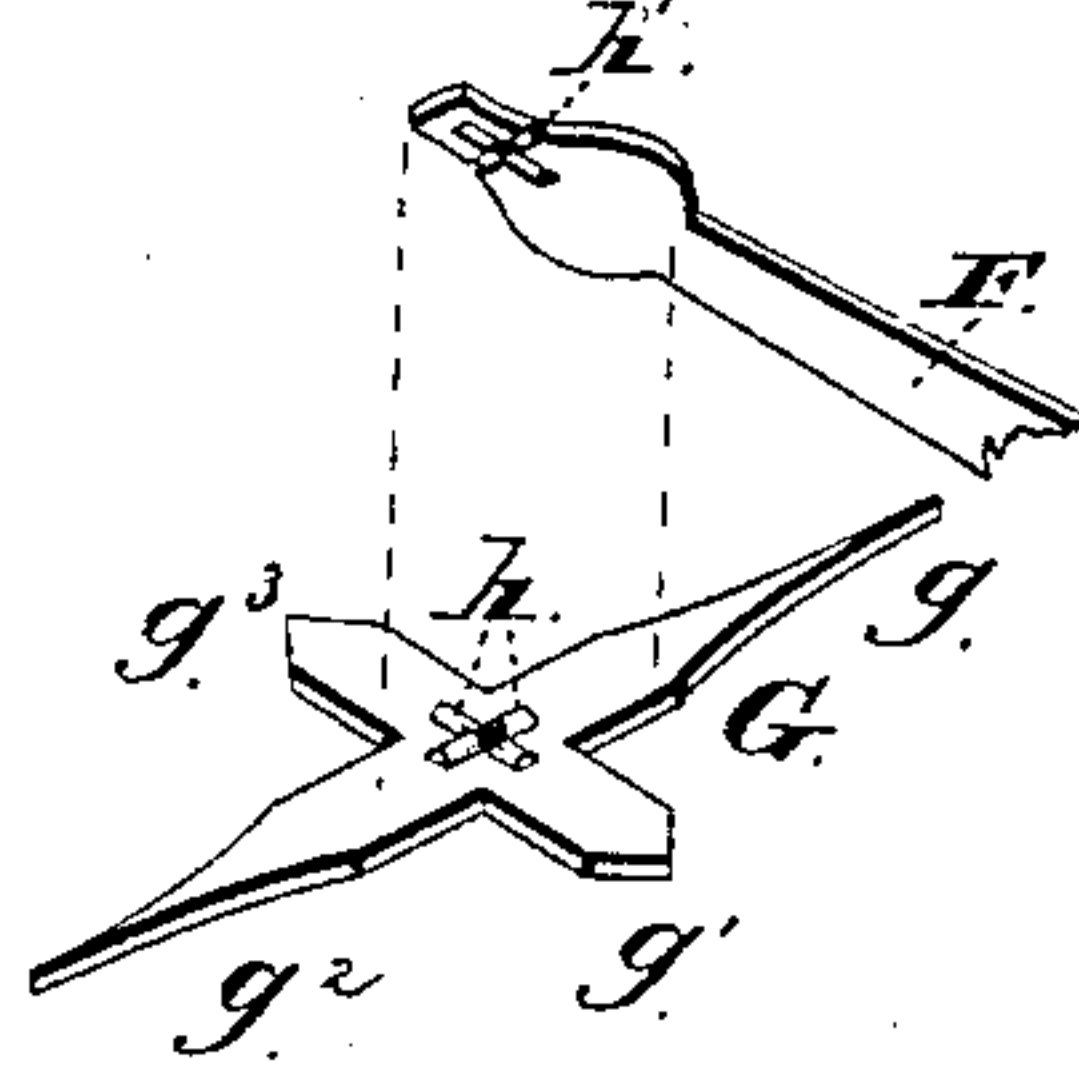


Fig. 7.

