(No Model.)

3 Sheets—Sheet 1.

F. D. BELKNAP.

ADDRESS PRINTING MACHINE.

No. 592,603. Patented Oct. 26, 1897.

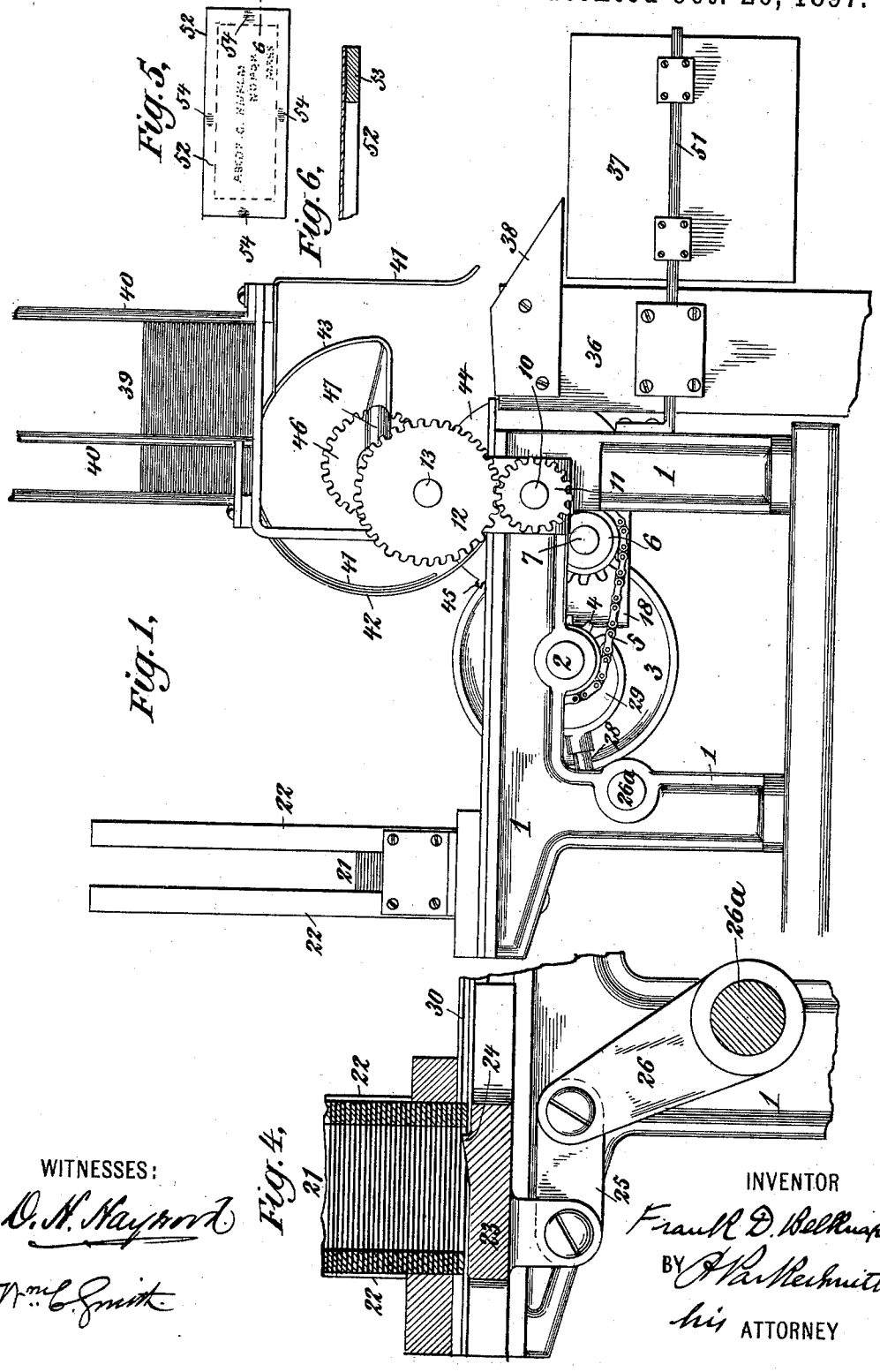


Fig. 1,

Fig. 5,

Fig. 6,

Fig. 4,

WITNESSES:

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Wm. C. Smith.

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(No Model.) 3 Sheets—Sheet 2.

