(Model.)

3 Sheets—Sheet 1.

# C. STAHLBERG.

## TIME STAMP.

No. 424,369. Patented Mar. 25, 1890.

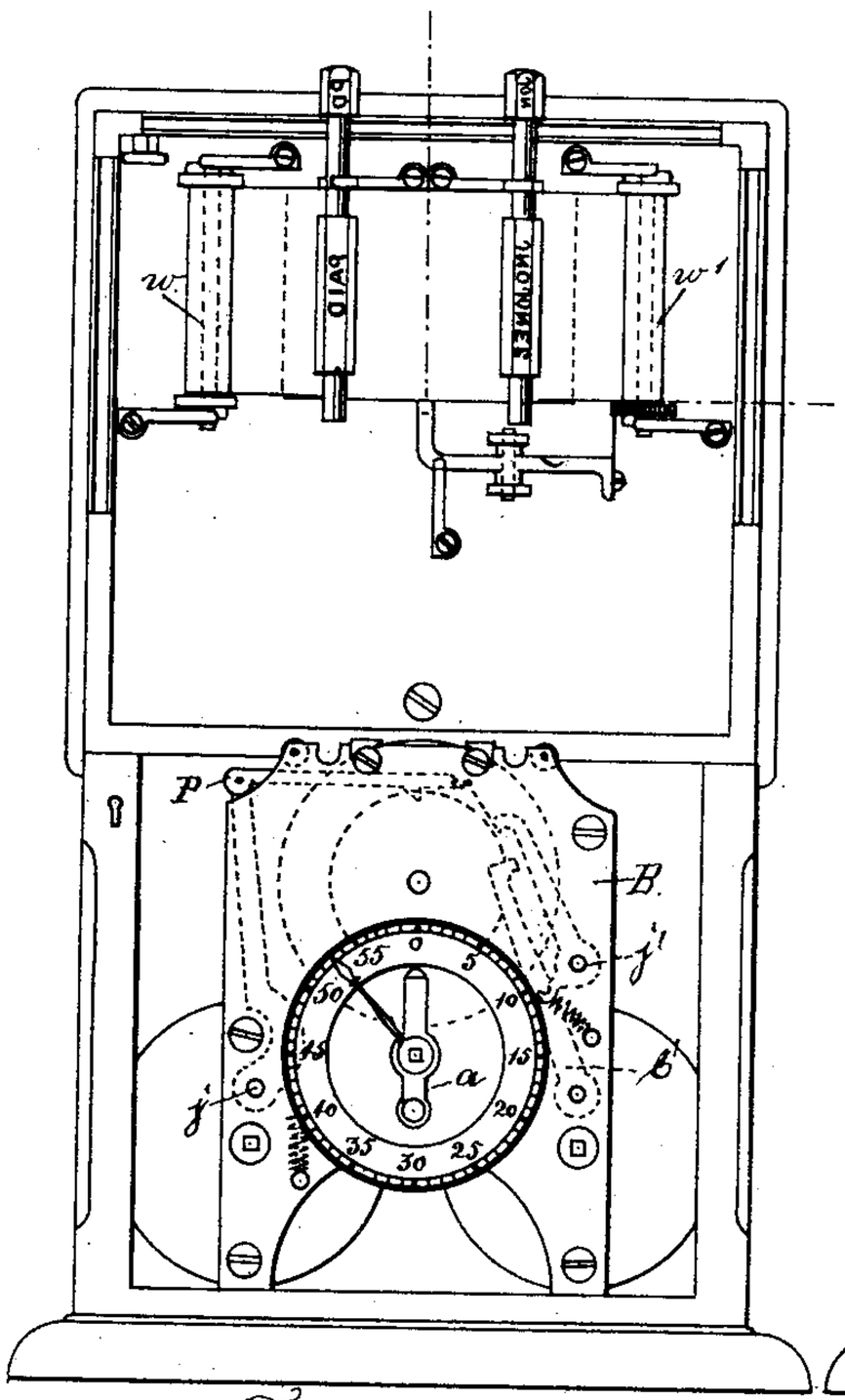


Fig. 1.

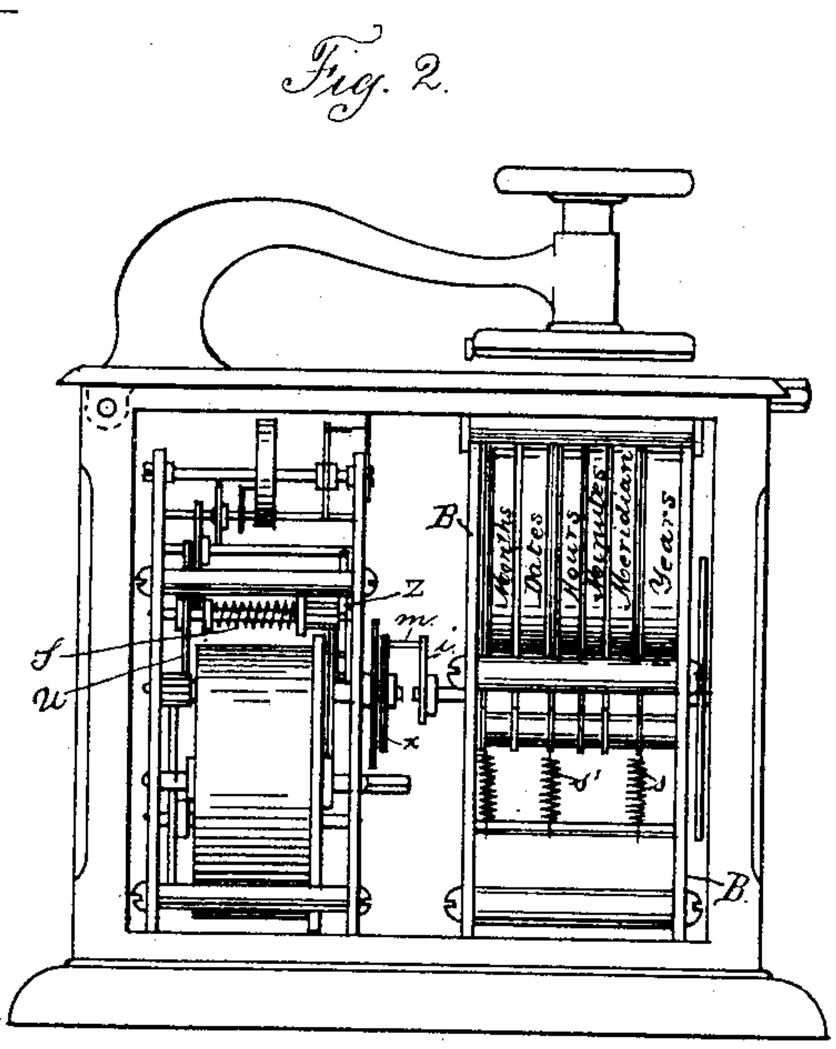


Fig. 2.

