

July 23, 1929.

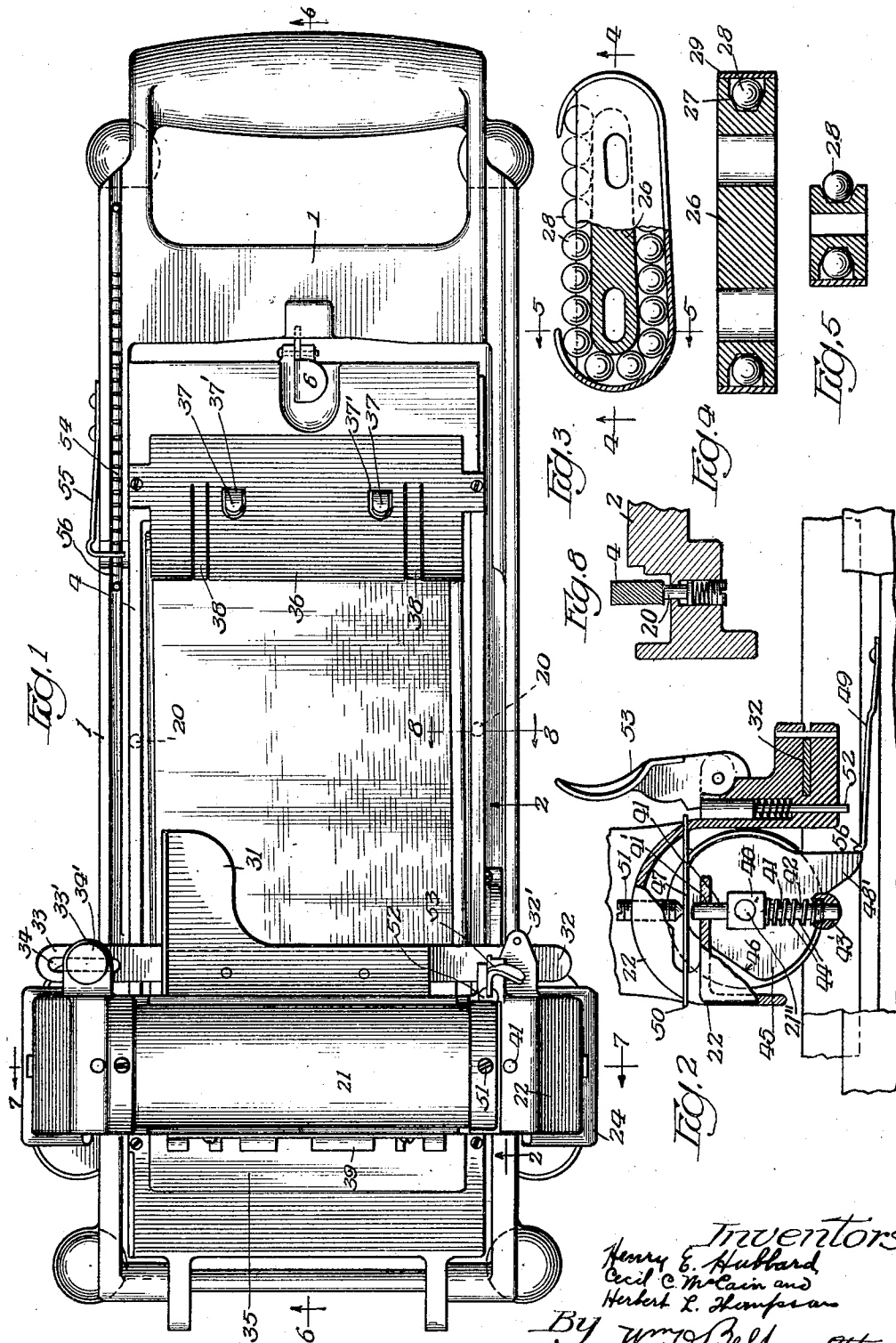
H. E. HUBBARD ET AL

1,721,996

PRINTING MACHINE

Filed Aug. 10, 1927

4 Sheets-Sheet 1



Inventors.
Henry E. Hubbard
Cecil C. McCain and
Herbert L. Thompson
By Wm. O. Bell Atty.

