

(No Model.)

2 Sheets—Sheet 1.

E. W. MORTON.
TIME AND CALENDAR STAMP.

No. 460,881.

Patented Oct. 6, 1891.

Fig. 1,

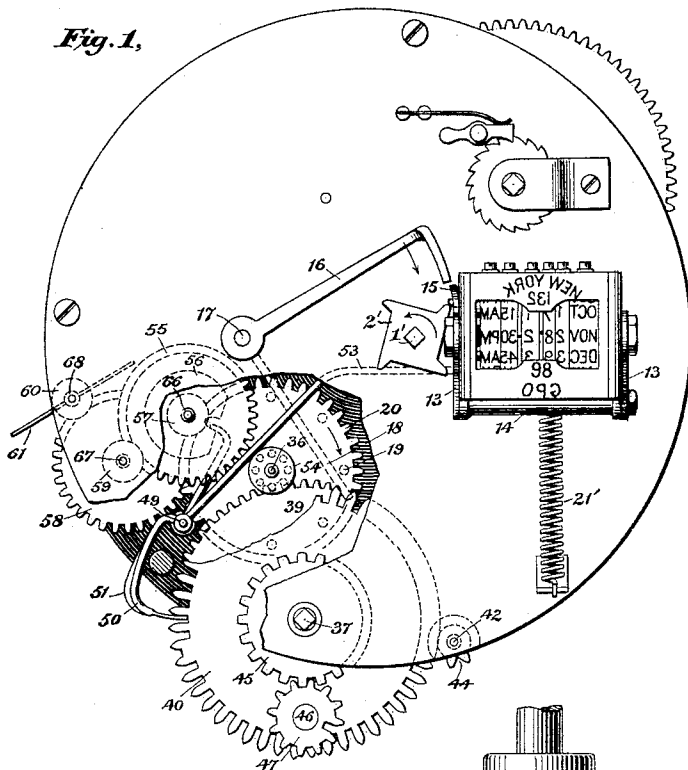
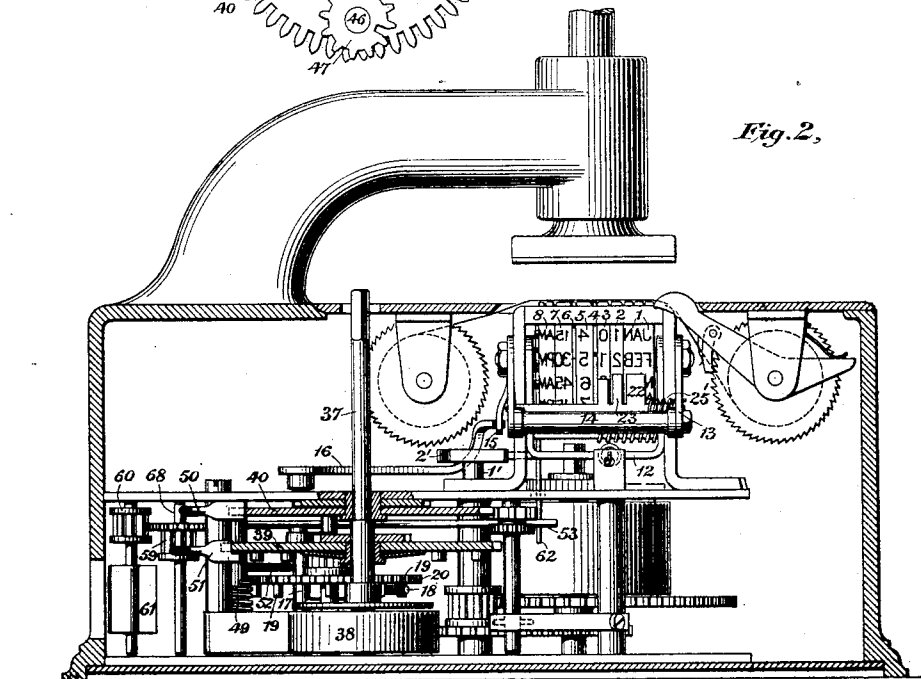


