

March 24, 1953

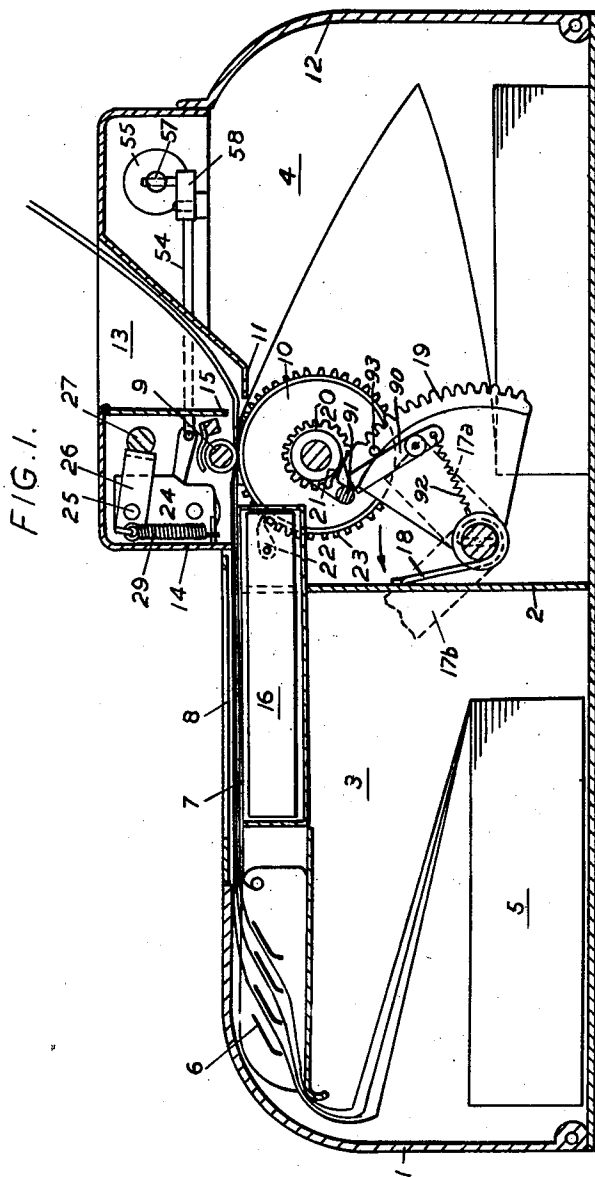
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2,632,385

PRINTING DEVICE IN AUTOGRAPHIC REGISTER

Filed March 3, 1950

5 Sheets-Sheet 1



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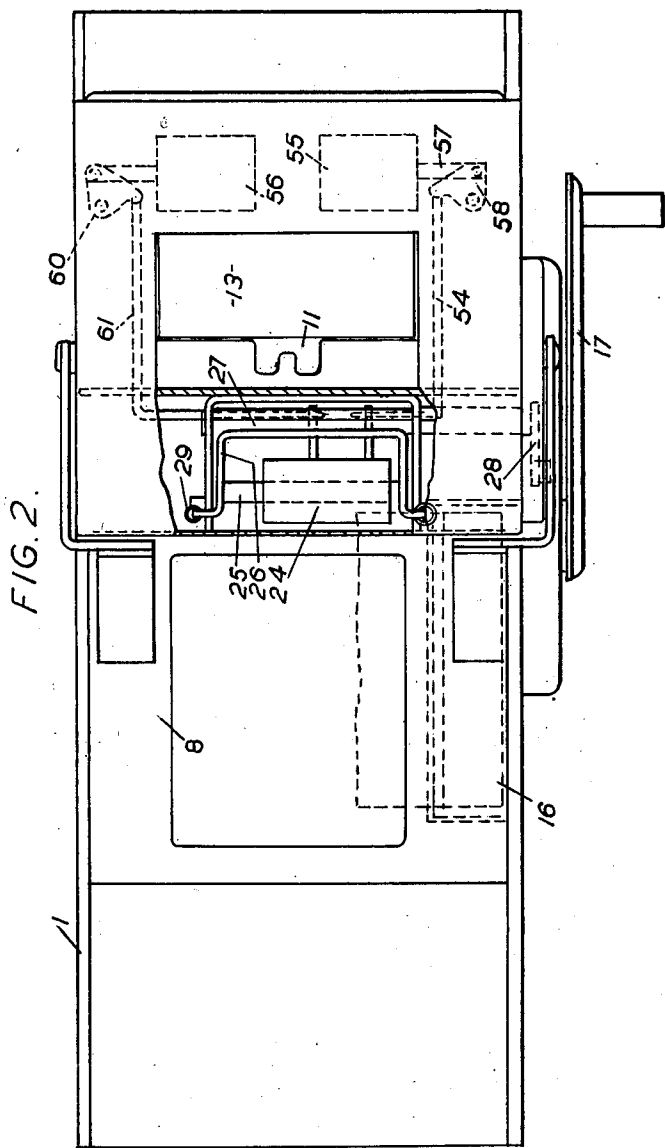
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PRINTING DEVICE IN AUTOGRAPHIC REGISTER

