(No Model.) 4 Sheets—Sheet 1.

C. STAHLBERG.

TIME STAMP.

No. 487,433. Patented Dec. 6, 1892.

Fig. 1.

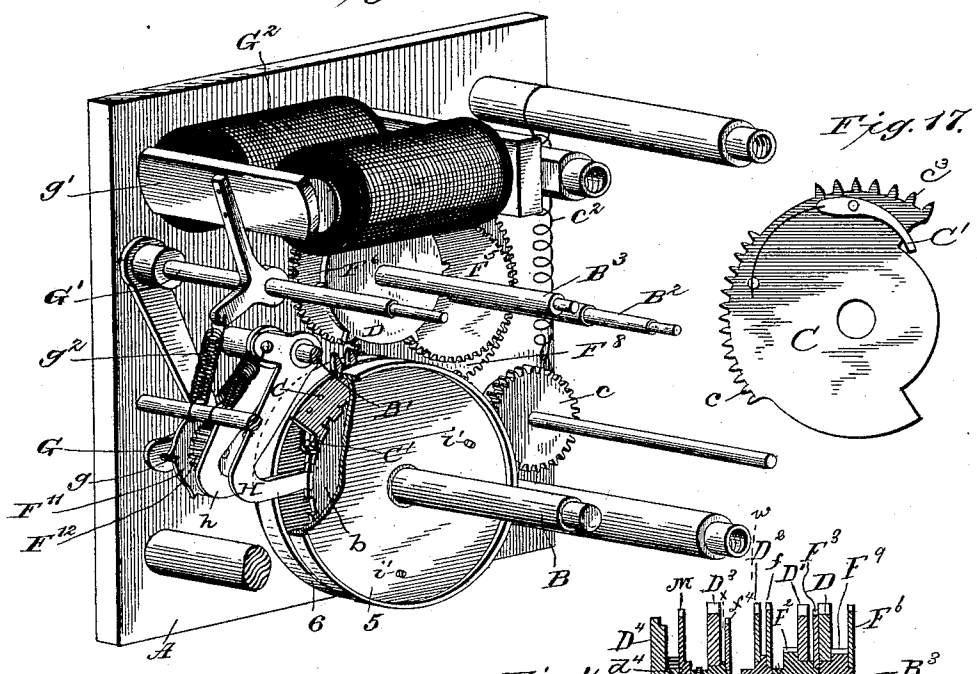


Fig. 17.

Fig. 4.

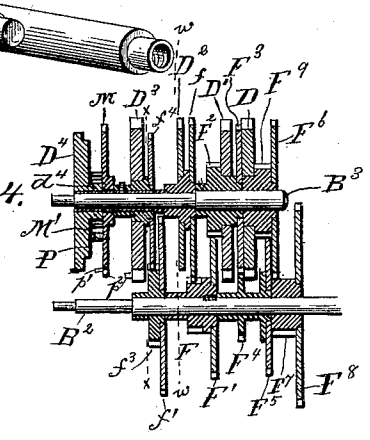


Fig. 2.

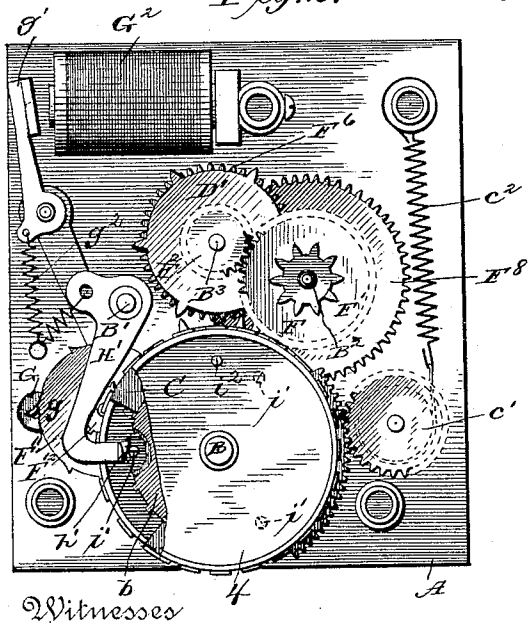
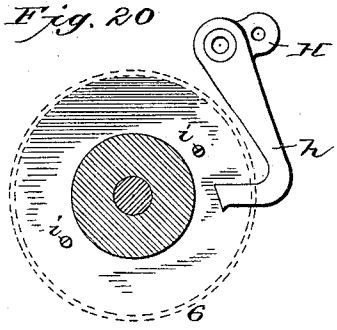


Fig. 20



Witnesses
E. F. Smith
Alex. F. Stewart.

Inventor
Charles Stahlberg
By Church & Church
his Attorneys

(No Model.) 4 Sheets—Sheet 2.

C. STAHLBERG.

TIME STAMP.

No. 487,433. Patented Dec. 6, 1892.

Fig. 13.

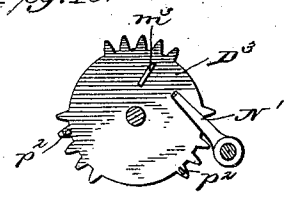


Fig. 3.

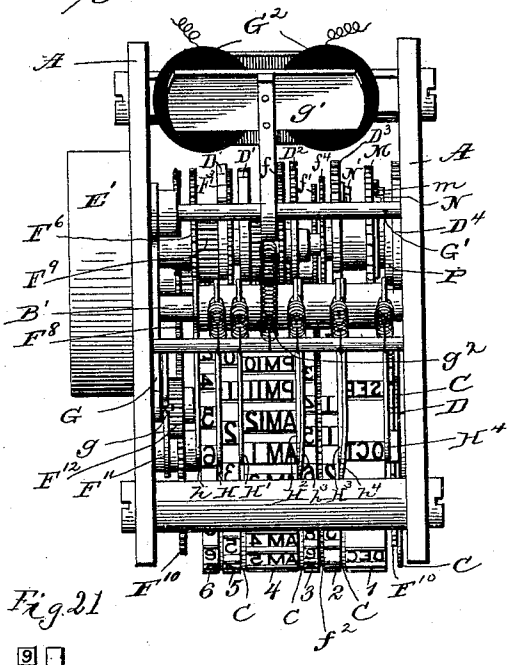


Fig. 19.

