No. 845,637. PATENTED FEB. 26, 1907.

O. E. HAUSBURG.

WATCHMAN'S ELECTRIC TIME DETECTOR.

APPLICATION FILED DEC. 3, 1904.

2 SHEETS—SHEET 1.

FIG. 1.

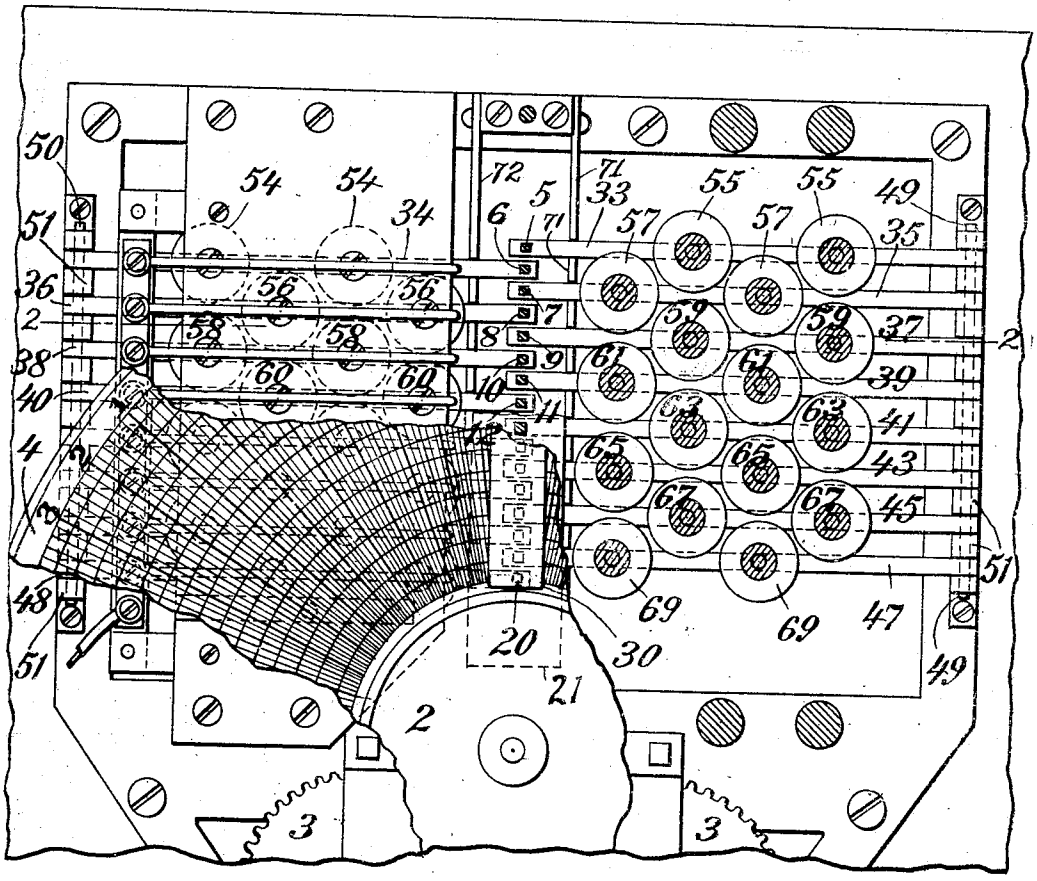
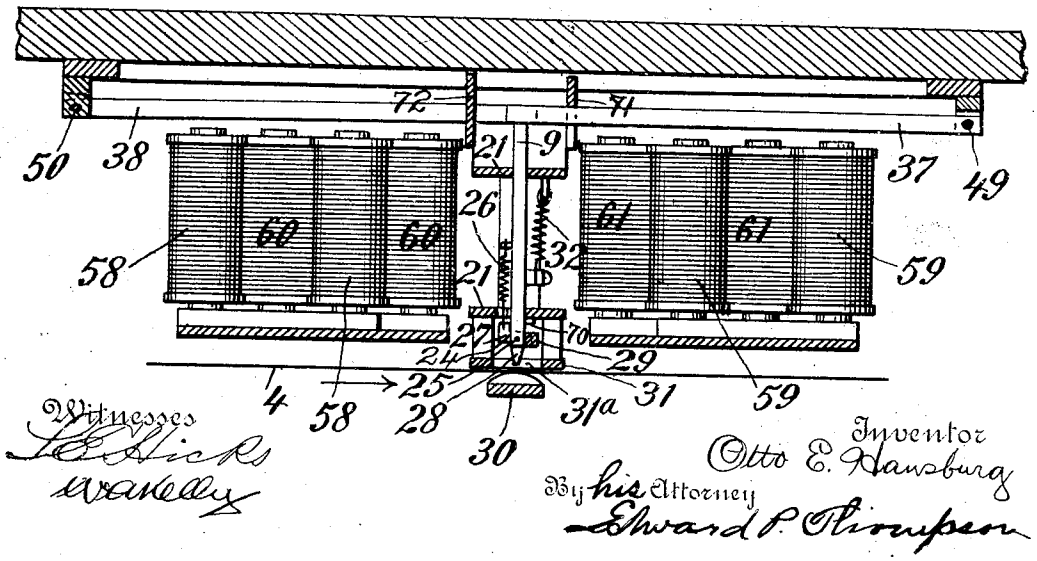


