Jan. 6, 1942. B. COOPER 2,268,924

TIME STAMP

Filed March 31, 1939 3 Sheets-Sheet 1

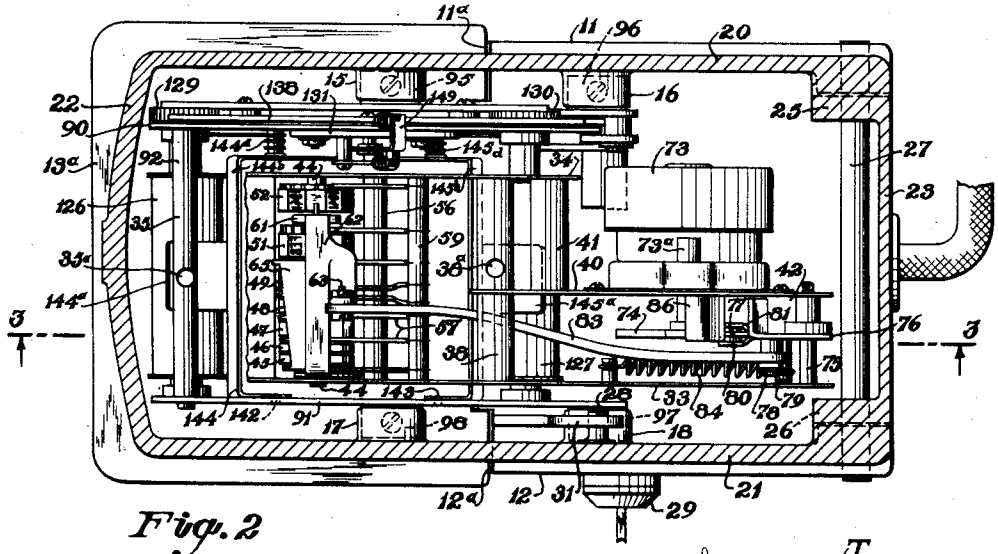


Fig. 2

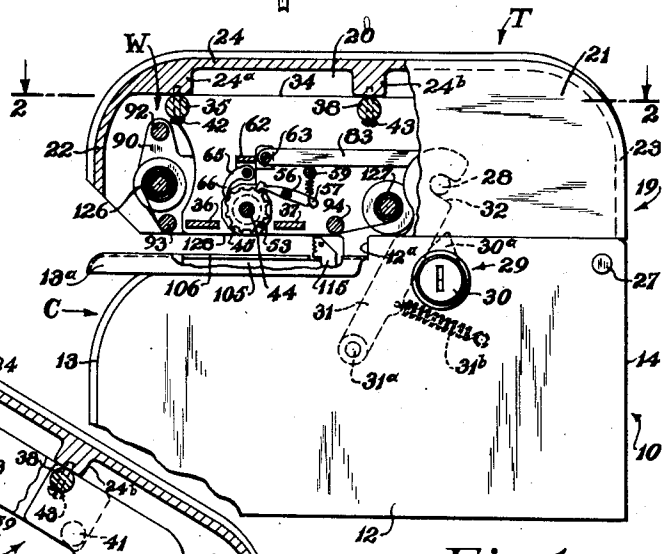


Fig. 1

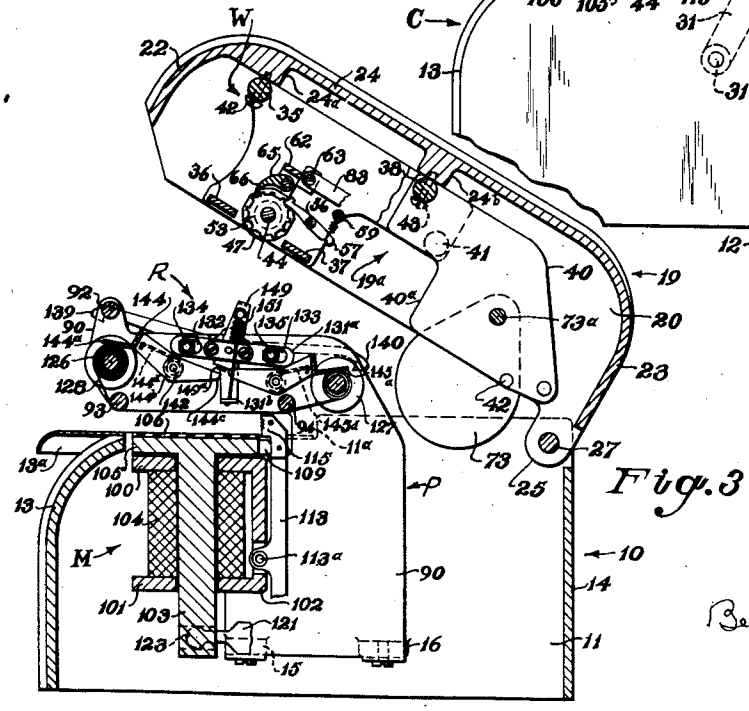


Fig. 3