Fig. 2,



Witnesses
Geo. W. Drexler
Edward Thorpe

Edwin W. Morton Inventor
By his Attorneys
Price & Stewart

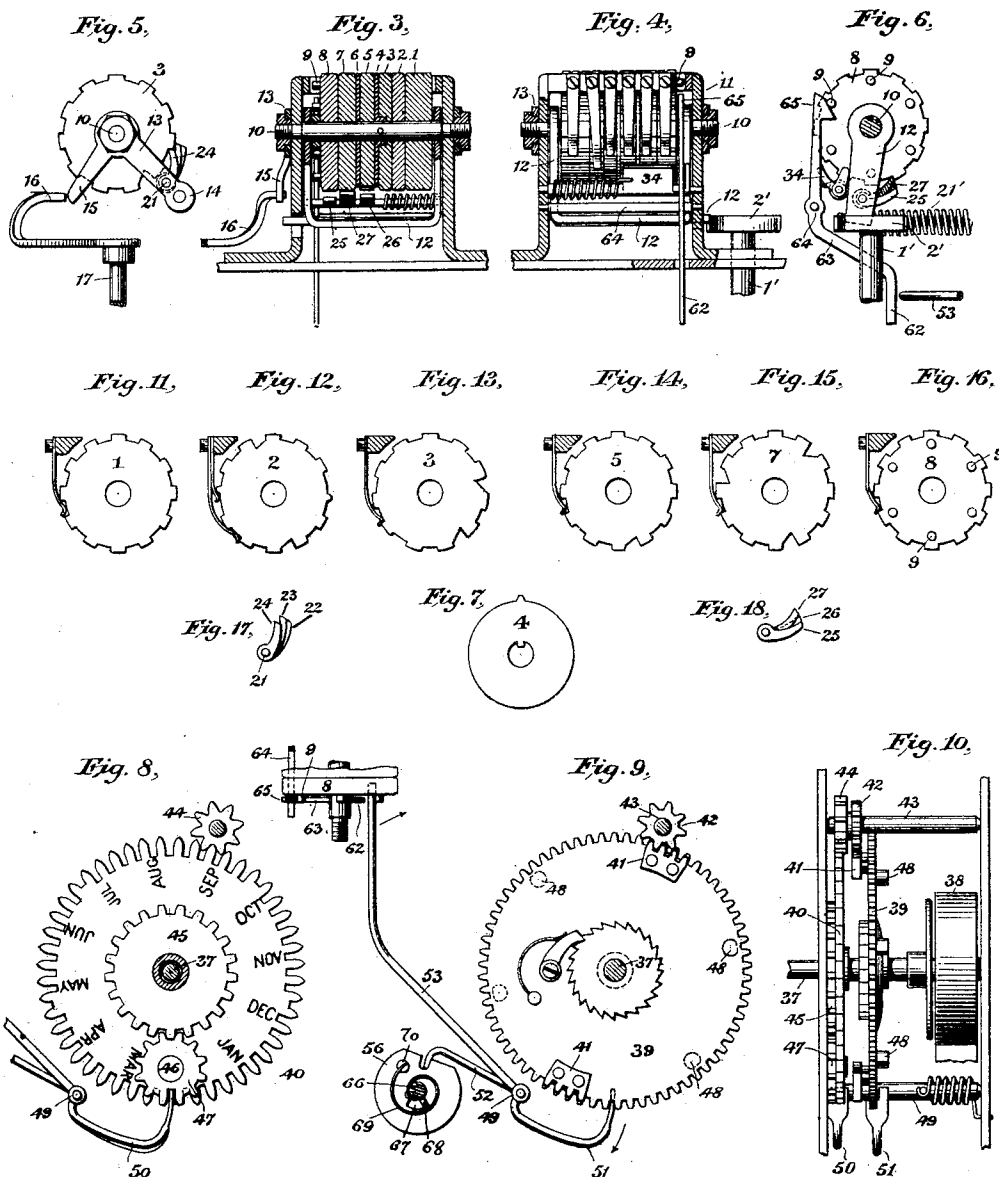
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2 Sheets—Sheet 2.

E. W. MORTON.
TIME AND CALENDAR STAMP.

No. 460,881.

Patented Oct. 6, 1891.



Witnesses
Geo. W. Brock
Edward Thorpe.

Edwin W. Morton
Inventor

By his Attorneys
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UNITED STATES PATENT OFFICE.

EDWIN W. MORTON, OF WHITE PLAINS, ASSIGNOR TO JOHN H. ALLEN, OF
NEW YORK, N. Y.

TIME AND CALENDAR STAMP.

SPECIFICATION forming part of Letters Patent No. 460,881, dated October 6, 1891.

Application filed January 30, 1890. Serial No. 338,672. (No model.)

To all whom it may concern:

Be it known that I, EDWIN W. MORTON, a citizen of the United States, and a resident of White Plains, in the county of Westchester, State of New York, have invented certain new and useful Improvements in Time and Calendar Stamps, of which the following is a full and complete specification, reference being had to the accompanying drawings.

My invention relates to time-stamps such as are used for printing upon letters or other papers the date and the hour of the day.

The structure employed for designating the hours and minutes which is described in this application is the same as that for which I filed an application for Letters Patent on September 21, 1889, Serial No. 324,702, patented February 3, 1891, No. 445,570, and which consists of type-wheels rotated by a series of parts, said parts being operated by a time mechanism. The mechanism described in that case was adapted for the purpose of moving the type-wheels with every minute, thereby making it possible to designate to the minute the time at which the stamp is made. For many purposes it is unnecessary to stamp the exact minute at which the register is made; but periods of fifteen minutes are sufficiently near together for the purpose of the register. When this is the case, I employ the structure shown in this application. It will be obvious from an examination of this structure that the periods of register may be varied to somewhat less than fifteen minutes, and of course to longer periods, if desired.

The object of my invention is to provide a simple structure and one which can be cheaply made for the purpose of registering not only the hours and minutes of the day, but also the day and month of the year, accommodating itself to all the variations of the days in the month and to operate automatically.

In the drawings, Figure 1 represents a plan view of my time-stamp with some of the plates and parts removed so as to show interior parts. Fig. 2 is a side elevation of the operating mechanism of the time-stamp, the case being removed. Fig. 3 is a sectional elevation of the type-wheels and standards and full elevation of part of their operating mechanisms. Fig. 4 is a side elevation of the type-

wheels and operating mechanisms from the opposite side. Fig. 5 is an elevation of the type-wheels and their operating mechanisms, the end supports being removed. Fig. 6 is a detail view of the structure by which the time mechanism through its type-wheels is made to trip into action the mechanism operating the type-wheels which indicate the month and days of the month. Fig. 7 is an elevation of a type-wheel, and represents one of the two stationary wheels, one used for an apostrophe and the other for a hyphen. Fig. 8 is a plan view of the detent-gear, by which the variations in days of the months are indicated, and superimposed upon it is the device by which the variation in the length of the month of February every fourth year is indicated. Fig. 9 is the detent-gear by which the operation of the mechanism operating the type-wheels indicating the days of the month is controlled. Fig. 10 is an edge elevation of the two detent-gears shown in Figs. 8 and 9, their detent-hooks, and connecting-pinions. Figs. 11, 12, and 13 are the three type-wheels, indicating the month, the days of the month, and the number of the days of the month. Figs. 14, 15, and 16 are the type-wheels indicating the hours and minutes. Fig. 17 is a side elevation of the pawls operating the type-wheels, Figs. 11, 12, and 13. Fig. 18 is a side detail elevation of the pawls operating the type-wheels, Figs. 14, 15, and 16 indicating the hours and minutes.

Referring to Fig. 1, 1' indicates the hour-arbor of a clock-train, upon which is keyed a spur-wheel 2'. In this case the spur-wheel is shown having four spurs; but the number of spurs may be varied to any practical extent, and other divisions of the hour obtained; or the arbor may be provided with a pinion, and that arranged to mesh with a gear carrying a spur-wheel, by which the periods between which the stamp is changed may be lengthened to any extent.

