B. P. HAYES.

PRINTER TABLE FOR REGISTERS AND THE LIKE.

APPLICATION FILED APR. 22, 1920.

1,362,792. **Patented Dec. 21, 1920.**

4 SHEETS—SHEET 1.

Fig. II.

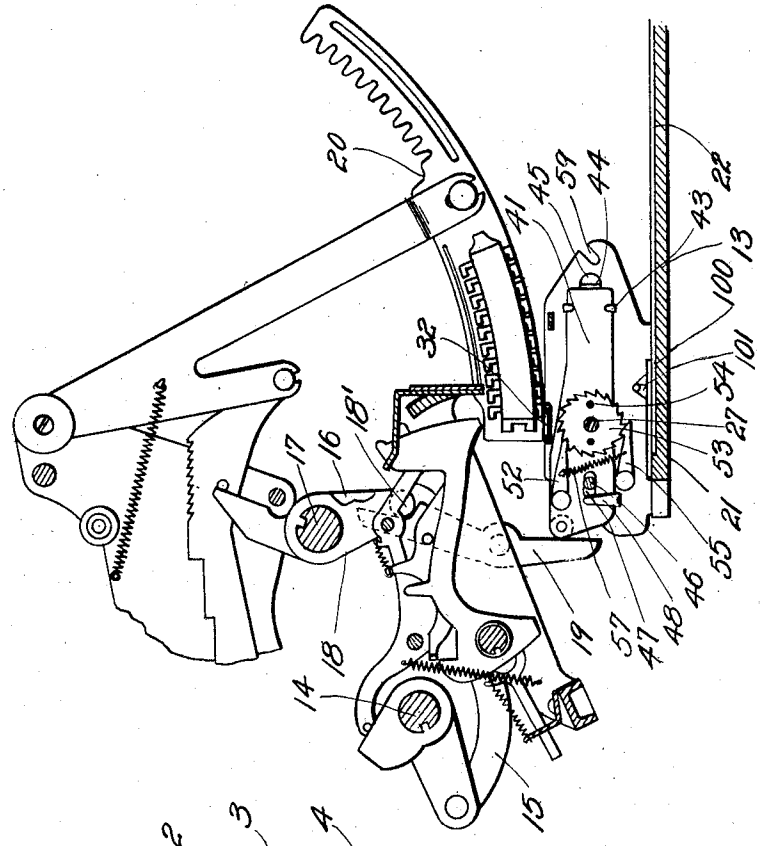
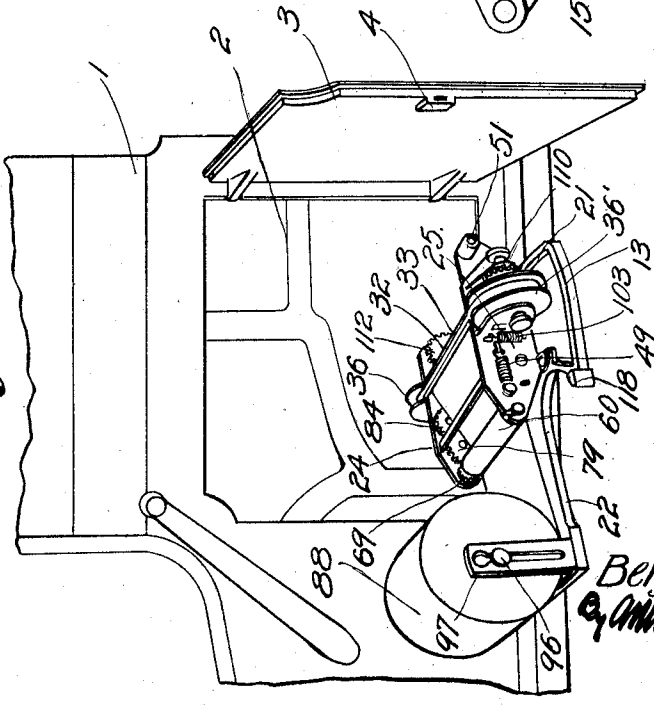


Fig. I.