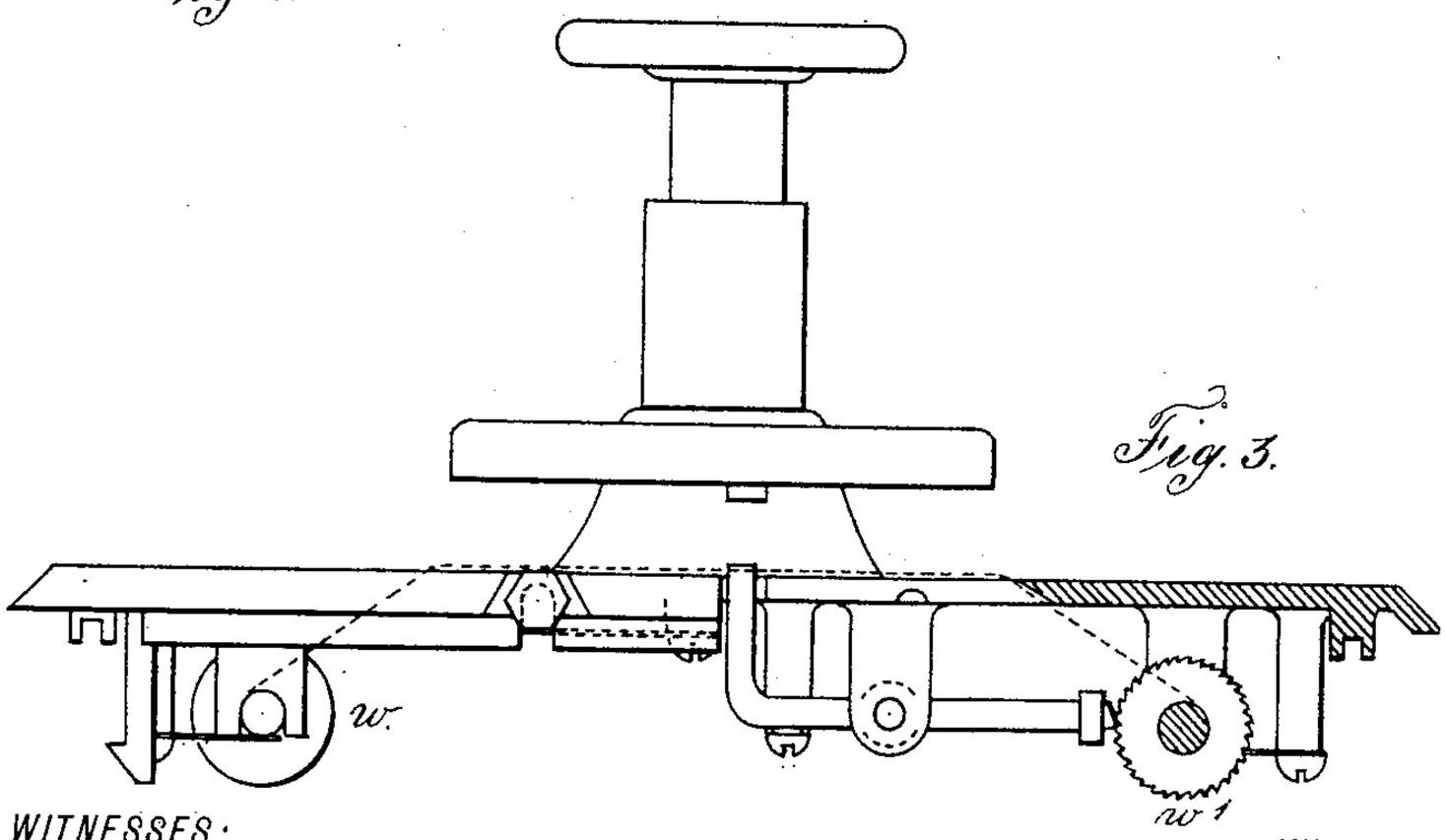


Fig. 3.

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(Model.)

3 Sheets—Sheet 2.

# C. STAHLBERG

## TIME STAMP.

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Fig. 4.

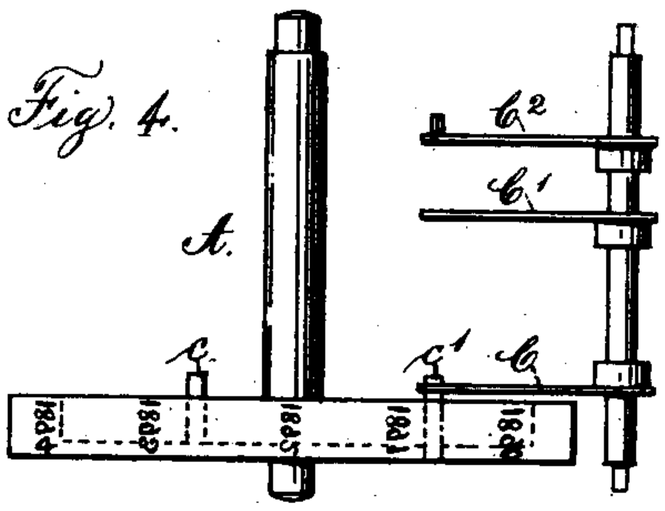



Fig. 6.

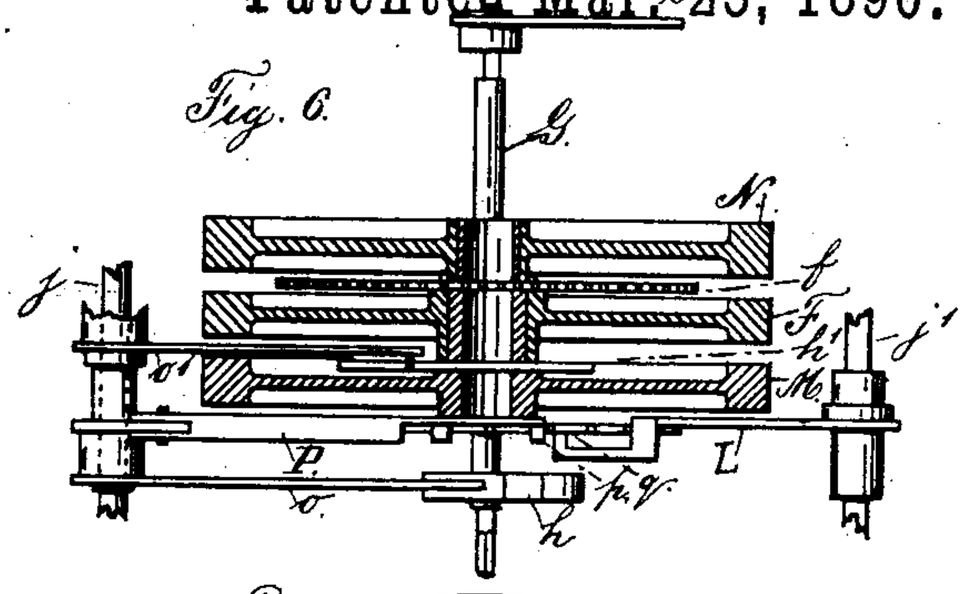



Fig. 5.