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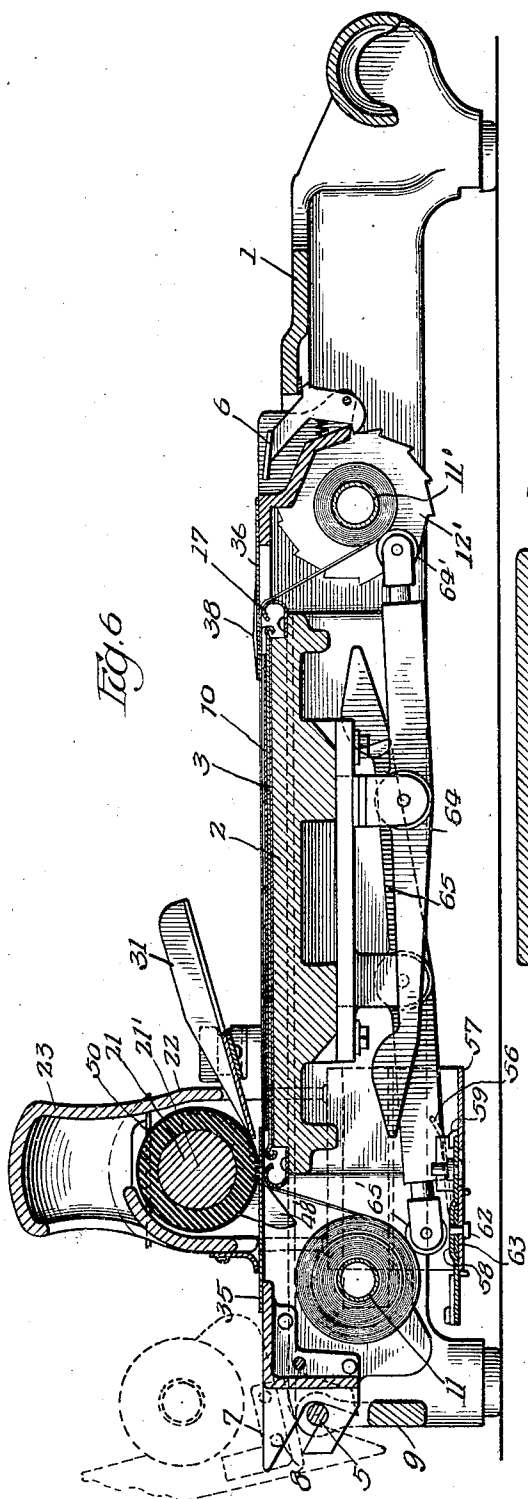
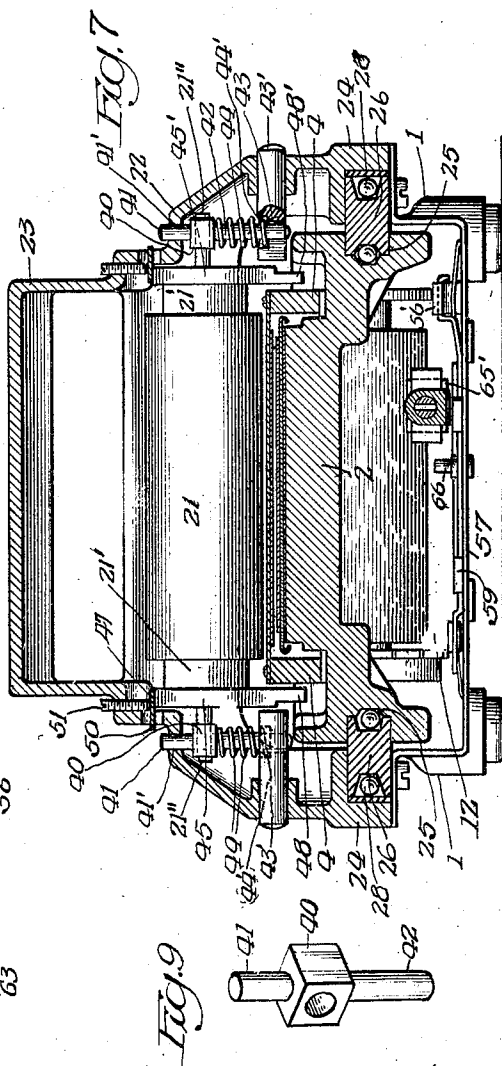
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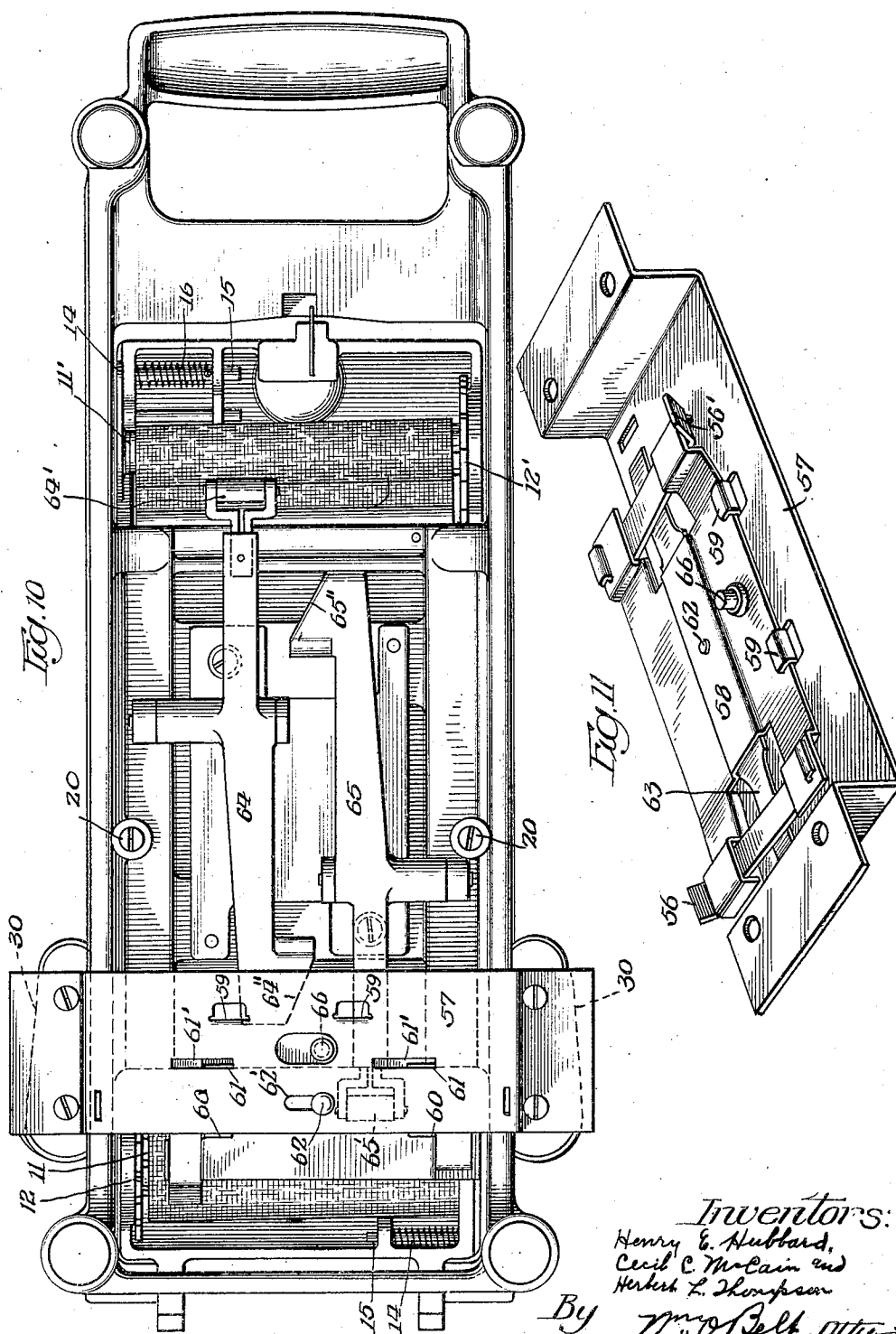
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PRINTING MACHINE