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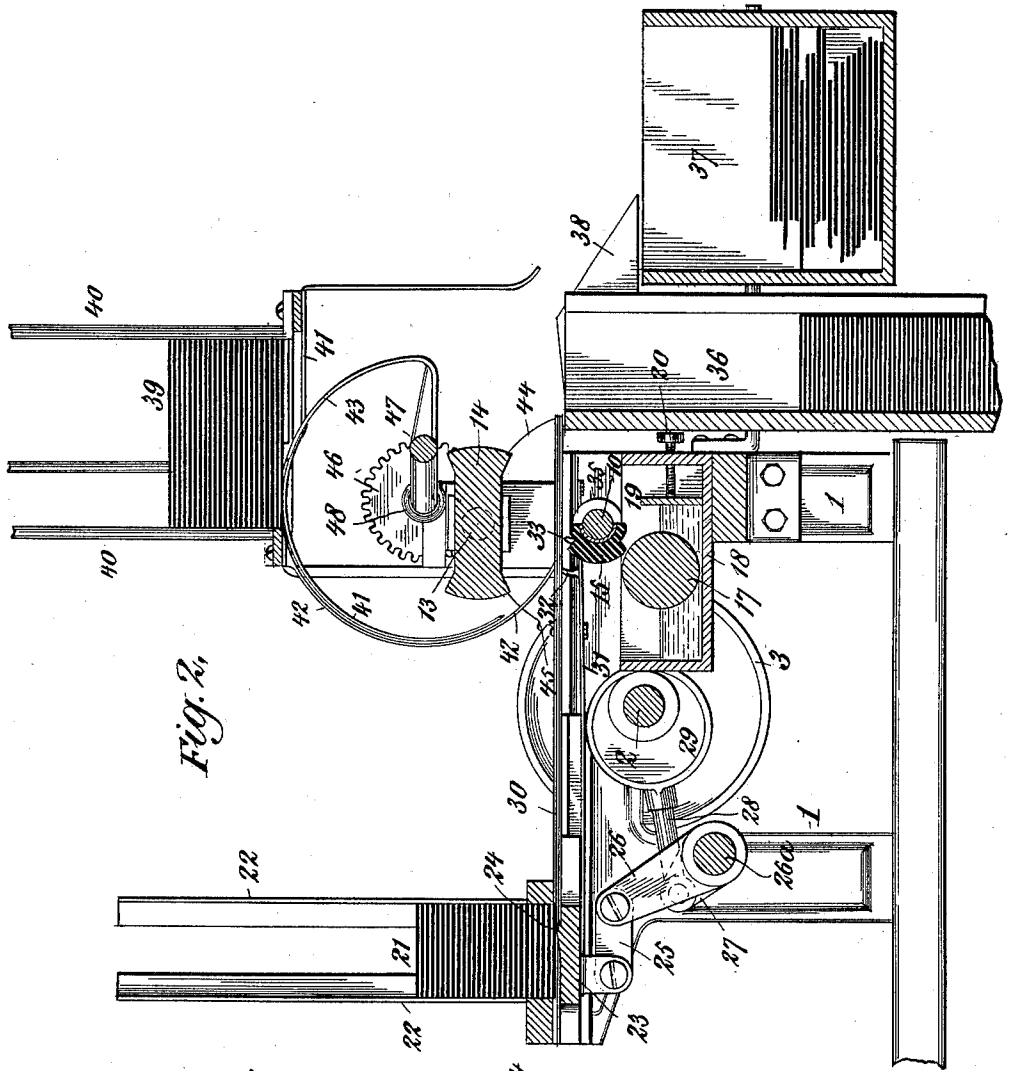


Fig. 2.

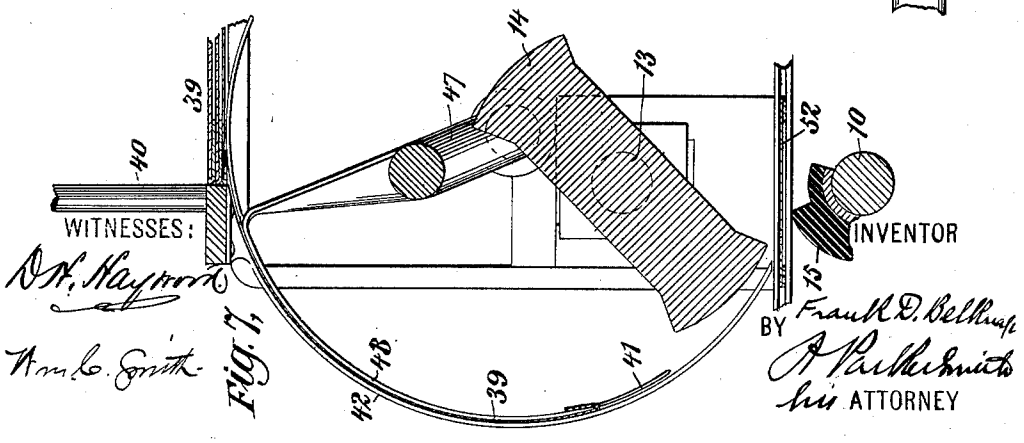


Fig. 1.