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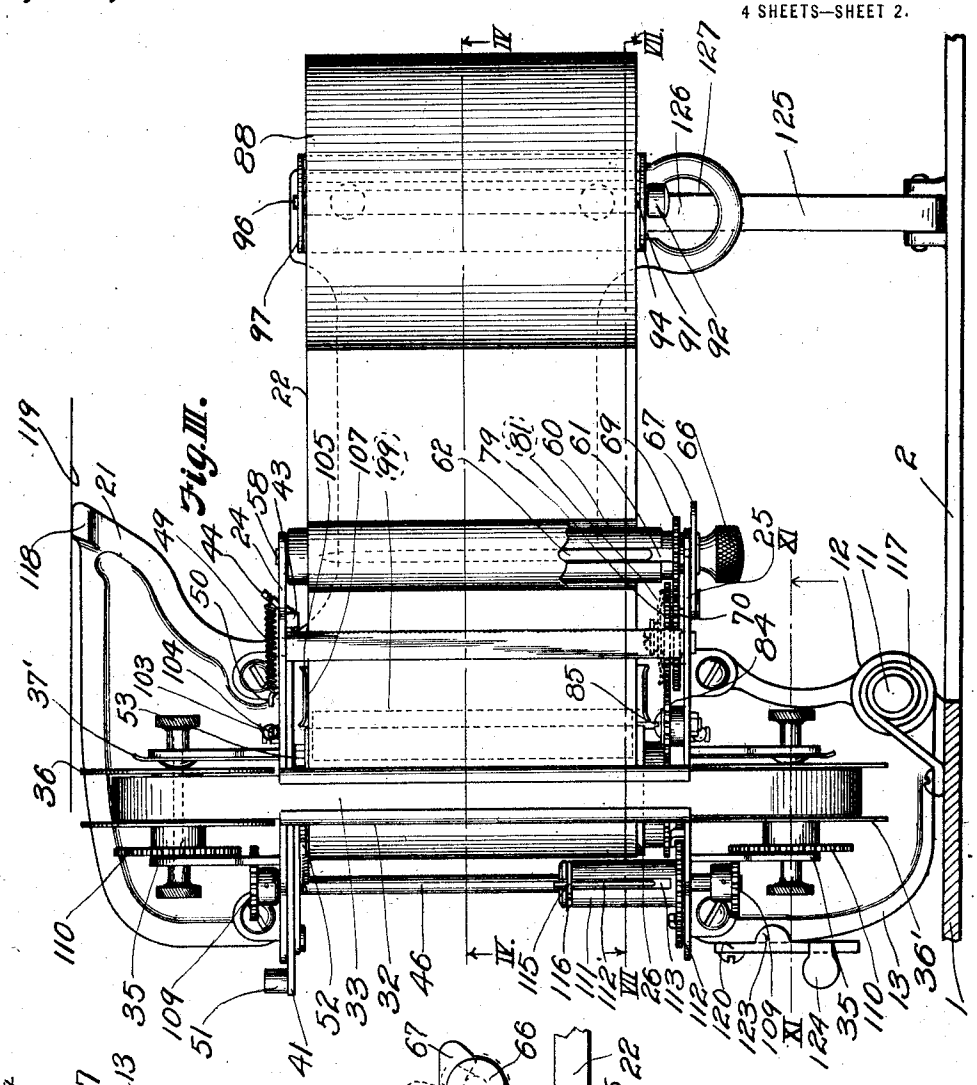


Fig. III.

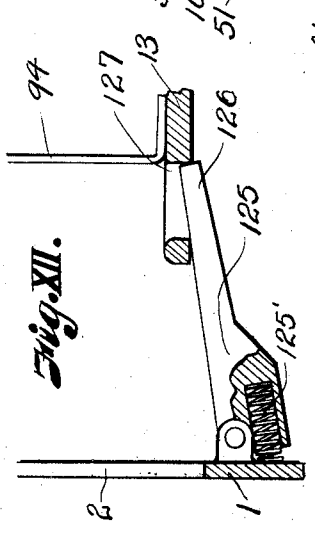


Fig. XII.

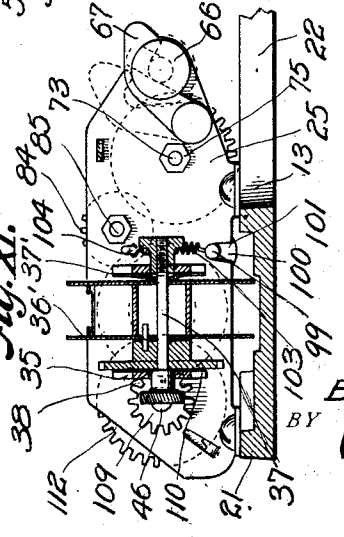


Fig. XI.