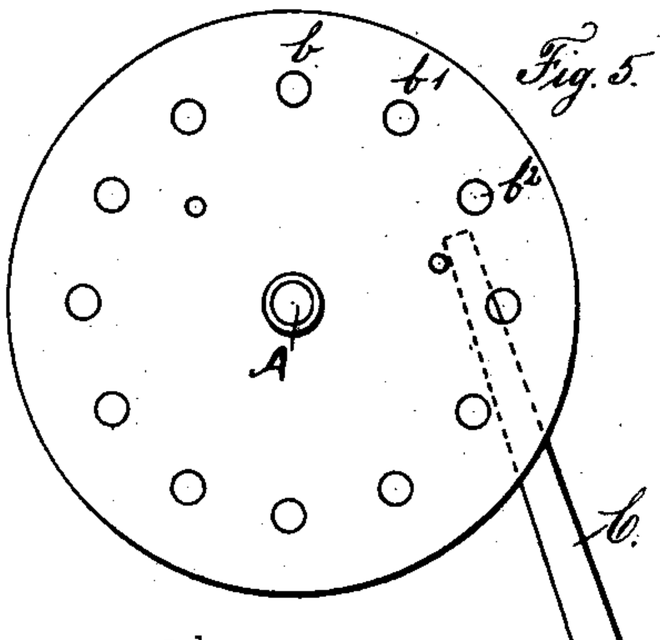



Fig. 7.

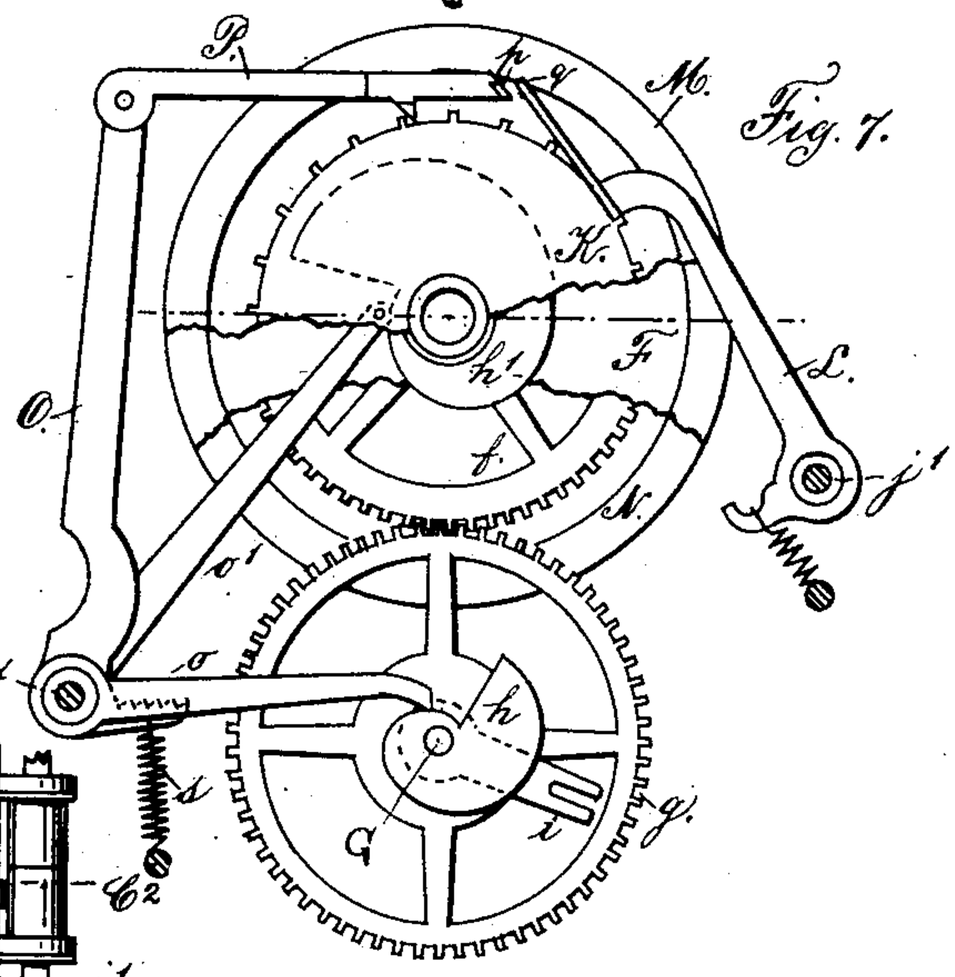



Fig. 8.

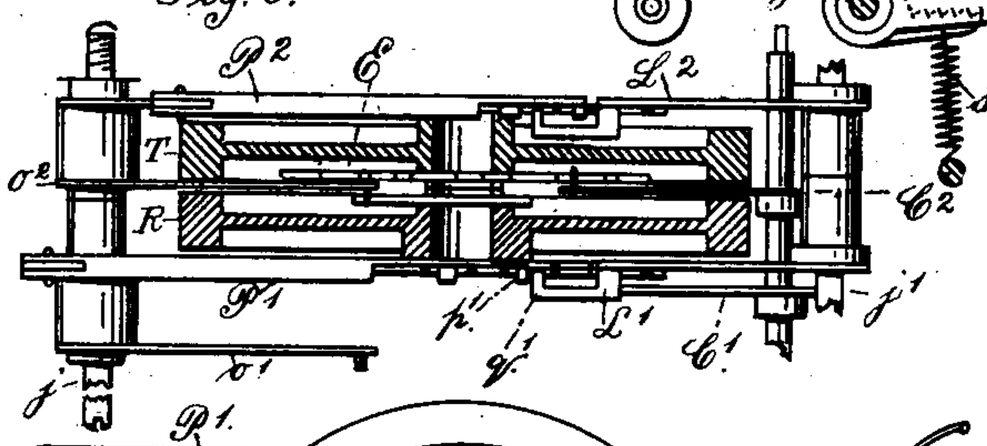



Fig. 9.