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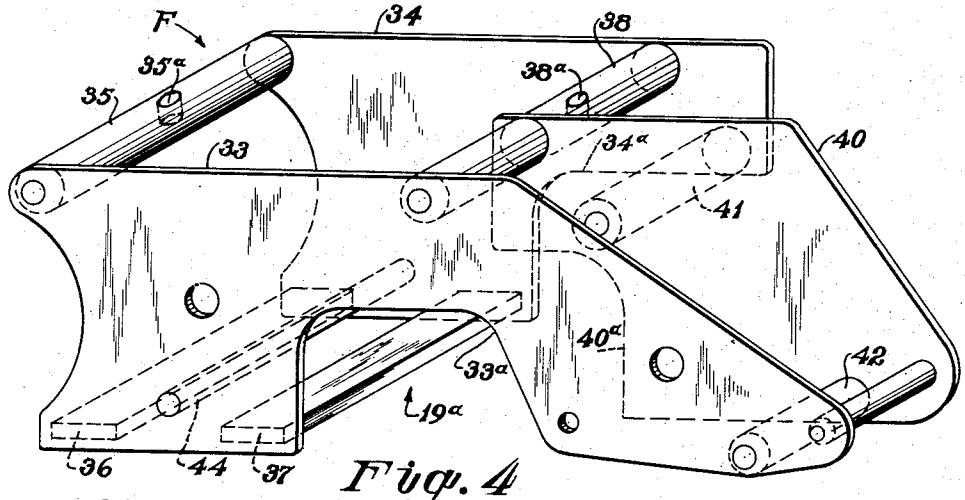


Fig. 4

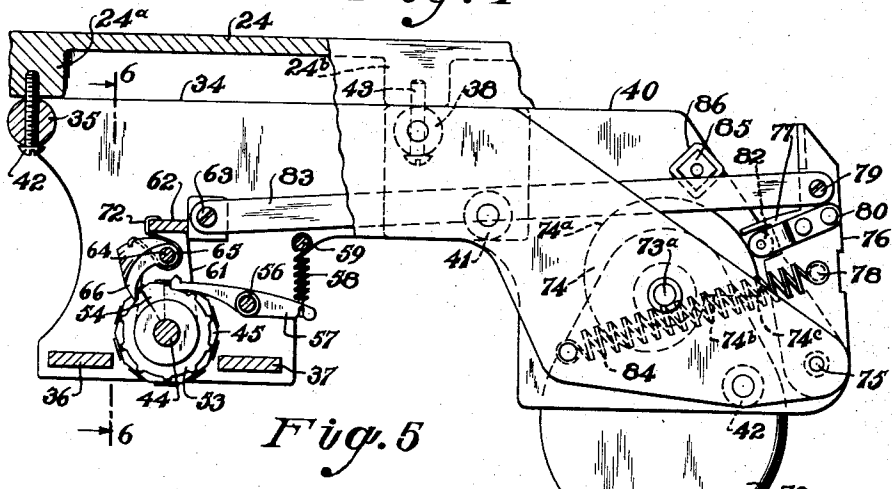


Fig. 5

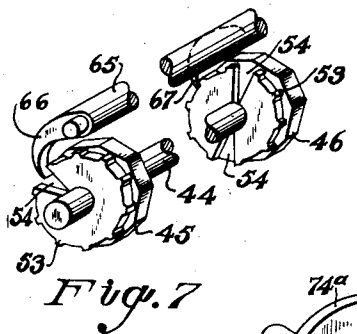


Fig. 7

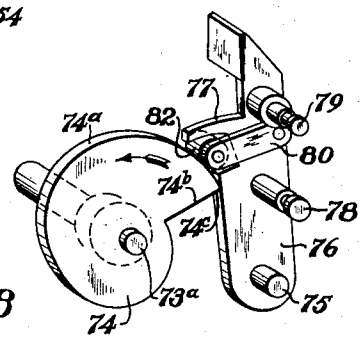
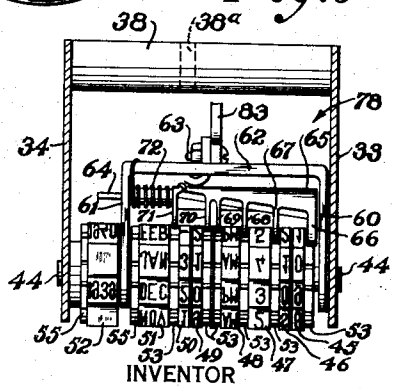