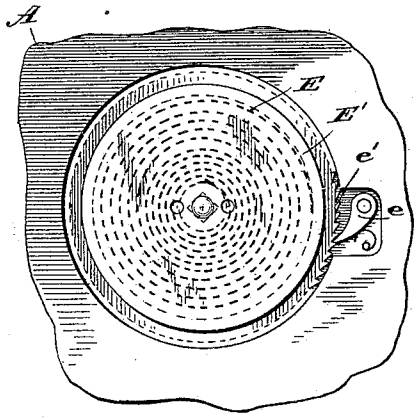


Fig. 21

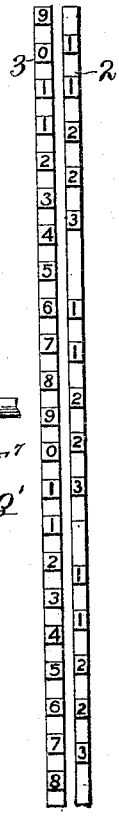


Fig. 14

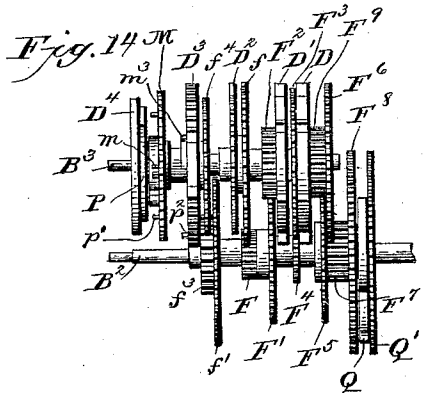
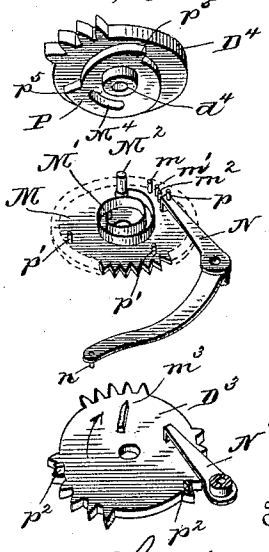


Fig. 11.



Witnesses
E. B. Smith
Alex. Stewart

Inventor
Charles Stahlberg
By Church & Church
his Attorneys

(No Model.) 4 Sheets—Sheet 3.

C. STAHLBERG.

TIME STAMP.

No. 487,433. Patented Dec. 6, 1892.

Fig. 6.

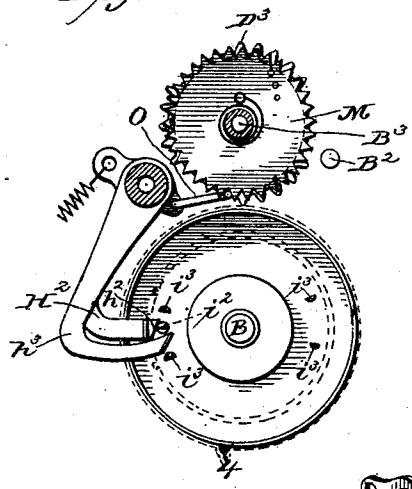


Fig. 5.

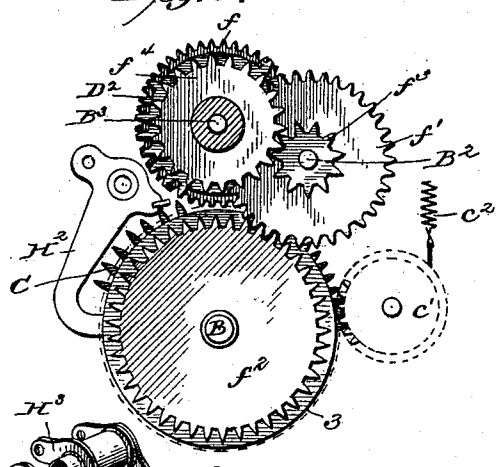


Fig. 9.

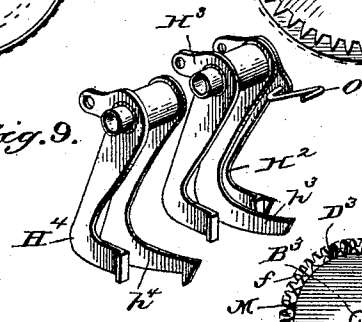


Fig. 8.

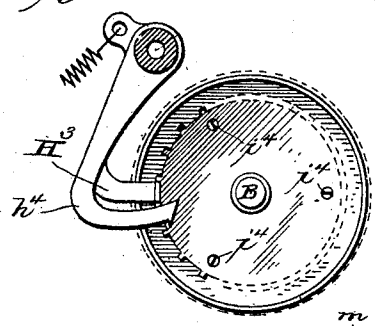


Fig. 7.

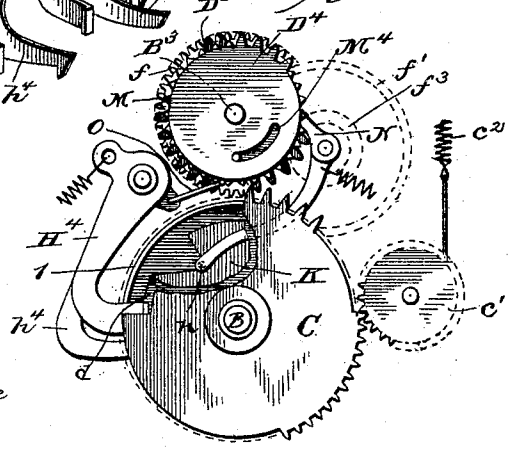


Fig. 10.

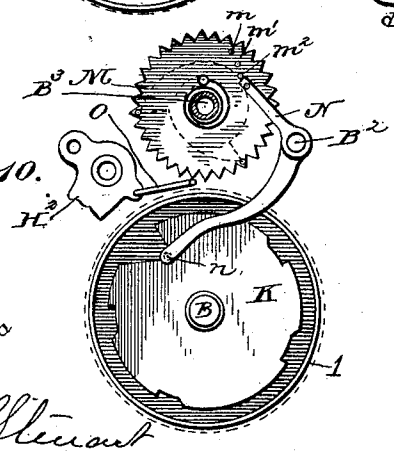
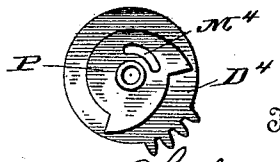


Fig. 12.



Witnesses
E. B. Smith
Alex. Sherman

Inventor
Charles Stahlberg
By Church & Church
his Attorneys

(No Model.) 4 Sheets—Sheet 4.

C. STAHLBERG.

TIME STAMP.

No. 487,433. Patented Dec. 6, 1892.

Fig. 16.