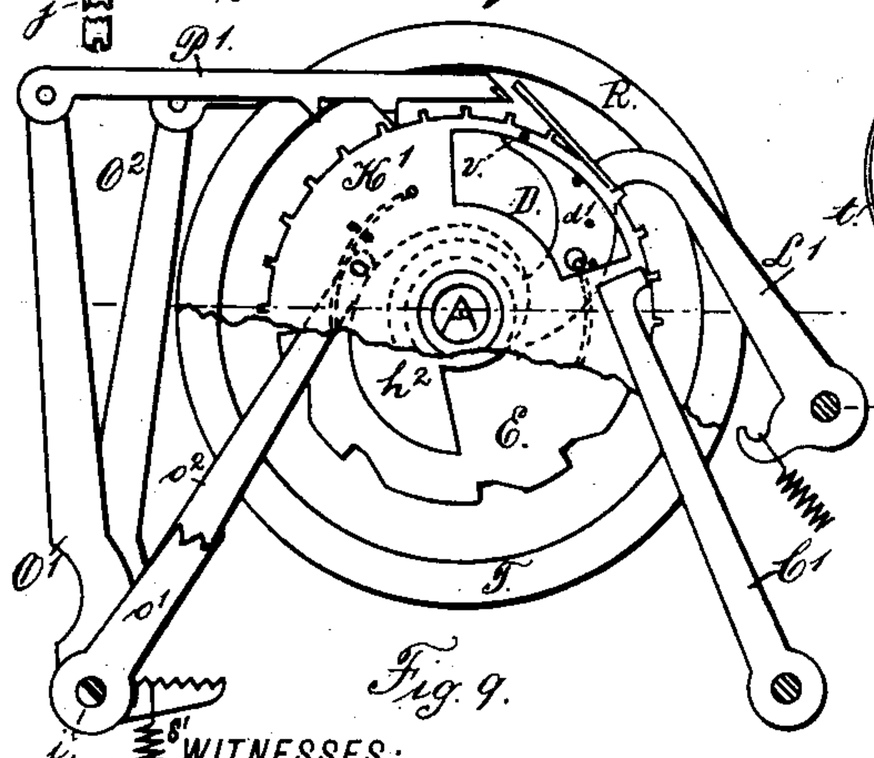



Fig. 10.

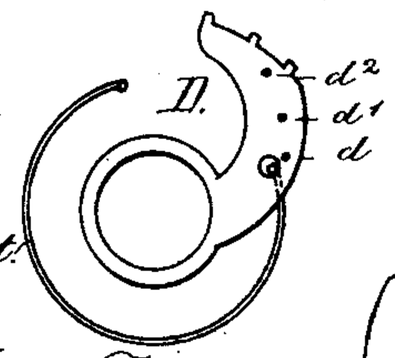
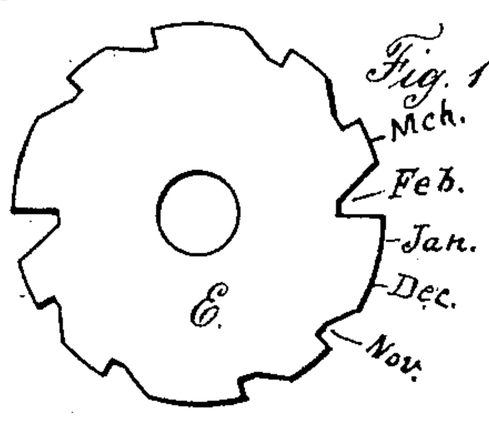



Fig. 11.

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(Model.) 3 Sheets—Sheet 3.

# C. STAHLBERG.

## TIME STAMP.

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Fig. 12.

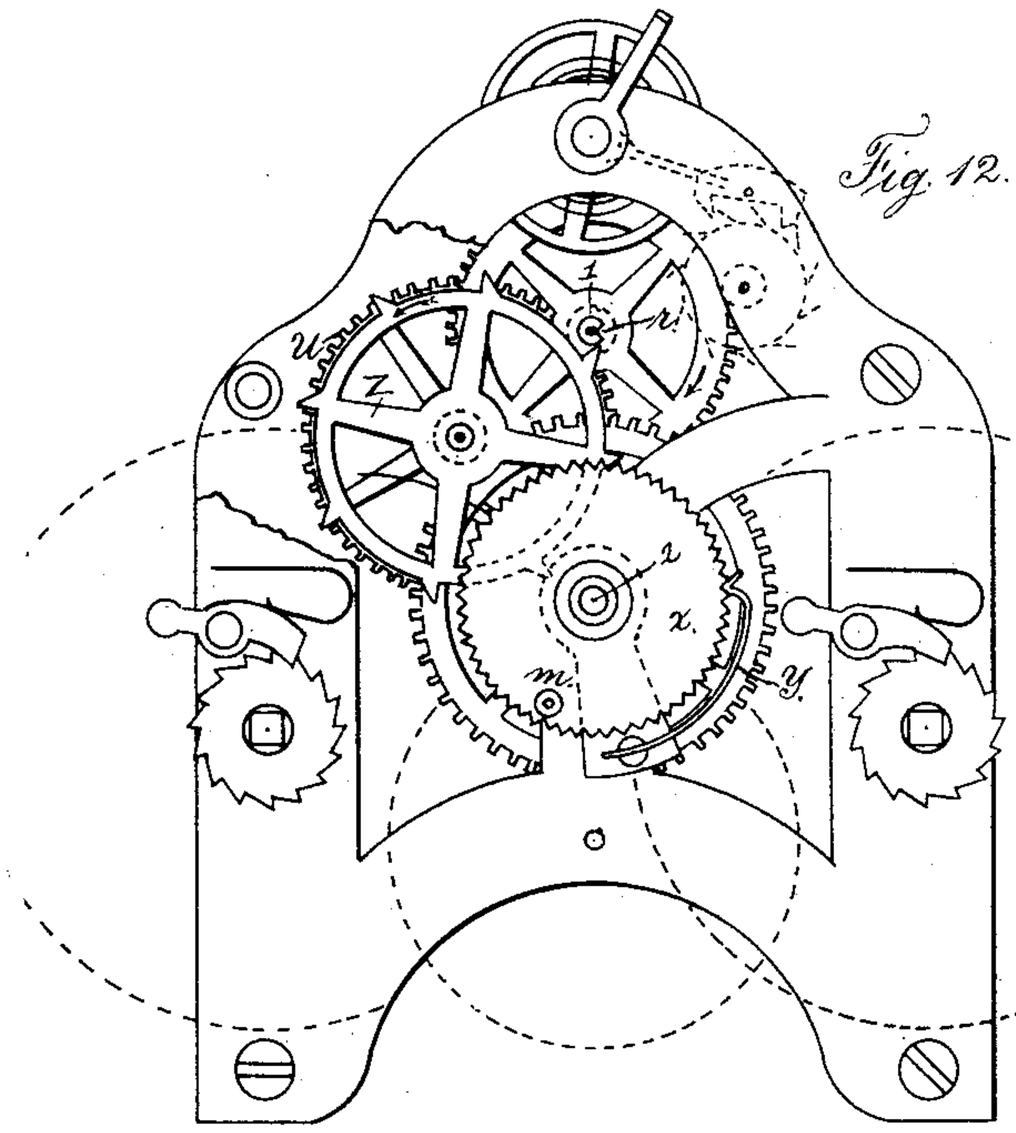



Fig. 13.