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4 Sheets-Sheet 3



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 Cecil C. McCain and
 Herbert L. Thompson

By *Wm. O. Bell, Atty.*

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4 Sheets-Sheet 4

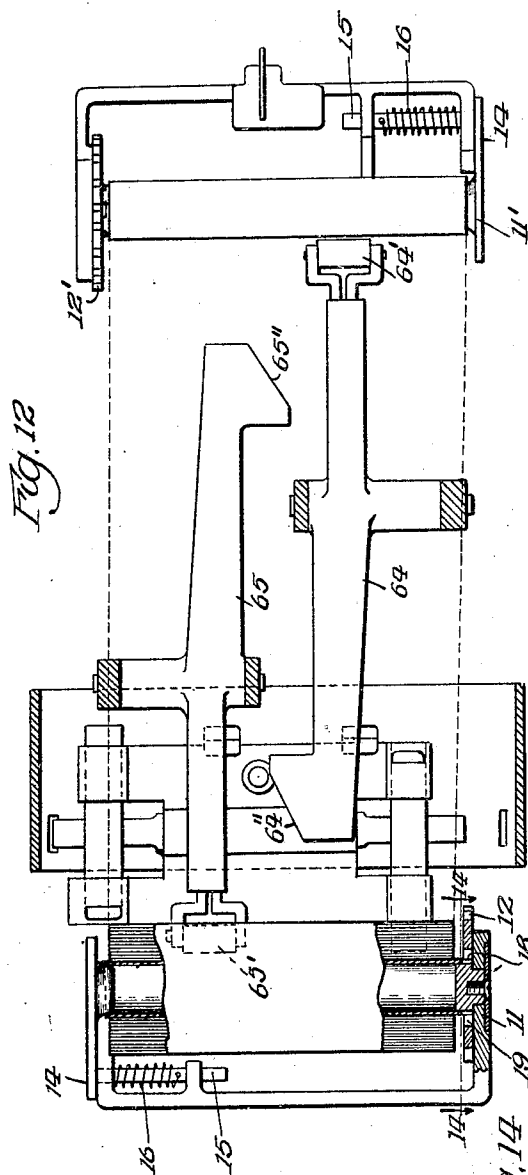


Fig. 12

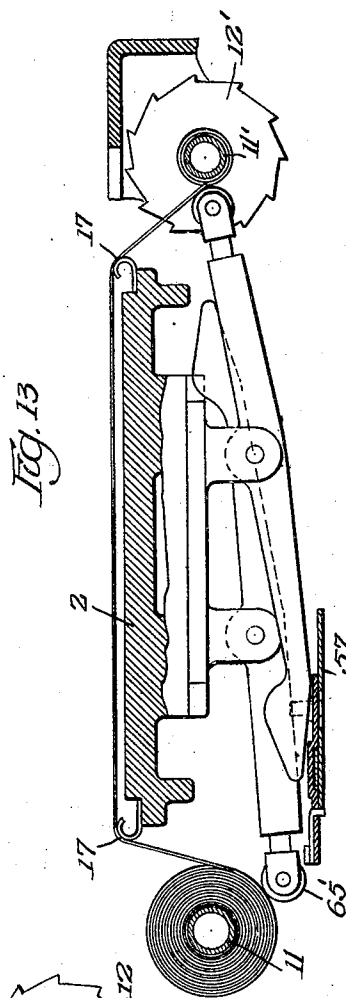


Fig. 13

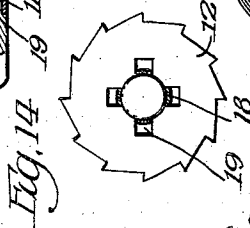


Fig. 1

By

67
Inventors:
Henry E. Hubbard,
Cecil C. McCain and
Herbert L. Thompson
Jr of Bel. City.

UNITED STATES PATENT OFFICE.