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(No Model.) 3 Sheets—Sheet 3.

F. D. BELKNAP.

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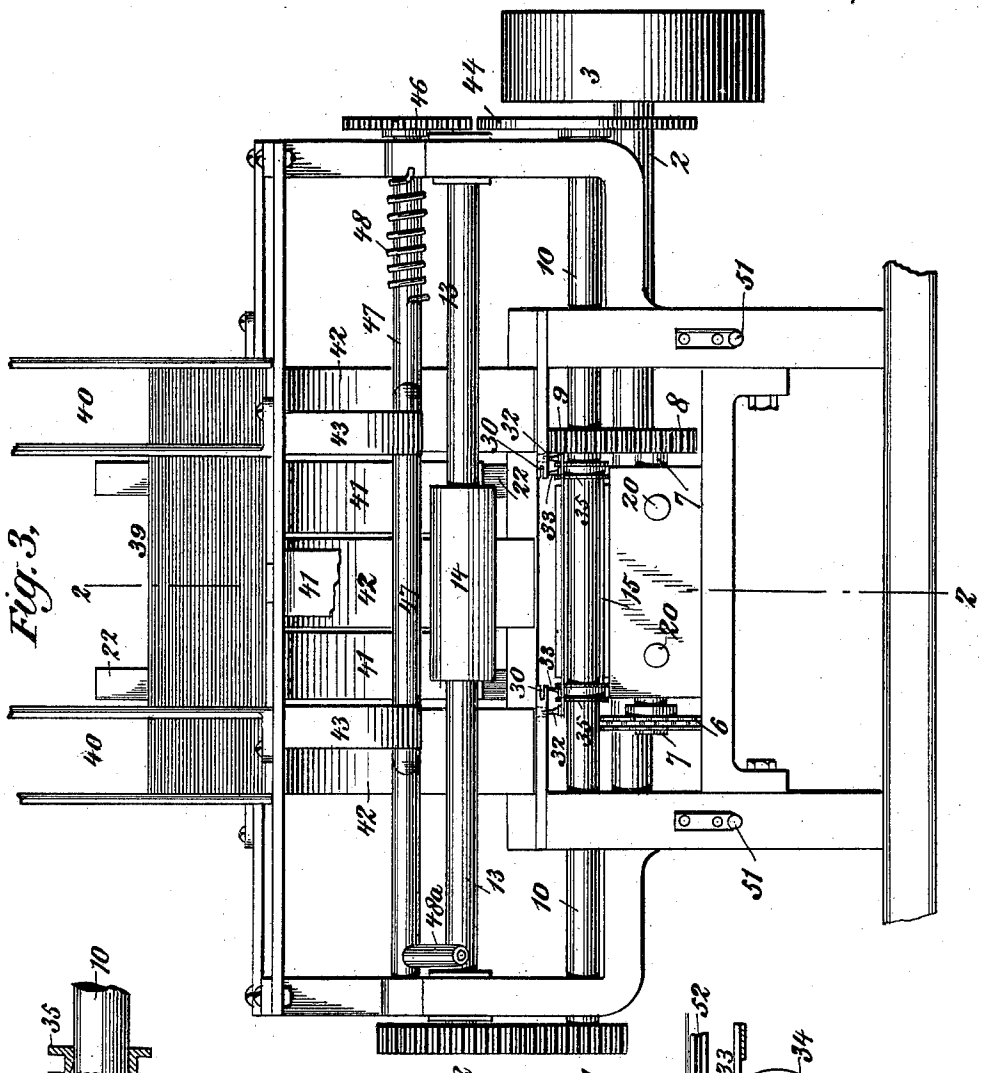


Fig. 3.

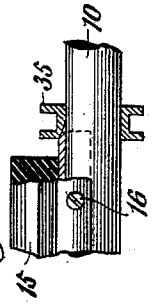


Fig. 9.