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5 Sheets-Sheet 2



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PRINTING DEVICE IN AUTOGRAPHIC REGISTER

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5 Sheets-Sheet 3

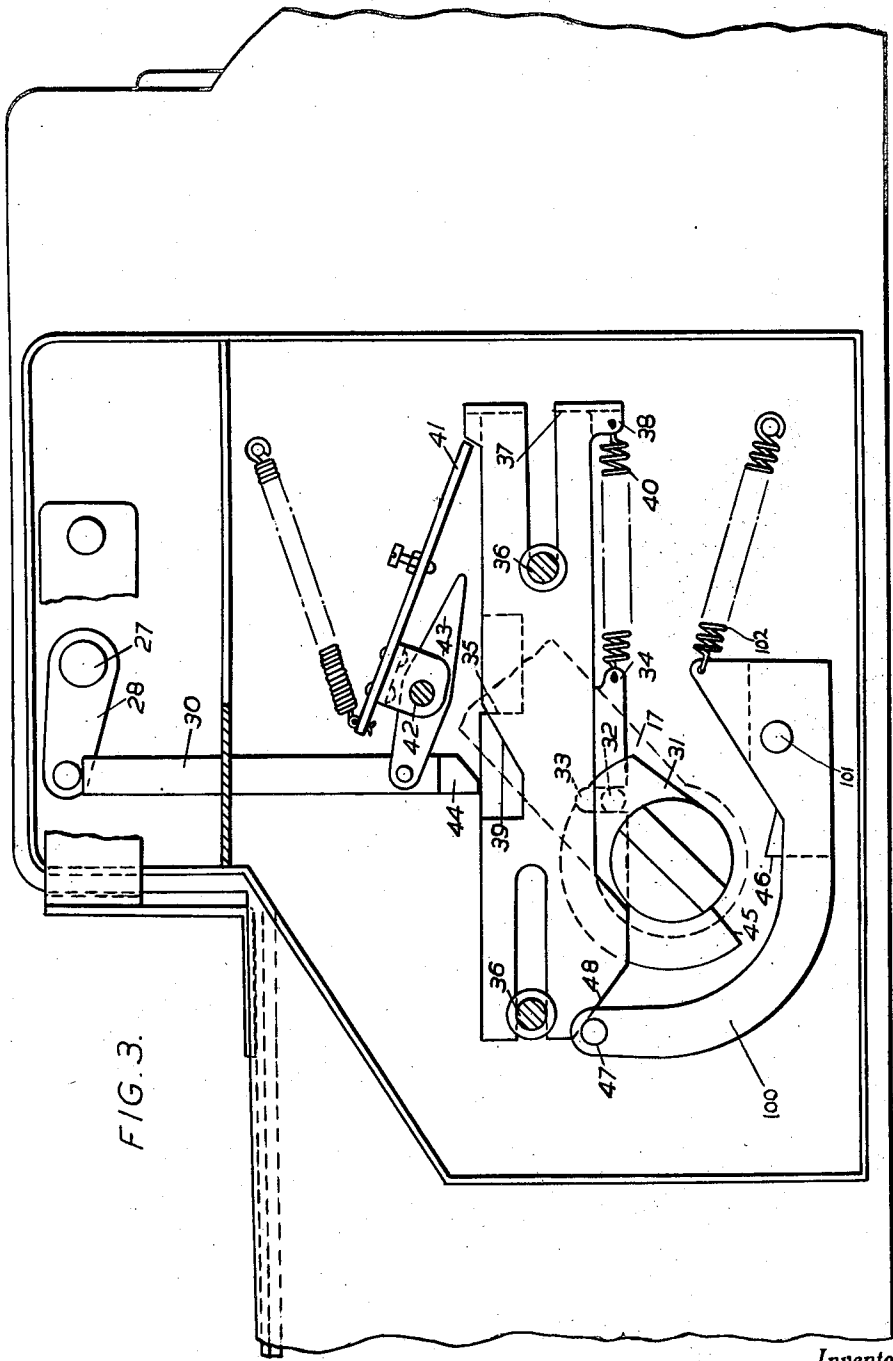


FIG. 3.

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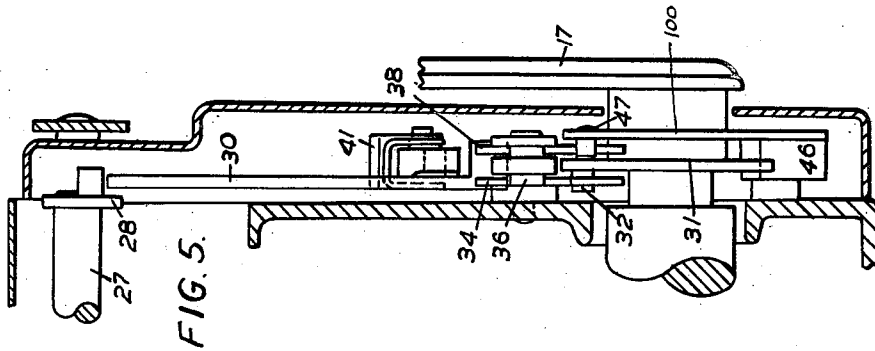
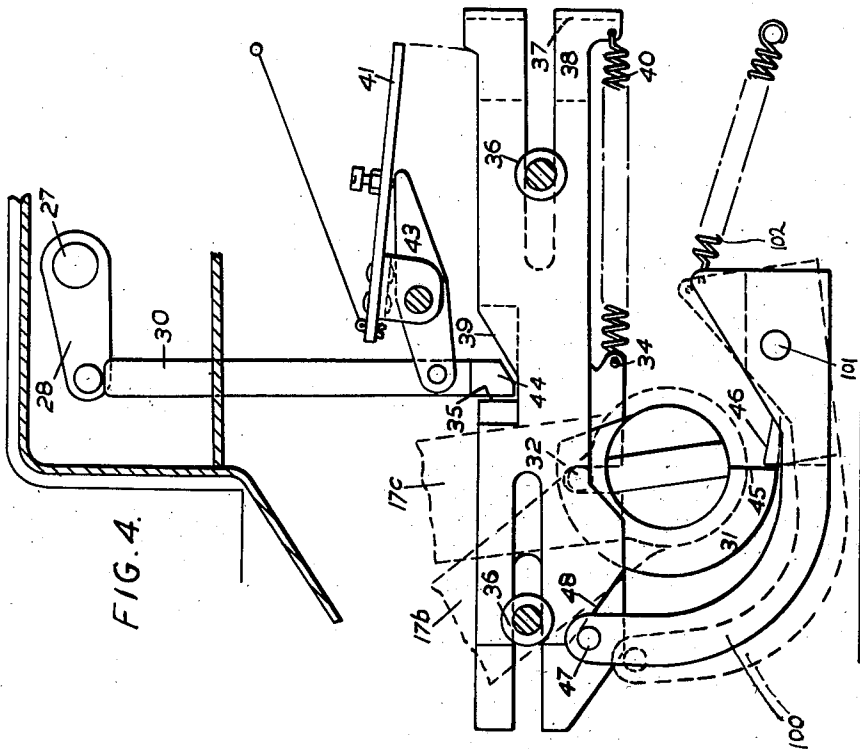
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PRINTING DEVICE IN AUTOGRAPHIC REGISTER