HENRY E. HUBBARD, OF CHICAGO, CECIL C. MCCAIN, OF GLEN ELLYN, AND HERBERT L. THOMPSON, OF ELGIN, ILLINOIS, ASSIGNORS, BY MESNE ASSIGNMENTS, TO ADDRESSOGRAPH COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF DELAWARE.

PRINTING MACHINE.

Application filed August 10, 1927. Serial No. 211,967.

This invention relates to printing machines of the kind which are adapted to print from a form through an ink ribbon, and its primary object is to provide a small, compact, portable, self-contained and efficient machine for printing cards, envelopes and similar articles.

Another object of the invention is to provide novel means for automatically moving the platen into impression position at the end of each complete operation of the machine, and for automatically moving the platen out of impression position at the beginning of each operation of the machine, and manually operated means for throwing said last mentioned means out of operation when an impression is to be made, so that the platen will travel in impression position above the form only when an impression is desired.

Another object of the invention is to provide novel means for feeding the card or other article to be printed into printing position during the impression stroke of the platen carriage, and for ejecting the printed card from the machine during the return stroke of the platen carriage.

And a further object of the invention is to provide novel means for feeding and reversing the ribbon.

In the accompanying drawing illustrating a selected embodiment of the invention,

Fig. 1 is a top plan view showing the carriage in initial position.

Fig. 2 is a transverse sectional view on the line 2—2 of Fig. 1.

Fig. 3 is a plan view partly broken away and in section showing one of the roller bearings.

Fig. 4 is a sectional view on the line 4—4 of Fig. 3.

Fig. 5 is a sectional view on the line 5—5 of Fig. 3.

Fig. 6 is a longitudinal sectional view on the line 6—6 of Fig. 1.

Fig. 7 is a transverse sectional view on the line 7—7 of Fig. 1.

Fig. 8 is a detail sectional view on the line 8—8 of Fig. 1.

Fig. 9 is a detail view of a portion of the platen mounting.

Fig. 10 is a bottom plan view of the machine.

Fig. 11 is a top plan view of the carrying

plate and dog slide detached from the machine.

Fig. 12 is a diagrammatic top plan view partly in section showing the ribbon feed and reversing devices.

Fig. 13 is a vertical sectional view showing the ribbon feed and reversing devices.

Fig. 14 is a sectional view on the line 14—14 of Fig. 12.

Referring to the drawings the machine comprises a main frame 1 having a bed 2 to receive a printing plate 3. The printing plate may be of any suitable kind, one form being covered by the co-pending application of Henry E. Hubbard, Serial No. 152,095, filed December 2, 1926. The printing plate is preferably made of a size to fit snugly on the bed so that it will remain in fixed position during the printing operation.

A skeleton ribbon frame 4 is pivotally mounted on a cross bar 5 at one end of the main frame and it is provided with a spring latch 6 at its other end to engage the main frame whereby the ribbon frame is locked securely in place upon the main frame. The ribbon frame has two ears 7 provided with angular slots 8 to engage the cross bar 5 for pivotally mounting the ribbon frame on the main frame. The ears 7 project sufficiently to engage the main frame at 9 when the ribbon frame is swung to open position, as indicated in broken lines in Fig. 6, to support the ribbon frame in this position while the printing plate is being inserted or replaced and to permit access to the ribbon mechanism for adjusting or replacing the ink ribbon.

The ink ribbon 10 is carried on two spools 11, 11' which are revolubly and removably mounted in the ribbon frame. The spools have driving engagement at one end with ratchet wheels 12, 12' and at their other ends the spools engage projections 13 on end plates 14 carried by rods 15 in the ribbon frame. A spring 16 on each rod 15 normally holds the end plate in operative engagement with the spool. These spools are alternately supply and takeup spools depending upon which of the two ratchets is engaged by the feed devices hereafter explained. The ribbon is drawn taut across the printing plate on the bed of the main frame and it is held free from the plate, and caused to travel smoothly thereover without dragging on the plate, by curved

guides 17 mounted on the bed at each end thereof, Figs. 6, 11. The ribbon is mounted in any suitable manner on the spools and the latter can be readily inserted and replaced in the ribbon frame, it being only necessary
 5 for this purpose to retract the movable end plates 14 against the tension of springs 16 until the spools are released, whereupon they can be removed and replaced. Any suitable
 10 provision may be made for engaging the spools with the ratchets 12, a convenient means being the provision of projections 18 on the end of the spool to engage recesses 19 in the ratchet.

15 Spring pressed posts 20, Figs. 1, 8 are mounted in the main frame to receive the side bars of the skeleton ribbon frame when the latter is in closed position to hold the ribbon frame under tension in proper working relation to the other parts of the machine, to provide for wear, and to avoid the necessity for
 20 extreme accuracy of fit. These posts engage the side bars of the ribbon frame about midway between the ribbon spools.