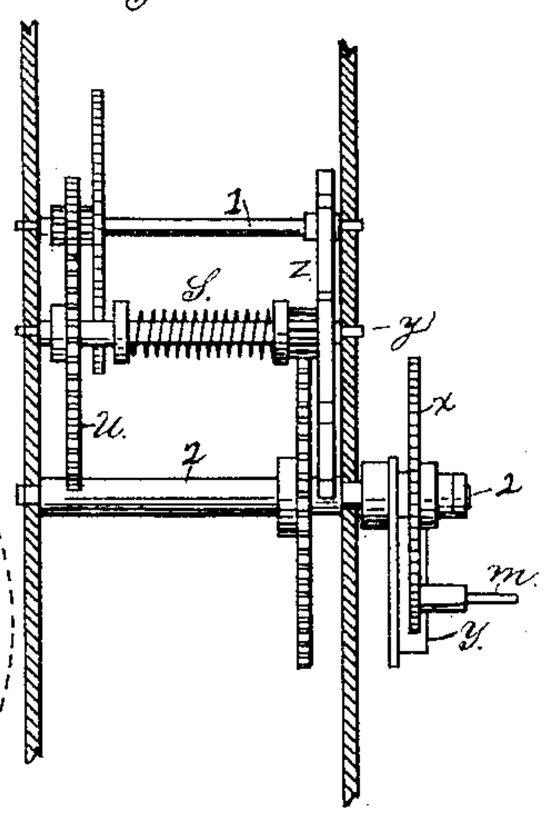
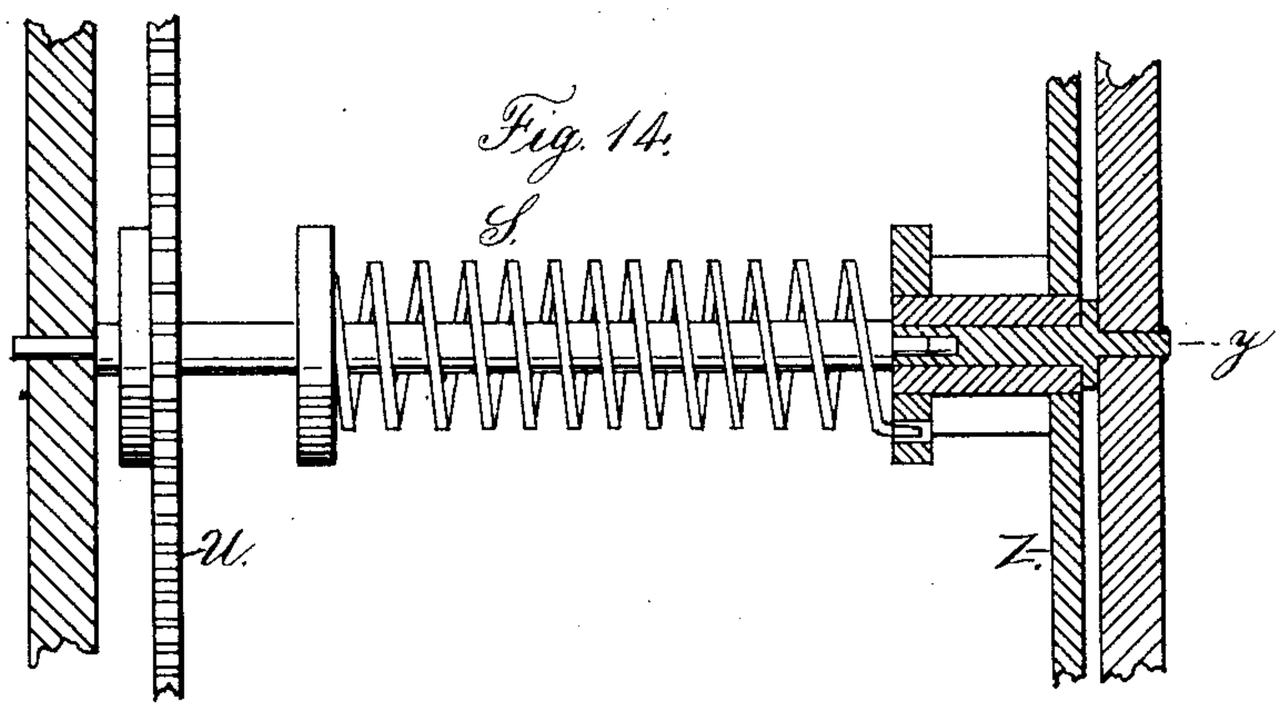



Fig. 14.

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# UNITED STATES PATENT OFFICE.

CHARLES STAHLBERG, OF BROOKLYN, NEW YORK, ASSIGNOR TO THE ACCURATE TIME STAMP COMPANY, OF WEST VIRGINIA.

## TIME-STAMP.

SPECIFICATION forming part of Letters Patent No. 424,369, dated March 25, 1890.

Application filed March 19, 1889. Serial No. 303,910. (Model.)

*To all whom it may concern:*

Be it known that I, CHARLES STAHLBERG, residing at Brooklyn, county of Kings, and State of New York, have invented certain new and useful Improvements in Time-Stamps, of which the following is a full and accurate description, reference being had to the accompanying drawings.

My invention relates to instruments by means of which the current time and date, together with other names and characters, may be printed on documents and similar articles, in which is embodied a series of type-wheels with mechanism to automatically set them, a clock-movement to run the same, a case wherein the instrument is mounted, and other appliances, more fully described hereinafter.

The objects of the invention are to provide an instrument by means of which the correct time and date may be printed; to construct them so that they will operate automatically in setting the type-wheels to the proper minute, hour, meridian, date, and month, with special reference to the different number of days in the different months of the common year and leap-year; to so arrange the mechanism that it may be manufactured cheaply and at the same time be good and of neat appearance and to have the instrument run with little power and keep accurate time, notwithstanding the extra strain put on the clock-movement, in order that the same may be available as a reliable watchman's time-detector, together with other good and valuable objects set forth in the detail description.

Heretofore automatic time-stamps have been made wherein ordinary clock-movements were used, the actuating-shaft of which moved with the ordinary continuous motion, and was converted into the required intermittent motion necessary for the minute type-wheel by cam, pawl, and ratchet devices, the latter also acting to transmit motion from the clock to the time-stamp mechanism. These intermediate devices used up so much of the clock-power that extra stiff mainsprings were required, which, again, caused the clock to keep time badly and necessitated frequent windings.

My invention does away with the above intermediate converting mechanism and fully corrects the faults mentioned.

Time-stamps, so far as I am at present aware, have never before been made to automatically move the month type-wheel at the proper time. In my invention this desirable feature is fully attained.

In the drawings, Figure 1 represents a front view of the time-stamp with the cover turned up. Fig. 2 is a side elevation with the cover in place. Fig. 3 is a front end view of the case-cover in part section. Figs. 4 and 5 are respectively top and front views of the year type-wheel. Figs. 6 and 7 are respectively top and front views of the meridian, minute, and hour type-wheels with their moving mechanism. Figs. 8 and 9 are respectively top and front views of the date and month wheels with their moving mechanism. In Figs. 6 and 8 the type-wheels are shown in section to give a clearer view of the moving mechanism. In Figs. 4 to 9 supports are not shown, to avoid confusion. Fig. 10 shows a toothed segment used in the date mechanism. Fig. 11 is a cam belonging on the month-wheel, used also in the date mechanism. Fig. 12 is a front elevation of the clock with frame broken—such parts as are not a part of the invention dotted to clearly show the special mechanism. Fig. 13 is a side view of a portion of the mechanism shown in full lines, Fig. 12. Fig. 14 is an enlarged side view in part section of the mechanism of wheels U and Z of the clock.

Similar letters of reference in the several figures indicate the same parts.

