

E. D. BELKNAP.
 DUPLICATING STENCIL PRINTING MACHINE.
 APPLICATION FILED JUNE 7, 1912.

1,060,309.

Patented Apr. 29, 1913.

4 SHEETS—SHEET 1.

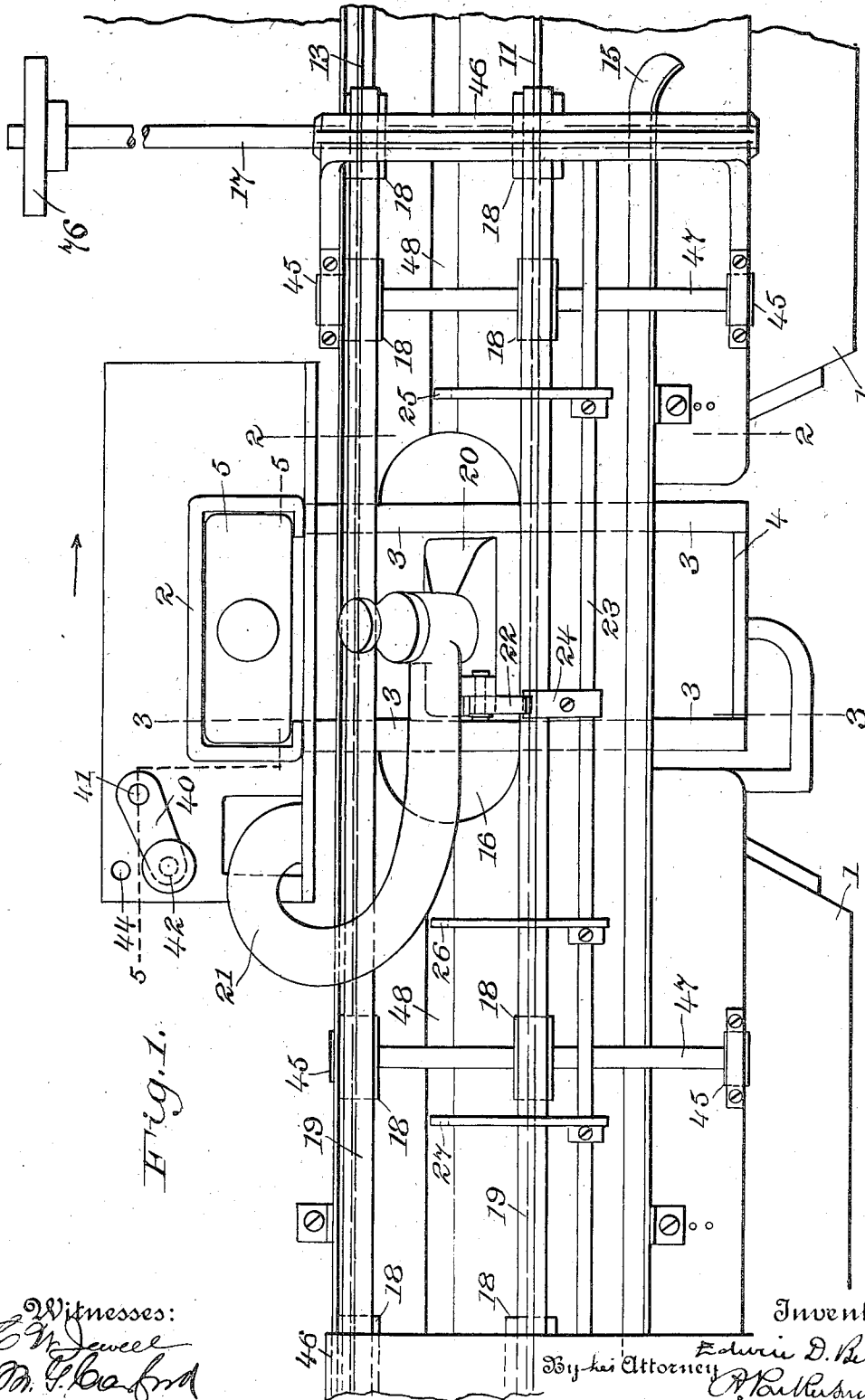


Fig. 1.