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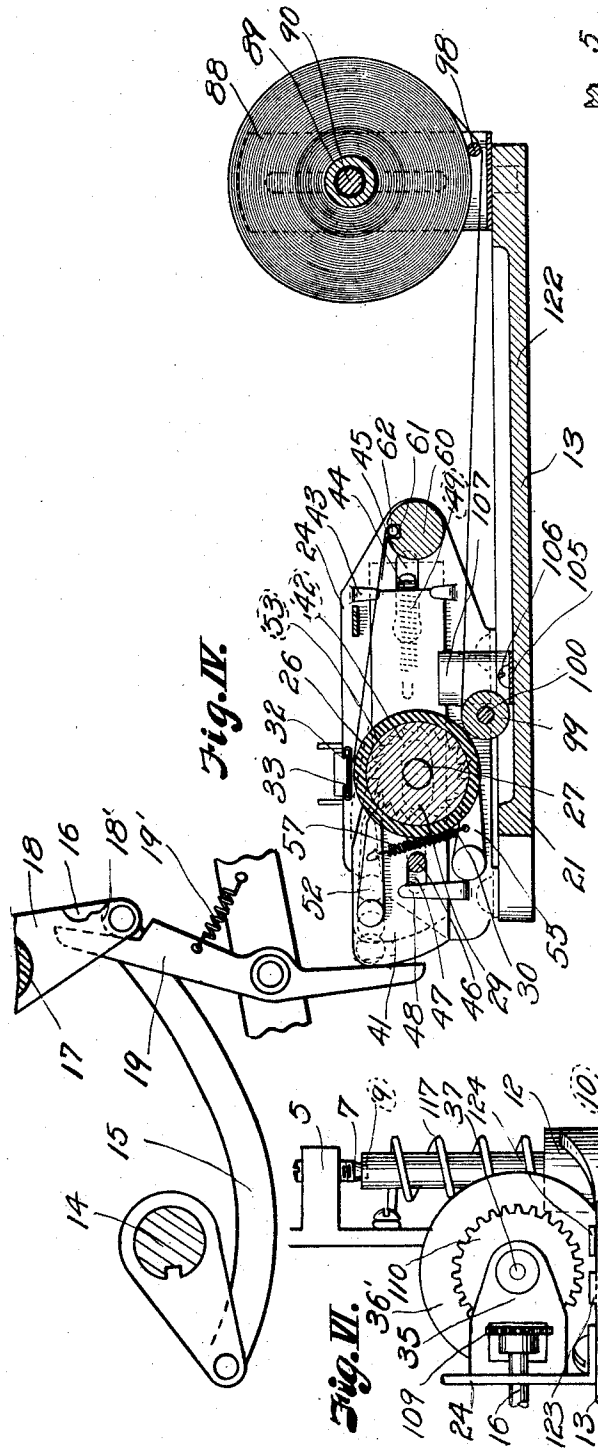


Fig. IV.

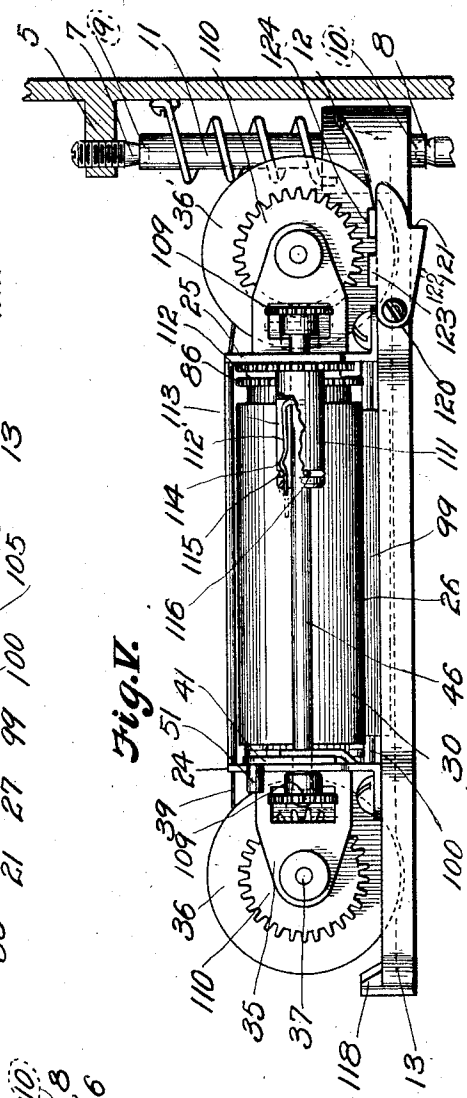


Fig. V.

Fig. VI.