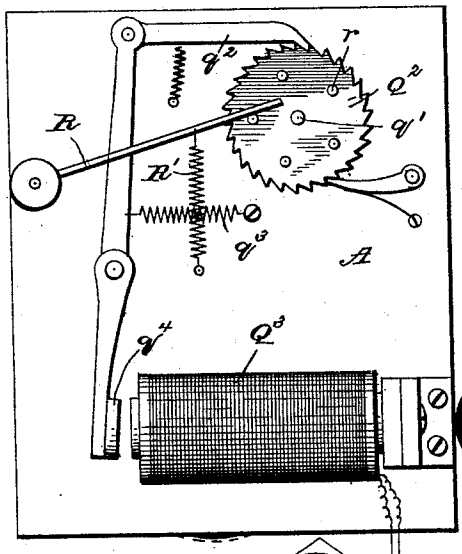


Fig. 15.

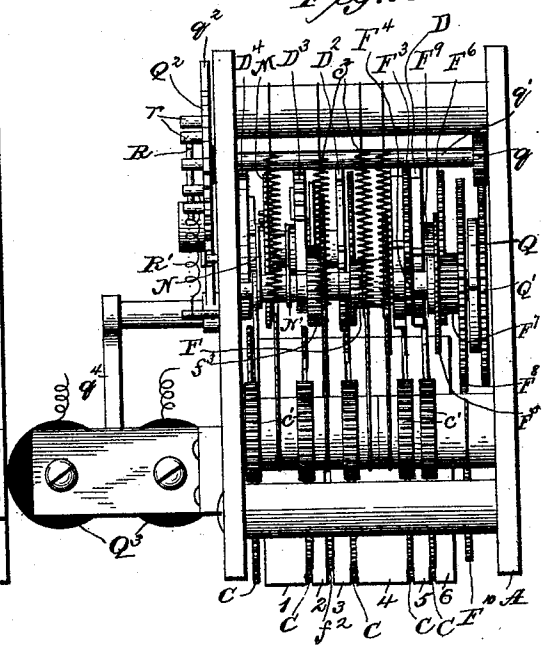
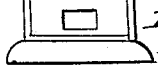


Fig. 18.



Witnesses
E. D. Smith
Alex. J. Stewart

Inventor
Charles Stahlberg
By Church & Church
His Attorneys

UNITED STATES PATENT OFFICE.

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

TIME-STAMP.

SPECIFICATION forming part of Letters Patent No. 487,433, dated December 6, 1892.

Application filed February 18, 1891. Renewed April 21, 1892. Serial No. 430,085. (No model.)

To all whom it may concern:

Be it known that I, CHARLES STAHLBERG, of New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Time-Stamps; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming a part of this specification, and to the figures and letters of reference marked thereon.

The present invention relates to improvements in that class of stamps designed to automatically present at the printing-point the indices for registering the proper month, day, hour, and minute, its objects being to produce an accurate device, compact and capable of a wide range of usefulness in the capacity of time-taker, watchman's time-recorder, correspondence-stamp, post-office stamp, dating-stamp, &c., and which shall be capable of being made one of a series of similar devices controlled and operated from a central station through the medium of an electric circuit.

The invention consists in certain novel details of construction and combinations and arrangements of parts, all as will be hereinafter described, and pointed out particularly in the appended claims.

Referring to the accompanying drawings, Figure 1 is a perspective view looking into the works of a stamp designed in accordance with my present invention, with all the parts removed except the minute-wheels, their operating mechanism, and connected parts. Fig. 2 is a vertical section looking at the hour-wheel and connections, with the drive-shaft for running the minute-wheel, which parts have been placed upon the shafts shown in Fig. 1, and a portion of the hour-wheel broken away to show the lock-lever for the hour-wheel and the pin on the minute-tens wheel for releasing the same. Fig. 3 is a side elevation of the assembled works. Fig. 4 is a longitudinal section through the power-shaft and shaft carrying the segment-resetting wheels. Fig 5 is a section taken in a plane just above wheel M, Fig. 4; and Fig. 6 is a section on the line $x\,x$, Fig. 4, showing the locking-levers and actuating-wheels in proper relative positions. Fig. 7 is an elevation looking at the end portions of the mechanism with the casing removed, portions of the year-wheel-operating segment and lock-wheel being broken away to show underlying parts. Fig. 8 is a view of the date-tens wheel, showing its locking-lever and the pins for releasing the month-wheel-locking lever. Fig. 9 is a view of the month-wheel and date-tens wheel locking-levers and their releasing-levers and also the date-wheel-locking lever and its arm for engaging the skipping-wheel. Fig. 10 is a plan of the cam on the month-wheel and lever and pins controlling the extent of the skip for long and short months. Fig. 11 is a detail perspective of the skip-controlling mechanism with the parts separated. Figs. 12 and 13 are detail plans of some of the wheels, Fig. 11. Fig. 14 is a side elevation of the shafts and gearing shown in Fig. 2 with the preferred mechanism for driving the power-shaft and minute mechanism. Fig. 15 is a side and Fig. 16 an end elevation of the preferred mechanism assembled. Fig. 17 is a detail of one of the segments. Fig. 18 is a side elevation of the preferred mechanism for carrying and supporting the stamp. Fig. 19 is an elevation of the spring-case shown in Fig. 2. Fig. 20 is an elevation of the minute-units type-wheel, its pins, and the release-lever for minute-tens wheel. Fig. 21 is a diagrammatical illustration of the arrangements on the date-units and date-tens wheels.

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

Heretofore in stamps of this character it has been found practically impossible to get them into compact form because of the apparent necessity for the employment of levers, strictly speaking, and other mechanism for driving the various wheels for recording the months, days, &c., which mechanism could not be completely arranged, and, furthermore, could not be subjected to such rough usage as would be given the stamps in the ordinary course of business without destroying the accuracy and possibly absolutely injuring the parts of the mechanism.

In my present invention I have practically done away with the lever connections, &c.,

heretofore deemed so necessary and employ gearing for driving and in a large measure controlling the various wheels, the only levers retained being those whereby the movement of the wheels are controlled one by the other to produce the proper sequence of movements to indicate the various phases of time.

Referring now to the drawings, the frame or casing is indicated by the letter A and is of the ordinary construction of clock-work frames—*i. e.*, having front and back plates in which the shafts are journaled and corner-posts for properly spacing the plates.

The type-wheels, to be presently particularly designated, are mounted on the shaft B, journaled in the lower central part of the frame to enable their peripheries to project far enough to give the necessary impression of the characters at the printing-point.