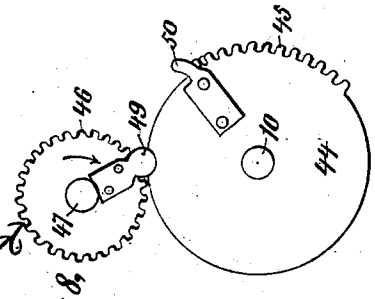


Fig. 8.

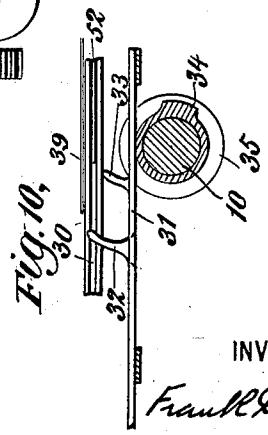


Fig. 10.

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UNITED STATES PATENT OFFICE.

FRANK D. BELKNAP, OF NEW YORK, N. Y.

ADDRESS-PRINTING MACHINE.

SPECIFICATION forming part of Letters Patent No. 592,603, dated October 26, 1897.

Application filed November 7, 1896. Serial No. 611,349. (No model.)

To all whom it may concern:

Be it known that I, FRANK D. BELKNAP, a citizen of the United States, residing at New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Stencil Printing-Machines; and I do hereby 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.

My invention relates to the art of printing; and it consists of a mechanism for printing by means of stencil-cards or other stencils. Various kinds of mechanism for this purpose have been heretofore patented to me; but it has become desirable to simplify and reduce the amount of mechanism involved in each machine and to do away with intermittent motion of the special printing mechanism in order to increase the speed. To secure these and other advantages, I have designed a simple and rapidly-working mechanism, the preferred form of which is illustrated in the accompanying four sheets of drawings, in which—

Figure 1 is a side view or elevation of the machine. Fig. 2 is a longitudinal section thereof on line 2 2 of Fig. 3. Fig. 3 is an end elevation of the machine looking from the right-hand end of Fig. 1 and with the collection-boxes removed. Fig. 4 is an enlarged detail in section of the stencil-card magazine and feeding-dog. Fig. 5 is a face view of my preferred form of stencil-card; and Fig. 6 is a section of a portion thereof, taken on line 6 6 of Fig. 5. Fig. 7 is an enlarged detail view in section of the printing mechanism, the magazine of objects to be printed, and the automatic feed for said objects. Fig. 8 is an enlarged detail of the gearing for said feed mechanism. Fig. 9 is a detail showing the method of attachment of the inking-pad to its shaft. Fig. 10 is a detail view showing the ejector mechanism.

Throughout the drawings like reference-figures refer to like parts.

1 represents the main frame of the machine. 2 is the main shaft, journaled in said frame and driven by belt-pulley 3. 4 is a sprocket-wheel mounted on said shaft, and 5 a sprocket-chain which transmits motion therefrom to the sprocket-wheel 6 on the shaft 7. On the other end of the shaft 7, as shown in Fig. 3, is the gear-wheel 8, which meshes with the gear-wheel 9, of equal size, on the shaft 10. Shaft 10 has a pinion 11, meshing with gear 12, of twice the diameter, which in turn is mounted on the shaft 13. On this shaft 13 is the cut-away roller 14, having two portions of its face left full at opposite ends of the same diameter, as shown in Fig. 2.

15 is a cut-away roller or inking-pad mounted on the shaft 10 and having a radius just one-half the radius of the roller 14. The full portions of these two rollers meet as they revolve, and as they are geared at the rate of two to one they will have the same circumferential velocity. The inking-pad 15 is attached to the shaft 10 by screws 16 (best shown in Fig. 9) and is also retained thereon by the rings 35, which compose the camway for the ejector mechanism.

17 is an ink-roller rotating in the ordinary form of ink-fount 18, which has the doctor-block 19, adjustable by means of the set-screw 20, all in the usual way. This ink-roller 17 is mounted on the shaft 7.

21 represents a series of stencil-cards in a vertical magazine composed of the strips 22 22. The reciprocating dog 23 forms the bottom of said magazine and has the projection 24 on its upper face. This dog is driven by link 25, crank 26 on shaft 26^a, operated by crank 27, driven by eccentric-rod 28 from eccentric 29 on the main driving-shaft 2.

30 represents one of the pair of parallel horizontal guides having grooves on their inner faces and extending from the bottom of magazine 22 to the point of tangency of the rollers 14 and 15. The upper portion of said groove is cut away under the magazine, so that the bottom cards will fall from said magazine into line with the groove.