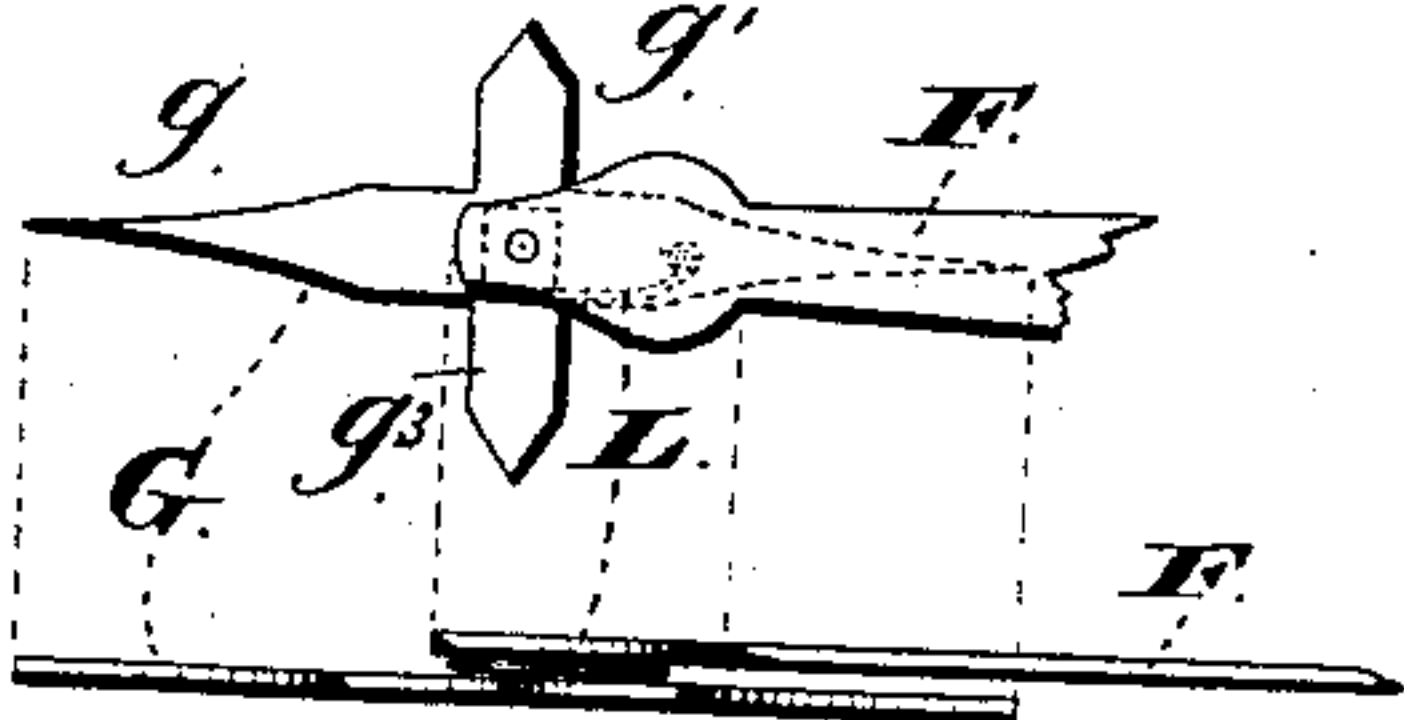


Fig. 8.