In the present instance the wheels are arranged on the shaft in the following order, to wit: 1, the month-wheel; 2, the date-tens wheel; 3, the date-units wheels; 4, the hour-wheel; 5, the minute-tens wheel, and 6 the minute-units wheel, and all of these wheels, save the minute-units wheel 6, have on one side or the other thereof lock-wheels *b*, having straight-sided teeth adapted to co-operate with some one of the locking-levers pivoted on the shaft B′ and adapted to be released periodically by the movement of some one of the other type-wheels to permit the said wheels to rotate forward under the influence of the normally-active impelling-springs, as will more fully appear hereinafter. Journaled also on the shaft B between and on the sides of the type-wheels corresponding to the lock-wheels are the operating-segments C, one for each wheel, save the minute-wheel, which segments are spring-actuated in one direction and through the medium of the pawls C′, engaging the lock-wheels *b* of each wheel, respectively, tend to move the type-wheels forward, such movement being prevented normally, however, by the lock-levers aforesaid. The operating-segments have at one point in their peripheries teeth *c*, which engage pinions *c*′, having the springs c^2 connected thereto for moving the segments to carry the type-wheels forward, and preferably at another point on their peripheries are other teeth c^3, adapted to co-operate with the resetting-wheels D, driven from the main motor and having relatively and widely spaced teeth, or what is commonly known as "mutilated gear-teeth," thereon which engage the operating-segments to reset them at the moments when the type-wheels are stationary and they have no work to perform, the gearing being so proportioned as that one of the spaces between their teeth is next the segment when the latter moves forward and the train is so arranged and the teeth of the mutilated gears so positioned that they engage the segments to rewind the springs in the same ratio that the springs are run down. As some of the type-wheels have to move farther than others, though less frequently, as the date and month wheels, to compensate for the different numbers of days in the months, the segments for operating them must have a greater range of movement. Hence they are provided with a greater number of teeth c^3, as shown, for instance, in Figs. 6, 7, and 17. The shaft B^2 carries the drive-gearing, and, as shown in Figs. 1, 2, 3, 4, and 19, the power is derived directly from a spring E, (dotted lines, Fig. 19,) within a drum E′ on the outside of the casing, one end of the spring being connected to the end of said shaft and the outer end to the drum, which latter is adapted to be turned to wind the spring and is prevented from moving in the reverse direction by the pawl *e* and peripheral ratchet-rim *e*′.

All the gears and pinions are loosely mounted on the shaft B^2, save the pinion F and its connected gear-wheel F′, and from these two, in this instance, the whole device is driven, the train of gearing being as follows: The wheel F′ meshes with the pinion F^2 on shaft B^3, which pinion carries the resetting-wheel D′ for the hour-wheel segment and also the gear-wheel F^3. The latter meshes with a pinion F^4, carrying the wheel F^5 and journaled on shaft B^2. From the wheel F^5 the train runs to pinion F^9, carrying the minute-tens segment-resetting wheel D and wheel F^6, and from the latter to the pinion F^7, carrying the large gear F^8, which meshes with the gear-wheel F^{10} on the minute-units wheel. The result of this train is that the resetting-wheel for the hour-wheel segment is given a relatively-slow movement, the corresponding wheel for the minute-tens-wheel segment a faster movement, and the wheel for running the minute-units the fastest of all, the speed of the type-wheels themselves being in exactly the same proportion relative to each other. From the pinion F the train runs in the opposite direction to the wheel *f*, which carries the resetting-wheel D^2 for the date-units-wheel segment, with which wheel *f* the direct connection of the train stops, but the date-units wheel 3 has upon one side a large gear f^2, Fig. 5, with which the gear *f*′ meshes. The latter carries a pinion f^3, meshing with a gear-wheel f^4, carrying the resetting-wheel D^3 for the date-tens-wheel segment and also the resetting-wheel D^4 for the month-wheel segment, the latter having only a few teeth at one side, as shown in Fig. 12. The wheels D^3, Fig. 13, and the wheel D^4, besides serving as the resetting-wheels for the said segments, also serve as two of the wheels for the skipping mechanism, an intermediate wheel M, mounted between them, being the other wheel of the skipping mechanism, which will be presently described.

In the device shown I propose to release the minute-units wheel, and through it all the other wheels, by means of an electro-magnet in a circuit over which impulses are sent at predetermined intervals by a distant time-piece, and in the simplest form of mechanism

a manually-wound spring is employed with a simple escapement stop-wheel F^{11}, Figs. 1 and 2, having a pinion F^{12} meshing with the wheel F^{10}, Fig. 3, on the minute-units wheel, and a pallet G, having pallet-points g and mounted on a shaft G′, which shaft also carries an operating-arm with an armature g' adapted to be moved in one direction by the electro-magnet G^2 in the circuit, as aforesaid, and in the other direction by a spring g^2 to release the train at proper intervals.

The locking-levers for the various type-wheels are, as before stated, pivoted on shaft B′, and they with their attached releasing-levers will now be described in their regular order, beginning with the one for minute-tens, and which in the drawings is lettered H. This lever H passes in between the two minute-wheels and has, as has all of the locking-levers, a rectangular end projection, which fits accurately into the space between two teeth of the lock-wheel and locks the wheel against movement in either direction until released. The release-lever h for the lever H is connected thereto through the hub and passes down on the opposite side of the minute-units wheel, where it projects into the path of the two releasing-pins i, one or the other of which engages the releasing-lever at the moment the units-wheel is changing from "9" to "0," and releases the tens-wheel, permitting it to move forward one space, which brings its next number to the printing-point. Two pins are employed, because two sets of digits are arranged on the periphery of the units-wheel, and it is necessary for the tens-wheel to jump as the change is made from one set of digits to the other. It is obvious, however, that were a single set of digits employed but one pin would be needed, and so, too, if more than two sets were employed there must be a pin for each set.

The minute-tens wheel for convenience has three sets of figures, from "0" to "5," inclusive, for indicating the tens, twenties, thirties, forties, and fifties, the "0" standing in place at the hour and during the time the minutes from "1" to "10" are being indicated.

As the registration of each set of numbers indicates the passage of one hour, the tens-wheel must needs carry three releasing-pins i', (one shown in full lines and the other in dotted lines in Fig. 2,) said pins being adapted to co-operate with the inclined end h' of the locking-lever H′ for the hour-wheel, the end of the lever being thus made to constitute its own inclined releasing-lever arm or projection. It is necessary, of course, that the lock-wheel in this instance be on the side of the hour-wheel next the minute-tens wheel, so that the pins and locking-lever may co-operate properly.