FIG. 2.



Witnesses
L. L. Hicks
Wm. Kelly

Inventor
Otto E. Hausburg
By his Attorney
Edward P. Thompson

THE NORRIS PETERS CO., WASHINGTON, D. C.

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FIG. 3.

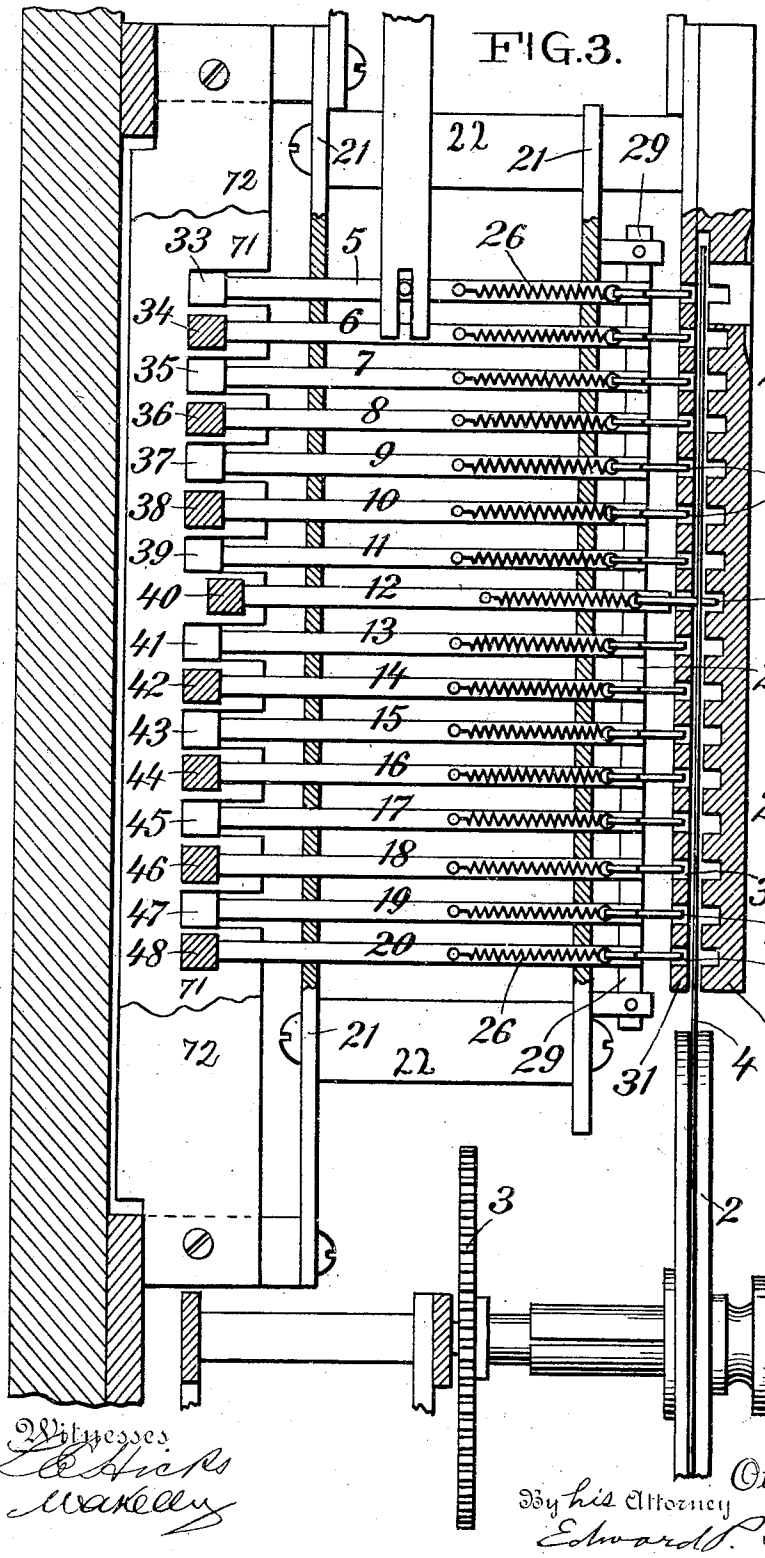


FIG. 4.