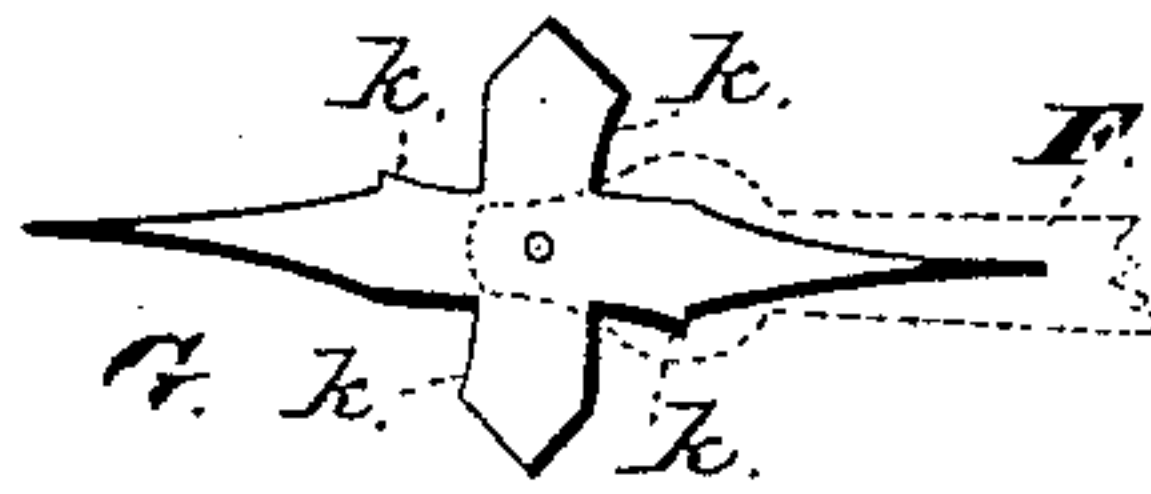


Fig. 10.