The hour-wheel 4 is provided with twenty-four indices and revolves once a day only, and has of course to release the date-units wheel but once in a revolution. Therefore it carries but one pin i^2, which engages the end h^2 of the locking-lever H^2 for the date and units wheel just as described with relation to the locking-lever H′ and as shown clearly in Fig. 6.

The date-units wheel 3 is provided on its periphery with two sets of digits and with an additional figure "1" between each set immediately after the "0," the arrangement, as shown in Fig. 21, thus being "0," "1," "1," "2," &c.

The date-tens wheels is provided on its periphery with three sets of numbers, as follows, to wit: "1 1" "2 2" "3," between each of which sets are blank spaces, as also shown in said Fig. 21.

The locking-lever H^3 for the date-tens wheel is provided with a releasing-lever, the two being connected at the hub, as shown clearly in Fig. 9, and straddle the said two wheels, as will be readily understood.

On the outer side of the date-units wheel are arranged two pairs of pins i^3, sections of which are shown in Fig. 6, said pins being adapted to release the tens-wheel. The first one of each pair operates as the change of the units-wheel is made from "9" to "0," so as to bring the first figure "1" or the first figure "2" or the "3" of the tens-wheel into position, and the second pin of each pair operates to release the locking-lever as the tens-wheel changes from the first figure "1" to the second figure "1," the result of which movements will be presently explained. The date-tens wheel rotates but once in three months, as each set of figures thereon indicates the first figures for the days of the month from the tenth to the thirty-first day, and said wheel is provided on the outer surface of its locking-wheel with three pins i^4, Fig. 8, adapted to engage the releasing-lever h^4 and release the month-wheel locking lever H^4 at the proper moment to cause the month change as the said date-tens wheel moves from "3" to blank.

Inside of the locking-wheel b for the month-wheel or between it and the month-wheel is arranged the cam K, having in its periphery the usual cam indentations of varying depth for the purpose of controlling the extent of the skipping at the end of the month.

If reference is made to my patent, No. 424,360, issued March 25, 1890, it will be seen that in that instance I mounted directly on the date-wheel what I was pleased to term a "sector," the function of which was to hold the locking-lever for the date-wheel out of engagement long enough for the proper skipping of days for the long and the short months, the position of the sector being determined by the cam on the month-wheel, and while in the present instance the mechanism is quite dissimilar, the principle so far as the controlling of the skipping for long and short months is concerned is the same; but I do not wish to be understood as limiting myself to this or any other skipping mechanism, as other mechanism may be substituted for it, and the other

devices and mechanisms hereinbefore described do not depend upon it for their individual successful operation.

Referring particularly to Figs. 7, 10, 11, and 14, it will be seen that between the wheels D^3 D^4 on the shaft B^3 is a loose intermediate wheel M, the said wheels D^3 D^4 being connected for simultaneous movement by means of a hub d^4. To this hub d^4 one end of the small coil-spring M′ is affixed, the opposite end being connected to the wheel M by means of the pin M^2. This wheel M is toothed and corresponds to the sector in my before-mentioned patent, being provided with three pins m m' m^2, arranged in succession, and any one of them adapted to be engaged by the bell-crank retarding-lever N, the opposite end of which is provided with a pin n, which rests in one of the cam depressions on the month-wheel. Thus for a month of twenty-eight days it will engage the first pin m^2 and for a month of thirty days the last pin m, the first one causing a skip of three days and the last of only one day.

The locking-lever for the date-units wheel is provided with a bent arm or extension O, Figs. 6, 7, and 9, the end of which under normal conditions—that is to say, during the month and when no skip is to be made—passes in between two of the teeth on wheel M; but when said wheel is arrested by the retarding-lever N the arm O will rest on the end of one of said teeth (see Fig. 10) and prevent the locking-lever from being thrown into engagement with its locking-wheel, it being a simple matter of computation to so adjust the depth of the cam depressions and the positions of the pins that the locking-lever shall be held out just the right length of time at the end of each short month; but to prevent any possibility of miscalculation or the effect of momentum and to positively arrest the movement at the proper moment—to wit, when the second figure "1" is brought into position—a stop m^3 is mounted on the wheel D^3, and adapted to engage an arm N′ of the bell-crank retarding-lever N, as will be readily understood. The intermediate pin m' has no office in the mechanism, as shown in the drawings, being designed to secure the proper skip for leap-years and the co-operation of the skipping lever with it is controlled by the year-wheel, which is not shown in the present device. Hence the mechanism must be regulated by hand to compensate for the twenty-ninth day of February in the leap-years.

So far I have not described any provision for skipping the extra figure "1" and bringing the date-tens wheel into position at the tenth and twentieth days, and this is accomplished through the mechanism for skipping days at the ends of the month only. Instead of the month-cam a cam P is provided on the under side of the wheel D^4, Figs. 11 and 12, which cam is adapted to engage the pin p on the retarding-lever N as the date-units wheel passes from "9" to "0" twice in succession—that is to say, at the ninth and nineteenth day, respectively—the third time, which would occur at the end of the month, said cam being inoperative. To accomplish this the said cam is provided with two projections only p^5, the distance between which in one direction around the wheel is twice as great as in the other, or, as will be more easily understood, the wheel is divided into three equal parts, and the two cam-points are located at two of the divisions and the pins m m' m^2 at the other division.

On the wheel M, outside of the orbit of the pins m and corresponding in position to the position of the cam-points p^5 of the cam P, are two pins p'. The end of the lever N is in position to pass outside of the pins m and inside of pins p'; but at the tenth day the cam P engages the pin p, throws the lever out into the path of one of the pins p', and causes the "skipping-wheel" (as I term wheel M) to be arrested and the locking-lever H^2 held out of engagement until the type-wheel has made one skip from "0" to the second "1," and the tens-wheel, by reason of the pins on the units-wheel, to move from the first to the second one of the figures, which are at the printing-point—*i. e.*, from "1" to "1" or "2" to "2."