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5 Sheets-Sheet 4



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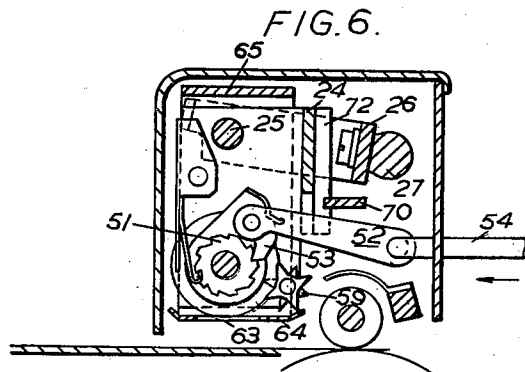
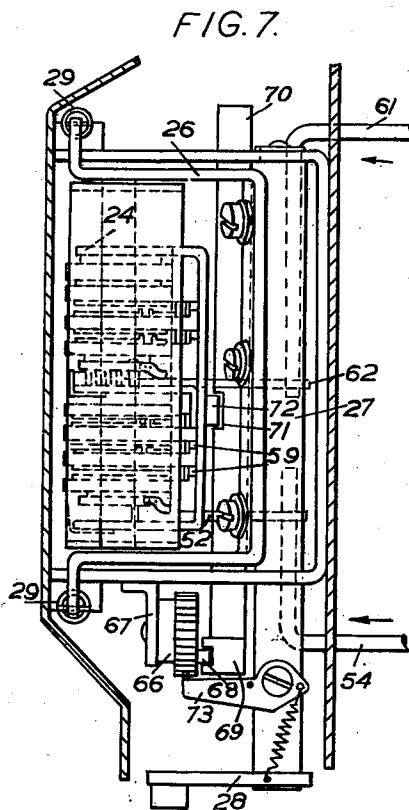
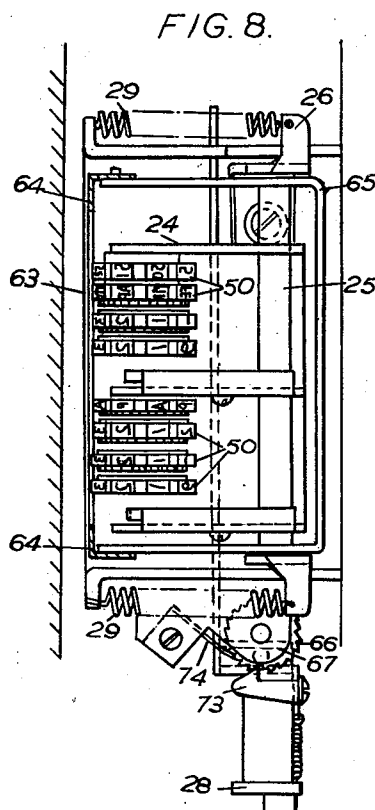
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2,632,385

PRINTING DEVICE IN AUTOGRAPHIC REGISTER

Filed March 3, 1950

5 Sheets-Sheet 5



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UNITED STATES PATENT OFFICE

2,632,385

PRINTING DEVICE IN AUTOGRAPHIC REGISTER

Alexander Adolphus Carlo Degen,
Harrow, EnglandApplication March 3, 1950, Serial No. 147,339
In Great Britain March 7, 1949

3 Claims. (Cl. 101—90)

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This invention relates to autographic registers of the type comprising a casing forming a compartment adapted to house a plurality of superimposed webs of paper forms, manually operable means for feeding said forms step-by-step in unison across a writing platen and through a second part of the register to a delivery point, and a printing member mounted in said second part and adapted to print information, such as the time and date of issue, consecutive number or other data on said forms each time said forms are advanced to a point intermediate said writing platen and delivery point. The webs of forms may be carbon backed or interleaved with carbon papers.

One of my principal objects is to provide such a register in which the printing member is itself movable as a unit towards said forms to print the information thereon even though said member comprises figure wheels adapted to be advanced by a clock to print the time and date of issue of said forms.

Another of my objects is to provide new mechanism for controlling the actuation of said printing member.

A further object is to provide means for causing said printing member to print the desired information on relatively different parts of consecutive forms in order to ensure maximum usage of the printing medium such as an inked or carbon impregnated ribbon or paper interleaved and positioned over said webs.

These and other objects will be more readily understood by reference to the annexed drawings which illustrate, by way of example only, one embodiment of my invention. In the annexed drawings:

Fig. 1 is a sectional side elevation of the apparatus.