31 represents a long rod or extension fastened to the dog 23 and having the upwardly-projecting fingers 32 and 33 near its outer end. This rod rests in the camway 35 on the shaft 10, which camway has a short raised portion 34. (See Fig. 10.)

36 represents a collection-box for the stencil-cards which have been forced out of the printing mechanism by the ejector-finger 33, and 37 represents a similar collection-box for

the printed objects, such as envelops, which have been forced out of the printing mechanism by the ejector-finger 32. 38 is a guide for said printed objects.

39 is a series of objects to be printed, such as envelops, resting in the magazine formed by the uprights 40 40. 41 is a metal strip forming a portion of the bottom of said magazine and extending around to the left in a semicircle which is tangential to said bottom. 42 42, &c., are a series of similar guides of slightly-larger radius than 41, so that a space is left between through which an envelop may pass.

43 is a semicircular pusher mounted on the shafts 47, which rotates on an axis coinciding with the center of the semicircle outlined by the guides 41 and 42. 43 is also arc-shaped and slips down between said semicircular guides. The shaft 47 is given periodic vibrations by means of the cut-away gear 44 on shaft 10, which has a portion of its teeth 45 left to engage with the pinion 46 on the shaft 47.

48 is a spiral spring which normally holds the shaft 47 in the position shown in Fig. 2, with the stop 48^a resting against the shaft 13. On the teeth 44 engaging with the teeth on pinion 46, a result secured without jamming by means of the coacting lugs 49 and 50, (see Fig. 8,) the shaft 47 is given a partial rotation in a direction indicated by Fig. 7, and when the teeth 45 have passed the spring 48 returns the shaft to its normal position.

51 51 represent horizontal rods attached to the main frame 1, on which the collection-boxes 36 and 37 may be slid and adjustably fixed.

52 represents an improved form of stencil-card composed of the pasteboard frame 53, to which the piece of stencil-paper 52 is attached at four separate points, as indicated at 54, Figs. 5 and 6.

The operation of my invention is as follows: When separate objects, such as envelops, are stacked up in the magazine 40 with the flaps of the envelops downward and leaving the open flap on the left-hand side, looking at Fig. 2, the stencil-cards on which the addresses or other words have been pricked out are stacked up in the magazine 22. The ink-fount 18 is filled with ink and motion given to the machine by means of the belt-pulley 3. The dog 23 will begin to reciprocate and catching the inner side of the frame 53 of the lower stencil-card (said cards being arranged in the magazine with the frame side down, as represented in Fig. 6) will force cards out along the parallel guides 30, one behind the other, in a continuous series. When the first card has arrived at the point of tangency of the rollers 14 and 15, an envelop will have been fed down on top of it by reason of the fact that the ends of the arc-shaped pusher 43 will have caught under the flap of the lowermost envelop at each reciprocation and forced the same down through the semicircular guides 41 and 42, as indicated in Fig. 7. It is a fact that the extreme ends of the flap of an envelop will always project slightly away from the body of the envelop, because the paste on the major portion of said flap causes it to curl under, and thereby lifts the extreme end, which has no paste, up from the face the distance sufficient to permit a thin pusher like 43 to enter and secure a firm grip on the envelop. The stencil-card and the envelop superimposed thereon being at the point of tangency of the two rollers 14 and 15 are seized by the full-faced portions thereof when they come around and carried forward a distance equal to the width of said faces in the direction of the circumference of the roller. During this operation the ink carried on the roller 15 is forced through the perforations of the stencil-card and the words or letters perforated therein are printed on the envelop. When the full-faced portions of the rollers let go of the card and envelop, the dog 23 and extension 31 come forward to perform the double function of feeding up another stencil-card and ejecting the card and envelop already printed. This last operation results by reason of the fact that the full-faced portion 34 of the camway 35 comes under the rod 31 and lifts it, so that the fingers 32 and 33 strike the envelop and stencil-card, respectively, and snap them out. On the backward stroke of the rod 31 the cam-face 34 is out of engagement, so that the fingers 32 and 33 travel back below the level of the new card and envelop placed in position for printing by the next operation.

The ejected card falls into the collection-box 36. The envelop, being larger than the dimensions of said collection-box, passes over its mouth and slides down the guides 38 into the collection-box 37.

The shaft 47 is shown bent to one side throughout its central portion. This is to enable it to clear the roller 14 and is a feature of construction rendered necessary by the proportion of the part in this particular machine and constitutes no feature of the invention.

The teeth 45 on the cut-away gear 40 sometimes jam against the teeth on the pinion 46, and lugs 49 and 50 are riveted to the sides of the said gear-wheel and pinion to cause the teeth to register and intermesh.