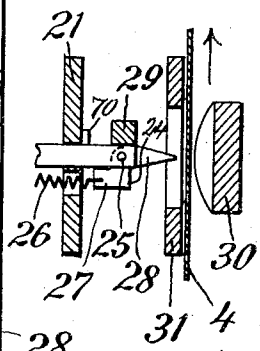
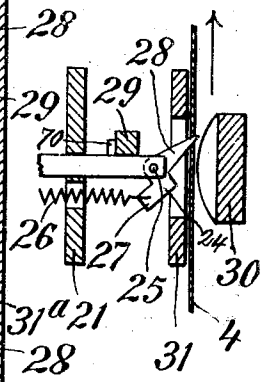


FIG. 5.



Witnesses.
L. E. Hicks
Wakelly

Inventor
Otto E. Hausburg
By his Attorney
Edward S. Thompson

THE NORRIS PETERS CO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

OTTO E. HAUSBURG, OF NEW YORK, N. Y

WATCHMAN'S ELECTRIC TIME-DETECTOR.

No. 845,637. Specification of Letters Patent. Patented Feb. 26, 1907.

Application filed December 3, 1904. Serial No. 235,385.

To all whom it may concern:

Be it known that I, OTTO E. HAUSBURG, a subject of the Emperor of Germany, and a resident of New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Watchmen's Electric Time-Detectors, of which the following is a specification.

My invention relates to that class of watchmen's time-detectors in which there are a central-station detector and substations having circuit-closers by which a current may be sent over the line from any station for perforating a dial in the detector at the central station.

More particularly, the invention relates to the central-station device, and therefore the rest of the system is not shown or described, as it has nothing to do with the invention.

The object of my invention is to be able to construct and supply a detector of convenient size adapted to record the watchman's calls at a great number of stations—as, for example, fifty or to a hundred or so. Heretofore the construction of detectors has taken up so much space and is so heavy that two or three are usually employed instead of only one.

A second object of the invention is to prevent the sticking of the perforators, whereby they will not return to their normal positions. The sticking may be caused by the breaking of a retractile spring or similar accident. In my device there is a stationary cam that automatically does the duty of the broken spring and always coöperates with the spring when not broken. If the operating-circuit is short-circuited by the watchman, yet the perforator will automatically retire from the hole that it has punctured.

The organization comprising the invention, without regard necessarily to the various scopes of the novelty, which are attended to in the claims hereinafter, consists of a dial; a carrier therefor; a clock-train for rotating said carrier; parallel sliding bars; crank-shaped perforators pivoted, respectively, to said bars, said perforators being rotary in one direction only; means for propelling said bars for driving said perforators through said dial; retractile springs and a bar-cam for returning said perforators to their normal positions after they have been tilted on their pivots by the action of said carrier; armatures acting directly upon said bars independently of any intermediate connection between them; magnets belonging to said armatures, each of the magnets having two spools for the respective poles of the magnets, one of the two spools of each magnet extending between the two spools of contiguous magnets to the extent of substantially half the diameter of the spools, there being one set of perforator-bar supporters arranged in a row and two sets of armatures on opposite sides of the row, each set having a common pivot and arranged alternately with each other by having the swinging ends of the armatures overlapping side by side alternately, and two notched plates, one for each set of armatures, for guiding the swinging ends of said armatures. By having the said cam behind the perforators they are pushed up into their correct positions during the return of the bars which carry said perforators. By having the spools of the magnets zigzag or staggered in the manner above stated the bars and armatures may be very close to one another, respectively, thus permitting the record to be received from a large number of stations by a single cenral detector. Also by having independent guides for the swinging ends of each of the two sets of armatures the overlapping free ends thereof, which operate the perforating-bars, may lie adjoining and all but touching each other and much nearer than otherwise.

I will now describe the construction in all its details by reference to the accompanying drawings.