Witnesses:
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M. C. Bradford

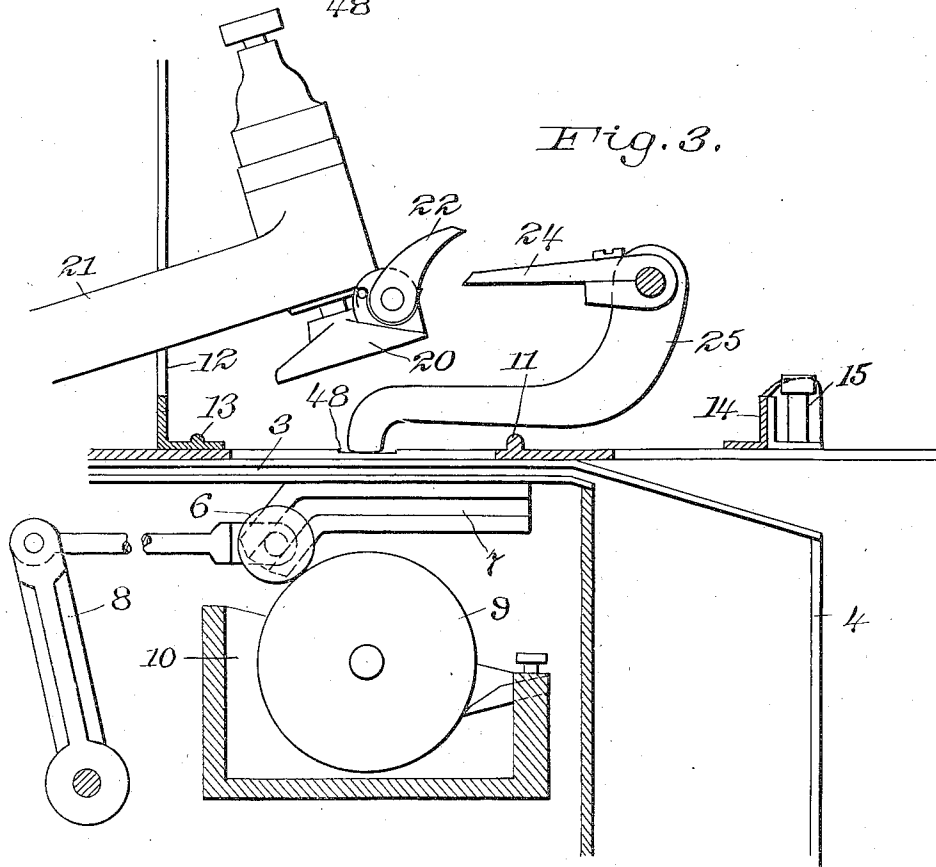