The type-wheels have on their periphery the type corresponding to the divisions of time which each one is intended to print, and are preferably arranged in the following order: first, the year-wheel; second, the meridian and hour wheel operating mechanism; third, the meridian-wheel; fourth, the minute-wheel; fifth, the minute-wheel-operating mechanism; sixth, the hour-wheel; seventh, the date-wheel-operating mechanism; eighth, the date-wheel; ninth, the month-wheel, and, finally, the month-wheel-operating mechanism.

The year-wheel, Figs. 4 and 5, is fast to the shaft A and has bearing in frame B, Figs. 1 and 2. On the shaft A the other type-wheels take their bearings, and are placed thereon

preferably in the order mentioned, although other arrangements may be made, if desired. The year-wheel is held in position by means of a flat spring *a*, Fig. 1, having its end bent and tapered to pass into any one of the holes *b b' b²*, &c.

*c* and *c'* are stop-pins set so that they engage the lever C when a leap-year is at the top, and thus cause the date-wheel to skip only two days on March 1 of these years, instead of three, as it does in a common year. These pins are placed on the web of the year-wheel at equal distances from the center, their angular location being determined by the type of the year-wheel, one pin for each leap-year. The type of a leap-year being in position for printing, its respective pin is then directly under the end of lever C, to intercept the fall of this lever. When any other year is on top, this pin will be out of the way of lever C. Levers C and C' are adjusted to such an angle with respect to each other that when C has fallen on one of the pins *c* and *c'* the end of C' will just escape contact with the pin *d* on segment D, (to be hereinafter described,) as the latter turns with the day-wheel, but will meet the pin *d'*. C, C', and C² are mounted on the same shaft pivoted in the frame B. C' engages pins on the segment D, Figs. 9 and 10. C² rides on the cam E, Figs. 9 and 11, on the month-wheel. Levers C' and C² are adjusted to such an angle with respect to each other that when C² is resting on the highest portions of cam E the end of C' will just escape contact with the pin *v* on the day-wheel. When C² rests in one of the shallower notches of cam E, C' should meet the pin *d²* on segment D. When C² rests in the deepest notches of cam E, then C' should meet the pin *d*.

The minute type-wheel F, Figs. 6 and 7, has its bearing on the hub of the meridian-wheel M and has attached thereto the gear *f*, which meshes into the gear *g* on the shaft G. This shaft is turned by the clock-movement at intervals corresponding to the divisions of time to be shown by the minute-wheel. The gear-wheel *f*, Figs. 6 and 7, fast to the minute type-wheel F, and the gear-wheel *g*, fast on the shaft G, merely serve to transmit the motion of the shaft to the minute-wheel unchanged, as a convenience of construction. The shaft G is an extension of the actuating-shaft of the clock. I have here shown it connected to the clock-shaft by a coupling device *i x m y*, more fully described hereinafter. This coupling can be varied by other known devices, and can be entirely dispensed with without changing the character of my invention by making the actuating-shaft of the clock long enough to extend clear through the time-stamp movement, thus directly taking the place of the shaft G. I do not consider such a change advisable on account of a slight increase in the cost of manufacture.

The meridian M and hour N type-wheels are fastened to the same hub on each side of the minute-wheel. This arrangement of the wheels gives the necessary room for the levers and pawls, and also gives the proper relative order and spacing to the impression. They (M and N) are practically one wheel and carry the type for the twenty-four hours of the day.

The moving mechanism for the wheel is as follows: A toothed wheel K, having twenty-four straight-sided teeth, is fastened to the hub of the meridian-wheel. A pawl L enters between the teeth of wheel K and locks the same from turning in either direction. Levers O and *o* are fastened to the same hub, and a spring *s* is attached to a serrated arm on lever O, giving the necessary power to actuate the lever O. Lever *o* rides on the cam *h*, which latter is fast to shaft G and turns once an hour. Loosely jointed to the upper end of lever O is a pawl P, which during its forward movement turns the wheel K. This pawl carries an extension with a projection *p* on its end to engage in its forward motion a similar extension and projection on pawl L. The projection *p* is inclined on its front face, and the projection *q* on pawl L is correspondingly inclined. The projections are so adjusted that *p* in its forward motion will enter under the projection *q* and cause the latter to rise on the inclined plane of *p*. The projections should be but very little wider than will suffice to keep the pawl L out of the teeth of wheel K until the latter has been fairly started by pawl P.

The action of this mechanism is as follows: When the lever *o* falls off cam *h*, the pawl P moves forward and its projection *p* meets projection *q*, thereby lifting the locking-pawl L out of the wheel. Then the pawl-point of P meets a tooth on wheel K, moving the same forward. In the meantime the projections *p* and *q* will be out of engagement, and the locking-pawl L will enter the next space between the teeth and again lock the wheel. On its return motion the pawl P rides over projection *q* and the teeth of the wheel. The locking-pawl L firmly holds the type-wheel and prevents it from being moved in either direction, thus giving a reliable tally at all times, and particularly when the instrument is used as a watchman's time-detector.

The operating mechanisms for the month and the date wheels are of similar construction as the above. The levers O' and O² are actuated, respectively, by the cam *h'* on the hour-wheel and the cam *h²* on the date-wheel R through the arms *o'* and *o²*. Levers O' and *o'* are fast to one hub and O² and *o²* are fast to one other hub. All the lever-hubs and all the locking-pawl hubs have their bearings respectively on shaft *j* and *j'*, mounted in the frame B.

The mechanism by means of which the date-wheel is adjusted at the end of months having less than thirty-one days is as follows: A segment D is pivoted on one side of wheel K', preferably in bearings concentric with the central shaft, and carries three pins projecting through a slot in the wheel K'. It

also has three teeth, registering with the teeth on wheel K′ when the stop-pin *d* is against the side of the slot, being held in such position by a spring *t*, which tends to press the segment forward, and in which position D turns with wheel K′, its teeth registering with those of K′, as just mentioned, and consequently having no effect on the lock-pawl L′. When, however, this segment is stopped by C′ coming in contact with one of the pins *d*, *d′*, or $d^2$, as will be presently explained, then one of its three teeth will stand under the pawl L′, preventing the latter from entering the tooth-spaces on K′, and the day-wheel thus be left free to turn and skip the days required.