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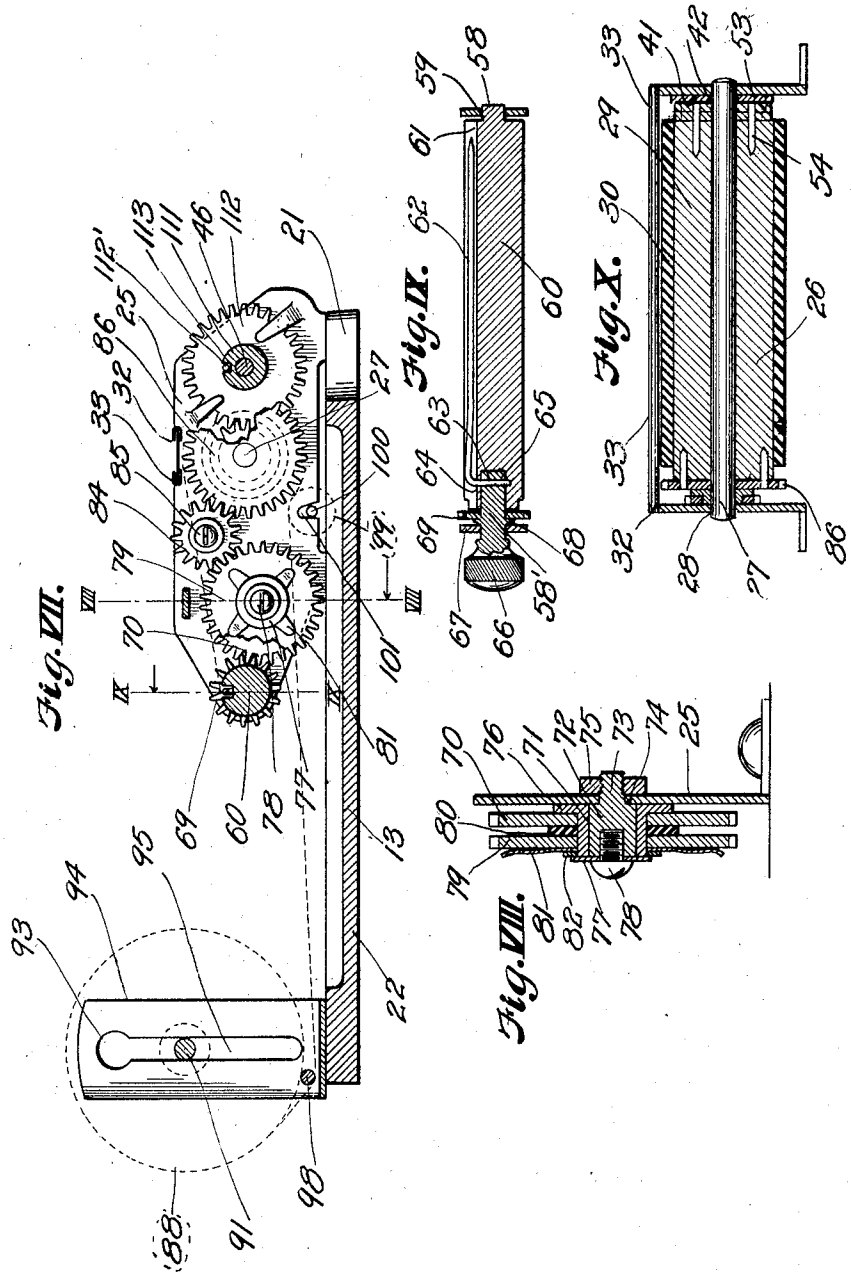
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4 SHEETS—SHEET 4.



INVENTOR

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UNITED STATES PATENT OFFICE.

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PRINTER-TABLE FOR REGISTERS AND THE LIKE.

1,362,792. Specification of Letters Patent. Patented Dec. 21, 1920.

Application filed April 22, 1920. Serial No. 375,745.

To all whom it may concern:

Be it known that I, BENJAMIN P. HAYES, a citizen of the United States, residing at Kansas City, in the county of Jackson and State of Missouri, have invented certain new and useful Improvements in Printer-Tables for Registers and the like; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters and figures of reference marked thereon, which form a part of this specification.

My invention relates to printer tables for register or like machines, and particularly for machines of the type shown in the application of myself and Frank D. Laughlin, for "Accounting machines," filed August 7th, 1916, Serial No. 113,656, the present invention relating particularly to the printer table and its operating mechanism as distinguished from the broad combination of the table with the register mechanism.

In machines of the character stated, comprising register and printing mechanisms, type for printing the entries made in the machine must be carried in substantial proximity to the operating parts, in order to form a compact machine, and consequently the paper strip and the inked ribbon forming the printer unit, must be located so close to the other parts of the machine that it is inconvenient to remove the strip after the record is made, or read the strip prior to its removal.

In machines of this character the printer unit is also usually assembled with the other operating mechanism within a closed case, in order to prevent access to the record and tampering with the machine.

It is the object of the present invention to provide an improved, separate printer unit which may be assembled in proper relation to the type and operating mechanisms and easily and accurately operated from the register mechanism.

In accomplishing this object, I have provided improved details of structure, the preferred forms of which are illustrated in the accompanying drawings, wherein,

Figure I is a perspective view of a portion of the case of a register or like machine, particularly illustrating the relation of the printer unit to the main operating mechanism of the register.

Fig. II is a vertical section of the printer unit and parts of the type mechanism, illustrating the relation of the unit to the type carrying and striking parts.

Fig. III is an enlarged plan view of the unit, part of the rewound paper strip being broken away for better illustration.

Fig. IV is a vertical, longitudinal section on the line IV—IV, Fig. III, and showing the operative relation between the printer unit and register mechanism.

Fig. V is an end view of the unit, a part of the ribbon-shift clutch being broken away.

Fig. VI is a detail elevation of the table mounting, particularly illustrating the latch for holding the table in exposed position.

Fig. VII is a vertical, longitudinal section on the line VII—VII, Fig. III.

Fig. VIII is an enlarged, vertical section on the line VIII—VIII, Fig. VII, particularly illustrating the frictional rewind drive.

Fig. IX is a longitudinal section of the rewind roller.

Fig. X is a longitudinal section of the platen and ribbon guide.

Fig. XI is a vertical section on the line XI—XI, Fig. III, particularly illustrating a ribbon drum and its operating mechanism.