Fig. 2 is a corresponding plan view with parts of the top cover removed.

Fig. 3 is a fragmentary side elevation of the autographic register with the side cover removed showing the interconnecting mechanism between the manually operated feeding lever and the operation of the printing member.

Fig. 4 is similar to Fig. 3 showing the position taken up by the mechanism when the manually operable feeding lever has been moved into its predetermined position for effecting the printing operation.

Fig. 5 is a sectional end view of the apparatus shown in Fig. 4.

Fig. 6 is a sectional side elevation of the printing member and associated mechanism.

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Fig. 7 is a plan view of the printing member and associated mechanism.

Fig. 8 is a front elevation of the printing member and associated mechanism.

Referring to the drawings Figs. 1 and 2 the autographic register illustrated comprises a casing 1, which is divided by a central baffle 2, to provide two compartments 3 and 4. A pack of two or more interleaved paper webs of forms 5, is placed in the compartment 3, the number of webs in the example illustrated being three, and these are drawn through a dividing grid 6 over a writing platen 7, and under an apertured guide plate 8, between a roller 9 and feed discs 10 whence the lower copy is fed down under a dividing lip 11 into the compartment 4, access to which can only be gained by unlocking a hinged door 12, whilst the two upper copies are fed out through an aperture 13 in the top cover 20 14 where the forms can be severed from the strips by tearing against a cutting edge 15 constituting the lower edge of the front member of the aperture 13.

A roll comprising one or more strips of duplicating carbon sheets, which in the example illustrated would be two, is positioned at 16 and the carbon strips are drawn from the roll laterally across the writing platen 7 to interleave the sheets of the strips of forms, one between the lower and middle sheet and one between the middle and upper sheet and are clamped by a guard plate 8 in this position. These provide for the duplication of the writing on the top sheet to the two under sheets.

The feeding of the paper webs or strips is accomplished by the manual operation of an external feeding lever 17 which is normally located in the position marked 17a in Figure 1 and is adapted to be pulled into the position marked 17b, as shown by the arrow, when the paper webs are to be fed forward, that is to say, towards the dividing lip 11. A coil spring 18 is provided on the axle of the lever 17 which serves to return it to the normal position 17a after operation.

Rotation is imparted to the feed discs 10 by operation of the manual lever 17 through the medium of a toothed quadrant 19 and pinion 20 respectively secured to the lever axle and feed disc shaft and situated within the casing 1 of the machine. The pinion 20 is formed with an arcuate cut-away portion 21 in which the arc of the quadrant fits and which serves to lock the feed discs against further movement during the

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return stroke of the feeding lever, after one complete revolution has been effected. A swinging pawl 90 resting against a stop 93 is provided on the quadrant and is urged by a spring 92 to engage with a lug 91 on the pinion 20 to initiate rotation of the feed disc shaft upon the commencement of each stroke of the lever 17, the engagement of the gear teeth thereafter serving to drive the shaft for the remainder of the stroke.

A non-return pawl 22 is fitted to the casing 1 of the machine and engages with the teeth 23 of the ratchet gear fixed to the feed disc shaft and prevents any reversal of motion of this shaft and of the feeding lever 17 during its operating stroke, that is, whilst the teeth of the quadrant 19 and pinion 20 are in engagement, return of the feeding lever being only possible when the feeding stroke is completed and the cut-away portion 21 of the pinion is in the position shown in the drawing in Figure 1 with the quadrant teeth disengaged.

The printing member 24 carrying the data to be printed is situated under the top cover 14 and is pivoted on a rod 25, carried by a stirrup 26 which is secured to a shaft 27. An arm 28 is secured on the end of the shaft 27. Springs 29 are provided which tend to pull the stirrup 26 downwards thus forcing the printing member 24 onto the paper strips, but the stirrup is normally held in the lifted position shown in Figure 1 by means of a link 30 (Figure 3) which holds the arm 28 in the lifted position. A mechanism is provided, as shown in Figure 3 and as will be described hereafter, whereby the arm 28 is released and the printing member 24 is allowed to drop under the action of the springs 29 to effect the printing operation during the manual operation of the feeding lever 17 when the latter has reached such a position during its stroke that the lower edge of the forms which have previously been written on have been fed under the top cover 14 and the printing member 24, thus precluding the possibility of any further information being written thereon. The position of the feeding lever under these circumstances is shown by 17c in Figure 4.