25 A roller platen 21 is movably mounted in a carriage 22 which is provided with a handle 23 and is adapted to be moved back and forth along the main frame and over the ribbon frame, from end to end thereof. The carriage frame has depending side members 24,
 30 and roller bearing devices are engaged with these side members and travel in guide grooves 25 in the sides of the main frame, Fig. 7. These roller bearings are shown in one
 35 form which we have found desirable for the purpose in Figs. 3-5 and are more particularly described in the co-pending application of Herbert L. Thompson, Serial No. 243,868, filed Dec. 31, 1927. Briefly, these bearings
 40 comprise a solid body 26 having a raceway 27 for a plurality of balls 28 which are retained in the raceway by a shield 29. The shield extends around the ends of the body and along
 45 the outer side thereof which is located adjacent the side member of the carriage, and the balls are left free on the inner side of the body to engage the guide groove 25 in the main frame. The bearing has a straight inner
 50 side and an inclined outer side, and that wall 30, Fig. 7, of the side member of the carriage which engages the bearing is also made inclined whereas the wall of the guide groove is, of course, straight so that the wedge
 55 shaped bearing can be forced snugly into place between the side member of the carriage and the side wall of the main frame, in which position it will remain while the carriage is being moved freely back and forth on the main frame. The roller bearing is efficient
 60 and noiseless and it enables the carriage to be moved easily and freely back and forth on the main frame.

A card guide 31, Figs. 1, 6, is mounted on the carriage to receive a card to be printed.
 65 and this card guide has end bars 32 and 33.

The end bar 32 is slidably engaged in a slot in the ear 32' on the carriage and the end bar 33 is slidably engaged with a slot in the ear 33' on the carriage so that the card guide may be moved crosswise of the machine and
 70 adjusted to receive and deliver the card in proper position relative to the form on the printing plate. The end bar 33 has a slot 34 to receive a screw 34' by which the guide is secured rigidly in adjusted position. The
 75 card is fed into the guide and against the platen 21 when the carriage is in initial forward position, Fig. 6. A bearing plate 35 is secured on the ribbon frame and projects over a portion of the ribbon and a portion
 80 of the printing device on the bed. The platen engages this bearing plate when it begins its rearward movement, to the right, Fig. 6, and this causes the platen to revolve. The card is fed in between the guide and the platen,
 85 and the revolving platen feeds the card under the platen. As the carriage proceeds upon its rearward travel the card is laid down by the platen upon the ribbon above the printing device and an impression is taken by pressure
 90 of the platen against the card. A plate 36 is fastened to the ribbon frame at the end thereof opposite the end of the frame to which the plate 35 is fastened, and yielding stop
 95 fingers 37 are secured on the under side of the ribbon frame and project upward through openings 37' in the plate 36 to engage the rear end of the card. This plate 36 is cut to provide fingers 38 which are bowed between their
 100 ends and project above the top surface of the plate. On the rearward travel of the carriage, to the right Fig. 6, the card is deposited in printing position and the impression is made. The card now lies on the fingers 38
 105 which lift the rear edge of the card above the plate 36 when the platen is at the end of its rearward movement. It is desired to eject the card from the machine on the return stroke of the carriage and for this purpose
 110 the carriage is provided at the front thereof with an ejector 39 to engage the elevated rear edge of the card over which it has just passed in its rearward travel and to push the card
 115 along as the carriage travels on its return stroke until the card is finally ejected from the machine at the front end thereof. The ejector is cut away as shown to clear the stops 37 and the fingers 38. The stops are
 120 provided to prevent the card from being accidentally fed along over the plate 36 as the platen roller travels thereover to the right, Fig. 1, and the function of the fingers 38 is to lift the edge of the card sufficiently to insure
 125 engagement of the ejector therewith on the return stroke of the carriage. Both the stops and the fingers are yielding to permit the platen roller to travel freely thereover.

It is desired that the platen should travel on its return stroke above operative impression position so that it will not engage and
 130

receive ink from the ink ribbon, and it is also desired that the platen should be out of operative impression position on the forward printing stroke of the carriage if there is no card in position, or if for any other reason it is not desired to make an impression. This is accomplished by mounting the platen yieldingly and providing a double faced cam for holding the platen in one or the other of its positions and suitable trip mechanism for shifting the cam to position the platen. The roller platen 21 is freely mounted on a shaft 21', Figs. 6, 7, which is relatively large in diameter and is provided with reduced ends 21'' journaled in blocks 40. Each block has an upwardly projecting pin 41 which engages a guide opening 41' in the side member of the carriage, and also a downwardly projecting pin 42 which engages a slot 43 in a pin 43' which is transversely mounted in the side member of the carriage. A spring 44 is arranged on the pin 42 between the block 40 and the pin 43 and the two springs 44 constitute a yielding support for the roller platen. Each pin 43 has a socket 44' to receive the end of the spring 44 and the engagement of the spring with this socket holds the pin in its position in the side member of the carriage. Cams 45, 45' are rigidly mounted on the reduced ends of the platen shaft, Figs. 2, 7, and each cam has two cam faces 46 and 47, the cam face 47 being higher than the cam face 46, Fig. 2. The cams also have feet 48, 48' which project down between the sides of the ribbon frame and the sides of the main frame. A spring 49 is fastened on one side of the main frame in the path of travel of the one foot 48 and it is arranged to project upward behind the foot after the carriage has reached the end of its return travel, Fig. 2. Flat spring plates 50 are secured at their ends in the carriage frame and the cam faces 46, 47 on the cams engage these spring plates which hold the cams against over-running when they are shifted back and forth. Set screws 51 in the carriage frame may be set to adjust the spring plates in proper position. A spring retracted push rod 52 on the carriage, Fig. 2, is adapted to be operated by depressing the lever 53 to depress spring 49 so that it will not obstruct foot 48 in the rearward printing travel of the carriage. A notched shifter rod 54 is held in adjusted position by a spring 55, Fig. 1, between a side of the main frame and a side of the ribbon frame, and it has an upturned end 56 in the path of the other foot 48'.