Fig. XII is a detail view of the lock for locking the table in functional position.

Referring more in detail to the drawings;

1 designates the case within which the operating mechanism of the main machine and the printer unit are housed, and which is provided with an opening 2, through which the printer unit may be moved when the paper strip is to be observed or removed, the opening being normally closed by a door 3, having a lock 4 whereby the interior of the cams may be protected.

Mounted on and extending inwardly from the side-wall of the case 1, adjacent one edge of the door opening, are upper and lower lugs 5—6 (Fig. VI) carrying point bearings 7—8, adapted for seating in sockets 9—10, in the ends of a pin 11. Fixed on the pin near the lower end thereof, is a boss 12, which is formed integrally with a table 13, that carries the printer mechanism, as hereinafter described.

The register mechanism, with which the

printer is adapted for use, comprises a main crank shaft 14, and operable from the main crank shaft is a link or pitman 15, having a connection through an arm 16 with a secondary shaft 17. Fixed on the secondary shaft is an arm 18 having a stud 18′ engagable, upon return movement of the crank shaft, with one arm of a lever 19; the lever 19 being held in engagement with the stud 18′ by the spring 19′, the other arm of which is adapted for abutment against an operating part of the printer unit to effect advance of the printer platen and inked ribbon. The arrangement and construction of the operating levers need not necessarily be of the exact construction and arrangement shown, as any suitable mechanism for operating the printer from the main machine may be utilized, providing there is no fixed or permanent connection between the operating mechanism and printer that would interfere with the free movement of the printer to and from functional position.

I have also illustrated type sectors 20, which may be operated from the main machine to strike selected type against the inked ribbon, in order to effect printing on paper strip. The preferred form of mechanism for operating the type sectors is that shown in the present drawings and fully illustrated in the joint application heretofore mentioned, but I do not wish to limit myself to any particular form of type nor operating mechanism therefor.

The table 13 comprises a body portion 21, which extends transversely of the main machine when the table is in functional position, and an L 22, the body carrying the platen and associated parts, and the L supporting the roll of paper strip which is fed to the platen.

Fixed on the body of the table and extending transversely thereof, are spaced, vertical plates 24—25. Rotatably mounted in said plates is a platen 26, having a shaft 27 located in apertures 28 in the plates 24—25, the platen preferably comprising an interior wooden body 29, and a hard rubber surface 30.

Also mounted on the plates 24—25 and extending transversely across the frame formed thereby, is a ribbon guide 32, preferably formed from a piece of strap metal, having its edges turned back to form the groove or guideway 33, and having a central portion of the body part cut away to expose the platen and the paper strip when the latter is in place.

Mounted on the outer face of each of the plates 24—25 is a yoke 35, and rotatably mounted in said yokes are ribbon drums 36—36′ of ordinary construction, having an axle 37 rotatably mounted in bearing apertures 38 in the yoke arms, the arms being preferably reinforced at the mountings to provide extended surfaces for the axle bearings.

An inked ribbon 39 has its ends fixed to the drums 36—36′ respectively, to wind and rewind thereon, as will presently be more fully described.

Located adjacent the frame plate 24 is a reciprocatory bar 41, having a slot 42, through which the platen shaft 27 projects to anchor the central portion thereof, the rear end of the bar being guided by the keeper lips 43 that are stamped from the plate 24, and by an ear 44, that is bent upwardly from the end of the bar and is movable in a slot 45 in the plate 24. The forward end of the bar is guided by a shaft 46 (presently described) that extends through a slot 47 in the bar, and by a keeper lip 48, which is stamped from the frame plate 24 and bent up along the inner face of the bar. The bar 41 is yieldingly urged rearwardly, *i. e.*, toward the main operating mechanism, by a spring 49, which is connected at one end with the ear 44 and at the other with a hook 50 that is stamped outwardly from the plate 24, the forward projection of the bar being limited by engagement of the forward end of the slot 47 with the shaft 46, but such projection being sufficient to effect engagement of a stud 51 with the free end 19 of the rocking lever.

Pivotally mounted on the bar 41 is a push pawl 52, the tooth of which lies on a ratchet wheel 53 that is fixed on the platen roll 26, preferably by the pins 54, so that when the bar 41 is moved forwardly upon operation of the main machine, the push bar will advance the platen one space, return movement of the bar, under tension of its spring, dragging the push pawl back ready for a succeeding operation.

Pivotally mounted on the frame plate 24 is a lock pawl 55, the tooth of which engages the ratchet wheel 53 from beneath and is adapted for coöperation with the push pawl to prevent overthrow of the platen, the two pawls being connected by the spring 57, so that both are yieldingly tensioned to engagement with the ratchet wheel, the push pawl yielding as it is dragged back to initial position over the teeth on the ratchet wheel, and the locking pawl yielding as the ratchet wheel is advanced.