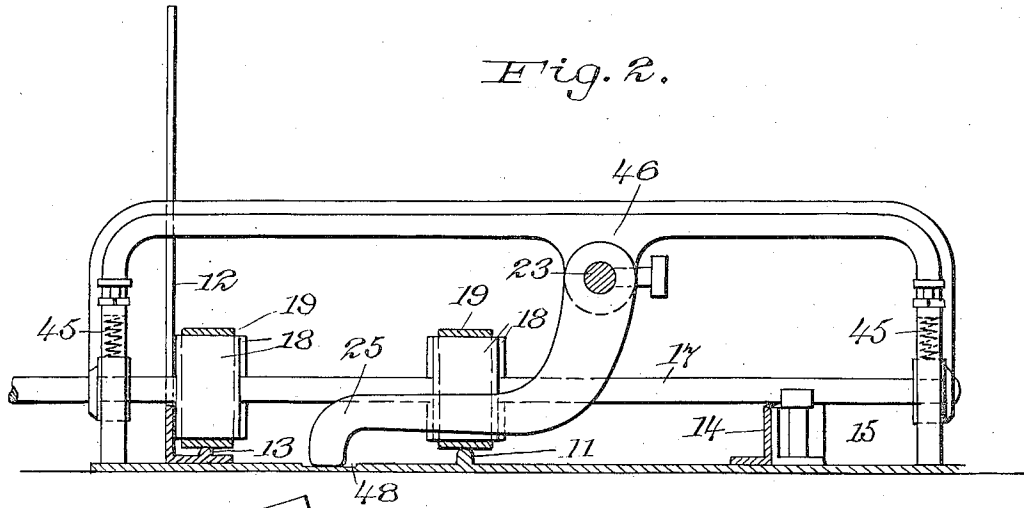
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