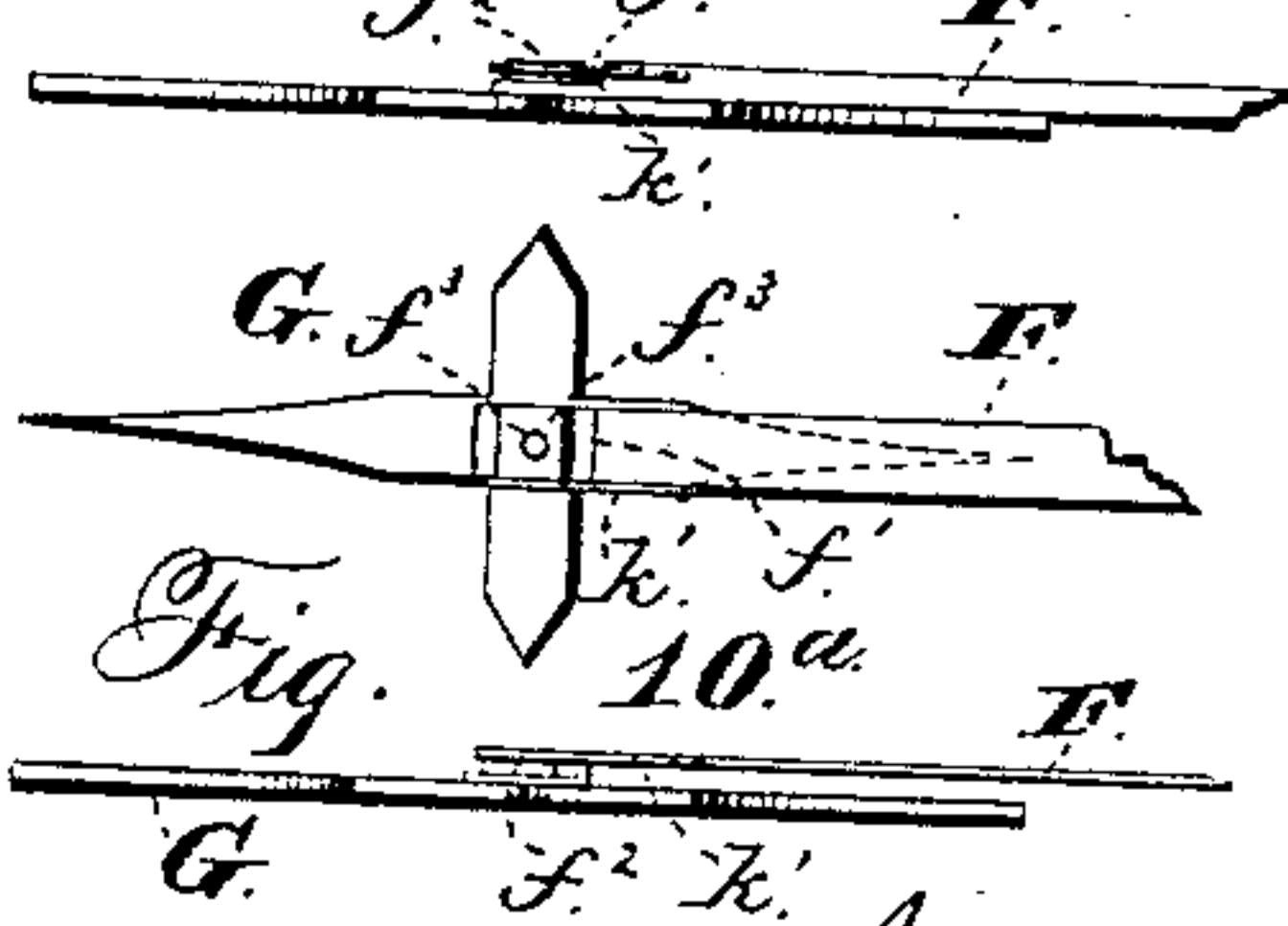
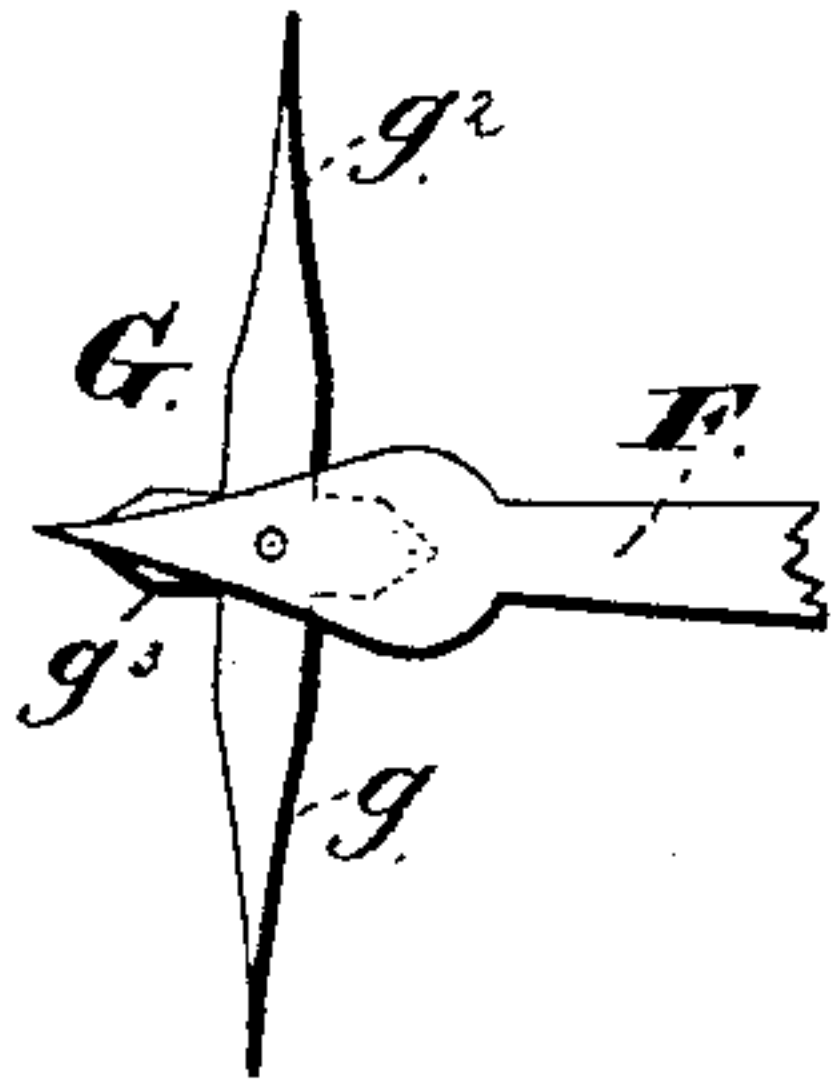


Fig. 9.



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UNITED STATES PATENT OFFICE.

PHILIP G. RUSSELL, OF WASHINGTON, DISTRICT OF COLUMBIA.

HAND FOR TIME-PIECES.

SPECIFICATION forming part of Letters Patent No. 290,116, dated December 11, 1883.

Application filed November 20, 1883. (No model.)