Rotatably mounted at the forward end of the frame plates, by studs 58—58′, which seat in bearing apertures 59 in said plates, is a take-up roll 60, having a longitudinal groove 61, within which is located a finger 62, preferably of spring wire, and beneath which the end of the paper strip is located to anchor the strip to the roll. The preferred construction and arrangement of the finger is that shown in Fig. IX, wherein the laterally turned end 63 of the finger is extended into aperture 64 in the roll, and

through an aperture 65 in the stud 58′, thereby not only anchoring the finger but also serving to hold the stud in place. The stud 58 is preferably enlarged at its exposed end and knurled to form a handle 66, whereby the roll may be manually operated.

To provide for easy application and removal of the take-up roll, I have preferably elongated the shaft portion of the stud 58′ and opened the aperture 59, within which that stud is seated, in order that the roll may be lifted from the frame at that end and withdrawn from the plate, a latch 67 being pivoted on the frame plate 25 to seat over the stud and retain the same in place and prevent its accidental removal from its mounting during operation of the machine. The latch 67 is slotted to fit over the stud on the take-up roll, and the stud 58′ is provided with a collar 68, between which and the platen 25, the latch is adapted to seat, but also to prevent longitudinal movement of the roll and thereby retain the gear connection, hereinafter described.

Fixed on the take-up roll, adjacent the plate 25, is a pinion 69, which meshes with an idle gear wheel 70 rotatably mounted on a bushing 71, carried by stud 72, that is attached to the plate 25, preferably by a threaded shank 73 whereby the shoulder of the stud is held firmly against the inner face of the plate. The bushing has a washer 76 at its outer end, bearing against the inner face of the plate 25 spacing the gear wheel 70 therefrom, the bushing being held in place by a washer 77 that is locked to the end of the stud 74 by a screw 78.

Also rotatably mounted on the bushing 71 is a gear wheel 79, having frictional driving relation with the wheels 70, through a friction washer 80, against which the gear 79 is pressed by the spring 81 that is held against the gear wheel 79 by the washers 82 and 77. This frictional driving mechanism is provided for the reason that the diameter of the strip on the take-up roll is constantly increasing while the advancing thrust of the roll is constant and slippage must be provided in order to effect uniform feed of the strip through the printer.

The slip gearing just described is operated from the platen through an idle pinion 84, that is rotatably mounted on a stud 85 on the frame plate 25, and meshes with the gear wheel 79 and with a gear wheel 86 fixed on the platen shaft, so that whenever the platen is advanced by the push pawl, as heretofore described, the take-up roll is also advanced one step to wind up the paper strip and present successively fresh surfaces of the strip at the printing position.

The paper strip is contained in a roll 88, wound on a hollow roller 89, that is rotatably mounted on a shaft 90, one end of which is circumferentially grooved to form the neck 91 and head 92, the latter being adapted for projection through an opening 93, in a standard 94, at the front of the table, and the neck 91 for travel in the vertical slot 95 in said standard and communicating at its upper end with the opening 93. The opposite end of the shaft is reduced to form the stud part 96, which is adapted for guided travel in the standard 97 opposite the standard 94.

Extending transversely between the standards 94 and 97, is a guide rod 98, upon which the roll of strip rests and revolves, and beneath which the strip is run on its way to the platen and take-up roll.

Another strip guide is located adjacent the platen and comprises a roll 99, having a central shaft 100, the respective ends of which are rotatably mounted in slots 101 in the lower edges of the plates 24 and 25, the said lower edges being recessed adjacent the slots to provide for the installation and removal of the roll studs, and the body portion of the plate being hollowed out to accommodate the body of the roll. The slots 101 open downwardly but the studs are retained therein by springs 103, having their respective ends connected with the roll studs and with hooks 104 stamped from the frame plates 24 and 25.

105 designates a strip guide, located adjacent the guide roll 99, and preferably comprising a strip of sheet metal secured to the table 13 by screws 106, the opposite ends 107 of which are turned up to form a guide-way, and bent outwardly to provide smooth bearing surfaces for the plate during its travel therebetween.

Referring now to the ribbon wind and reversing mechanism:—

The shaft 46, which has heretofore been mentioned as a guide and stop for the reciprocatory bar 41, extends through the plates 24 and 25 and carries at its opposite ends the pinions 109, adapted for meshing with the crown wheels 110 that are fixed on the ribbon drums 36—36′, according to position of the shaft, the location of the pinions relative to the crown wheels being such that but one pinion at a time can mesh with its crown wheel.

Loosely mounted on the shaft 46 is a sleeve 111, having a gear wheel 112 meshing with the gear wheel 53 on the platen, so that when the platen is advanced the sleeve 111 is rotated. The shaft 46 is longitudinally movable in the sleeve 111 but keyed thereto by a spring finger 112′, one end of which is fixed to the shaft, and the body of which is located within a longitudinal slot 113 in the sleeve, so that when the sleeve is rotated a side of the sleeve bears against the spring finger and moves the shaft around with it. The spring finger has a hump 114 at its free

end, coöperating with an abutment 115 on the sleeve, here shown to comprise a wire 116 that is fixed to the sleeve and bridges the slot 113. With this arrangement the hump may be locked on either side of the abutment to retain either of the pinions 109 in mesh with the crown wheel on the respective ribbon drums. No means is shown for automatically shifting the reversing shaft, as it may be moved manually, as required. It is apparent that as the pinions on the shaft 46 both engage the crown wheels at the sides adjacent the frame, the respective drums will be operated in different directions, so that the drums are both revolved outwardly to properly wind the ribbon thereon. The drums comprise frictional devices 37′, for retarding their movement while unwinding.