The time-stamp mechanism consists of a series of type-wheels shown in Fig. 2, and which are numbered 1, 2, 3, 4, 5, 6, 7, and 8, and which are shown in side elevation in Figs. 11, 12, 13, 14, 15, and 16. Wheel 1, indicating the month, is divided into twelve

sections, each of which bears type indicating a month of the year, and these are arranged in proper succession—January, February, March, April, May, June, July, August, September, October, November, and December. Type-wheel 2 has upon it twelve figures, which indicate the tens of the days of the month, and are as follows: 1 1 2 2 3, 1 1 2 2 3. Type-wheel 3 indicates the units of the days of the month, and has upon it eleven figures—1 2 3 4 5 6 7 8 9 0 1. Type-wheel 4 is a stationary disk carrying an apostrophe. Type-wheel 5, which indicates the hours of the day has upon it twelve figures, 1 to 12, consecutively. Type-wheel 6 is a stationary disk bearing a hyphen. Type-wheel 7, which indicates the minutes, has upon it twelve sets of figures, as follows: 00, 15, 30, 45, 00, 15, 30, 45, 00, 15, 30, 45. Type-wheel 1, which indicates the month, has twelve notches between the types, all of equal depth. Type-wheel 2, indicating tens of days of the month has ten notches of equal depth and two diametrically opposite to one another of greater depth than the others. Type-wheel 3, indicating units of the days of the month, has nine notches of equal depth and two of greater depth than the rest, which are located upon said wheel with one shallow notch between them. Type-wheel 5 has twelve notches and one deeper than the others. Type-wheel 7 has twelve notches and three of greater depth than the others and of equal depth and located one hundred and twenty degrees from one another. Type-wheel 8 has twelve sets of type and twelve notches of equal depth between them. This type-wheel is located on the shaft carrying the type-wheels at one extreme end, and on the outside of this wheel there are six pins, numbered 9 9 9, each located sixty degrees from one another, each pin being immediately beneath the letters "A. M." upon the periphery of the wheel.

The eight type-wheels just described are mounted loosely upon a shaft 10, which is journaled in the standards 11 11. From this shaft 10 are hung two rocking frames 12 and 13. (See Figs. 3, 4, 5, and 6.) By preference I hang the frame 12 on the shaft inside of the standards 11 11 and the frame 13 outside of said standards. The frame 13 is provided on its outer extremity with a weight 14, which will cause the frame to drop back by gravity when raised. To one side of said frame, near its journal, is secured a finger 15, by which the frame is operated, the finger and frame constituting a bell-crank lever pivoted on the shaft 10. The extremity of this finger is engaged by an arm 16, keyed to a rock-shaft 17, which is journaled in the frame of the time mechanism, and to which is secured an arm 18 within the framework of the time mechanism, which engages with pins 19 19 on the side of a wheel 20 geared to a train, to be hereinafter described, and by which the arm 16 is caused to operate the rock-frame 13 at predetermined intervals.

Journalled in the frame 13 is the rocking

shaft 21, to which are secured pawls 22 23 24, and which engage the type-wheels 1 2 3, which indicate the month and days of the month. This pawl is shown in side elevation in Fig. 17, from which it will be seen that the pawl 24 is the lowest pawl, pawl 23 the next highest, and pawl 22 higher still. The position of the pawls is somewhat exaggerated in this figure. They are all rigidly secured together and to the shaft 21, which rocks freely in the frame 13. Said pawls are held in engagement with the face of the type-wheels by the spring 25, secured to the frame 13 at one end and coiled around the shaft at the other end. The operation of the type-wheel in this case is similar to that described in my application heretofore referred to.

The wheel 3 is provided with eleven notches upon its periphery, two of which are much deeper than the others, as shown by Fig. 13, and are located on said wheel with but one shallow notch between them. As pawl 24 engages the periphery of said wheel it will turn it forward as the frame 13 is rocked; but the pawls 23 and 22 being rigidly connected to the pawl 24 will be held out of engagement with the wheels 2 and 1 until the pawl 24 falls into one of the deep notches in the wheel 3. This will permit the pawl 23 to come into engagement with one of the notches of the wheel 2, and as the frame is rocked will move both of said wheels forward the distance of one notch. As the frame carrying the pawls recedes, the pawl 24 will be drawn out of the deep notch in wheel 3 and will rest again upon the periphery of said wheel and hold the pawl 23 out of engagement with the wheel 2. The wheel 3 will then move one step alone, but the succeeding notch in said wheel being a deep one, when the pawl 24 falls into it, the pawl 23 will again engage the wheel 2, and both wheels 2 and 3 will be moved forward one step. The remaining eight notches of wheel 3 being shallow, said wheel alone will turn until the first deep notch is again reached, thus making a complete revolution and bringing into the field of the stamp all of the numbers upon its periphery, 1 2 3 4 5 6 7 8 9 0 1.

The succession of the days of the month, from 31 to 1, makes it necessary on the unit-wheel No. 2 to provide two 1's in succession. This fact, if not provided against, would present in the field of the stamp two 11's and 21's. To obviate this, the mechanism controlling the motion of the rocking frame 13, carrying the pawls, is caused to operate said frame twice in succession when 11 is reached and twice when 21 is reached, and the two deep notches in the wheel 3 are so located in relation to one another and to the pawls that when the pawl 24 falls into the first of said notches the pawl 23 will engage wheel 2 and both wheels will be moved forward together, carrying the figures 09 out of the field of the stamp, and 10 into the field. The next motion of the pawls will move wheel 3 one step and supply

the place of the 0 with 1, exposing 11 in the field of the stamp. On receding, the pawl 24 will fall into the second deep notch of the wheel 3 and pawl 23 will engage wheel 2, and both wheels will be moved at the next motion of the pawls, bringing a second 11 into the field of the stamp. This same operation is repeated when the 21 is reached. The driving mechanism is so constructed that when the first 11 and 21 are exposed the pawls will be quickly operated twice and throw the first 11 and 21 out of the printing-field and the second one into the field, thus skipping the duplicate 11 and the duplicate 21, and leaving the stamp in position, when the rocking frame is operated again to expose the proper succeeding number. The wheel 2, as before stated, has two notches diametrically opposite to one another of greater depth than the others. The wheel 1 has twelve notches of equal depth, and with every three revolutions of wheel 3 and every half-revolution of wheel 2 the wheel 1 must move forward one notch in order to bring the succeeding month into the field of the stamp. This is done by the same device by which wheel 2 was turned when wheel 3 had made a revolution—that is to say, the pawl 24 will fall into the deep notch in wheel 3—and when wheel 2 has made a half-revolution one of its deep notches will be coincident with this deep notch of wheel 3. Hence the pawls 24 and 23, falling into said notches simultaneously, will permit the pawl 22 to assume a lower position than before, when it will engage one of the notches of the wheel 1, and the succeeding motion of the rocking frame will cause all three wheels to move forward together, thus carrying the types registering the 31st of one month forward one step and exposing the succeeding types, which will register the first of the succeeding months and the types registering the name of the month forward one step and expose the name of the succeeding month.