On the wheel D^3 are provided two additional stops p^2 p^2, corresponding to the stop m^3, only they are adapted to engage the arm N′ when the bell-crank retarding-lever engages the pins p', the functions of the stops in every instance being the same. The spring M′ serves to bring the wheel M back to normal position as soon as released from the retarding-lever, and to gage and limit its movement the pin M^2 passes through a curved slot M^4 in the wheel D^4. The operation of this immediate part of the mechanism is as follows: Assuming that the date-wheels are printing the fifteenth day, the second figure "1" on the tens-wheel will be in position, and the units-wheel will move regularly forward by means of its operating-segment and the release of its locking-lever by the hour-wheel until the nineteenth day is ended, when as the units-wheel passes from "9" to "0" the first one of a pair of the pins i^3 will engage the tens-wheel-releasing lever h^3 and permit the first figure "2" on the tens-wheel to come to the printing-point indicating the twentieth day. Then as the units-wheel passes from "0" to the first figure "1" the cam P operates upon the retarding-lever N to throw it in the path of one of the pins p' and bring a tooth of the wheel M beneath the arm O of the units-wheel-locking lever H^2, preventing the same from engaging until the second figure "1" comes into position, and as the units-wheel passes from "1" to "1" the second of the pins i^3 engages the releasing-lever h^3 and permits the tens-wheel to advance one tooth, bringing its second figure "2" into position, at which point it remains until the units-wheel has gone forward to the twenty-ninth day. As the units-wheel passes from "9" to

"0" the first one of the next pair of pins i^3 is brought into operation and the tens-wheel advanced one space, bringing the "3" into position and indicating the thirtieth day. If the month is one having thirty-one days, the retarding-lever N passes outside of the pin m and the units-wheel advances one space, bringing the first figure "1" into position and indicating the thirty-first day; but if the month be one having a less number of days—say thirty—the retarding-lever will be moved into position by the cam on the month-wheel to engage the pin m, causing the locking-lever H^2 to be held out of engagement and a skip of the tens-wheel made from "0" to the second figure "1," the tens-wheel being moved, as usual, when the units-wheel changes from the first figure "1" to the second figure "1," bringing a blank space on the tens-wheel into position, when the units-wheel is advanced regularly until the end of the ninth day, and as it turns from "9" to "0" the tens-wheel-locking lever is released and the first figure "1" is brought into printing position. The next movement of the mechanism brings one of the points of the cam P into position for causing a skip of the units-wheel to the second figure "1" and the consequent advance of the tens-wheel to the second figure "1" to indicate the eleventh day, the operations being thus repeated, as described, with relation to the twentieth day. The skipping at the end of shorter months is caused by the engagement of the retarding-lever with either the pin m' or m^2, the latter causing a skip of three days—*i. e.*, from the twenty-eighth to the first of the next month by holding the locking-lever H^2 out of engagement for a proper period. The month-wheel-locking-lever is released at the moment the tens-wheel moves from "3" to blank. Hence the end of the bell-crank lever N rests in position until the wheels are completing their movements and there is no need of the lever remaining longer in position, the only requisite being that the end of the lever should reach the proper place for the next month before the movement of the cam ceases.

The operation of the whole device is readily seen from the foregoing, it being necessary only to send impulses through the electro-magnet once a minute to release the minute-units wheels at minute intervals, and the latter through the mechanism described controls directly or indirectly the operation of the whole train; but with the mechanism so far described it is necessary to wind the motor-spring manually, and it has heretofore been found necessary where an accurate mechanism is made either to have a manually-wound spring or else employ strong currents of electricity, owing to the fact that it requires a comparatively powerful and long range of movement to actuate the minute-wheel once a minute, it being obvious that it cannot be actuated more or less frequently when acurate registration is required. To overcome these defects and provide a mechanism which will operate the entire device through the medium of comparatively-weak currents and a magnet having a relatively-short range of movement is one of the objects of the present invention, and by referring to Figs. 14, 15, and 16, it will be seen how the result is accomplished. The wheel F^8, which meshes with the wheel F^{10} on the minute-units wheel, remains unchanged; but instead of being driven through the train of gearing comprising the wheels and pinions F′ to F^7, it is itself the driver and has secured thereto on its outer side the inner end of a light coil-spring Q, the outer end of which is secured to the large gear Q′, meshing with a pinion q on a shaft q' and serves as a constant source of power, being wound by the mechanism to be now described. On the shaft q' and preferably outside of the casing is a ratchet-wheel Q^2, which is adapted to be operated by the pawl q^2, which is moved forward by a spring q^3 and retracted by the electro-magnet Q^3 and armature q^4. The relatively-rapid movement of the wheel F^8 with the before-described gearing-down train and the further extension of the gearing through the wheels Q′, q, and Q^2 with the interposition of the spring Q enables me to run the train of gearing with a very light current and weak electro-magnet, it being necessary to operate the magnet a number of times in each minute, the power being accumulated in the spring, and the only other requirement is that the minute-wheel should be released once a minute. This I accomplish by mounting on the end of the shaft G′, carrying the pallet, a pallet-operating arm R, which while it is operated by the electro-magnet is not operated at each movement of the same but projects into the path of the series of pins r on the wheel Q^2, and one of said pins is brought into position for operating the pallet once a minute. In the construction shown the pallet-operating arm is moved in one direction by the said pins and in the opposite direction by the spring R′.

In the practical working of a stamp I prefer to mount it in a support such as is shown in Fig. 18. S is a base mounted on a vertical pivot held rigidly in any suitable manner. s s are two pairs of arms pivoted to the base and similarly pivoted to a case S′, which they carry at the outer ends. The stamp mechanism is mounted in this case and has a direct vertical movement, which always presents the face of the types squarely to the printing-surface. Upward movement of the stamp is limited by the stop s^2, and I prefer to elevate it by means of the coil-springs S^2, connected to the stop and the lower pair of arms, it being only necessary then for the operator to depress the stamp to make the impressions, thereby materially increasing the speed with which these devices may be handled, and adapting them for use in post-office work, &c.

If desired to make the impressions direct from the type, an inking-roller T is employed,

mounted on an arm t, pivoted on the end of the bell-crank lever T′, the latter being in turn pivoted between the upper pair of arms, and has one of its shorter arms connected by a link T^2 to the base S. The arm is held up by a link spring T^3, connected at one end to a third arm t^3 of the bell-crank lever and at the opposite end to the said roller-carrying arm t in front of its pivotal connection. When the casing is depressed, the ink-roller is drawn over the face of the type, and as the downward movement continues the roller moves beyond the casing and is held up off of the printing-surface, the upward movement of the casing causing a reverse movement of the roller.

The impulses for operating the stamp may be sent over the line and controlled by a distant clock of any of the well-known varities, in one instance the impulses being sent a certain definite number of times per minute and in the other instance once a minute.