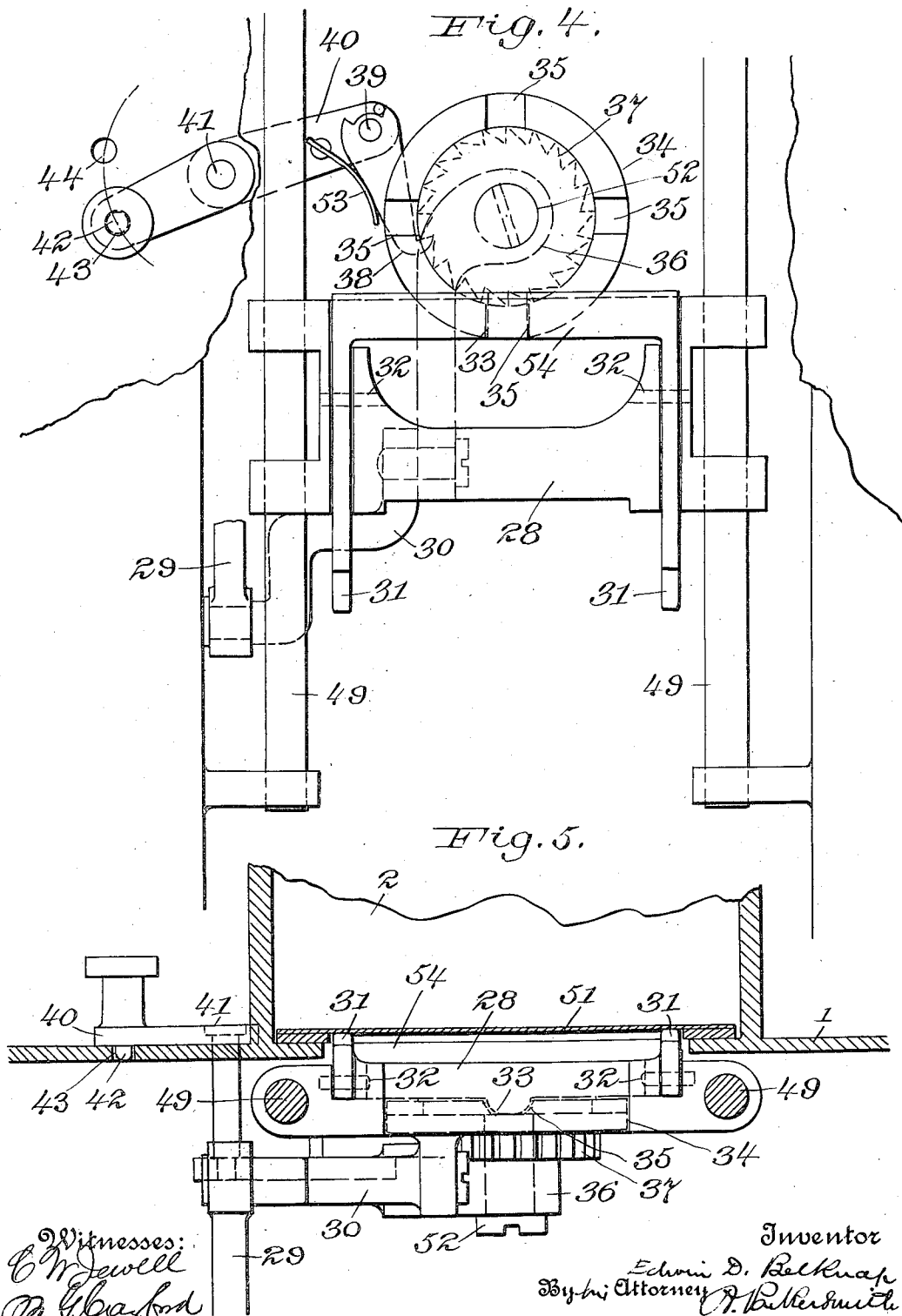
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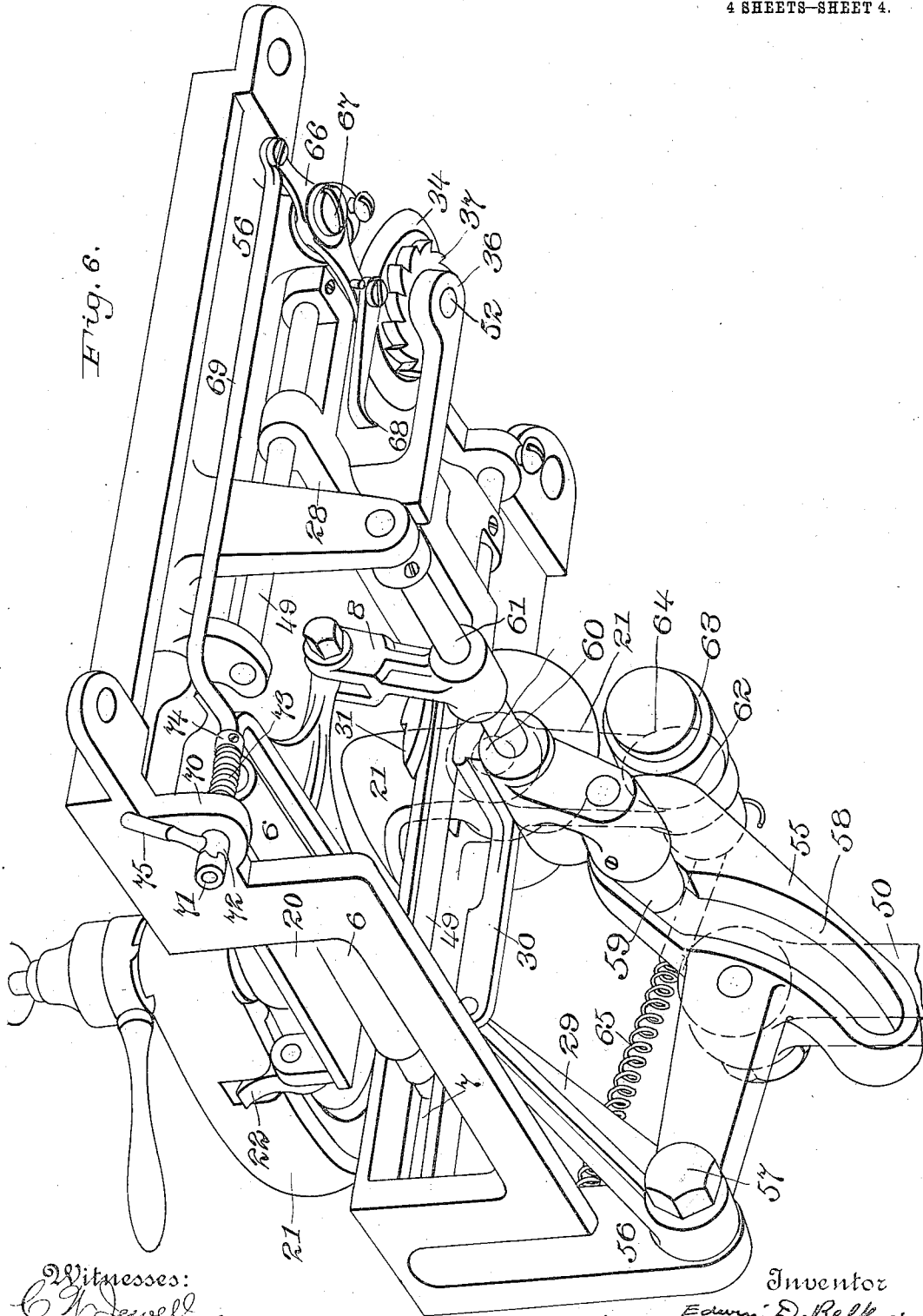