The pawl shown in Fig. 18 has three pawls 25, 26, and 27. 25 is higher than 26, and 26 higher than 27. These pawls operate the wheels 5, 7, and 8. It will be seen that the lowest pawl 27 engages with the wheel 7 and turns it as the rock-frame, in which the shaft 28 is journaled, is operated. The pawl 26 engages with the wheel 5 and operates it, while the pawl 25 engages with the wheel 8 and operates it. The notches in the wheel 7 are, as before stated, twelve in number, three of them much deeper than the others. This wheel makes one revolution every three hours. The wheel 5 has twelve notches, one only of which is deeper than the others, and this wheel makes one revolution every twelve hours. The wheel 8 has twelve notches all the same depth. It will now be seen that when the pawl 27 is resting upon the wheel 7 and is moved it will cause said wheel to rotate until said pawl falls into one of the deep notches of said wheel. That pawl then falling lower than its former position will permit the pawl

26 to engage with the wheel 5 and turn it forward one step. This will carry the deep pawl of wheel 7 beyond the reach of pawl 27 and raise the pawl 26 out of engagement with the wheel 5. The wheel 5 will then be stationary until the wheel 7 has moved forward four steps, when the pawl 27 will again fall into a deep notch of wheel 7, and the pawl 26 will again engage with the wheel 5 and move it forward one step. When the wheel 5 has made one complete revolution and the deep notch in said wheel is engaged by the pawl 26, if at the same time the pawl 27 engages the deep notch in the wheel 7, this will permit the pawl 25, which is the highest pawl, to fall low enough to engage one of the teeth upon the wheel 8. This will take place when twelve hours have expired, and the wheel 5, having hours upon it, has moved twelve steps. The change will then be necessary from A. M. to P. M., and this will be made by moving the wheel 8 forward one step.

Arms 16 and 18 are secured to the rock-shaft 17.

20 is a gear-wheel keyed to the arbor 36, and in the face of which are inserted pins 19, &c.

Arbor 37 is journaled in the frame of the time mechanism, and is driven by a clock-spring 38, of the usual form, which is used for the striking-trains of clocks. Keyed to said arbor are two gears 39 and 40, which are about the same size, but with a different number of teeth in each. Wheel 39 has sixty-six teeth, while wheel 40 has forty-eight teeth.

Secured to one side of the wheel 39 are two segments of a gear 41 41, which mesh with a pinion 42, keyed to the shaft 43, to which is also keyed the pinion 44. The wheel 39 is driven by the clock-spring 38, and the wheel 40 is driven by the segments 41 41, when they come into engagement with the pinion 42.

Surrounding the shaft 37, but free of it and secured to the frame of the machine, is a gear 45, having twenty-one teeth.

Journaled upon a stud 46 in the side of the wheel 40 is a pinion 47, which has twelve teeth, and which meshes with the gear 45. The notches of this pinion are all of the same depth save one, which is much deeper than the others. This one is of the same depth as the teeth in the gear 40. The gear 40 is divided into twelve parts, each of which is designated with the name of one of the months of the year. Between each two of these twelve divisions are four teeth, and the last notch of the September, November, April, and June sets is shallower than the others. On the side of the gear 39 are four pins 48, 48, &c., so located that when the detent-hook of the wheel 39 falls upon them it will be held out of engagement with the gear 39, and the train will run until this pin has passed.

49 is a rock-shaft journaled in the frame of the time mechanism, and to which are attached several detent-hooks. The detent-

hooks 50 and 51 project on the one side of the rock-shaft and engage with the gear-wheels 39 and 40, while the detent-hook 52 and the detent-rod 53 project on the other side. The
 5 detent-hook 52 engages the detent-wheel 56, while the rod 53 is engaged by the lower arm 62 of the bell-crank lever 63, which is pivoted at 64 in the standard of the type-wheels, the other arm 65 of said bell-crank engaging with
 10 the pins 9 9, &c., on the side of the type-wheel 8, and by which the bell-crank is operated.

36 is the arbor upon which the gear 20 is mounted. Upon the same arbor is also keyed
 15 a lantern-pinion 54, which meshes with the gear 39 and is driven by it.

The arbor 66 carries three wheels—the lantern-pinion 57, which meshes with the wheel 20 and is driven by it, the gear 55, and the detent-wheel 56. Upon the arbor 67 are mounted
 20 two wheels—the gear 58, which meshes with the pinion 60 and drives it, and the pinion 59, which meshes with the gear 55 and is driven by it. The arbor 68 has mounted upon it a
 25 pinion 60 and a fan 61.

The gear 39, driven by the spring 38, drives two trains. One consists of the pinions 42 and 44 and the gear 40, which is driven whenever a segment 41 comes into engagement
 30 with the pinion 42, and the other of the pinion 54, gear 20, pinion 57, and gear 55, pinion 59 and gear 58, pinion 60 and fan 61. The detent-hooks 50 and 51 are of the same length, and each strikes its gear at the same
 35 relative point, except that the hook 51 is provided with a finger on the same side as the pins 48 48, which is long enough to strike upon one of said pins when it comes into its path and holds the remaining portion of the
 40 detent-hook out of engagement with the teeth of the gear. The gear 39 will thus be allowed to run until the pin 48 has passed beyond the end of this finger. The purpose of this device will be readily understood. It will be
 45 seen by observation of the gear 39 that it is divided into sixty-six parts, each half into thirty-three parts. This is designed for the purpose of enabling the days of the month to be designated with each tooth of this gear.