The obvious advantage of a system in which a series of stamps can be absolutely and accurately controlled from a central station and timepiece are too obvious to mention, and will be at once appreciated by those skilled in the art, especially where, as in the present instance, it is not necessary to employ a manually-wound spring, the whole power for the initial movement being accumulated in a spring which may be wound at short intervals by a weak current of electricity or other medium for connecting the controlling-clock and stamp.

I do not wish to be understood as limiting myself to the employment of the mechanisms herein described in a "time-stamp," as the same may be employed in any time-indicator, and the type-wheels, instead of being adapted to make impressions, may be employed to give visual indications of the passage of time. Therefore in the claims the term "time-stamp" will be understood as covering this class of devices.

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

1. In a time-stamp, the combination, with the spring-impelled printing mechanism for indicating the phases of time and locking-levers co-operating with said printing mechanism and holding the same against the tension of the impelling-springs, of the minute printing mechanism controlling said locking-levers to release the same at predetermined intervals and permit the impelling-springs to actuate the printing mechanism, substantially as described.

2. In a time-stamp, the combination, with the spring-impelled type-wheels for indicating the phases of time, the locking-wheels thereon, and the locking-levers engaging said wheels and holding them against rotation under the influence of their impelling-springs, of the minute-wheel controlling the locking-levers for the said printing-wheels, whereby the same are released and the wheels permitted to rotate under the influence of their said impelling-springs, substantially as described.

3. In a time-stamp, the combination, with the month, date, and hour type-wheels having independent impelling-springs independent of the releasing mechanism for the locking-levers, of the minute-wheel, the locking-lever for the hour-wheel moved thereby, the locking-lever for the date-wheel moved by the hour-wheel, and the locking-lever for the month-wheel moved by the date-wheel, said locking-levers being adapted when released to lock the wheels against movement under the influence of their impelling-springs, substantially as described.

4. In a time-stamp, the combination, with the month, date, and hour type-wheels having independent impelling-springs independent of the releasing mechanism for the locking-levers and a locking-lever for each wheel for holding them against the power of their impelling-springs, of the minute-wheel, the pin thereon controlling the locking-lever of the hour-wheel, the pin on the hour-wheel controlling the locking-lever of the date-wheel, and the pin on the latter controlling the locking-lever of the month-wheel, substantially as described.

5. In a time-stamp, the combination, with a series of independent printing-wheels for the various phases of time to be indicated and a corresponding series of independent impelling-springs normally connected with and tending to rotate said wheels forward, of locking-levers engaging and holding the wheels from rotation under the influence of said springs and periodically-operated releasing mechanism for throwing said locking-levers out of engagement and permitting the springs to operate, substantially as described.

6. In a time-stamp, the combination, with a series of independent printing-wheels for the various phases of time to be indicated, and a corresponding series of independent impelling-springs normally connected with and tending to rotate said wheels forward, and periodically-released locking-levers engaging and normally holding said wheels from rotation under the influence of their impelling-springs, of a driven train of gearing for rewinding each of said series of springs, substantially as described.

7. In a time-stamp, the combination, with a series of independent printing-wheels for the various phases of time to be indicated, a corresponding series of independent impelling-springs normally connected with and tending to rotate said wheels forward, and periodically-released locking-levers engaging and normally holding said wheels from rotation under the influence of their impelling-springs, of a driven train of gearing carrying mutilated gears for resetting the springs during the periods of rest of the type-wheels, substantially as described.

8. In a time-stamp, the combination, with a

series of independent printing-wheels for the various phases of time to be indicated, a corresponding series of independent impelling-springs normally connected with and tending to rotate said wheels forward, and periodically-released locking-levers engaging and normally holding said wheels from rotation under the influence of their impelling-springs, of a driven train of gearing carrying mutilated gears for resetting the springs during the time the type-wheels are at rest, the teeth of the mutilated gears being proportional and connected in the train to move at the same ratio as the type-wheels, whereby the springs are rewound the exact amount that they are run down by the movement of the type-wheels, substantially as described.

9. In a time-stamp, the combination, with the type-wheels, of the segments engaging the same to advance the wheels, the springs for turning the segments in one direction, and the power-gearing for turning them in the opposite direction, substantially as described.

10. In a time-stamp, the combination, with the type-wheels, of the segments, the pawl connections between the segments and said wheels, the springs for turning said segments in one direction, and the power-driven mutilated gears for turning them in the opposite direction, substantially as described.

11. In a time-stamp, the combination, with the type-wheels mounted on a common shaft, of the operating-segments mounted on the same shaft between the wheels, the springs for moving said segments, and the train of gearing for rewinding the springs, substantially as described.

12. In a time-stamp, the combination, with the type-wheels mounted on a common shaft, of the toothed operating-segments mounted on the same shaft between the wheels, the pawl connections between the segments and wheel-springs for moving the segments in one direction, and the driven mutilated gearing engaging the segments and moving them in the opposite direction, substantially as described.

13. In a time-stamp, the combination, with the type-wheels mounted on a common shaft and carrying the lock-wheels, of the toothed operating-segments mounted on said shaft between the wheels and having the pawls engaging the lock-wheels, the gears meshing with said segments, the springs connected to the same to move the segments in one direction, the power-train, and the mutilated gears carried by said train for moving the segments in the opposite direction and rewinding the springs, substantially as described.

14. In a time-stamp, the combination, with the minute-units wheel having a series of sets of digits thereon, a spring for turning the same, and escapement controlling its movements, of the minute-tens wheel, the spring for rotating the same, the locking-lever, and the pins on the units-wheel engaging the locking-lever as the end of each set of digits passes from the indicating-point, substantially as described.

15. In a time-stamp, the combination, with two printing-wheels arranged side by side, the lock-wheel on one of them, and a pin on the other, of a locking-lever having the rectangular projection engaging the lock-wheel and the inclined end projecting into the path of the pin on the other type-wheel, whereby the rotation of the latter causes the release of the former, substantially as described.

16. In a time-stamp, the combination, with the date-units wheel, having a set of digits thereon with a duplicate figure "1" and a date-tens wheel having duplicate figures "1" and "2," a figure "3," and a blank or zero space thereon, of a locking-lever for the tens-wheel and a pair of releasing-pins on the units-wheel for releasing the said lever twice in succession and permitting the same to remain at rest during the time the units-wheel is passing the digits from "2" to "9," substantially as described.

17. In a time-stamp, the combination, with the date-units wheel and the date-tens wheel, of a locking-lever for the date-tens wheel and a pair of relatively-closely-spaced pins on the units-wheel for releasing said levers twice in succession, whereby the tens-wheel is caused to move at irregular intervals and the proper registration made, substantially as described.