On the month-wheel T, which makes one revolution in two years, is fastened the circular disk or cam E, having notches corresponding in number and position to the months on the periphery, said notches being formed of proper depth and angular distance apart to cause the proper number of days to be skipped at the end of the months having the least number of days. Cam E, through levers $C^2$ and C′, is the cause of arresting the movement of segment D, thus causing the skipping of days at the end of the month, and the number of days skipped depends on which pin *d*, *d′*, or $d^2$ on the segment D is engaged by the lever C′. When a full month of thirty-one days is exposed for printing, one of the curved peripheral portions of the cam E should be under the lever $C^2$, and then C′ should clear all pins *d*, *d′*, $d^2$, and *v*. When a month of February is similarly exposed, then a deep notch should be under the lever $C^2$. The depth of this notch should be such that C′ will meet pin *d*, thus causing a skip of three days. For a thirty-day month a notch should be under $C^2$ deep enough to cause C′ to meet pin $d^2$ and high enough to cause C′ to clear pin *d′*. The notches have the back side an inclined plane to raise lever $C^2$ easily when the month-wheel T turns. When cam E has taken C′ out of engagement with the pins on the segment, the latter will fly to place by virtue of spring *t*, its teeth will again match those of K′, and then locking-pawl L′ can again enter the tooth-spaces. The lever C′ is so adjusted in length with respect to the pins and teeth on the segment D that one of the latter's teeth will stand fairly under the pawl L′ when the movement of the segment is arrested. The distances between the pins *d*, *d′*, and $d^2$ is equal to the distance between the radial lines of the teeth taken at the point where the pins are located, said pins being equal distances apart measured on their respective radii. Their position with respect to the three teeth is determined by the position of the end of lever C′ and the pawl L′. When pin *d* is against lever C′, then the tooth farthest forward in the direction of rotation should stand under pawl L′. The normal position of the segment D should be such that the tooth on the segment farthest forward will stand four tooth-spaces ahead of the tooth-space in which the lock-pawl lies when *l* is in position to print. A stop-pin *v* is placed on the edge of wheel K′ nearly two tooth-spaces back from pin $d^2$. The office of this pin is to stop the date-wheel in case the cam E has not had time to lift lever C′ out of engagement with the segment-pins, thus preventing the date-wheel from skipping more days than required. The pin *v* is necessary in ordinary cases where the type-wheels are heavy and require time to get started; but when the type-wheels are made very light and the actuating-spring on the date-wheel mechanism is very carefully adjusted as to strength then the pin *v* can be left off. I do not recommend this construction, as the mechanism will then be less sure in its action. P′ has two pawl-points with range enough to move the wheel K′ four spaces. These pawl-points are placed at such a distance apart that when the forward one has moved the wheel two spaces the rear one will engage the teeth and move the wheel during the other two spaces, and the cam *h′* on the meridian or hour wheel M N has throw enough to give pawl P′ the necessary range. The pawl P′ is cut away on the side to clear the projection *q′*. The cam, through the medium of levers *o′* and O′, pushes back the pawl P′ to its greatest extent at each revolution, (once in twenty-four hours,) thus throwing the spring S′ under tension and storing power to move the pawl the necessary distance to skip the days in short months. Lock-pawl L′, when not held by segment D, allows but one tooth to pass at a time, and the teeth of wheel K′ hold pawl P′ until cam *h′* commences to lift lever *o′*.

The action is as follows: In a month having thirty-one days the lever $C^2$ rides on a high portion of cam E, and the lever C′ is brought out of range of any of the pins on D or pin *v*, allowing the date mechanism to move one tooth at a time. In a month having less than thirty-one days the lever $C^2$ is in one of the notches of the cam E, and thereby brings lever C′ in range with one of the pins *d*. For instance, in the month of February, $C^2$ is in one of the deepest notches, in which position lever C′ is in range with pin *d*. On the 28th day of February, when the change is taking place, the pin *d* meets lever C′, which stops the motion of segment D, leaving one of the latter's teeth under the locking-pawl L′, thus allowing pawl P′ to turn the wheel four spaces. In the meantime lever $o^2$ will have fallen off cam $h^2$, thus allowing the month-wheel to move one space. This, through cam E, raises lever C′ out of range, the segment again flies to place, and pawl L′ is free to lock wheel K′. The stop-pin *v* meets lever C′ and stops the momentum of the type-wheel, giving the locking-pawl time to get in position. In a leap-year the pin *c* or *c′* prevents lever $C^2$ from falling so far into the February notch of cam E. Then the pin *d′* is brought into action

and wheel K′ rotated only three spaces. In a month having thirty days pin $d^2$ meets the lever C′, and the wheel K′ rotates only two spaces.

The clock-movement, Figs. 2, 12, 13, and 14, is constructed to move the shaft which actuates the type-wheel mechanism equal distances at intervals of one minute or at such intervals as is desirable, the shaft being stationary during the intervals. In this case I use the center shaft of the clock, which usually carries the minute-hand. I gain this intermittent motion of the actuating-shaft 2 by interposing an auxiliary motor or spring S in the train of the clock. This really divides the clock-train into two portions. The lower portion of the train is driven by the regular mainsprings of the clock, and its office is to wind the auxiliary motor-spring once a minute.

The motion of the lower train is arrested by a stop mechanism, and is released at the proper time by the clock-train as follows: The last wheel Z of the lower train, which is in effect an escapement-wheel, is adapted to engage with the shaft of a wheel *l* in the upper train, which latter turns once a minute and usually carries the second-hand. A notch *r* on this shaft allows the movement of the escapement-wheel Z to take place. The spring S is the connection between the upper and the lower train. It is put to proper tension, and then propels the upper train continuously. At the end of each minute it is rewound by the lower train. The spring will thus exert a practically-uniform power on the clock balance-wheel or regulate and cause the same to keep accurate time, notwithstanding the varying power of the regular mainsprings. The actuating-shaft 2 being in the lower train, it will be seen that it can move only at minute intervals. Thus I obtain the motion suited to the setting of the minute-wheel and require only simple transmitting mechanism to carry this motion to the type-wheel.

I do not require an extra mechanism to convert the continuous motion of an ordinary clock, which has been the case in all time-stamps heretofore constructed. Again, by my device in the clock-movement I save all lost motion and loss by friction occasioned by the above-mentioned intermediate converting mechanisms. The result is that my time-stamps will run from eight to ten days at one winding, where former time-stamps required to be wound about every day, both using the motive power of an ordinary eight-day clock.

The details of the clock mechanism are as follows: The wheel Z has the desired number of escapement-teeth thereon and turns in an opposite direction to the second-hand wheel *l*. It is geared with the center wheel 2, so that the latter will make sixty jumps in one revolution. The escapement-teeth rest against the shaft of wheel *l* and are thin enough to enter the notch *r* on the shaft 1 without binding. When this notch *r* comes in front of a tooth of the wheel Z, the latter will enter and be held and carried with the notch until it can escape. The next tooth will be arrested on the shaft until the notch comes around again. The wheel Z has its bearings on a short stud *y*, which is riveted to the clock-frame. This stud has also a small hole at its inner end, which forms the bearing for the forward pivot of the wheel U. The cylindrical spring S has one of its ends fastened by means of a collet to the shaft of wheel U, and its other end is fast to the hub of wheel Z. It is necessary that the two wheels, which are connected by the auxiliary motor-spring, should be geared to turn an equal number of times, in order to prevent increase or decrease in the tension of the spring. Wheel U meshes into the pinion of the second-hand wheel *l*.

In coupling the actuating-shaft of the clock-movement with the shaft G of the time-stamp I use a device whose objects are, first, to form a secure shaft-coupling; second, to prevent this coupling from binding the shafts it couples, should the latter be out of line; third, to provide means for setting the minute type-wheel to the time, so that the type will align without further adjustment.