It will be remembered that, as has been heretofore stated in describing the revolution of the type-wheels indicating the days of the month, that it was necessary to provide two
 50 1's, in order that the figure 31 for the last day of the month and the figure 1 for the first day of the succeeding month should follow one another in succession. It is therefore necessary in printing the remaining numbers of the days of the month to provide two 11's and two
 55 21's, because when the 11 was reached in the order of figures it was necessary that the succeeding number should be 12, but as two 1's had to follow one another on the scale, it would be necessary to provide an additional one on
 60 the type-wheel of 10. This makes it necessary to have two 11's and two 21's. Thus it will be seen that as the number of teeth on

the wheel 39 corresponds with the number of days in the month, and as the two extra figures, two 11's and two 21's, are necessary to
 70 present the proper figures upon the type-wheel for printing in proper succession, these two must be added to the number of teeth. Therefore, thirty-three teeth are placed in each
 75 half of this wheel, making sixty-six in the whole revolution. Pins 48 48, which, it will be observed, are two in number in each half of the gear 39, are so located that as that wheel
 80 revolves they will cause the swinging arms to operate the figures indicating the days of the month to move twice when the 11 is reached and twice when the 21 is reached, thus moving forward the first 11 without exposing it
 85 in the printing-surface, and presenting the second 11, which is followed by 12, and so moving forward the first 21 and exposing the second 21 in the printing-field.

It will be remembered that the wheel 40 was described as having forty-eight teeth, four of which were shallower than the others—that
 90 is to say, the one immediately preceding that marked "September," "November," "April," and "June." The purpose of these four shallow teeth is in order that the months of the
 95 year having but thirty days might be made to expose only thirty numbers in succession and skip the 31, and cause the figure 1 for the succeeding month to follow the 30 of the preceding month. This is done by a method
 100 similar to that just described, by which the duplicate 11's and 21's are skipped by the wheel 39. The shallow notches in the wheel are of such a depth that when the detent-hook 50 falls into them the detent-hook 51
 105 will be held out of engagement with the wheel 39, and it will be permitted to run forward another notch, just as was the case when the long end of the detent-hook 51 struck upon the pin 48, thus causing the
 110 rock-frame 13 to operate its pawls and push forward the number 31, without leaving them exposed in the printing-field for a sufficient length of time to be printed with. In this way the variation in the days of the month is accomplished between the 30's and the 31's.

Another mechanism is employed where the month of February is to be indicated, in which for three years in succession the numbers must be made to skip from 28 to 1, and on the fourth year to expose the number 29.
 120 This is accomplished in the following way: The wheel 47 has twelve teeth, and is pivoted upon a stud in the side of the wheel 40, and the teeth are coincident with those of the wheel 40. The notches may be so located
 125 that they will coincide with the notches of the wheel 40, and they are located in relation to said notches, and also with reference to the stationary wheel 45, so that they will exactly coincide with the notches in the wheel 40.
 130 The wheel 45 has twenty-one teeth, and is fixed stationary to the frame of the machine. As the wheel 40 revolves, the wheel 47 will be caused to rotate upon it, stud 46, by meshing

with this stationary gear. The gears 45 and 47 are so arranged in size and in number of teeth that the gear 47 will make one and three-quarter revolutions, because it has twelve teeth and the stationary gear has twenty-one—that is to say, there will be twelve teeth meshing making one revolution and nine making three-quarters of a revolution. It will thus be seen that if this is continued with every four revolutions of the wheel 40 the gear 47 will make seven complete revolutions. It will be remembered that the gear 47 has twelve teeth, the notches of which are shallow and are of the same depth as the shallow notches of the gear 40. When the gear 40 revolves and the detent-hook 50 falls into the notches of the wheel 47, those notches will be low enough to permit the detent-hook 51 to escape the gear 39 and allow said gear to run until wheel 40 has carried the gear 47 beyond the reach of the detent-hook 50, when the detent-hook 50 will again fall into a deep notch, 51 will fall into a notch in the gear 39, and the train will be stopped again. It will be observed that this gear 47 is located on the wheel 40 at the point indicating the month of February, and as it revolves it will expose three shallow notches in the gear 40, so that three days will be skipped—29, 30, and 31—for the month of February, making a skip in the numbers of the printing-field from 28 to 1 of the succeeding month. In every four revolutions of the gear 40 the wheel 47 will make seven complete revolutions, and the deep notch in said wheel will be brought round, so that it will coincide with a deep notch in gear 40. The wheel 47 is employed for the purpose of indicating the proper number of days in the month of February, and the deep notch just described, when it coincides with one of the deep notches of the wheel 40, will permit the number 29 to be exposed in the field of the printing-stamp. The skip will then take place from 29 to 1, the two succeeding shallow notches beneath the detent-hook 50 holding the detent-hook 50 out of engagement with the wheel 39 and allowing that wheel to run so as to operate the rock-frame and carry the numbers 30 and 31 beyond the field of the stamp.

It will be remembered that the hour-arbor of the time-train is driven by a regular time mechanism, causing it to make one revolution in one hour. This device operates to trip the striking-train into action, as it would in an ordinary striking-train of a clock, but of course by a different mechanism. The mechanism employed for this purpose has been described, and is shown in Fig. 6. The rocking lever 62 65, which is pivoted upon the shaft 64, operates to trip the calendar-train into action. The arm 65, as before stated, comes in contact with the pins 9 9 of type-wheel 8 and is moved out of its normal position by them, thereby moving the arm 62 in an opposite direction and striking upon the

end of the long arm 53, moving it and thereby rocking the arbor 49. As this arbor is rocked the detent-hooks 50 and 51 are drawn out of engagement with the wheels 40 and 39, and the detent-hook 52 is drawn out of engagement with the detent-wheel 56. The detent-wheel 56, being in train with the fan which regulates the speed of its movement, runs as soon as it is released until it has made one complete revolution. The train is so geared that the revolution of the detent-wheel 56 will be sufficient to carry the wheel 39 forward one notch, so that as soon as the fan-train is stopped by the detent-wheel 56, the detent-hook 52 falling into its notch, the detent-hooks 50 and 51 will fall into notches in the wheel 40 and 39 and stop that train. When, however, the shallow notches in the wheel 40 are struck by the detent-hook 50, or the detent-hook 51 strikes upon a pin 48, the detent-hooks 51 and 52 will be held out of engagement with their detent-wheels 39 and 56, and allow the train to run until the wheel 56 has made a second complete revolution. This is done once for every month which has thirty days, in order to skip the thirty-first day, and twice in every month to skip the duplicate 11 and duplicate 21, and three times at the end of February for three years in succession, and twice every fourth or leap year.