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Witnesses:
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UNITED STATES PATENT OFFICE.

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

DUPLICATING STENCIL-PRINTING MACHINE.

1,060,309.

Specification of Letters Patent.

Patented Apr. 29, 1913.

Application filed June 7, 1912. Serial No. 702,340.

To all whom it may concern:

Be it known that I, EDWIN D. BELKNAP, a citizen of the United States of America, residing at New York city, county and State of New York, have invented certain new and useful Improvements in Duplicating Stencil-Printing Machines, of which the following is a specification.

My invention relates to printing apparatus and comprises an improvement in stencil printing machines of the general type illustrated in Patent No. 976,142, granted to me under date of November 22, 1910.

The present invention is designed to facilitate the filling out of certain documents such as gas bills in which a name, or name and address with perhaps other matter, have to be printed in two or more places. To this end I have invented certain attachments to a machine of the general type described in the above mentioned patent in which the sheet to be printed is held at two or more points in its line of travel through the printing mechanism and the stencil card, or other device cooperating with the printing mechanism, is held therein during one or more repetitions of the printing operations on different portions of the sheet.

The best form of apparatus at present known to me, embodying my invention, as applied to machines using stencil cards, is illustrated in the accompanying sheet of drawings in which,

Figure 1 is a plan view of the machine with parts broken away. Fig. 2 is a detail cross section on a vertical plane, taken on line 2—2 of Fig. 1, looking in the direction of the arrow. Fig. 3 is a similar section taken on line 3—3 of Fig. 1 the feed mechanism for feeding the sheets being omitted for greater clearness. Fig. 4 is a detail plan view of the card feed apparatus with the table of machine removed and parts broken away. Fig. 5 is a vertical section of the same taken on line 5—5 of Fig. 1, and Fig. 6 is a perspective assembled view of a slightly modified form of mechanism.

Throughout the drawings like reference figures indicate like parts.

1 is the table of the machine, above, and one side of which, is the card magazine 2, containing a stack of cards on which the weight 5 rests, while the used card receptacle 4 is at and below the other side of the table.

3 indicates the card runway or guides connecting 2 and 4.

The usual inking mechanism shown in Fig. 3 comprises the roller 6 reciprocated in guides 7, by crank 8, or equivalent device, and doctor roll 9, located in ink reservoir 10.

On the table 1 of the machine is formed the rib 11, and on this table is the vertical guide plate 12 with a flange on which is formed rib 13. On the opposite side of the table is guide strip 14 with outwardly curved end 15. These form the passageway, or guide for the sheets of paper to be fed into the machine for printing, and near the middle the table has an elongated cutaway portion 16, over the card guides and inking mechanism and under the vertically reciprocating platen 20 carried on curved lever 21. The sheets to be printed (not shown in the drawing) are fed along this guideway by any suitable, continuously acting feed mechanism such as endless tapes 19, 19, running over pulleys 18, 18. Some of these pulleys are mounted on driving shaft 17, and others on idler shafts 47, 47. The shafts are preferably mounted in downwardly pressed spring bearings 45, 45. In the path of the sheets fed along by these tapes are a series of stop fingers 25, 26 and 27, rigidly but adjustably mounted on shaft 23, which is journaled in housings 46, 46. To insure the ends of these stop fingers falling below the level of the sheets fed to them, they rest in a slot 48, running lengthwise of the table. The shaft 23 also carries the lug or finger 24, which is located in the path of the single acting spring dog 22, carried by platen 20. The fingers 25, 26 and 27 are adjustable on shaft 23 so as to vary the positions in which they will hold the sheets fed against them by the constantly moving tapes 19, 19.

The stencil card feeding mechanism shown in Figs. 4 and 5 comprises the usual carriage 28, reciprocated on guides 49, 49, by driving link 30 connected to vibrating arm 29. On this carriage is pivoted at 32, 32, the card feed claws 31, 31, which are weighted at the rear end so as to normally hold their forward ends, or engaging faces, up in a position to grasp the under side of card 51, as shown in Fig. 5. The rear ends of the claws are connected together by a cross piece 54, carrying a downwardly extending projection or button 33, shaped to

register with depressions 35, 35, in disk 34, as shown in Fig. 5. In this position every reciprocation of the carriage feeds a card out from magazine 2 under platen 20 and over the inking device. Disk 34, however, is journaled on stud 52 in the end of arm 36, which is cast integral with carriage 28, and said disk has ratchet teeth 37, on its under side with which pawl 38 coöperates. This pawl is pivoted at 39 to bell crank lever 40 which, in turn, is journaled at 41 in table 1, and has the spring pin 42 in its upper, outer end, adapted to drop into either of the holes 43 or 44 in said table. The pawl 38 is forced into yielding engagement with the ratchet teeth 37 by spring 53.