18. In a time-stamp, the combination, with the date-units wheel and the date-tens wheel controlled thereby, of the locking-lever for the units-wheel, a skipping-wheel for holding said lever out of engagement, and a cam for moving said skipping-wheel into operative position at the tenth and twentieth days, substantially as described.

19. In a time-stamp, the combination, with the date-units wheel and the date-tens wheel controlled thereby, of the locking-lever for the units-wheel, a skipping-wheel for holding said lever out of engagement, and a cam having two points moved by the units-wheel for throwing the skipping-wheel into operative position at the tenth and twentieth days, substantially as described.

20. In a time-stamp, the combination, with the spring-impelled date-wheel, locking-lever therefor, and month-wheel having the cams thereon, of the skipping-wheel separate from the date-wheel for holding the locking-lever out of engagement and a retarding-arm moved by the month-wheel and engaging the skipping-wheel at the end of short months to cause the proper skipping of indices, substantially as described.

21. In a time-stamp, the combination, with the spring-impelled date-wheel, locking-lever therefor, and month-wheel having the cams thereon, of the skipping-wheel separate from the date-wheel, the retarding-lever moved by the month-wheel and engaging the skipping-wheel at the end of short months, and the cam

engaging and moving said lever into position to engage the skipping-wheel at the tenth and twentieth days, substantially as described.

22. In a time-stamp, the combination, with the date-units wheel having a set of digits thereon with duplicate figures "1," of a date-tens wheel having a partial set of digits with the figures in duplicate, save the last one, a skipping-wheel, and operating mechanism therefor controlling the skipping of the units-wheel from "0" to the second figure "1," and a locking-lever for the tens-wheel, controlled by the units-wheel and operated during the passage of the units-wheel from the first figure "1" to the second figure "1," substantially as described.

23. In a time-stamp, the combination, with the date-wheel, the skipping-wheel, the gears between said date-wheel and skipping-wheel, and the spring forming the connection between the skipping-wheel and said gears, of the retarding-lever engaging said skipping-wheel and the locking-lever for the date-wheel, held out of engagement by the skipping-wheel when in operative position, substantially as described.

24. In a time-stamp, the combination, with the date-wheel, driving mechanism, and the wheel D^4, connected by gearing with said date-wheel, of the skipping-wheel M, mounted in proximity to the wheel D^4, a spring connecting the said wheels, the locking-lever for the date-wheel held out of engagement by the skipping-wheel, and the retarding-arm engaging the skipping-wheel to hold it in operative position, substantially as described.

25. In a time-stamp, the combination, with the date-wheel, driving mechanism, and the wheel D^4, connected by gearing with said date-wheel, of the skipping-wheel M, mounted in proximity to the wheel D^4, a spring connecting the said wheels, the locking-lever for the date-wheel held out of engagement by the skipping-wheel, the retarding-arm engaging the skipping-wheel to hold it in operative position, and the cam moving with the wheel D^4 and engaging the retarding-arm to set the same, substantially as described.

26. In a time-stamp, the combination, with the date-wheel, driving mechanism, and the wheel D^4, connected by gearing with said date-wheel, of the skipping-wheel M, mounted in proximity to the wheel D^4, a spring connecting the said wheels, the locking-lever for the date-wheel held out of engagement by the skipping-wheel, the retarding-arm engaging the skipping-wheel to hold it in operative position, the cam moving with the wheel D^4 and engaging the retarding-arm to set the same, and the stop for arresting the movement of the wheel D^4, substantially as described.

27. In a time-stamp, the combination, with the date-wheel, driving mechanism, the wheels D^3 D^4, connected by gearing with said date-wheel, skipping-wheel mounted between the wheels D^3 D^4, and the spring connecting the skipping-wheel and wheels D^3 D^4, of the locking-lever for the date-wheel held out of engagement by the skipping-wheel, the retarding-arm engaging the skipping-wheel to set the same, the cam on the wheel D^4 for moving the arm, and the stops on the wheel D^3 for arresting the movement of the date-wheel, substantially as described.

28. In a time-stamp, the combination, with the printing mechanism, substantially as described, and the train of gearing for driving said printing mechanism, of the spring for driving said train, a winding mechanism for said spring, an electric motor for driving said winding mechanism at short predetermined intervals, and an escapement controlling the movement of the printing mechanism operated by the winding mechanism, substantially as described.

29. In a time-stamp, the combination, with the type-wheels, independent impelling-springs therefor, and a train of gearing for rewinding said springs, of the minute-wheel-impelling spring connected in said train to drive the same and an electric motor for rewinding said minute-wheel-impelling spring, substantially as described.

30. In a time-stamp, the combination, with the type-wheels, independent impelling-springs therefor, and a train of gearing for rewinding said springs, of the minute-wheel-impelling spring connected in said train to drive the same, an electric motor for rewinding said minute-wheel-impelling spring, and an escapement controlling the movement of the minute-wheel operated by said electric motor, substantially as described.

31. In a time-stamp, the combination, with the type-wheels, independent impelling-springs therefor, and a train of gearing for rewinding said springs, of the minute-wheel-impelling spring connected in said train to drive the same, a ratchet-wheel for rewinding the last-mentioned spring, an electric motor for turning said ratchet-wheel, an escapement controlling the movement of the minute-wheel, and a series of pins on the ratchet-wheel for operating the escapement, substantially as described.

32. In a time-stamp, the combination, with the printing mechanism and the casing therefor, of the parallel arms carrying said casing mounted on a pivoted support, substantially as described.

33. In a time-stamp, the combination, with the printing mechanism and the casing therefor, of the parallel arms carrying said casing, the pivotal support to which said arms are connected, and the springs for elevating the casing, substantially as described.

34. In a time-stamp, the combination, with the printing mechanism and the casing therefor, of the parallel arms carrying said casing, the pivotal support to which said arms are connected, the spring for elevating the casing, the inking-roller, the lever carrying the

same, pivoted on the arms, and the link connected to said lever for moving the inking-roller, substantially as described.

35. In a time-stamp, the combination, with the printing mechanism and the casing therefor, of the parallel arms carrying said casing, the pivoted support to which said arms are connected, the spring for elevating the casing, the inking-roller, the lever carrying the same pivoted on the arms, the link connected to said lever for moving the inking-roller, and the spring for holding the roller in contact with the types while passing over the same, substantially as described.

CHARLES STAHLBERG.

Witnesses:
BENJ. D. BREWSTER,
GEORGE N. THOMPSON.