It is important when the time mechanism operates the detent-hooks that they should not fall back into the teeth of the various gears until the detent-wheel 56 has made one complete revolution. To accomplish this the detent-wheel 56 must move quickly enough to insure the detent-hook 52 not falling into the notch in said wheel before it can be moved from beneath the hook. The train, acting upon the detent-wheel, will move it; but it might happen that it would not do so quickly enough to prevent the detent-hook falling back into the notch. To insure the quick action of the detent-wheel, I mount the wheel 56 loosely upon its arbor, and cut from it a segment 67 next the arbor. I then provide a key 68 in the arbor, which enters the segment cut from the wheel and operates to turn the wheel as the arbor turns. To the arbor I secure a flat spring 69, then coil it around the arbor, and fasten it to the wheel by a stud 70. The tension of this main spring acting upon the train will turn the arbor 66 as far as the detent-hook 52 will permit, and consequently will coil the spring attached to the arbor 66 and to the detent-wheel 56 and hold the key in the side of the segment, on which it will exert a pressure to turn the wheel 56 by the pressure of the main spring. As soon now as the detent-hook is raised the coiled spring on the detent-wheel will at once turn it as far as the key on the arbor will permit, and thus instantly carry the detent-notch beyond the reach of the detent-hook and insure the running of the train for its regular period.

The operation of the device is as follows: The time-train drives the arbor 1' constantly

at the rate of one revolution an hour. The spur-wheel 2', which is keyed to the said arbor, revolves once in an hour, but having four spurs upon it, operates the rock-frame 12 once every fifteen minutes, thus moving the unit of minutes forward from 15 to 30 to 45 to 0 and, at each succeeding hour at every fourth movement of the minute type-wheel the hour-wheel is moved forward one step, exposing a type indicating a succeeding hour. As the rock-frame 12 is carried forward, carrying with it its pawls and moved by the spur-wheel 2, it stretches a spring 21, which will draw the rock-frame back as soon as it is released by the spur-wheel and move the type-wheels forward, and the sudden action of this spring would probably carry the type-wheels forward too rapidly and beyond the point where it was desired to have them stop. The dog 34 is therefore employed to engage the time-wheels and stop them. It is pivoted, as before described, in the standard of the type-wheels and checks the motion of the type-wheels indicating time. As soon as they have passed from one position to another it then remains in engagement with the time type-wheels until the rock-frame 12 is brought forward to its extreme position, when said frame, by striking a bell-crank arm, will throw said dog out of engagement with the type-wheels and allow them to be turned, but will drop again as soon as the rock-frame moves in the direction to operate the type-wheels. As the wheel 8 revolves the pins 9 9 will strike the end 65 of the rocking lever 63 and move it outward, thereby moving the end 62 in an opposite direction. The arm 53, which is in contact with the end 62 of said rocking lever, is connected, as before described, to the rock-shaft 49, and, as it is moved in one direction by said arm 62, it will cause all the detent-hooks 50, 51, and 52 to release their gears and to permit the calendar train to run. The running of the calendar-train will cause the pin 19 19 to come into contact with the arm 18, which is secured to the rock-shaft 17, and, as each one of the pins strikes upon said arm as wheel 20 revolves, it will move said arm forward and rock the shaft 17, thereby also moving the arm 16 and causing it to throw the rock-frame 13 through a sufficient distance to operate its type-wheels one step forward. This takes place for each day in the week. When 11 is reached, two 11's would be exposed in the field of the stamp in succession, if the train is allowed to run one step at a time. This is, however, avoided by the pin 48, which lifts the end of the detent-hook 51 and permits the train to run for two revolutions of the detent-wheel 56, thereby moving the rocking frame 13 twice in succession and carrying the duplicate 11 beyond the printing-field of the stamp and exposing the second 11, which is succeeded by 12. This operation is repeated when the duplicate 21 is reached. When 30 is reached, if the month being indicated is a month having only thirty

days, the shallow notch of the wheel 40, being beneath the detent-hook 50, will hold the detent-hook 51 out of engagement with the wheel 39 and allow the train to run long enough for the detent-wheel 56 to make another complete revolution and move the type indicating the 31 through the field of the stamp without stopping there, skipping that number, indicating 30 as the last day of the month and 1 as the first day of the succeeding month. When February is reached, it is necessary to skip three numbers 29 30 31, and it will be recollected, as before described in detail, that the wheel 47 presents three shallow notches in the periphery of the wheel 40 and causes these three numbers to be skipped. The three shallow notches necessary for this purpose may be permanent notches, such as are employed to skip 31 in thirty-day months, or the wheel 47 may be used every fourth year, when the deep notch in the wheel 47 becomes coincident with one of the deep notches of the wheel 40 and presents only two shallow notches in the wheel 40, thus causing only two days to be skipped, 30 and 31, instead of 29, 30, and 31, as usual.

It will be readily seen that the wheels 47 and 45 may be omitted altogether and three shallow notches placed permanently in wheel 40 in the February section, so that three days will be skipped every February.

Any form of inking mechanism may be employed with this stamp, such as a ribbon run across the top of the type and moved forward by a lever struck by a platen which falls upon the thing to be printed. I have shown the usual form of hand-stamp in the drawings, but any similar device or other appliance may be employed. I do not confine myself to any of the particular forms described in this application, but desire to claim, broadly, the combination of a time-stamp with a calendar-stamp.