In Fig. 6 most of the above described parts, or slightly modified forms thereof, are shown in perspective as they appear when looking at the under side of the table. 50 is a connecting rod operated from a crank or other motor device, not shown, to vibrate cam bell crank 55, pivoted to the main frame 56 at 57. This cam bell crank has the cam slot 58 engaging cam roller 59 on crank 60 carried by shaft 61, journaled in the main frame and carrying crank arm 8 which reciprocates the inking roller 6, before described. Driving arm 29 reciprocating the card feed carriage forms one portion of the cam bell crank. The external cam face 62 of the cam bell crank engages cam roller 63 on the lower end 64 of curved lever 21 which is loosely journaled on shaft 61, said cam roller being held in contact with cam face 62 by spiral spring 65 fastened to the main frame 56 at one end and to the journal pin of roller 63 at the other.

The modified form of card feed disabling device consists of a lever 66 pivoted at 67 to the frame 56 on the side opposite to that shown in Fig. 4, carrying pawl 68 which engages ratchet teeth 37 on the back stroke of the card feed carriage and giving disk 34 its partial rotation on said back stroke of the carriage. Rod 69 connected to the other end of lever 66 extends through an opening in a lug 70 of frame 56 and terminates in a cam cap 71. Cam sleeve 72 is journaled on this rod and confined between lug 70 and cam cap 71. Spiral spring 73 is confined between collar 74 on rod 69 and the other side of lug 70. Crank handle 75 on cam sleeve 72 serves to rotate it so as to pull rod 69 toward lug 70 and pull lever 66 into position such as will swing pawl 68 into operative position to be engaged by teeth 37, or so as to permit spring 73 to force the rod 69 in the other direction and swing pawl 68 out of operative position.

The operation of the apparatus is as follows: The feed shaft 17 is rotated continuously by a belt (not shown) running from any suitable motor over pulley 76 (see Fig. 1) and connecting rod 50 is reciprocated by

the same motor. A sheet of paper fed into guides 12 and 14 is seized by feed tapes 19, 19, but stopped by finger 25. When the platen rises, spring dog 22 strikes lug 24, lifting the stop fingers and the paper is fed forward by the constantly moving tapes 19, 19; under the platen, being stopped in its first position by finger 26, all the fingers having dropped back into the position shown in Figs. 4 and 5. At the same time the stencil card in the bottom of the magazine 2 has been fed forward under the platen, projection 33 resting in one of the depressions 35, as indicated in Fig. 5, and the forward ends of claws 31, 31, being raised and in position to grasp a card, and after the platen has descended, the ink roller 6 runs under the card and forces ink up through the stencil on to the under side of the sheet in the well known way. These movements result from motion of the cam bell crank permitting spring 65 to pull the lower end 64 of curved lever 21 toward it and lower platen 20, and the ink roller being reciprocated by the before described mechanism controlled by cam slot 58. If pawl 68 is in operative position, disk 34 is given a partial rotation on the back stroke of the card feed carriage so that projection 33 rides up out of the depression 35, in which it rested, and this elevates the rear of claws 31 and depresses their forward ends so that on their next reciprocation they do not seize a card, and the same card remains in printing position under the platen. The upward motion of the platen has, however, lifted the stop fingers and the constantly moving tapes feed the printed sheet forward into the second position where it strikes stop finger 27, dropped in front of it. On the second dropping of the platen and second reciprocation of the inking roller, the same name, or address, or other matter stenciled on the card, is therefore again printed on the sheet in a second place. The next back stroke of the card feed carriage again turns the disk 34 so that another depression 35 comes under projection 33, and the feed claws are again in operative position. On the third operation a second card is fed into printing position, a second sheet is fed into the first printing position, and the sheet previously printed discharged, on lifting of the stop finger 27. The operations above described are then repeated. By turning handle 75 on cam sleeve 72 the pawl 68 may be swung out of operative position, and, button 33 remaining always in one of the depressions 35, 35, a new card is fed at each printing operation.

By varying the number and position of the stop fingers and the number and positions of the depressions 35, 35, relative to the number of ratchet teeth 37, the number and positions of the duplicate printings on each

sheet can be varied. When the form shown in Fig. 4 is used the position of bell crank lever 40 is shifted by dropping the spring pin 42 into hole 44, as indicated in dotted lines, Fig. 4, so that the pawl 38 is moved into a position where it will not engage ratchet teeth 37, and, the projection 33 being left in one of the depressions 35, the card feed will operate at each reciprocation, and each sheet will be printed but once from each stencil in the usual way. When the disabling mechanism of either form is out of gear, the stop finger 27 is so adjusted on the shaft 23 as to be permanently out of operation.