Figure 1 is an elevation of a portion of the device so drawn as to represent as much as possible in one figure, certain parts being broken away, some parts omitted, and some parts in section. Fig. 2 is a cross-section at the line 2 2 in Fig. 1 looking downward. All parts are not in section, however, although on the section-line. All portions are in their normal positions in these two figures. Fig. 3 is a central vertical section of the device seen in Fig. 1 viewed from the left, except that more of the device is taken into account and it is not in the normal phase, one of the perforators being seen in the position of puncturing the dial. Some portions are not in section, in order to represent as much as possible in one view. Fig. 4, in conjunction with Fig. 5, shows the manner of operating the perforator, Fig. 4 being a section in the normal position, and Fig. 5 the same just after a puncture.

In all the figures involved dotted lines

represent hidden elements, and heavy wavy lines broken edges.

The elements composing the device are the dial-carrier 2, which is automatically driven by a motor, the form partly shown being a clock-train 3; a dial 4 on the carrier 2, made of paper or any other material that is easily puncturable; a series of sliding bars 5 6 7 8 9, &c., parallel to one another and located in the same plane and as close together as will permit them to be properly supported for motion lengthwise; parallel plates 21, having holes for forming bearings for said bars; posts 22, connecting said plates; a third parallel plate 31, having holes 31[a] therein opposite the ends of the said bars 5 6 7, &c., the bars having notches in corresponding ends; cranks 24 in the respective notches; pivots across the notches and numbered 25; and supporting the cranks so that an edge of each crank bears against the bottom of its notch to permit the rotation of the crank in but one direction, the said edge acting as a stop in one direction only, one set 28 of the arms of the cranks all pointing in the direction of the length of the bars and being sharpened to be able to puncture the dial when pushed forward, the other set of arms of the cranks extending perpendicular to the plane of said bars, retractile springs carried by said bars and having corresponding ends attached thereto and the remaining ends secured to the respective last-named arms, the said springs being at 26, which normally pull the cranks against the bottoms of said notches, and a bar-cam 29 on the opposite side of the bars 5 6 7, &c., measured from the retractile springs 26, the arms to which said springs are pivoted being numbered 27. This cam lies close to the shoulders of the cranks and is in their paths when the bars are on the return stroke, so as to act in setting up the perforators again, the pointed arms 28 forming the perforators for the dial. The cam 29 is stationary, being mounted upon one of the plates 21.

The cranks whose arms are the perforators 28 and the arms 27 are not only prevented from turning in one direction by striking the bases of the notches, but because the arms 27 are shaped to strike against the sides of the bars 5 6 7, &c., when in the normal position. By pushing on the perforators 28 to separate the arms 27 further around from the bars the perforators may thus be turned and the springs 26 will be put under tension ready to retract the perforators 28 when released from the pushing force. The aforementioned holes 31[a] in one of the plates—namely, 31—are for the passage of the perforators 28. There is also a notched plate 30 opposite the perforators 28, but on the other side of the dial 4, for the purpose of permitting a clearance for the perforators after they have been pushed through the dial, while the portions of the plate 30 between the notches serves as a resisting backing for the dial. Retractile springs 32 are provided for the bars 5 6 7, &c., one end of each being fastened to one of the plates 21 and the other to each of the bars themselves.

Bearing against the respective bars 5 6 7, &c., are levers 33 34 35 36 37, &c., serving as armatures, as they are made of iron, those with odd numbers being pivoted to a common pivot 49 on one side of the bars 5 6 7, &c., and those with the even numbers to the pivot 50 on the other side of said bars. Again, those with the odd and even numbers overlap each other in succession sufficiently to bring them to the respective ends of the said bars. The said levers are spaced by blocks 51, through which pass the respective pivots 49 and 50, and are guided at their free or swinging ends by the notched plates 71 and 72, 71 being the guide for the levers on one side of the said bars and 72 for the levers on the other side thereof. As there is nothing interposed between the overlapping ends of the levers, they are permitted to lie as close together as they may without actually touching each other.

The spools for the operating-magnets are staggered in the following fashion: There are two sets of magnets, one set being for those armature-levers on one side of the bars 5 6 7, &c., and the other set for those armatures on the other side of said bars. In the right-hand set the two spools of the successive magnets are 55 57 59 61, &c., and the two spools of the successive magnets on the opposite of the bars are numbered with even numbers 54 56 58, &c. In each set of magnets one of the spools of any magnet extends between the two spools of contiguous magnets. Thus the left-hand spool numbered 55 extends between the two spools 57 to the extent of substantially half its diameter, with the result that the magnets, which are bulky, may be placed so that the armatures therefor are very close together. The precaution should be taken to have the spools on any magnet sufficiently far apart to admit another spool part way at least, preferably about half-way, as shown. By this combination of sliding bars, independent guides for the two sets of armatures, and staggered spools I am able to increase the capacity of the instrument without materially increasing the bulk, so that it is perfectly feasible to make a fifty or hundred station detector.