What I claim as new is—

1. The combination of a time-train with a series of type-wheels which are operated by said time-train to expose in the field of a stamp type indicating correctly the time of day, with a second train combined with and operating a second series of type-wheels, which are provided with type to indicate the month and the days of the month, said train being tripped into operation by the time-train at predetermined intervals.

2. The combination of a time-train the arbor of which is provided with a spur-wheel having any number of spurs and a series of type-wheels mounted upon a shaft and having upon their peripheries types arranged so as to indicate the time of the day, and also one of said wheels having a series of letters indicating A. M. and P. M., said wheels being provided with a series of notches in their peripheries of varying number and depth, and a series of pawls rigidly secured together and mounted in a swinging frame which is engaged and operated by the spur-wheel on the

hour-arbor of the time-train, the pawls being arranged in different planes and engaging the peripheries of the type-wheels, the notches in the type-wheels being so arranged that the lowest pawl will operate its wheel until it has made the desired portion of a revolution, said pawl will then fall into a deep notch in said wheel, which will permit the next pawl to engage the next wheel, and when noon or midnight is reached the change must be made from A. M. to P. M. or from P. M. to A. M., then the pawl operating the A. M. and P. M. wheel engages it and moves it, substantially as described.

3. The combination of a time-train with a series of type-wheels which are operated by said time-train to expose in the field of the stamp type indicating correctly the time of the day, with a second train combined with and operating a second series of type-wheels mounted upon the same shaft as the first set, and which are provided with types to indicate the month and the days of the month, said second train being tripped into action, so as to operate its type-wheels by one of the type-wheels of the first series which indicate time, substantially as described.

4. The combination of a time-train with a series of type-wheels which are operated by said time-train to expose in the field of the stamp type indicating correctly the time of the day, with a second train combined with and operating a second series of type-wheels, which are provided with type to indicate the month and the day of the month, said train being tripped into action at predetermined intervals by the action of the time-train, the calendar-train consisting of a train of gears driven by a spring and held still by a detent which is raised by the action of the time-train operating upon it by one of the time type-wheels, and lugs or other equivalent device upon the detent-wheels so located as to prevent the detents from stopping its train at periods when it is desired to have it run, substantially as described.

5. The combination of a time-train with a series of type-wheels which are operated by said time-train to expose in the field of the stamp type indicating correctly the time of the day, with a second train combined with and operating a second series of type-wheels, which are provided with type to indicate the month and the day of the month, said train being tripped into action at predetermined intervals by the action of the time-train, the calendar-train consisting of a train of gears driven by a spring and held still by a detent which is raised by the action of the time-train operating upon it by one of the time type-wheels, and means co-operating with the detent to prevent the detents from stopping its train at periods when it is desired to have it run, substantially as described.

6. The combination of a time-train with a series of type-wheels which are operated by said time-train to expose in the field of a

stamp type indicating correctly the time of the day, with a second train combined with and operating a second series of type-wheels, which are provided with type to indicate the month and days of the month, the wheels indicating the days of the month being provided with type indicating two 11's and two 21's, the train operating the calendar type-wheels being tripped into action by the time-train, and mechanism for causing the first of the duplicate 11's and 21's to be skipped when they come into the field of the stamp, substantially as described.

7. The combination of a time-train with a series of type-wheels which are operated by said time-train to expose in the field of a stamp type indicating correctly the time of the day, with a second train combined with and operating a second series of type-wheels, which are provided with type to indicate the month and days of the month, the wheels indicating days of the month being provided with type indicating two 11's and two 21's, and lugs or other equivalent devices attached to the detent-wheel of the calendar-train which are so located as to hold the detent out of engagement with said wheel and permit said wheel to run and carry the duplicate 11 and 21 into and out of the field of the stamp instantly, exposing the second 11 and 21 for printing, substantially as described.

8. The combination of a time-train with a series of type-wheels which are operated by said time-train to expose in the field of a stamp type indicating correctly the time of the day, with a second train combined with and operating a second series of type-wheels, which are provided with type to indicate the month, the wheels indicating days of the month being provided with type indicating two 11's and two 21's, and lugs or other equivalent devices attached to the detent-wheel of the calendar-train which are so located as to hold the detent out of engagement with said wheel and permit said wheel to run and carry the duplicate 11 and 21 into and out of the field of the stamp instantly, exposing the second 11 and 21 for printing, and lugs or other equivalent device so located upon the detent-wheel as to prevent the detent controlling days of the month from stopping said wheel when the number 31 comes into the printing field of months having but thirty days, substantially as described.

9. The combination of a time-train with a series of type-wheels which are operated by said time-train to expose in the field of a stamp type indicating correctly the time of the day, with a second train combined with and operating a second series of type-wheels, which are provided with type to indicate the month, the wheels indicating days of the month being provided with type indicating two 11's and two 21's, and lugs or other equivalent devices attached to the detent-wheel of the calendar-train, which are so located as to hold the detent out of engagement with said

wheel and permit said wheel to run and carry the duplicate 11 and 21 into and out of the field of the stamp instantly, exposing the second 11 and 21 for printing, and the detent-wheel controlling days of the month provided with lugs or other equivalent devices so located upon the detent-wheel as to prevent the detent controlling days of the month from stopping said wheel when the number 31 comes into the printing field of months having but thirty days, and a gear journaled on a stud upon the detent-wheel controlling days of the month and located at the part of said wheel controlling the days of February and provided with teeth so proportioned to those of the detent-wheel that controls days of the month that when they become coincident with said notches and the detent falls into them it will not fall low enough to allow the other detent to engage the other detent-wheel and stop the train, and when this is the case the other detent-wheel will raise all the detent-hooks out of engagement with their detent-wheels and allow the train to run until stopped again.

10. In a calendar-train, the combination of a time-train with a series of type-wheels indicating months and days of the month, and mechanism connecting said train and the type-wheel indicating units of days, whereby said time-train is caused to turn said unit type-wheel one step every twenty-four hours, with other type-wheels indicating tens of days and months, and mechanism connecting said wheels, whereby the motion of the unit-wheel controls the motion of the others, said time-train being provided with a detent and detent-wheels which has upon it lugs or other equivalent devices so located as to hold the detent out of engagement with said detent-wheel and allow it to run unchecked at predetermined intervals.