In initial position of the carriage the cams and platen are in printing position, Fig. 2. If an impression is to be made the operator manipulates lever 53 with the thumb of his hand which grasps the handle 23 of the carriage to depress push rod 52 and spring 49 so that the foot 48 may pass freely over this spring. Thus the platen is permitted to re-

main in impression position and an impression is made. When the other foot 48' strikes shifter 54 the cams and platen are shifted, cam faces 46 engage plates 50 and springs 44 lift the platen above impression position so that the platen may travel back to initial position without engaging the ribbon. As foot 48 rides over spring 49 on the return travel of the carriage the resistance of the spring is sufficient to swing the cams and platen to impression position with cam faces 47 engaging plates 50. Thus the platen is set for printing every time it is returned to initial position. If an impression is not to be made on the printing travel of the carriage, the lever 53 is not operated, and the spring 49 obstructing foot 48 causes the cams to swing until cam faces 46 engage plates 50 which permits springs 44 to lift the platen above impression position.

It is desired to provide means for automatically feeding and reversing the ink ribbon during the use of the machine. For this purpose oppositely disposed feed dogs 56, 56', Fig. 11, are mounted on a carrying plate 57, which is fastened to the side members of the carriage beneath the main frame. The dog 56 is adapted to engage and operate the ratchet 12, and the dog 56' is adapted to engage and operate the ratchet 12', Fig. 10. But only one of these dogs should operate at a time to feed the ribbon from one spool to the other and therefore the dogs are engaged with a plate 58 which is slidable back and forth transversely of the machine on the carrying plate 57. Lips 59 are struck from the carrying plate to engage one edge of the slide plate, lips 60 are struck from the slide plate to engage one edge of the carrying plate, and lips 61 are struck from the slide plate to operate in grooves 61' in the carrying plate. A headed stud 62 on the slide plate projects through and operates in a slot 62' in the carrying plate. This stud is also employed to secure the spring plate 63 to the slide plate, the end portions of the spring engaging the dogs to hold them in operative relation to the teeth of the ratchets. Shifter levers 64, 65 are pivotally mounted on the underside of the main frame in parallel relation. The lever 64 has on one end thereof a roller 64' which operates in engagement with the ribbon on the spool 11', and at its other end it has a weighted cam 64''. The lever 65 has at one end a roller 65' which operates in engagement with the ribbon on the spool 11, and at its other end it has a weighted cam 65''. A stud 66 on the underside of the slide member is arranged to engage one or the other of the cams 64'', 65''.

The cam end of the shifter lever 64 or 65 will be elevated whenever the roller end engages a full spool, and the cam end will be lowered when the roller end engages an empty or nearly empty spool. When the ribbon

has been nearly exhausted from one spool its shifter lever will have swung to carry its cam into position to engage the stud 66, whereby the dog slide 58 is shifted laterally of the machine. Prior to this shifting operation a dog has been positioned to engage the ratchet of the spool which has been functioning as a take-up spool to turn the spool a tooth of the ratchet at each operation of the carriage and the other dog has been idle, but when the dog slide is shifted as described the other dog is brought into position to engage the ratchet of the spool which before has been functioning as a supply spool and which now begins to function as a takeup spool, and thereupon this latter spool is turned a tooth of the ratchet at each operation of the carriage. Thus a shifter lever is caused to operate by the supply spool when the ribbon has been nearly exhausted therefrom, and each spool functions alternately as a supply spool and as a takeup spool. The ribbon is fed a step equal to one ratchet tooth at each printing operation, and this is accomplished and the ribbon is reversed automatically so that it requires no attention except for replacement when this becomes necessary.

The invention provides a machine of simple and compact construction which embodies many of the desirable functions and operations of a highly organized printing machine of this type. The machine is designed primarily for printing cards from forms of different sizes and kinds but it may be used for printing envelopes and other articles within the capacity of the machine. The bed may be made to receive printing plates of the kind described or it may be made to receive individual type or electrotypes or other printing forms, as will be obvious to those skilled in the art. The machine is capable of comparatively rapid operation, the cards being fed into the guide with one hand while the carriage is being operated by the other hand, and since this is all the manual operation involved it is apparent that no particular skill is required for operating the machine and that it is adaptable for general office use.

We have shown and described the machine in a form which has been found commercially practicable, but we reserve the right to make any changes therein as fall within the scope of the following claims.

We claim:

1. A printing machine comprising a main frame, a bed on the main frame adapted to receive a printing form, a cross bar at one end of the main frame, a skeleton ribbon frame having slotted ears at one end to engage said bar for pivotally mounting the ribbon frame thereon, and a latch device on the other end of the ribbon frame arranged to engage the main frame for securing the ribbon frame to the main frame.
2. A printing machine comprising a main

frame, a bed on the main frame adapted to receive a printing form, a ribbon frame movably mounted on the main frame, and yielding means engaging the ribbon frame for holding the ribbon frame under tension when it is in operative position on the main frame.