To all whom it may concern:

Be it known that I, PHILIP G. RUSSELL, of Washington, in the District of Columbia, have invented certain new and useful Improvements in Clocks and Watches; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, in which—

Figure 1 shows a plan view of my improved hour-hand for clocks and watches as applied to or operating in connection with the form of dial to which it is especially adapted; Fig. 2, a similar view of a portion of the dial and the outer end of the hour-hand, showing the position of the arms of the turn-piece after the hand, as shown in Fig. 1, has passed the pin on the dial; Fig. 3, a bottom plan view of my hour-hand; Fig. 4, a view in side elevation of the hand; Fig. 5, a detail view of the outer end of the hand, with a spring frictional device applied to the turn-piece; Fig. 6, a detail view, showing means for insuring the proper turning of the turn-piece and for holding it from accidental turning; Fig. 7, detail views of other means for obtaining the same results; Fig. 8, a detail view of the outer end of the hour-hand with the turn-piece thereon, having arms of a slightly-modified shape for co-operation with the pin on the dial; Fig. 9, a plan view of another form of the outer end of my improved hour-hand, and Figs. 10 and 10^a detail views of modifications of the form or construction shown in Fig. 7.

The object of my invention is to enable the time mechanism now in use to be readily adapted to indicate time on the twenty-four-hour system without change of the time-train or dial-wheel; and to this end it consists in the construction, arrangement, and combination of parts, as hereinafter described, and more specifically pointed out in the claims.

In the drawings, A designates the dial-face of a clock or watch. Inside the circle B of the ordinary twelve-hour graduations is a concentric circle of graduations, C, to indicate the hours, from thirteen to twenty-four, inclusive. The graduation-marks of the inner circle are on the same radii with the marks of the outer or ordinary circle. The one which is on the same radius with the one-hour mark is numbered thirteen, and the rest are consecutively numbered from that up to twenty-four.

The minute-hand D is of the ordinary form and length and travels over the outer circle of graduations, as usual.

The hour-hand E consists of the arm F, attached to and carried by the ordinary hour-hand sleeve. This arm extends to or nearly to the inner circle of graduations, as shown in the drawings. At the end of said arm is pivoted a turn-piece, G, having the four arms g , g' , g'' , and g''' extending from it at right angles to each other. The arms g and g'' are, as shown, longer than arms g' and g''' . The sides of the arms, near where they intersect, are, as shown at d , made straight for a short distance. The outer ends of the arms are reduced in size or tapered to points.

On the dial-face is fixed a pin, H, in such a position that, while the end of arm F will clear it, one of the arms, as g , of the turn-piece G will strike it, and as the hour-hand moves on will be held back and turned down by said pin, so that the turn-piece will be turned to bring the next arm, g' , up into line with arm F, as shown in Fig. 2. The long arm g of the turn-piece, as shown in Fig. 1, before it has come into contact with the pin, extends beyond the inner circle of graduations, so as to indicate the hours on the outer circle. When this long arm has been turned down, as described above, and the short arm g' brought up into line with the main portion of the hour-hand, the point or end of said short arm will indicate the hours on the inner circle of graduations. Thus a continuous indication of the hours from one to twenty-four, inclusive, is obtained without any change in the time-train or dial-wheels. When the hour-hand has arrived at the twenty-four-hour mark on the inner graduated circle, the short arm g' strikes against the pin H, is held back, as arm g was, and turned down, so that the long arm g'' is brought up to take its place in line with the main portion F of the hour-hand. Time will then be indicated on the outer graduated circle again. At the end of the circuit of the hour-hand around the dial this arm g'' strikes against and is turned down by the pin H, so that the other short arm, g''' , of the turn-piece is brought up into position. At the end of its travel, to indicate the hours on the inner circle of graduations, arm g''' is in turn engaged by the pin, so that the turn-

piece G is again turned a quarter-revolution, and arm *g* is again brought up into position, as described, and as shown in Fig. 1. The turn-piece, it will be observed, is balanced, so that there is no liability of its being turned upon its pivot by any jar. The opposite arms are of equal weight and size. As shown in Fig. 4, it can be pivoted upon the top of the end of arm F, or on the under side thereof; but I prefer the latter arrangement, as shown clearly in Fig. 3.