The operation is as follows: The clock-train 3 rotates the dial 4 continually all night or during the period that any property is to be protected. When any magnet is electrically energized—for example, 60—the armature 40 is attracted, the bar 12 is pushed lengthwise through the plates 21, the perforator 28 belonging to that particular bar is driven through the dial, making a hole in it as a record to be visible, and the retractile

spring 32 belonging to that bar is stretched and then recoils just as soon as the current is cut off from said magnet. The current is apt to remain a few seconds after puncture, but the perforator 28 will be automatically liberated from its hole by the action of the dial 4, which will turn the perforator 28 to one side and will slide over the point thereof, this action being represented in progress in one of the small views. The spring 26 belonging to that perforator will become extended and will pull back the perforator to its normal position as soon as the current is cut off. The cam 29 joins in this returning of the perforator to its normal position, for it lies in the path of the same and is stationary, thereby guiding the perforator to its lengthwise position with respect to its bar. These two retractors are independent of each other, too, for if one breaks the other will act alone for the purpose.

Each of the sliding bars 5 6 7, &c., carries a stop-pin 70 (see Figs. 2, 4, and 5) for limiting its motions in each direction by abutting against one of the plates 21 and the cam-bar 29, respectively.

It should be noticed in my invention that the points of the perforators 28 are of a peculiar shape. (See Figs. 3, 4, and 5.) Heretofore the perforating-pins of electric watchmen's clocks have consisted of a straight round wire with a sharp point. A pin of such shape is apt to very often stick fast in the dial if the paper should happen to be a little heavy, because the spring which is to withdraw the pin must be of a limited stiffness, so as not to require too many batteries to pull it up to perforate the dial. Also a pin of this shape can never be depended upon to disengage itself from the dial when the dial rotates, as it always sticks and holds the dial. In order to overcome these difficulties, I give my perforating-pin its present shape, as shown, which consists in making the point thereof flat and chisel-shaped, two of the sides of the said point being flat and parallel to each other and the remaining two sides sloping toward each other and coming together in an acute angle to form the cutting edge. When the perforator 28 is mounted to rotate on its carrier by the action of the dial, as in my present invention, then the sloping portion of the point is disposed in the direction of motion of the dial. The stop-pin 70 on the carrier prevents the point 28 from being driven through the dial to too great a depth or beyond its sloping portion. On account of the shape of that portion of the perforator 28 which enters the material of the dial it is impossible for it to be grasped and held by the edges of the hole it makes, and also with the construction described it is impossible for the said perforator to bind in the perforation when it is rotated by the movement of the dial.

I claim as my invention—

1. In a watchman's electric time-detector, the combination of a clock-train, for rotating a record-dial, parallel sliding bars, crank-shaped perforators pivoted respectively to said bars, said perforators being rotary in one direction only from their normal positions, means for sliding said bars for driving said perforators through said dial, and retractile springs and a bar-cam for returning said perforators to their normal positions after being tilted on their pivots by the action of the rotating dial.

2. In a watchman's electric time-detector, the combination of a dial-carrier, a clock-train for rotating said carrier, a series of sliding bars, each having a notch, a crank in each notch, and pivoted therein, one of the arms of the crank being pointed to form a perforator for said dial, and the crank bearing against the bottom of the notch so as to be able to turn in one direction only, said direction being that of the dial-carrier, the other arms of the cranks extending outward from said bars, retractile springs connecting the last-named arms to said bars, and a bar-cam transverse to said bars and normally behind said cranks as measured from said springs, said perforators being rotary only toward said cam.

3. In a watchman's electric time-detector, the combination of a rotating dial-carrier, parallel bars, plates with bearings for said bars, means for sliding said bars, and rotary in one direction only, said carrier constituting the element for rotating said perforators, a single bar-cam lying in the paths of said arms for retracting said perforators to their normal positions after being rotated by said carrier, and stop-pins on said bars and projecting between said cam and one of said plates for limiting the motions of said bars.