3. A printing machine comprising a main frame, a bed on the main frame adapted to receive a printing form, a ribbon frame pivotally mounted at one end on the main frame and adapted to be detachably secured at its other end to the main frame, spools mounted in the ribbon frame at opposite ends thereof to carry an ink ribbon which travels across the printing form, said spools being arranged below the plane of the form, and means on the bed at the ends thereof for guiding the ribbon in its travel.

4. A printing machine comprising a main frame, a bed on the main frame adapted to receive a printing form, a ribbon frame carrying a ribbon and mounted on the main frame, a carriage arranged to travel on the main frame, a roller platen carried by said carriage, means for automatically lowering the platen into impression position as the carriage completes its return travel, and means for raising the platen above impression position as the carriage starts on its printing travel.

5. A printing machine comprising a main frame, a bed on the main frame adapted to receive a printing form, a ribbon frame carrying a ribbon and mounted on the main frame, a carriage arranged to travel on the main frame, a roller platen carried by said carriage, means for automatically lowering the platen into impression position at the initial position of the carriage, means for raising the platen above impression position as the carriage starts on its printing travel, and manually operated means for throwing said last mentioned means out of operative position.

6. A printing machine comprising a main frame, a bed on the main frame adapted to receive a printing form, a ribbon frame carrying a ribbon and mounted on the main frame, a carriage arranged to travel on the main frame, a bodily movable roller platen carried by said carriage, means on the carriage for raising and lowering the platen, a device on the main frame for operating said means to raise the platen above impression position as the carriage starts on its impression travel, and means on the carriage for throwing said device out of operative position.

7. A printing machine comprising a main frame, a bed on the main frame adapted to receive a printing form, a ribbon frame carrying a ribbon and mounted on the main frame, a carriage arranged to travel on the main frame, a bodily movable roller platen carried by said carriage, means on the carriage for raising and lowering the platen, a spring device arranged in the path of movement of

said means to operate the same, and a manually operable plunger for throwing said device out of operative position.

8. A printing machine comprising a main frame, a bed on the main frame adapted to receive a printing form, a ribbon frame carrying a ribbon and mounted on the main frame, a carriage arranged to travel on the main frame, a bodily movable roller platen carried by said carriage, means on the carriage for raising and lowering the platen, a shifter rod arranged on the frame in the path of movement of said means to operate the same, and means for adjusting said rod.

9. A printing machine comprising a main frame, a bed on the main frame adapted to receive a printing form, a ribbon frame carrying a ribbon and mounted on the main frame, a carriage arranged to travel on the main frame, a bodily movable roller platen carried by said carriage, cam means for lowering the platen into impression position at initial position of the carriage, a movable device on the main frame arranged to operate said cam means as the carriage starts on its printing travel to raise the platen above impression position, and means for throwing said movable device out of operative position.

10. A printing machine comprising a main frame, a bed on the main frame adapted to receive a printing form, a ribbon frame carrying a ribbon and mounted on the main frame, a carriage arranged to travel on the main frame, a bodily movable roller platen carried by said carriage, means comprising a cam device for lowering the platen into impression position at initial position of the carriage, a movable device arranged in the path of movement of the cam device to operate the cam device for raising the platen above impression position as the carriage starts on its printing travel, a plunger for throwing said spring device out of operative position, and a manually operated lever for depressing said plunger.

11. A printing machine comprising a main frame, a bed on the main frame adapted to receive a printing form, a ribbon frame carrying a ribbon and mounted on the main frame, a carriage arranged to travel on the main frame, a bodily movable roller platen carried by said carriage, a pair of cams on said platen each having a foot, a device on the main frame to engage the foot of one cam for shifting the platen out of impression position, and a device on the main frame to engage the foot of the other cam for shifting the platen into impression position.

12. A printing machine comprising a main frame, a bed on the main frame adapted to receive a printing form, a ribbon frame carrying a ribbon and mounted on the main frame, a carriage arranged to travel on the main frame, a bodily movable roller platen carried by said carriage, a platen shaft, a pair of cams on said platen shaft each having a foot, a device on the main frame to engage the foot of one cam for shifting the platen out of impression position, a device on the main frame to engage the foot of the other cam for shifting the platen into impression position, and means for throwing said last mentioned device out of operative position.

13. A printing machine comprising a main frame, a bed on the main frame adapted to receive a printing form, a ribbon frame carrying a ribbon and mounted on the main frame, a carriage arranged to travel on the main frame, a bodily movable roller platen carried by said carriage, a platen shaft, a pair of cams on said platen shaft each having a low cam face, a high cam face and a foot, parts on the carriage to be engaged by said cams, and means on the carriage to engage said feet for shifting the cams to high cam position before the platen moves to impression position and to low cam position after the impression has been made to lower the platen into and elevate it above impression position.

14. A printing machine comprising a main frame, a bed on the main frame adapted to receive a printing form, a ribbon frame carrying a ribbon and mounted on the main frame, a carriage arranged to travel on the main frame, a bodily movable roller platen carried by said carriage, a cam device having a low cam face and a high cam face, a part on the carriage adapted to be engaged by said cam faces for holding the cam device in adjusted position, means for operating said cam device to throw the low cam face into operative engagement with said part after an impression has been made, means for operating said cam device to throw the high cam face into operative engagement with said part at the end of the return travel of the carriage, means for operating said cam device to throw the low cam face into operative engagement with said part as the carriage starts on its printing travel, and means for throwing said last mentioned means out of operative position so that the carriage may proceed on its printing travel with the platen in impression position.