Fig. 8

Fig. 6



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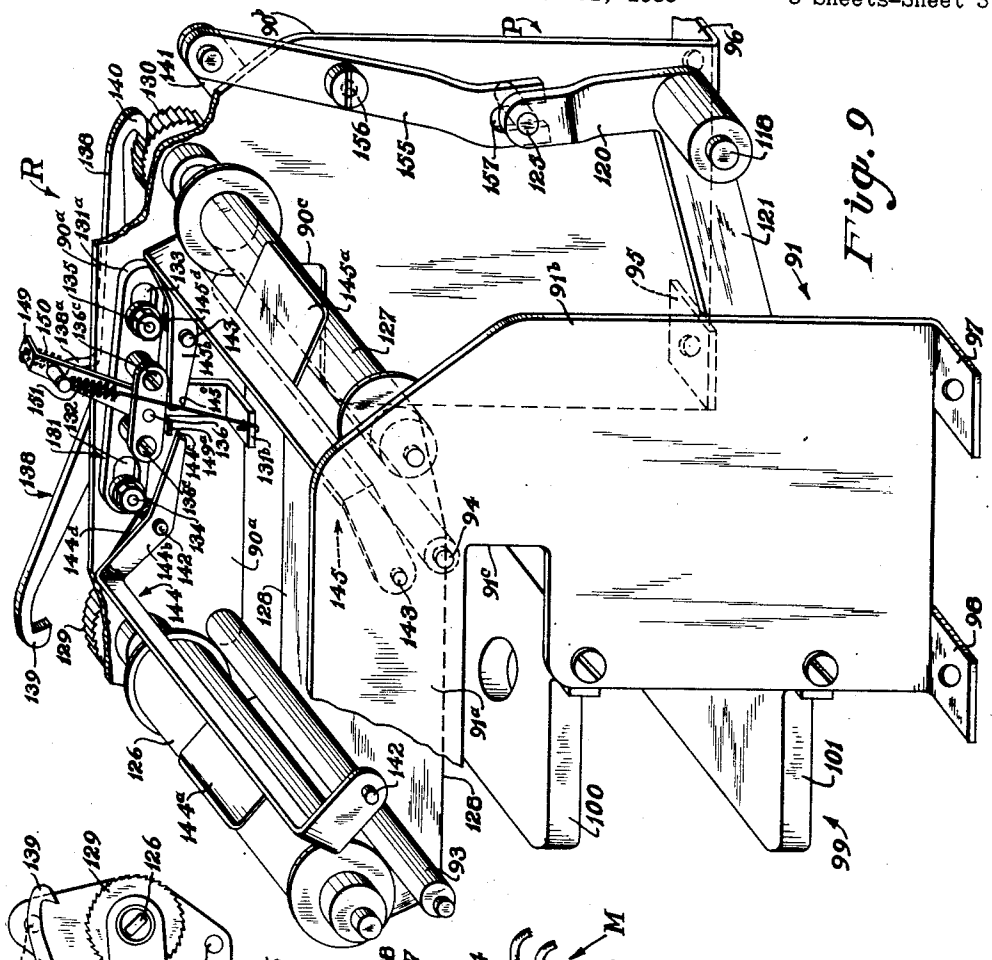


Fig. 9

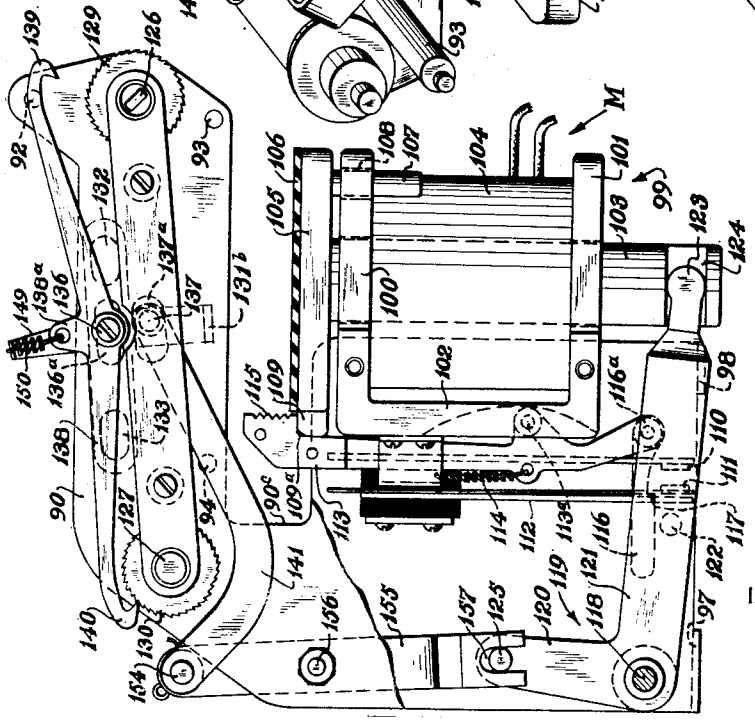


Fig. 10

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Patented Jan. 6, 1942 2,268,924

UNITED STATES PATENT OFFICE

2,268,924

TIME STAMP

Benjamin Cooper, Jersey City, N. J.