In Fig. 5 I show a spring-washer or frictional device, I, which I contemplate using with the turn-piece to prevent any accidental turning thereof. The four arms of the concave spring-washer, which is of a common and well-known form, bear upon the under side of the turn-piece. The pivot-pin O of the turn-piece passes through the center of this washer, and said washer bears down against the head *o* of the pivot-pin. A simple saucer-shaped spring-disk, either with or without its sides cut or slit, can be used, if desired. The above-described or any other form of spring-washer or frictional device can be used, obviously for the same purpose, between the turn-piece and the face of the main portion of the hand, instead of between the pivot-pin head and the outer or lower face of the turn-piece.

In Fig. 6 I show means for holding the turn-piece more firmly. Upon the face of the turn-piece which is to be in contact with the face of arm F are formed low flanges or ribs *h h*, intersecting each other at a right angle. They are formed with beveled or sloping sides, so as to be triangular in cross-section. The opposing face of the arm F around the pivot-pin is formed with correspondingly-shaped grooves, *h' h'*, also intersecting each other at right angles.

A spring-washer, like that already described herein, is to be used to press the turn-piece up against the face of the arm to set the ribs into the grooves. Said ribs and grooves are of course to be so formed and situated that they will tend to hold the turn-piece, after a full quarter-revolution, with one of its arms extending out from and in line with the arm F. The grooves can be made a little wider than the ribs, so that if the turn-piece be turned nearly through a quarter-revolution the spring-washer, by pressing the ribs against the inclined sides of the grooves, will cause the piece to be turned a little farther, so that the upper edges of the said ribs shall rest centrally in the grooves.

In Fig. 7 I show means for causing and insuring a quicker turn of the turn-piece than can be made where the pin alone is relied upon to do the turning, and for holding said piece from rotation until one of its arms again comes in contact with the stop-pin on the dial-face. In this case the turn-piece is pivoted to the arm F without any spring-washer. On its side or face which is toward the arm is formed a square hub, K, against which bears

the light spring L. The faces of the hub are parallel with the arms of the turn-piece, as shown. With this arrangement the turn-piece is held from any chance turning, and when it has been rotated by the action of the stop-pin H nearly through the desired quarter of a revolution it will, by the stress of the spring against the hub, be turned quickly through the rest of such quarter-revolution, and then be again held as before. The change in the indicating point or end of the hour-hand from one circle of graduations to the other will thus be quickly made. Such quick transition from one circle of graduations to the other is very desirable to prevent confusion and mistake in reading when the hour-hand is near the twelve or twenty-four hour mark.

In Fig. 8 a slightly-modified form of turn-piece is shown. On that side of each arm which is to come into contact with the pin H is a slight projection, *k*. This projection is situated on the arm beyond the point where the pin H strikes as the hour-hand arrives at the twelve or twenty-four hour mark. As the hand travels past that mark and the stop-pin, the latter causes the arm to turn back and down, as described. Where none of the arms of the turn-piece are very long, the stop-pin can be placed so near the circle of the travel of the center of the turn-piece that even when the arms have the contact portion straight-sided, as shown in the other figures, each arm as it passes out from under the pin will be brought down, so as to be at a right angle to the main portion of the hour-hand. Where any of the arms are of considerable length, it is not desirable to place the pin so near the circle of travel of the center of the turn-piece, as the point of one of the long arms might strike it. So the pin is then set farther away and a projection, *k*, is provided on the contact side of each arm, of such a height or size as to insure that when it passes out from under the stop-pin the turn-piece will have been turned through a complete quarter-revolution, and the arm will have been brought down to be at an exact right angle with the main portion of the hand.

In Fig. 9 is shown a slightly-modified form of hand. In this case the main portion of the hour-hand projects out so as to pass over the stop-pin. It also extends beyond the circle of travel of the ends of the short arms of the turn-piece, which are not, as described above, used as pointers or indicators. The sharp end of the hour-hand proper marks the time on the inner circle of graduations.