15. A printing machine comprising a main frame, a bed on the main frame adapted to receive a printing form, an ink ribbon stretched across the form, a carriage arranged to travel on the main frame, a roller platen carried by said carriage, and means independent of the printing form for causing the platen to start the feed of the article to be printed into impression position as the carriage moves on its impression travel.

16. A printing machine comprising a main frame, a bed on the main frame adapted to receive a printing form, an ink ribbon stretched across the form, a carriage arranged to travel on the main frame, and a guide on the carriage to receive the article to be printed

and guide it into position beneath the platen and means on the main frame independent of the form for imparting a rotative movement to the platen before it engages the form so that the platen will feed the article into impression position as the carriage moves on its impression travel.

17. A printing machine comprising a main frame, a bed on the main frame adapted to receive a printing form, an ink ribbon stretched across the form, a carriage arranged to travel on the main frame, a roller platen carried by said carriage, a plate arranged to engage the platen at the bottom thereof when the platen is in initial position to cause the platen to revolve when the carriage starts on its impression travel, and a guide for guiding the article to be printed under the platen so that the platen will feed the article into impression position as the carriage carries the platen through impression position.

18. A printing machine comprising a main frame, a bed on the main frame adapted to receive a printing form, an ink ribbon stretched across the form, a carriage arranged to travel on the main frame, a roller platen carried by said carriage, means for causing the platen to feed the article to be printed into impression position as the carriage carries the platen through impression position, and means on the carriage for ejecting the printed article on the return travel of the carriage.

19. A printing machine comprising a main frame, a bed on the main frame adapted to receive a printing form, an ink ribbon stretched across the form, a carriage arranged to travel on the main frame, a roller platen carried by said carriage, means for elevating the adjacent end of said article slightly above printing position after the platen moves thereover in its impression travel, and means on the carriage to engage said elevated end of the article and for ejecting the article from the machine on the return travel of the carriage.

20. A printing machine comprising a main frame, a bed on the main frame adapted to receive a printing form, a ribbon frame mounted on the main frame, a carriage arranged to travel on the main frame, a roller platen carried by said carriage, two spools mounted in the ribbon frame and carrying a ribbon which is stretched across the printing form, feeding means on said spools, means carried by the carriage for alternately operating the spool feeding means, and means controlled by the length of ribbon on a spool for operating said last mentioned means.

21. A printing machine comprising a main frame, a bed on the main frame adapted to receive a printing form, a ribbon frame mounted on the main frame, a carriage arranged to travel on the main frame, a roller platen carried by said carriage, two spools mounted in the ribbon frame and carrying a

ribbon which is stretched across the printing form, feeding means on said spools, a plate carried by the carriage and movable transversely of the main frame, a dog on said plate to engage the feeding means of one spool and another dog on said plate to engage the feeding means of the other spool, and automatically controlled means for shifting said plate to move the dogs alternately into operative and inoperative positions.

22. A printing machine comprising a main frame, a bed on the main frame adapted to receive a printing form, a ribbon frame mounted on the main frame, a carriage arranged to travel on the main frame, a roller platen carried by said carriage, two spools mounted in the ribbon frame and carrying a ribbon which is stretched across the printing form, feeding means on said spools, a plate carried by the carriage and movable transversely of the main frame, a dog on said plate to engage the feeding means of one spool and another dog on said plate to engage the feeding means of the other spool, and means controlled by the length of ribbon wound on one spool for automatically shifting said plate to carry the dogs into position for winding the ribbon on the other spool.

23. A printing machine comprising a main frame, a bed on the main frame adapted to receive a printing form, a ribbon frame mounted on the main frame, a carriage arranged to travel on the main frame, a roller platen carried by said carriage, two spools mounted in the ribbon frame and carrying a ribbon which is stretched across the printing form, feeding means on said spools, devices carried by the carriage for operating said feeding means alternately, weighted levers pivoted on the carriage, means operated by the levers for reversing said feeding means, and rollers on the levers operating in contact with the ribbon on the spools.

24. A printing machine comprising a main frame, a bed on the main frame adapted to receive a printing form, a ribbon frame mounted on the main frame, a carriage arranged to travel on the main frame, a roller platen carried by said carriage, two spools mounted in the ribbon frame and carrying a ribbon which is stretched across the printing form, feeding means on said spools, a plate carried by the carriage and movable transversely of the main frame, a dog on said plate to engage the feeding means of one spool and another dog on said plate to engage the feeding means of the other spool, levers pivoted on the carriage, weighted cams at one end of said levers, rollers at the other end of said levers operating in contact with the ribbon on the spools, and means on the plate adapted to be engaged by the cams for shifting the plate and reversing the ribbon feed.

25. A printing machine comprising a main

frame, a bed on the main frame adapted to receive a printing form, a ribbon frame mounted on the main frame, a carriage arranged to travel on the main frame, a roller platen carried by said carriage, two spools mounted in the ribbon frame and carrying a ribbon which is stretched across the printing form, feeding ratchets on said spools, a slide plate carried by the carriage, dogs on the slide plate for operating said ratchets alternately, a stud on the slide plate, counterbalanced levers pivoted on the main frame, rollers carried on opposite ends of said levers and engaging the ribbon on the spools, and cams on the weighted ends of said levers for engaging said stud and shifting said plate to reverse the ribbon feed.

HENRY E. HUBBARD.
CECIL C. McCAIN.
HERBERT L. THOMPSON.