The mechanism whereby the release of the arm 28 is effected will now be described with particular reference to Figures 3, 4 and 5. Fixed concentrically to the boss of the feeding lever 17 is a flanged disc 31 carrying a pin 32 which engages with a slot 33 formed in a sliding member 34 which is supported on two locating collars 36 fixed to the casing of the machine. The link 30 has a toe 44 which abuts against the top edge of the member 34 which is cut away to form a step 35. Consequently when the lever 17 is operated to feed the paper webs forward the pin 32 draws the sliding member 34 to the left, as viewed in the drawings, until the lever is in the position 17c, as shown in Figure 4, whereupon the toe 44 of the link 30 drops over the step 35 and the arm 28 is released, the printing member 24 being forced by the springs 29 onto the paper webs.

Adjacent the sliding member 34 is a second sliding member 38 which is influenced to follow the motion of the member 34 by means of an interconnected spring 40, but it is initially prevented from moving by a catch 41 pivoted at 42, as shown in Figure 3. Also mounted on the same pivot is the lever 43 the end of which is connected to the link 30 and therefore when the latter drops over the step 35 as shown in

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Figure 4, the lever 43 rocks, lifting the catch 41 out of engagement with the follow-up member 38 which is therefore rapidly drawn to the left in line with the member 34 by the interconnected spring 40. A slanting cam edge 39 formed on the upper edge of the member 38 engages with the toe 44 of the link 30 lifting the latter, the arm 28 and consequently the printing member 24 into the normal position again. The end of the follow-up member 38 is bent over at 37 to form an abutment against the end of the sliding member 34, thereby constraining the amount of motion of the former in relation to the latter.

It will be seen from the foregoing that, once the manually operable lever 17 has been moved into the position 17c, the dropping of the link 30 to effect the printing operation and its subsequent raising into the normal position is entirely automatic and cannot be influenced by any further operation of the lever 17, backward movement of the latter being prevented by the non-return pawl 22, shown in Figure 1, as already described.

The flanged disc 31 is formed with a radial edge 45 which abuts against a stop pawl 46 when the lever is moved into the position 17c, thereby preventing further movement of said lever. The pawl 46 is provided with an arm 100 pivoted on a shaft 101 and attached to a spring 102. The arm 100 carries a pin 47 which engages with a cam edge 48 on the follow-up member 38, and upon the motion of the latter when it is released by the catch 41, the pawl 46 is forced down out of engagement with the radial edge of the flanged disc 31 and completion of the stroke of the lever 17 into the position 17b can be effected. At the same time the spring 102 is stressed. It will thus be seen that the lever 17 is held in the position 17c until the printing operation is completed, the catch 41 lifted and the follow-up member 38 moved under the influence of the spring 40.

When the lever 17 is returned to its original position ready for the next feed movement, that is to say into the position shown in Figure 3, the pin 32 returns the member 34 whilst the toe 44 is held in the raised or inoperative position by the member 38 as the step 35 passes underneath, thereafter the arm 100 returns the member 38 to the position shown in Figure 3 ready for the next cycle of operation as before described.

Details of one form of construction of the printing member is shown in Figures 6, 7 and 8. This provides for the printing of the date and time (in hours and minutes) as, for example, "50 MR 12—P 2. 48" representing "1950 March 12th—2. 48 p.m.," but it is to be understood that the invention is not necessarily confined to means for printing this data only. The type wheels 50 are mounted on the printing frame 24 which is pivoted on and adapted to slide along the rod 25 carried by the stirrup 26 which, as has already been stated, is secured to the shaft 27, an extension of which carries the arm 28.

The "units minute" type wheel is provided with a ratchet 51 adapted to be operated step-by-step by the pawl 53 and link 52, the outer end of which is pivotally connected to the operating rod 54. The operating rod 54 is adapted to be reciprocated in the direction of the arrow by an electromagnetic solenoid 55 (Fig. 2) housed under the top cover through the medium

of the solenoid plunger 57 and bellcrank 58. The pivotal connection between the link 52 and operating rod 54 is to provide for the downward thrust of the printing frame 24 during the printing operation and the lateral sliding of the frame on the rod 25 without effecting the pulsing of the ratchet 51 by means of the operating rod 54. The solenoid 55 is adapted to be connected in the circuit of a master clock and slave system of a known type which provides for an electric impulse to be given to the solenoid once every minute.