Fastened by a suitable support to the actuating-shaft 2 of the clock is a spring-pawl Y, having a V-shaped toe fitting into correspondingly-shaped teeth, sixty in number, on a wheel *x*. Wheel *x* has its bearing on shaft 2, and the spring-pawl Y keeps it from turning. Wheel *x* carries a pin *m*, which latter fits into the slot of a crutch *i*, Figs. 6 and 7. Crutch *i* is fast to the shaft G. When the two movements are mounted in the case, pin *m*, entering into crutch *i*, forms a secure coupling. By putting extra pressure on the minute type-wheel spring Y will give and allow it to be set. This coupling can be replaced by others well known, or, as before stated, it can be left off entirely by making the actuating-shaft 2 long enough to extend through the time-stamp, thus taking the place of shaft G.

When the instrument is especially intended for a watchman's time-detector, a rigid coupling should be used—as, for instance, the one last described.

The case, Figs. 1 and 2, consists of a frame with glass sides. It has a cover hinged on the back and provided with a lock and key, which prevents access to the interior by unauthorized parties. The cover carries the spools for the inking-ribbon *w* and *w′*, with the mechanism for automatically moving the same, the details of which are constructed similar to other known devices and require no further description. The cover being thus constructed gives easy access to all parts of the instrument.

In using the instrument as a watchman's time-detector it is fastened down and locked, and the watchman is required to take impressions at specified times. Owing to the locked

type-wheels, he cannot set them to make false impressions.

I do not claim herein the arrangement of the hour, minute, and meridian wheels, as the same has been made the subject of a divisional application filed on the 9th day of January, 1890, Serial No. 336,354.

Having thus described my invention, what I claim as new is—

1. In a time-stamp, the combination, with the movable type, type-moving mechanism, and a motor connected therewith for moving the type into printing position, of a stop for arresting the movement of the type mechanism and a clock-train controlling the stop to release the same at predetermined intervals, substantially as described.

2. In a time-stamp, the combination, with the movable type and a motor-spring geared thereto, of a stop arresting the movement of the type and an independent clock-train controlling the stop to release the same at predetermined moments, said clock-train being driven by a motor separate from first-named motor, substantially as described.

3. In a time-stamp, the combination, with the movable type, a motor connected therewith for moving the same into printing position, and a stop for arresting the movement of the type, of a clock-train controlling said stop to release the same at predetermined moments, a motor for actuating the clock-train, and gearing connecting said clock-train motor and the motor for driving the printing mechanism, whereby the clock-motor is wound by the movement of the printer-motor, substantially as described.

4. In a time-stamp, the combination, with the type-wheel, an actuating-spring, and a train of gears connecting said wheel and spring, and a stop interposed in said train, of a clock-train independent of the printing mechanism and controlling said stop, an actuating-spring for said clock-train, and a gear-wheel connected to one end of said clock-spring and gearing with the type-wheel train, substantially as described.

5. In a time-stamp, the combination, with the type-moving mechanism and a locking-pawl therefor, of an actuating-pawl engaging and operating the locking-pawl and type-moving mechanism during its forward stroke, whereby the locking-pawl is released and the type moved into position and locked while the pawl is moving in one direction, substantially as and for the purpose specified.

6. In a time-stamp, the combination, with the time-printing mechanism, the toothed wheel connected therewith, and the pawl L, engaging said wheel to prevent the movement of the printing mechanism and having the projection $q$ thereon, of the pawl P and projection $p$, substantially as and for the purpose specified.

7. In a time-stamp, the combination, with the type-wheel and the toothed wheel connected therewith, of the actuating-pawl P, having the projection $p$ thereon, with the inclined lower face, and locking-pawl L, having the projection $q$, with the inclined upper face, whereby the actuating-pawl is lifted during the return movement, substantially as described.

8. In a time-stamp, the combination, with the month-printing mechanism, the date-printing mechanism, and a wheel having a single line of regularly-spaced teeth controlling the same, of a pawl engaging said toothed wheel, a sector engaging the pawl and holding it out of the path of the teeth on said wheel, and a lever operated by the month-printing mechanism to throw said sector into operative position, substantially as described.

9. In a time-stamp, the combination, with the month-printing wheel, the date-printing wheel, and toothed wheel connected thereto, of a pawl engaging said toothed wheel, a sector mounted on said wheel and engaging the pawl to hold it out of the path of the teeth, and a lever operated by the month-printing wheel to throw said sector into operative position, substantially as described.

10. In a time-stamp, the combination, with the printing mechanism and a locking-pawl L′, of a movable piece D, having pins $d$ and $d^2$, levers C′ and C², and a cam E, substantially as and for the purpose set forth.

11. In a time-stamp, the combination, with the date-printing mechanism, the toothed wheel connected therewith, and a locking-pawl therefor, of the spring-pressed sector mounted on said wheel for keeping the locking-pawl out of engagement therewith, and a lever controlled by the month-wheel for moving said sector into operative position, substantially as described.

12. In a time-stamp, the combination, with the date and month printing mechanisms, of a locking-pawl for the date mechanism, a sector for holding said pawl out of engagement, a lever operated by the month-printing mechanism to throw said sector into operative position, and a stop-pin on the date mechanism, with which the lever co-operates to arrest the movement of the date mechanism, substantially as described.

13. In the mechanism for moving and locking the day or date type-wheel of a time-stamp, the combination, with a locking-pawl L′, of a movable piece D, having pins $d$ and $d^2$, levers C′ and C², a cam E, and a stop-pin $v$, substantially as and for the purpose set forth.

14. In a time-stamp, the combination, with the year, month, and date printing mechanisms, a locking-pawl for the date mechanism, and a movable sector for holding said pawl out of engagement, of a lever operated by the month-printing mechanism to throw said sector into operative position, and a lever operated by the year-wheel for controlling the extent of such engagement, substantially as described.

15. In the mechanism for moving and locking the day or date type-wheel of a time-stamp,

the combination, with a locking-pawl L′, of a movable piece D, having a pin $d'$, levers C and C′, and pins $c$ and $c'$, substantially as and for the purpose set forth.

16. In the mechanism for moving and locking the day or date type-wheel of a time-stamp, the combination, with a locking-pawl L′, of a movable piece D, having a pin $d'$, levers C and C′, pins $c$ and $c'$, and a stop-pin $v$, substantially as and for the purpose set forth.

17. In a time-stamp, the combination, with the printing mechanism and motor therefor, a separate clock-train, and an auxiliary spring connecting the motor and clock trains, of a stop-wheel Z in the motor-train and a notched shaft $r$, controlled by the clock-train, for releasing the stop-wheel at predetermined intervals, substantially as described.

18. In the moving and locking mechanism of the day or date type-wheel of a time-stamp, the combination, with the stop-pin $v$ on the wheel K′, of levers C′ and $C^2$ and cam E, substantially as and for the purpose set forth.

19. In a time-stamp, the combination, with the day-wheel having a variable movement to compensate for the unequal number of days in the months and having the cam $h^2$ connected thereto, of the month-wheel, the actuating-pawl therefor operated by the cam $h^2$, and the lever operated by the month-wheel and controlling the extent of the variable movement of the day-wheel, substantially as described.

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Witnesses:
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