11. The combination of a time-train with a series of type-wheels which are operated by said train to expose in the field of the stamp the name of the month and the day of the month, the wheels indicating days of the month being provided with duplicate 11's and duplicate 21's, said time-train being provided with two detent-wheels and two detents, one of said detent-wheels being provided with lugs or other equivalent devices so located as to prevent said wheels being engaged by their detents at the periods which would cause the duplicate 11 and 21 to be exposed in the field of the stamp, thereby allowing the train to run and carry the first 11 and 21 through the field of the stamp without stopping there, and the other detent-wheel—that controlling the number of days in the month—being provided with similar lugs or other equivalent devices so located as to prevent its detent from stopping its motion at the periods which would expose the figure 31 in the field of the stamp in month having but thirty days.

12. The combination of a time-train with a series of type-wheels which are operated by

said train to expose in the field of the stamp the name of the month and the day of the month, the wheels indicating days of the month being provided with duplicate 11's and duplicate 21's, said time-train being provided with two detent-wheels and two detents, one of said detent-wheels being provided with lugs or other equivalent devices, so located as to prevent said wheels being engaged by their detents at the periods which would cause the duplicate 11 and 21 to be exposed in the field of the stamp, thereby allowing the train to run and carry the first 11 and 21 through the field of the stamp without stopping there, and the other detent-wheel—that controlling the number of days in the month—being provided with similar lugs or other equivalent devices so located as to prevent its detent from stopping its motion at the periods which would expose the figure 31 in the field of the stamp in months having but thirty days, the latter detent-wheel having pivoted upon its side a small gear located upon that part of the detent-wheel controlling days of the month, which is employed to indicate February, which meshes with a stationary gear secured to the frame of the time-stamp, and through which the shaft of the month-controlling detent-wheel passes, said small gear being revolved by being carried around the stationary gear by the motion of the month-controlling detent-wheel, the notches in said small gear being of such depth that when they become coincident with the notches of the detent-wheel they will hold the detent-hook of said wheel high enough to prevent the detent-hook of the other wheel—said detents being rigidly secured together—from holding its detent-wheel, the train being thus allowed to run until the detent-hooks fall, carrying the figures 29, 30, and 31 at the end of the month of February through the field of the stamp without stopping there, and exposing the succeeding figure 1 for the first of March, substantially as described.

13. The combination of a time-train with a series of type-wheels which are operated by said train to expose in the field of the stamp the name of the month and the day of the month, the wheels indicating days of the month being provided with duplicate 11's and duplicate 21's, said time-train being provided with two detent-wheels and two detents, one of said detent-wheels being provided with lugs or other equivalent devices, so located as to prevent said wheels being engaged by their detents at the periods which would cause the duplicate 11 and 21 to be exposed in the field of the stamp, thereby allowing the train to run and carry the first 11 and 21 through the field of the stamp without stopping there, and the other detent-wheel—that controlling the number of days in the month—being provided with similar lugs or other equivalent devices so located as to prevent its detent from stopping its motion at the periods which would expose the figure 31 in the field of the

stamp in months having but thirty days, the latter detent-wheel having pivoted upon its side a small gear, being provided with a number of shallow notches and one deep notch, located upon that part of the detent-wheel controlling days of the month, which is employed to indicate February, which meshes with a stationary gear secured to the frame of the time-stamp and through which the shaft of the month-controlling detent-wheel passes, said small gear being revolved by being carried around the stationary gear by the motion of the month-controlling detent-wheel, said small gear being provided with a number of shallow notches and one deep one, the shallow notches being of such depth that when they become coincident with the notches of the detent-wheel they will hold the detent-hook of said wheel high enough to prevent the detent-hook of the other wheel—said detents being rigidly secured together—from holding its detent-wheel, the train being thus allowed to run until the detent-hooks fall, carrying the figures 29, 30, and 31 at the end of the month of February through the field of the stamp without stopping there, and exposing the succeeding figure 1 for the 1st of March, the deep notch in said gear being so located that when it becomes coincident with one of the notches of the month-controlling detent-wheel, which will occur once in every four revolutions of said wheel or once in every four years, the month-controlling detent will fall into said notch and stop and hold the figures 29 in the field of the stamp during the 29th of February in leap year, and the shallow notches of the small gear then following the deep one will cause the 30 and 31 to be skipped, substantially as described.

14. In a calendar-train, the combination of a spring and two detent-wheels, one driven by the spring and the other by gearing from the first, a pair of detents engaging said detent-wheels and rigidly secured together, a time-train controlling the detents of the calendar-train and operating them to release the calendar-train at predetermined intervals,

and a series of type-wheels the periphery of which is armed with type indicating the month and days of the month, the wheels of the series indicating days of the month being provided with duplicate 11's and 21's, the spring-driven detent-wheel of the calendar-train being provided with lugs or other equivalent device for holding the detent of said wheel out of engagement with it when these numbers are reached, so as to skip the first of said duplicates and expose the second in the field of the stamp, and the second of said detent-wheels being provided with deep and shallow notches or other equivalent device, whereby when the detent-hook of said wheel falls into said shallow notches the detent of the spring-driven wheel will be prevented from catching and holding it and the train will run until this notch is passed, and the number brought into the field of the stamp will be at once carried out of said field, these shallow notches in the second detent-wheel being so located as to cause the number to be skipped in the months having thirty days and the numbers 29, 30, and 31 to be skipped in February, substantially as described.

15. The combination, in a calendar-stamp, of two proximate type-wheels of equal diameter revolving upon a common axis to designate and print the days of the month, the first having eleven equal peripheral spaces bearing digits and a cipher and a duplicate 1 adjacent to first 1 and the second having twelve equal peripheral spaces and bearing two series of figures, as follows: 0 1 1 2 2 3, as and for the purpose specified, and operating substantially as described.

In testimony that I claim the foregoing as my invention, I have signed my name in presence of two witnesses this 13th day of November, 1889.

EDWIN W. MORTON.

Witnesses:

P. E. RICHTER,
JAMES N. STEWART.