Application March 31, 1939, Serial No. 265,291

2 Claims. (Cl. 234—57)

This invention relates to time stamps, and is particularly directed to time stamps which are influenced by the insertion of a slip of paper in printing position to automatically actuate the printing mechanism to print information such as the time and date on said paper.

An object of this invention is to provide a highly improved and simplified time stamp of the character described which shall be relatively inexpensive to manufacture yet rugged and well adapted for severe use.

Yet another object of this invention is to provide a time stamp of the character described in which the operating mechanism shall be readily removable from its case without disassembling the same, whereby said mechanism is easily accessible for inspection or repair.

Other objects of this invention will in part be obvious, and in part be hereinafter pointed out.

The invention accordingly consists in features of construction, combination of elements, and arrangement of parts which will be exemplified in the invention hereinafter described and of which the scope of application will be indicated in the following claims.

In the accompanying drawings:

Fig. 1 is a side elevational view of a time stamp embodying the invention, in operating position, with part of the upper case wall removed to disclose the interior construction;

Fig. 2 is a cross-sectional view taken on line 2—2 of Fig. 1;

Fig. 3 is a sectional view taken on line 3—3 of Fig. 2 with the upper case swung upwardly;

Fig. 4 is a perspective view of the type wheel frame;

Fig. 5 is a view of the type wheel operating mechanism;

Fig. 6 is a front elevational view of the mechanism shown in Fig. 5;

Fig. 7 is a perspective view of a portion of the wheel transfer mechanism;

Fig. 8 is a perspective view of the type wheel actuating arm;

Fig. 9 is a perspective view of the ribbon and printing mechanisms; and

Fig. 10 is a side elevational view of the ribbon and printing mechanisms.

Casing

Referring now to Figs. 1, 2 and 3, T designates a time stamp comprising a casing C, having a lower case 10 and an upper case 19. The lower case 10 is open at the top and bottom and has side walls 11 and 12, a front wall 13, and a rear wall 14. The side walls 11 and 12 each have integral therewith and near the bottom thereof, two inwardly projecting horizontal mounting lugs 15, 16 and 17, 18 respectively, said lugs being formed with vertically tapped holes. The forward portion of walls 11 and 12 are cut away, forming notches 11*a* and 12*a* respectively, into which a sheet of paper, to be stamped, may be inserted.

Fastened to the side walls 11 and 12 and front wall 13 in any suitable manner is a horizontal plate 13*a*, projecting outwardly from said walls 11, 12 and 13 forming a convenient shelf for guiding papers to be inserted in the notches 11*a* and 12*a*. Said shelf 13*a* is formed with the portion contained within the casing C cut away, so as not to obstruct the opening at the top of lower case 10.

The upper case 19 has side walls 20 and 21, a front wall 22, a rear wall 23, and a top wall 24. The top wall 24 has integral therewith two downwardly extending lugs 24*a* and 24*b*, having tapped vertical holes therein. Integral with side walls 20 and 21 and adjacent the rear wall 23 are two downwardly extending ears 25 and 26. Also integrally formed with the side wall 20 and extending horizontally inwardly is a locking stud 28.

The upper case 19 is positioned on the lower case 10 so that the ears 25 and 26 fit between the side walls 11 and 12 adjacent the rear wall 14. A horizontal shaft 27 rigidly attached to side walls 11 and 12, extends through aligned holes in ears 25 and 26 so that the upper case 19 is pivotable with respect to the lower case 10 about said shaft.

Pivotally attached to side wall 12 of lower case 10, as at 31*a*, is an arm 31 disposed adjacent the inside face of said side wall. A coil tension spring 31*b* connected between the arm 31 and the wall 12 urges said arm in a counter-clockwise direction looking at Fig. 1. Arm 31 is formed with a notch 32 in its upper end. Also attached to side wall 12 and projecting inwardly therefrom is a lock 29 of any suitable type having a rotary barrel 30 disposed so that the key receiving portion is at the outside. Integral with barrel 30, and projecting upwardly perpendicular thereto is a cam 30*a*, cooperating with the arm 31. The notch 32 is disposed to engage the stud 28 when the upper case 19 is in normal operating position, as shown in Fig. 1, so that the two case members 10 and 19 are normally locked with respect to each other. By inserting the key into lock 29 and rotating the barrel 30 counter-clockwisely, looking at Fig. 1, the cam 30*a* pivots arm 31, causing notch 32 to release the pin 28 and

permit the upper case 19 to be pivoted away from the lower case 10 for inspection of the time stamp mechanism, as shown in Fig. 3.