It is important that the printer unit retain a fixed relation to the type and main operating mechanism while the machine is in use, and for this purpose I provide for yieldingly urging the unit to this functional position. Such means comprises a spring 117 (Figs. III, V and VI), one end of which is attached to the case 1 and the other to the table 13, so that when the table is moved on its pivotal mounting to project it through the door opening in the case, the spring is tensioned and will automatically return the table to functional position as soon as the table is released, the inward movement of the table being limited by engagement of a heel 118 on the table, with a dividing plate or the like 119 in the case. In order to hold the table in extended or "open" position, I provide a latch 120, which is pivoted on the rear edge of the table and has a shoulder 121 for engaging the edge of the case 122 at the bottom of the door opening, the latch being free to move by gravity and having an inclined lower edge 122′ adapted for movement over the edge of the case to permit the latch to seat, having a stop ear 123 for engaging the top of the table to limit the downward movement of the latch, and having a handle 124 whereby the latch may be lifted when the table is to be replaced.

In order to lock the table in functional position, I provide a latch 125, which is yieldingly urged upwardly from the floor of the case 1, by the spring 125′ and has a head 126, adapted to seat in the socket 127 that projects laterally from the free end of the table. With this arrangement, when the table is swung inward the latch is displaced to effect its seating in the socket, and when the table is to be moved to exposed position, the latch may be depressed to permit the table to pass thereover.

Assuming the parts to be constructed and assembled as described, the operation may be briefly described as follows:

With each operation of the crank shaft of the main machine, the rocking lever butts against the reciprocatory bar to operate the push pawl and advance the platen. When the platen is revolved by the push pawl, it operates the gearing, including the slip gears whereby the platen is connected with the take-up roller, and rotates the roller a determined distance. The paper strip, being secured to the take-up roll, is drawn forward, presenting a fresh surface for the type which operate at such periods during the operation of the machine that there will be no interference between the advancing tape and the striking of the type.

The paper strip is drawn from a supply roll carried on the spaced standards at the end of the L portion of the table and run through the printer unit to the take-up roll, the supply roll being sufficient to provide paper strip for a considerable period, and thus located in a part of the machine where the space for containing it is available.

It is customary for the strip showing each day's business to be removed at the end of the day, therefore, the diameter of the rolled up strip is not sufficient to interfere with, or crowd the mechanism adjacent the rear end of the table while the parts are in operation.

When the strip is to be removed at the end of a day or any other period, the case is unlocked, the latch 125 depressed to free the table, and the front end of the table, *i. e.*, the L portion, swung out through the door opening against the tension of the spring 17, the latch 121 engaging the case to hold the table against the tension of the spring to permit the operator to release the table while withdrawing the strip.

When the printed portion of the strip is removed and the free end again attached to the take-up roll, the latch 121 may be released and the spring 17 will automatically swing the table back to functional position, depressing the latch 125 so that it will automatically reassume its locking relation with the table and hold the table in proper relation to the rocking lever and type sectors.

While I have mentioned the withdrawal of the table for the purpose of removing the printed strip, it is apparent that the table may be exposed (as described) at any time during the day when it is desired to read any entry on the strip. Removal of the table through the opening in no way affects the entries, nor the operation of the register mechanism.

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

1. In combination with register mechanism including character indicia adapted for movement to a definite impression line, a

printer unit movable as a unit with respect to the register mechanism and having a platen registering with the impression line of the character indicia when the unit is in functional position, strip advancing mechanism in said unit comprising a push member, and a push member in the register mechanism engageable with that in the printer unit to advance the strip.

2. In combination with register mechanism including character indicia adapted for movement to a definite impression line, a printer unit movable as a unit with respect to the register mechanism and having a platen registering with the impression line of the character indicia when the unit is in functional position, strip advancing mechanism in said unit comprising a push member, and a push member in the register mechanism independent of that in the unit and adapted for abutment thereagainst when the register mechanism is operated, to advance the paper strip.

3. In combination with register mechanism including character indicia movable to a definite impression line, a printer unit comprising a pivotally mounted table, a platen on the table, registering with said impression line when the unit is in functional position, means on the table for advancing the strip, means in the registering mechanism for actuating the strip advancing means, and means yieldingly urging the printer unit to functional position.

4. In combination with register mechanism including character indicia movable to a definite impression line, a printer unit comprising a pivotally mounted table, a platen on the table, registering with said impression line when the unit is in functional position, means on the table for advancing the strip, means in the registering mechanism for actuating the strip advancing means, means yieldingly urging the printer unit to functional position, and a latch for retaining said unit in non-functional position.