Interconnection between the "units minute" wheel, the "tens minute" wheel, and the hour wheel is effected by customary stepped tooth transfer pinions 59.

A solenoid 56 may also, if desired, be employed to operate the "units" date wheel in a similar manner through the medium of bell crank 60, operating rod 61 and link 62. The interconnection between the "units" date wheel, the "tens" date wheel, and the months wheel being effected by similar tooth transfer pinions to those shown at 59.

Printing on the upper web or strip of forms is effected through a length of carbon impregnated ribbon 63, as used for instance in typewriters, which is stretched across a gap formed in a ribbon holder frame 64, the ends of the ribbon being attached by means of a clip or gumming to the two ends of the frame 64. A stirrup 65 is pivotally mounted on the rod 25 to span the printing frame 24 the ends of which are provided with pins on which the ribbon holder 64 can be clipped. Printing on the lower webs or strips of forms is effected through the interleaved duplicating carbon sheets drawn from the roll 16 already described, the roll being of such a length as to extend under the path of the printing frame 24.

So as to ensure that the printing impression takes place on a fresh portion of carbon ribbon and interleaved carbon sheets at each stroke means are provided for automatically moving the printing frame 24 step-by-step laterally to and fro along the rod 25. For this purpose a ratchet wheel 66 is mounted to rotate on a pivot pin projecting from a frame 67 secured to the body of the machine. The ratchet is provided with an eccentrically mounted pin 68 which engages with a slot formed in a cross-head 69 connected to a slide 70 which is slotted at 71 to engage with a member 72 secured to the printing frame 24. Rotation of the ratchet causes the slide 70 to travel to and fro and this motion is imparted to the printing frame 24 by means of the member 72. Step-by-step rotation of the ratchet is effected by means of a spring tensioned pawl 73 mounted on the shaft 27, oscillation of which at each printing stroke causes the pawl to step the ratchet one tooth. A non-return pawl 74 is provided.

I claim:

1. An autographic register comprising a casing forming a compartment adapted to house a plurality of superimposed webs of paper forms, manually operable means for feeding said forms step-by-step in unison across a writing platen and through a second part of the register to a delivery point, a movable spring-loaded printing member mounted in said second part above the path of said forms and adapted to print information thereon, a movable step-shaped member which is adapted to hold said printing member

inoperative against its spring loading, a movable cam member connected to said step-shaped member by a spring which is unstressed when said printing member is held inoperative, an interconnection between said feed means and said step member adapted to move said step member to release said printing member for a printing stroke and to stress said cam spring each time said forms are advanced to a point intermediate said platen and delivery point, and means for preventing movement of said cam by said stressed spring until after each printing stroke has taken place, said cam being thereafter operative to return said printing member to said inoperative position.

2. An autographic register according to claim 1, and comprising means for reciprocating said printing member in a series of steps across the path of said forms whereby printing is effected on relatively different parts of consecutive forms.

3. An autographic register comprising, a casing forming a compartment adapted to house a plurality of superimposed webs of paper forms, manually operable means for feeding said forms step-by-step in unison across a writing platen and through a second part of the register to a delivery point, printing means movably mounted in said second part above the path of said forms and adapted to print information thereon, a first spring normally urging said printing means toward said platen, releasable and return means normally holding said printing means inoperative against said first spring, and adapted to release said printing means for a printing stroke when said forms are in an advanced position and thereafter to return said printing means, said releasable and return means comprising, a pair of slides engaging said printing means, a second spring interconnecting said slides, the first slide being connected to said manually operable means for sliding movement in a first direction to release said printing means for a printing stroke, said spring being stressed due to said movement of said first slide to urge the second slide in said first direction, detent means holding said second slide against the action of said second spring, means responsive to the completion of the printing stroke for releasing said detent means, and means on said second slide for engaging and returning said printing means against the action of said first spring upon movement of said second slide in said first direction under the action of said second spring.

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