Time wheel unit

The printing wheels and their associated driving mechanism are constructed as an integral unit W, disposed in the upper case 19 and adapted to be removed therefrom as a unit. Unit W comprises a frame F, Fig. 4, having two vertical parallel side plates 33 and 34, parallel to the side walls 21, 20 of upper case 19, and interconnected by studs 35 and 36, screwed to the mounting lugs 24a and 24b. The plates 33 and 34 are further fastened together near their lower edge by studs 36 and 37. A motor mounting plate 40, parallel to and disposed between said side plates 33, 34 is fixed thereto by studs 41, 42 and supported on stud 36.

The plate 33 is formed with a cutaway portion 33a extending upwardly from the bottom edge mediately the ends of said plate. The plates 34 and 40 are formed with corresponding cutaway portions 34a and 40a so that there is provided in frame F, extending upwardly from the bottom thereof an open, unobstructed space 19a for purposes hereinafter appearing.

The frame F is disposed in the upper case 19 so, that the side plates 33 and 34 are spaced away from the side walls 21 and 20, Fig. 2, and the front edges of said plates are spaced back from the front wall 22, Fig. 3. There is thus provided, for purposes hereinafter appearing, an unobstructed space between the frame F and the side walls 20, 21 and the front wall 22 of the upper case 19.

Mounted on and between the plates 33, 34 is a transverse horizontal shaft 44 located between the cut-out portions 33a, 34a and the front edge of said plates, and somewhat above and between the studs 36, 37. The shaft 44 carries eight rotary type wheels 45, 46, 47, 48, 49, 50, 51 and 52. The wheels 45 and 46 indicate the minutes, wheel 47 the hour, wheel 48 the a. m. and p. m., wheels 49 and 50 the date, wheel 51 the month, and wheel 52 the year, all of said wheels being of usual construction and provided with the necessary numbers or letters on their circumferential face, as indicated in Fig. 6. Each of the wheels 45, 46, 47, 48, 49 and 50 has rigidly mounted on one face thereof a coaxial ratchet wheel 53, having one or more notches 54, as shown in Figs. 5 and 7. Wheels 51 and 52 each have concentrically attached thereto a ratchet wheel 55, said ratchet wheels not being provided with any notches.

A shaft 56 parallel to the shaft 44 and also connected between the side plates 33 and 34 has pivotally mounted thereon eight pawls 57, one for each type wheel, said pawls cooperating with ratchets 53 and 55 to prevent reverse or clockwise rotation of the type wheels, looking at Fig. 5. Each pawl 57 is spring pressed into engagement with its respective ratchet by a spring 58, attached between said pawl and a shaft 59, parallel to shaft 44 and disposed between the side plates 33 and 34. Also pivotally mounted on shaft 44 is a U-shaped yoke 78 comprising side arms 60 and 61 and a top connecting arm 62. Rigidly attached to said top arm 62 is an ear 63 for the purpose hereinafter appearing. Side members 60 and 61 carry a transverse shaft 64 on which is pivoted a wheel advancing unit 65, comprising six fingers 66, 67, 68, 69, 70 and 71, positioned to cooperate with ratchet wheels 53 to advance the same in the well known manner. The fingers are constructed in stepped arrangement so that the finger 66 is slightly longer than the finger 67, finger 67 is slighty longer than finger 68, and so forth. The wheel advancing unit 65 is spring pressed by a coil spring 72 so that the fingers are urged to engage the ratchet wheels 53.

On plate 40 is mounted a clock motor 73 of any suitable construction having an output shaft 73a extending through an aperture in said plate. Rigidly attached to said shaft is a cam 74 having a spiral edge 74a and a radial edge 74b. Mounted between plates 40 and 33 is a transverse shaft 75 to which is pivoted an arm 76 having a pair of parallel arms 80, 81 carrying a roller 82 maintained in contact with cam 74 by spring 84 which interconnects said arm with the frame F. Arm 76 is formed with a forwardly projecting finger 77 above the roller 82 to prevent the roller from striking the point 74c of the cam at the end of the spiral edge. A link 83 connects a stud 78 on arm 76 with ear 63 on yoke 78.