4. In a watchman's electric time-detector, the combination of a dial-carrier, a clock-train for rotating said carrier, parallel sliding bars, crank-shaped perforators pivoted respectively to said bars, said perforators being rotary in one direction only, means for sliding said bars for driving said perforators through said dial, retractile springs and a single bar-cam for returning said perforators to their normal positions after being tilted on their pivots by the action of said carrier, said means consisting of armatures acting directly upon said bars independently of any intermediate connection, and of magnets for said armatures, each of the magnets having their two spools for the respective poles of the magnets, one of the two spools of each magnet extending between the two spools of contiguous magnets.

5. In a watchman's electric time-detector, the combination of a recorder for acting upon a rotary dial, means for moving said recorder for making a record upon said dial, said re-

corder being free to rotate through the action of said dial, independent devices for turning back said recorder to its normal position, a sliding bar for holding said recorder, a magnet-armature bearing upon said bar, and a retractile spring for said bar.

6. In a watchman's electric time-detector, the combination of a dial-carrier, a clock-train for rotating said carrier, a series of sliding bars parallel to one another, and located in the same plane, notches in corresponding ends of said bars transverse to said plane, cranks in the respective notches, pivots carried by the bars and supporting the cranks with one edge of each crank against the bottom of the corresponding notch to prevent the crank from turning in more than one direction from its normal position, one of the arms of each crank being pointed to form a perforator for the dial, and the said arms all pointing in the linear direction of the length of the bars, the other arms of the cranks extending perpendicular to the plane of said bars, retractile springs connected both to said bars respectively and to said last-named arms respectively, a bar-cam on the opposite side of said bars from the last-named arms, magnet-armatures bearing against said bars for driving them lengthwise for driving the perforators through said dial, a two-pole magnet for each armature, a spool for each pole, said spools for each magnet being parallel to each other, and to the spools of the other magnets, and so arranged that one of the spools of any magnet extends between the two spools of a contiguous magnet, and a common pivot for the armatures, and a like combination of armatures facing the above combination of armatures and so arranged that the armatures of the two combinations alternate with each other, for acting upon said bars.

7. In a watchman's electric time-detector, the combination of a dial-carrier, a clock-train for rotating said carrier, parallel sliding bars, crank-shaped perforators pivoted respectively to said bars, said perforators being rotary in one direction only, means for returning said perforators to their normal positions after being tilted on their pivots by the action of said carrier, armatures acting directly upon said bars, independently of any intermediate connection, for sliding said bars for driving said perforators through said dial, and a magnet for each of said armatures, each of the magnets having two spools, for the respective poles of the magnet, one of the two spools of each magnet extending between the two spools of contiguous magnets.

8. In a watchman's electric time-detector, the combination of a dial-carrier, a clock-train for rotating said carrier, a series of sliding bars parallel to one another, and located in the same plane, notches in corresponding ends of the bars transverse to said plane, cranks in the respective notches, pivots carried by the bars and supporting the cranks with one edge of each crank against the bottom of the corresponding notch to prevent the crank from turning in more than one direction from its normal position, one of the arms of each crank being pointed to form a perforator for the dial, and the said arms all pointing in the linear direction of the length of the bars, the other arms of the cranks extending perpendicular to the plane of said bars, retractile springs connected both to said bars respectively, and to said last-named arms respectively, magnet-armatures bearing against said bars for driving them lengthwise to drive the perforators through said dial, a two-pole magnet for each armature, a spool for each pole, said spools for each magnet being parallel to each other, and to the spools of the other magnets, and so arranged that one of the spools of any magnet extends between the two spools of a contiguous magnet, a common pivot for the armatures, and a like combination of armatures facing the above-named combination of armatures and so arranged that the two combinations alternate with one another, for acting upon said bars.

9. In a watchman's time-detector, the combination of perforators for a record-sheet, the perforating ends of said perforators being of rectangular cross-section and having two sides plane and parallel to each other and the remaining two sides plane and sloping toward and meeting each other in a cutting edge, means for operating said perforators to perforate said record-sheet, and stops for limiting the entrance of the perforators into the material of the record-sheet beyond a predetermined extent.

10. In a watchman's time-detector, the combination of perforators for a record-sheet, holders for the perforators, said perforators sufficiently sloping so that the record-sheet, as it moves will cam said perforators free from said sheet.

In testimony whereof I have hereunto signed my name in the presence of two subscribing witnesses.

Dated this 2d day of December, 1904.

OTTO E. HAUSBURG. [L.S.]

Witnesses:
EDWARD P. THOMPSON,
WILLIAM A. KELLY.