With the form shown in Fig. 4, the disk 34, is shifted, and the claws 31, raised into, or lowered out of, operative position just at the end of the forward stroke of the feed carriage.

The advantages of my invention comprise its capacity for use to print automatically a series of names, and addresses, or other matter, one, or two, or more times on each sheet fed to the machine, and in any desired positions.

Other card feed disabling mechanisms could be substituted for those shown and other means employed for operating the stop fingers, so long as the proper timing of the various operations were preserved.

Having, therefore, described my invention, I claim:

1. In a printing apparatus the combination with an intermittently operating printing mechanism of continuously operating apparatus for feeding thereto a series of separate sheets to be printed, and a series of stop fingers adapted to arrest the motion of each sheet at a plurality of points while still within the area of operation of the printing apparatus, whereby said printing apparatus is enabled to operate a plurality of times upon each sheet, and at different points thereon.

2. In a printing apparatus adapted to operate with a series of stencil cards, the combination with the printing mechanism of apparatus for feeding thereto a series of sheets to be printed, and means for stopping each sheet at a plurality of points during the printing operations, said means comprising a series of stop fingers normally lying in the path of the sheet to be printed, and a trip for lifting said fingers momentarily out of said path operatively engaged by the printing mechanism after each printing operation.

3. The combination with an intermittently acting printing mechanism of a continuously operating feed mechanism adapted to feed to said printing mechanism a series of articles to be printed, a series of stop fingers normally lying in the path of travel of said articles and adapted to engage

and hold each article consecutively in different positions within the area of operation of the printing mechanism, and means for moving said fingers momentarily out of said path after each operation of the printing mechanism.

4. The combination with an intermittently acting printing mechanism of a continuously operating feed mechanism adapted to feed to said printing mechanism a series of articles to be printed, a series of stop fingers normally lying in the path of travel of said articles and adapted to engage and hold each article consecutively in different positions within the area of operation of the printing mechanism and means for moving said fingers momentarily out of said path after each operation of the printing mechanism, said printing mechanism comprising a reciprocating platen adapted to press down on the article being printed, and said means for moving the stop fingers comprising a trip finger carried by said platen.

5. The combination with an intermittently acting printing mechanism of a continuously operating feed mechanism adapted to feed to said printing mechanism a series of articles to be printed, a series of stop fingers normally lying in the path of travel of said articles and adapted to engage and hold each article consecutively in different positions within the area of operation of the printing mechanism, and means for moving said fingers momentarily out of said path after each operation of the printing mechanism, together with reciprocating mechanism for feeding a series of stencil cards to said printing mechanism, and means for disabling said feed mechanism during a certain number of its reciprocations.

6. In a printing apparatus adapted to operate with a series of stencil cards, the combination with the printing mechanism of means for feeding one stencil card to it for each printing operation, comprising a pivoted reciprocating claw adapted to engage with its forward end the under side of the card and having a weighted rear end provided with a downward projection which normally forces the front or engaging end of the claw upward, into engaging position, a disk on which the rear end of said claw rests, provided with spaced recesses into which the projection on said rear end may drop far enough to bring the front end of the claw into operative position, and ratchet mechanism adapted to give said disk a partial rotation at each reciprocation of the card feeding mechanism.

7. In a stencil printing mechanism, the combination of a vertically reciprocating platen, means for continuously feeding a series of articles to be printed beneath said

platen, a series of stop fingers normally lying in the path of said articles and mounted on a single shaft, a single-acting pawl carried on said platen, and a lug on said
5 finger shaft located in the path of said pawl, whereby said fingers hold the articles to be printed stationary during the descent of the platen, but are momentarily disengaged from said articles during the upward
10 motion of the platen.

8. In a printing apparatus adapted to operate with a series of stencil cards, the combination with the printing mechanism of apparatus for feeding thereto a series of

articles to be printed, and means for stop- 15
ping each article at a plurality of points during the printing operations, together with mechanism for feeding a stencil card to said printing mechanism between each
20 two printing operations, and a device for automatically disabling said card feeding mechanism during predetermined intervals of time.

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Witnesses:

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