In Figs. 10 and 10^a are shown modifications of the form of hand shown in Fig. 8. The outer end of the arm F is cut away above at *f'*, and upon the upper surface of this cut-away portion is supported the small square plate *f*², fixed upon the upper end of the pivot-pin *f*³, which passes through the arm and carries upon its lower end the turn-piece. A flat spring, *k'*, bears against the squared side of this plate and serves the same purpose as

did the spring described above, as acting in connection with the squared hub shown in Fig. 7. In Fig. 10^a the end of the arm F, which is thin, is bent down at a right angle to the rest of the arm, and then out again in a line parallel thereto. The arrangement of turn-piece, square plate, and spring, which has been just described, is used also with this form of arm.

10 If desired, the circle of graduations up to twelve can be the inner one, and the other the outer. My hour-hand will indicate the hours just as well then as with the arrangement of dial-circles, as shown in the drawings, and described hereinbefore.

15 An hour-hand constructed like mine can obviously be used in connection with more than two concentric dials, if desired, for the arms of the turn-piece could all be made of different lengths, so that each one, when turned up into indicating position, would mark the time on a different dial-circle.

By my invention I make it possible to readily change the watches and clocks, as already constructed and now in use, so that they shall indicate time on the twenty-four-hour system without the necessity of any alteration in the time-train or dial-wheels. All that is necessary is to put on the dial-face the secondary circle of twelve graduations, from thirteen to twenty-four, inclusive, as described, and then substitute one of my new hour-hands and fix the small stop-pin in the proper or desired position on the dial. The minute-hand, of course, requires no alteration.

20 Clock or watch hands constructed in accordance with my invention, as set forth hereinbefore, can be made quite cheaply, so that the expense of changing the watches and clocks now in use to indicate time on the twenty-four-hour system can be made very small.

It is designed that the turn-piece be pivoted and arranged to turn quite easily, so that the movement of the hour-hand cannot possibly be interfered with. As, however, as is well known to those familiar with the manufacture of watches and clocks, it requires some considerable force to stop the hour-hand of a clock or watch, there is no danger of the light pivoted turn-piece which I use interfering with the movement of the hand.

I do not claim as my invention a dial-face provided with the ordinary twelve-hour graduations and with a secondary concentric circle of graduations from thirteen to twenty-four, inclusive.

I do not claim herein, broadly, an hour-

hand provided with a pivoted indicating time-piece, and adapted to be changed in its indications from one of the concentric dials to the other and back again; nor, broadly, anything shown and claimed in a division of this case to be filed herewith by me.

Having thus described my invention, what I claim is—

1. In combination with the four-armed turn-piece pivoted at or near the end of the main arm of the hour-hand, means for holding it from accidental turning, substantially as shown and described.

2. In combination with the four-armed turn-piece pivoted on the main arm of the hour-hand, means for holding the turn-piece from accidental turning, and for insuring a complete quarter-turn thereof when it is partially rotated, by means provided for that purpose, substantially as described.

3. In combination with the four-armed turn-piece pivoted at or near the end of the main arm of the hour-hand, the stop-pin on the dial-face adapted to arrest one of the arms of turn-piece at each complete revolution of the hour-hand, and as the hand moves on to turn such arm down, so that the next arm on the turn-piece will be brought up into line with the hour-hand arm to form the index end of the hand, substantially as shown and described.

4. In combination with the concentric dials, one showing the hours up to twelve and the other from thirteen to twenty-four, inclusive, as shown and described, the hour-hand carrying a pivoted turn-piece having alternately long and short arms at right angles to each other, and of such length that as the piece is rotated, so as to bring the arms successively into line with the main portion of the hour-hand, the end of each long arm will indicate time on the outer dial and that of each short one on the inner, and the stop-pin on the dial adapted to arrest and turn back the arm which forms the index end of the hour-hand when said hand arrives at the end of its circuit of twelve hours, so that the succeeding arm will be brought up to indicate time on the other dial, substantially as shown and described.

In testimony that I claim the foregoing I have hereunto set my hand this 20th day of November, 1883.

PHILIP G. RUSSELL.

Witnesses:

JAS. E. HUTCHINSON,
WILLIAM FITCH.