Numerous changes could be made in the details of my invention without departing from the principle thereof. The number of full-faced portions of the rollers 14 and 15 might be varied if their relative speeds of rotation were varied accordingly. Other forms of stencil-feeding card mechanism and different forms of stencil-cards might be used. The ejector mechanism might be varied or in some cases dispensed with, and so on, without detracting from the advantages of my improved apparatus, which consist in its compactness and smoothness and rapidity of action combined with small first cost.

It is evident that in order to prevent the smearing of ink on the roller 14 and its con-

sequent transfer to the backs of the objects to be printed the dimensions of the ink-carrying pad or roller 15 in the line of its motion should be only equal to and preferably less than the width of the stencil-card. In the particular construction which I have here illustrated it is also necessary that the other dimension of the ink-carrying pad in the line of its axis should be less than the distance between the parallel guides in order that it may pass between them and grip the stencil-card. Consequently the dimensions of the ink-carrying pad both ways should be less than the dimensions of the stencil-card.

A special advantage results from the semicircular form of guides for the envelops in that as the bottom envelop is seized and tilted downward at the beginning of its motion its rear edge tends to tilt upward and so lifts the pile of envelops above it up away from the mouth of the guides and tends to prevent the jamming of two or more envelops into the guide at the same time.

Having therefore described my invention, what I claim as new, and desire to protect by Letters Patent, is—

1. In a stencil printing-machine, the combination of the revolving ink-carrying roller, which has a portion of its face cut away, along its entire breadth, and has a full-faced portion along its entire breadth for the remainder of its circumference, the coacting roller which revolves at the same circumferential speed and means for feeding ink to the ink-carrying roller, substantially as described.

2. In a stencil printing-machine, the combination of the stencil-card, a revolving ink-carrying roller having its face cut away so as to leave one or more portions whose surface dimensions are less than those of the stencil-card, the coacting roller which revolves at the same circumferential speed as the ink-carrying roller, and means for feeding ink to the ink-carrying roller, substantially as described.

3. In a stencil printing-machine, the combination of the stencil-card, a revolving ink-carrying roller having its face cut away so as to leave one or more portions whose surface dimensions are less than those of the stencil-card, the coacting roller which revolves at the same circumferential speed as the ink-carrying roller, and means for feeding the ink to the ink-carrying roller, together with means for guiding the stencil-card to the point of tangency of the two rollers, substantially as described.

4. In a stencil printing-machine the combination of the stencil-card, a revolving ink-carrying roller having its face cut away so as to leave one or more portions whose surface dimensions are less than those of the stencil-card, the coacting roller which revolves at the same circumferential speed as the ink-carrying roller, and means for feeding ink to the ink-carrying roller, together with means for guiding the object to be printed to the point of tangency of the two rollers, substantially as described.

5. In a stencil printing-machine, the combination of the stencil-card, a pair of revolving partly-cut-away rollers, one of which carries ink, a pair of parallel grooved guides which conduct the card to the point of tangency of the two rollers, the distance between the two guides being greater than the width of the roller-surfaces, substantially as described.

6. In a stencil printing-machine, the combination of the stencil-card, a pair of revolving partly-cut-away rollers, one of which carries ink, a pair of parallel grooved guides which conduct the card to the point of tangency of the two rollers, the distance between the two guides being greater than the width of the roller-surfaces, means for feeding the card along the guides, and means for feeding the object to be printed to the same point of tangency of the rollers, substantially as described.

7. In a stencil printing-machine the combination of the printing mechanism, the stencil-card magazine located at one side thereof, the straight guides from said magazine to the printing mechanism, the magazine of objects to be printed, located over the printing mechanism and the semicircular guides from said magazine to said mechanism, substantially as described.

8. In a stencil printing-machine the combination of the printing mechanism, the magazine of stencil-cards, the guides leading therefrom to the printing mechanism, the reciprocating dog which forces the bottom card from the magazine into the guides and the ejector which consists of an extension of said dog and discharges the card that has been used from, at the same time it feeds a fresh card to, the printing mechanism, substantially as described.

9. In a stencil printing-machine, the combination of the two coacting rollers, composing the printing mechanism, the guides for stencil cards and envelops leading thereto, the reciprocating ejector, and the cam on one of said rollers which lifts the ejector into operative position on the forward stroke but allows it to sink below the level of the card on the return stroke, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

FRANK D. BELKNAP.

Witnesses:

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PETER R. GATENS.