Motor 73 rotates cam 74 one complete revolution each minute in a counter-clockwise direction, looking at Fig. 5. The roller 82 being pressed into engagement with said cam rides on the spiral edge 74a thereof. As said cam rotates, arm 76 is pivoted clockwisely, looking at Fig. 5, against the tension of spring 84 to pull link 83 for rotating yoke 78 clockwisely about shaft 44. When the point 74c of the cam passes finger 77, arm 76 is returned counter-clockwisely by the spring 84 until said arm is restrained by a stop 85 on plate 40. Said stop may have a flexible sheath 86 thereabout to absorb the shock. Link 83 is consequently moved to the left rocking the type advancing unit 65 about shaft 44 in a counter-clockwise direction, looking at Fig. 5, to advance the type wheels in the well known manner.

The month wheel 51 and the year wheel 52 may be advanced manually, by using a stylus on the ratchet wheel 55 associated with each wheel.

Printing mechanism

Means is provided for printing the data indicated on the type wheels automatically, upon inserting a sheet of paper into the notches 11a, 12a. To this end there is mounted within case 10, a frame P, Figs. 3 and 9, which carries mechanism M for moving a platen 105, on which the paper inserted into the notches 11a, 12a rests, upwardly toward the type wheels; and ribbon feed mechanism R for feeding a printing ribbon 128 located below the type wheels, to print the data of the type wheels onto the inserted sheet of paper.

Frame P comprises a pair of substantially similar plates 90, 91, rigidly interconnected by crossbars 92, 93, and 94, and formed at their lower ends with outwardly extending apertured ears 95, 96, 97 and 98 engaging the studs 15, 16 and 17, 18 of lower case 10, and attached thereto by screws or in any other suitable manner.

The plates 90 and 91 are parallel to the side walls 11 and 12 of the lower case 10 and project above said case, the upper portions of said plates extending into the upper case 19, and disposed between the plates 33, 34 of frame W, and the side walls 21, 20 of said upper case, Figs. 1 and 2.

The lower portions of the plates 90, 91, disposed within the lower case, are designated by numerals 90b and 91b. The upper portions of said plates, disposed in the upper case, are designated by numerals 90a, 91a. Said plates are formed with notches 90c and 91c, located between said portions and registering with the notches

11a, 12a of case 10, to permit the paper to be stamped, to be inserted into said notches.

Rigidly interconnected between the lower portions 90b and 91b of plates 90 and 91 and serving as a further mechanical brace, is a U-shaped solenoid frame 99. The frame 99 comprises a horizontal top and bottom walls 100, 101 formed with vertically aligned openings, and a vertical wall 102 connecting said horizontal walls.

Slidably received in the vertically aligned holes in the solenoid frame members 100 and 101 is a solenoid plunger 103 carrying the printing platen 105 at its upper end provided with a printing pad 106. At the lower end of the plunger is a slot 124. Platen 105 has a rearwardly extending lug 109 and a downwardly extending pin 107 slidably received in a guide hole 108 in the top wall 100 of solenoid frame 99. Surrounding said plunger 103 is a solenoid coil 104.

Mounted on vertical wall 102, and insulated therefrom and from each other, are a rigid contact arm 110, a spring contact arm 111. Fixed to said wall and insulated therefrom is a stop 112 against which said spring arm 111 normally rests. Pivotally mounted to vertical wall 102, as at 113a, is a lever 113 having at its upper end a serrated edge 115. The arm 113 is tensioned by a spring 114 so that the edge 115 normally rests on the lug 109 of platen 105 as shown in Fig. 10. At the bottom end of said lever is pivotally connected, as at 116a, a lever 116 made of insulation having thereon a projection 117. Said projection 117 is normally positioned to engage the contact arm 111, as shown in Fig. 10. Pivotally connected to side plate 90, as at 118, is a bell crank 119 having an upwardly extending arm 120 and a horizontal arm 121. Arm 121 has integral therewith an inwardly extending stud 122 adapted to cooperate with the lever 116 in a manner to be hereinafter explained. At the end of said arm 121 is a ball joint 123 slidably received in slot 124 in the plunger 103. The arm 120 has at its upper end a pin 125. Also pivoted to side plate 90, as at 156, is a lever 155 having at its bottom end a slot 157, slidably receiving the pin 125. The coil 104 is connected to a suitable source of power through the contacts 110 and 111.

When a sheet of paper is inserted between the type wheels and the platen, the forward edge of said paper engages the serrated edge 115 of the lever 113 rocking said lever counter-clockwisely, looking at Fig. 10, so that the edge 115 thereof moves away from the lug 109. The lever 113 is balanced so as to require a very small pressure for its rotation. The insulation lever 116 is moved to the right and projection 117 moves contact 111 into engagement with contact 110 thereby exciting the solenoid coil 104 for moving the platen 105 upwardly. As the platen rises the lug 109 having been released from under the serrated edge 115 engages said edge maintaining lever 113 in its tensioned position during the entire travel of the platen. Thus, the circuit for excitation of the solenoid, after having been closed by the insertion of the paper, becomes thereafter independent of the continued pressure of the paper against lever 113.