5. In combination with register mechanism including character indicia movable to a definite impression line, a printer unit comprising a table movable independently of the register mechanism, a platen rotatably mounted on the table and adapted for registration with the impression line, means on the table for advancing a paper strip, a reciprocatory bar in actuating relation to the platen and strip advancing means, main operating mechanism in the register mechanism, means operable by the main operating mechanism for actuating the character indicia, and other means operable by the main actuating mechanism for abutment against the reciprocatory bar to rotate the platen and advance the paper strip.

6. In combination with register mechanism including character indicia movable to a definite impression line, a pivotally mounted table, means yieldingly urging the table to functional position, a platen rotatably mounted on the table, and adapted for receiving impact of the character indicia, means on the table for supporting a paper strip roll, means for advancing the platen and paper strip roll and means operable from the register mechanism for operating said actuating means when the table is in functional position.

7. In combination with register mechanism comprising character indicia, a main operating mechanism and a case inclosing said mechanism and having an opening therein, a pivotally mounted table normally located within the case and movable through said opening, a platen on said table adapted for registration with the impression line when the unit is in functional position, paper strip supply and take-up members on the table, means in the register mechanism for actuating the take-up members and platen, means operable from the register mechanism for operating said last named means, and yielding means urging the table to functional position.

8. In combination with register mechanism comprising character indicia, a main operating mechanism and a case inclosing said mechanism and having an opening therein, a pivotally mounted table normally located within the case and movable through said opening, a platen on said table adapted for registration with the impression line when the unit is in functional position, paper strip supply and take-up members on the table, means in the register mechanism for actuating the take-up member and platen, means operable from the register mechanism for operating said last named means, yielding means urging the table to functional position, and a latch for retaining the table in extended position against the tension of said spring.

9. In combination with register mechanism comprising character indicia and an inclosing case having a door opening, a vertical shaft pivotally mounted adjacent one edge of the door opening, a table mounted on said shaft adapted to swing therewith to project a portion of its body through said opening, a spring fixed to the case and to the table to yieldingly urge the table to functional position within the case, paper strip advancing and backing members mounted on the table, and means operable by the register mechanism for actuating the strip advancing members.

10. In combination with register mechanism comprising character indicia adapted for movement to a definite impression line and an inclosing case having a door opening, a vertical shaft pivotally mounted adja-

cent one edge of the door opening, a table mounted on said shaft adapted to swing therewith to project a portion of its body through said opening, a spring fixed to the case and to the table to yieldingly urge the table to functional position within the case, paper strip advancing and backing members mounted on the table, means operable by the register mechanism for actuating the strip advancing members and a latch pivotally mounted on the table and adapted for engagement with a portion of the case to retain the table in extended position against the tension of said spring.

11. In combination with register mechanism including character indicia adapted for movement to a definite impression line and a case inclosing the mechanism and comprising a door opening, vertically spaced lugs on the case adjacent one edge of the door opening, point bearings on said lugs, a shaft pivotally mounted on said point bearings, a table fixed on said shaft and adapted for projection through the door opening, a spring fixed to the case and to the table to yieldingly urge the table to functional position within the case, paper strip supply and take-up members on said table, a platen on the table for receiving impact from the character indicia when the table is in functional position, and means operable from the register mechanism for actuating the strip advancing means.

12. In combination with register mechanism including character indicia and comprising a case for inclosing the mechanism, provided with a door opening, a table pivotally mounted in said case, adapted for projection through said opening and provided with a latch socket, a spring urged latch yieldable to permit return of the table and settable in said socket to retain the table in functional position, paper strip and backing members on the table, and means operable by the register mechanism for actuating said members.

13. In combination with register mechanism including character indicia, a printer unit movable independently of the register mechanism to and from functional position, comprising strip advancing mechanism, including a reciprocatory bar, a rocking lever having an arm adapted for abutment against the bar, and means operable from the register mechanism for actuating said lever.

14. In combination with register mechanism including character indicia, a printer unit movable independently of the character mechanism and comprising a platen adapted to receive impacts from the character indicia, paper strip and take-up rolls, a reciprocatory bar, a push pawl on said bar engageable with the platen to advance the same, means operable from the platen for actuating the take-up roll, a rocking lever having an arm adapted for abutment against said bar, and means operable from the register mechanism for actuating said rocking lever.

15. In combination with register mechanism including character indicia adapted for movement to a definite impression line, a printer unit comprising a pivotally mounted table, spaced frame plates on the table, a platen rotatable in the frame plates, a strip take-up reel rotatable in the frame plates, a reciprocatory bar mounted on one of said plates, a push pawl on the bar engageable with the platen, a locking pawl on said frame plate engageable with the platen, a spring connecting said pawls to urge the same to engagement with the platen, a rocking lever having an arm adapted for abutment against said bar, and means operable from the register mechanism for actuating said lever.

In testimony whereof I affix my signature.

BENJAMIN P. HAYES.