Furthermore, the rear upper edge of ear 109 has a cammed surface 109a, engaging the edge 115 and causing arm 113, after having been rocked by the sheet of paper, to be pivoted an additional amount for applying a substantial pressure to the spring contact arm 111 and causing a firm contact between said contact arm and the arm 110. It is seen, therefore, that although a slight pressure of the paper is sufficient to initiate excitation of coil 104, the subsequent motion of platen 105 applies a substantial contact pressure to the arms 110, 111 eliminating any tendency toward sparking or fluttering which would produce insufficient energization of coil 104 and result in a light print.

As platen 105 rises bell crank 120 is pivoted counter-clockwisely, looking at Fig. 10, moving stud 122 upwardly. Just as the platen is about to press the paper against the type wheels, lug 122 engages lever 116 rocking said lever clockwisely about its pivot point 116a. Projection 117 thereupon releases contact 111 allowing said contact to return to normal position, and breaking the circuit for excitation of the solenoid coil. Thus, the platen is automatically released after each printing.

Ribbon mechanism

The ribbon feed mechanism R, Fig. 9, comprises two ribbon rollers 126 and 127 journalled on and between the side plates 90 and 91, and the printing ribbon 128 passes from the roll 126 under the studs 93 and 94 to the roll 127. The roll 127 is received in the space 19a in frame F whereas roll 126 fits into the space between the front end of said frame and the front wall 22 of case 19.

Means is provided to advance the ribbon after each print. To this end there is attached to the rolls 126, 127 and disposed adjacent the outside face of side wall 90, ratchets 129 and 130 respectively. Mounted on plate 90 are a pair of inwardly extending guide studs 134 and 135. Slidably mounted on said studs is a T-shaped member 131 having slots 132, 133 to receive said studs. Member 131 has a central downwardly extending leg 131b and carries a horizontal pivot pin 136 extending through a horizontal slot 136a in plate 90.

Means is provided to horizontally reciprocate the T-shaped member 131 as the plunger 103 is vertically reciprocated. To this end there is fixed to the lug 131b of the T-shaped member 131, a stud 137 passing through a horizontal slot 137a in the plate 90 and projecting outwardly through said plate. Interconnecting the upper end of the lever 155 with said stud 137 is a downwardly curved link 141, disposed adjacent the outside face of plate 90.

It will now be understood that as the plunger reciprocates up and down, levers 119 and 155 will be oscillated about their pivotal points to cause the T-shaped member 131 to be horizontally reciprocated.

Means is provided to unwind the ribbon 128 from one of the rolls onto the second roll a predetermined amount for each printing operation, until said second roll is wound up to a predetermined extent, and then to automatically reverse the operation to unwind the ribbon from said second roll onto the first roll a predetermined length for each printing operation, and then again to reverse the ribbon feeding operation when said first roll is wound up to a predetermined extent. To this end, there is pivoted to the pivot pin 136, a pawl arm 138 located on the outside of the plate 90 and provided with a pair of downwardly extending, symmetrical pawls 139 and 140, one on either end. One of said pawls is adapted to cooperate with the ratchet 129, and the other pawl with the ratchet 130. The pawl member 138 has a central upwardly extending apertured ear 138a.

There is further pivoted to the pin 136, a mem-

ber 149, the upper end whereof is connected to the ear 138a by a coil tension spring 150. The pivoted member 149 is also connected by a coil tension spring 151 to the lower end of the leg 131b. The spring 151 serves to rotate the member 149 to inclined position on either one side or the other of the vertical. Stop pins 136c serve to limit the angular movement of member 149. When member 149 is pivoted in one direction by spring 151, the spring 150 urges the pawl member 138 to pivot in the same direction to retain one of the pawl members 139, 140 in engagement with one of the ratchet wheels 129, 130.

When the reversing mechanism R is positioned, as shown in the drawings, with the pawl member 140 in engagement with the ratchet 130, the ribbon 128 will be unwound from the roll 126 and be wound on the roll 127 each time the platen 105 is raised. As the time stamp is operated, reciprocation of the plunger 103 will cause reciprocation of the T-shaped member 131, as described above. Reciprocation of the T-shaped member 131 will cause reciprocation of the pawl member 138 with the pawl 140 engaging the teeth of the ratchet 130, to rotate the roll 127 for winding the ribbon 128 onto said roll and unwinding the ribbon from the other roll 126.

Means is provided to rotate the member 149 about the pin 136 to the other side of the vertical, whereby the pawl member 138 is also pivoted by spring 150 about said pivoted pin to disengage the pawl 140 from the ratchet 130 and to cause the pawl 139 to engage the ratchet 129. To this end, there is pivoted on aligned pins 142, on the frame walls 90, 91, a U-shaped member 144 having one side arm 144b formed with a projection 144c normally disposed below the lower end of a projection 149a on pivot arm 149. On the yoke 144 is a plate 144a normally tensioned against the roll of ribbon 126 by a spring 144d. As the roll 126 is unwound and decreases in diameter, the yoke 144 will pivot in a counterclockwise direction, looking at Fig. 9 of the drawings.

There is also pivoted on aligned studs 143 on frame walls 90, 91, a yoke 145 similar and symmetrically disposed with respect to the yoke 144, and having a side arm 145b adjacent the frame wall 90 and formed with a projecting finger 145c likewise normally below the projection 149a on the arm 149.

On yoke 145 is a plate 145a, normally urged to contact the top of the roll 127 by torsion spring 145d. As the roll 127 is wound up and increases in thickness, the finger 145c will be brought further below the lug 149a. However, as the roll 127 winds up, the roll 126 will be unwound and reduced in diameter causing the finger 144c to rise into the path of the lug 149a. The T-shaped member 131 may reciprocate without being affected by the yokes 144, 145 until the roll 126 is unwound to a predetermined extent, at which time the finger 144c will be in the path of the lug 149a and cause the member 149 to be pivoted about the pin 136 from the position shown in Fig. 9 of the drawings, to the opposite inclination. The pawl member 138 is simultaneously oscillated, thereby releasing ratchet 130 and engaging pawl 139 with ratchet 129. Further operation of the time stamp will then cause the roll 126 to be wound and the roll 127 to be unwound, and the ribbon is then fed in an opposite direction. When roll 127 has become unwound, the edge 145c will again reverse the pawl arm 138 causing spool 127 to be wound up again.

Referring to Figs. 1, 2 and 3, it is seen that when the upper case 19 is in operating position with respect to the lower case 10, the forward portion of frame F, carrying the type wheels, telescopes into the space enclosed within the walls 90, 91 of frame P, and the ribbon rolls 126, 127, so that the printing platen 105 is directly beneath the type wheels, and the ribbon 128 is between said platen and said wheel. The ribbon mechanism R, being completely assembled on side plate 90 fits into the space between the wall 34 of frame F and the side wall 20 of upper case 19, as shown in Fig. 2. The arm 32 locks the upper case 19 against the lower case 10, so that the impact of the platen against the wheels, upon printing, does not swing said wheels upwardly. It is further seen that, except for arm 32, there is no mechanical connection between the frame F in upper case 19 and the frame P in lower case 10, permitting said upper case to be readily pivoted upwardly without disassembling any of the time stamp mechanism.

It will thus be seen that there is provided a device in which the several objects of this invention are achieved and which is well adapted to meet the conditions of practical use.

As various possible embodiments might be made of the above invention, and as various changes might be made in the embodiment above set forth, it is to be understood that all matter herein described or shown in the accompanying drawings is to be interpreted as illustrative and not in a limiting sense.

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

1. In a time stamp, a lower case, an upper case pivotally connected thereto, a printing type mechanism and a type mechanism advancing means wholly mounted in said upper case, whereby said type mechanism advancing means is operative when said upper case is swung away from the lower case, as well as when the upper case is in operative relation to the lower case, a printing platen and means for moving the same mounted in said lower case, a printing ribbon and printing ribbon advancing means supported by said lower case and projecting thereabove into the upper case, the printing ribbon being located beneath the type wheels and above the platen when the upper case is in operative position on the lower case, said type mechanism and type mechanism advancing means constituting a unit removable as a whole from the upper case, and the printing platen, moving means, printing ribbon and advancing means constituting a unit removable as a whole from the lower case.

2. A time stamp comprising a lower case open at the top, and an upper case hinged at its rear lower end to the upper rear end of the lower case, said upper case being open at the bottom, a support detachably secured within said upper case, type mechanism and type mechanism advancing means, including a clock motor, wholly mounted on said support and constituting a unit together with said support, said unit being removable as a whole upon detaching said support from said upper case through the lower open end of the upper case, a support detachably secured within said lower case, a printing platen and means for operating the same mounted on said second mentioned support, said second support projecting up through the upper open end of the lower case into the lower open end of the upper case, print-

ing ribbon advancing means mounted on the projecting portion of said second support, and said second support together with the printing platen, operating means and ribbon advancing means, being removable as a unit through the upper open end of the lower casing, upon detaching said second support from said lower casing, said type mechanism advancing means being operative by means of the motor when said upper case is swung away from the lower case, as well as when the upper case is in operative relation with the lower case.

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