Dec. 1, 1931. H. P. ELLIOTT 1,833,938

STENCIL PRINTING MACHINE AND SHEET FEEDING DEVICE THEREFOR

Filed Dec. 31, 1928 3 Sheets-Sheet 1

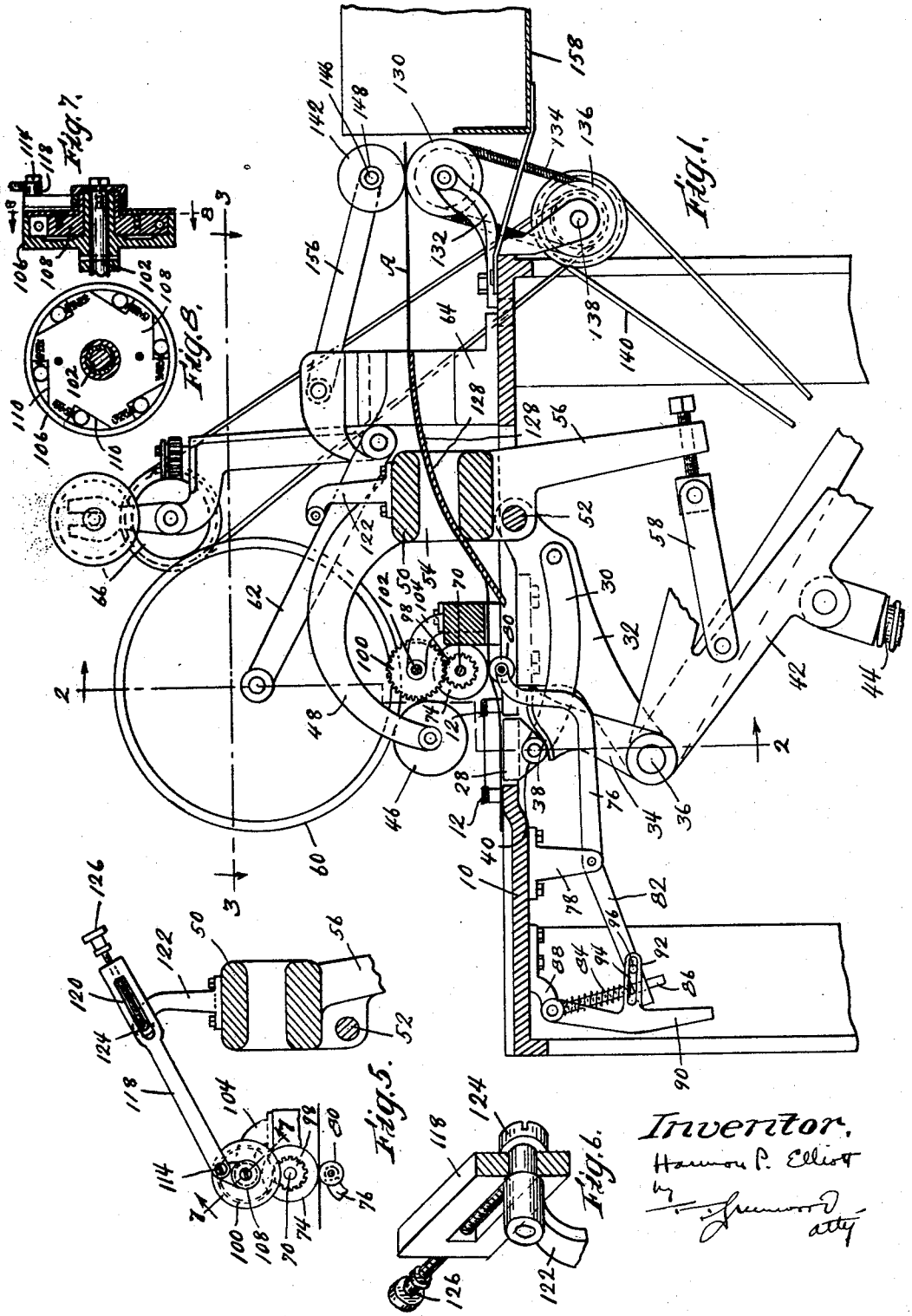


Fig. 1.

Fig. 2.

Fig. 3.

Fig. 4.

Fig. 5.

Fig. 6.

Fig. 7.

Inventor.
Harmon P. Elliott
by
Atty

Dec. 1, 1931. H. P. ELLIOTT 1,833,938

STENCIL PRINTING MACHINE AND SHEET FEEDING DEVICE THEREFOR

Filed Dec. 31, 1928 3 Sheets-Sheet 2

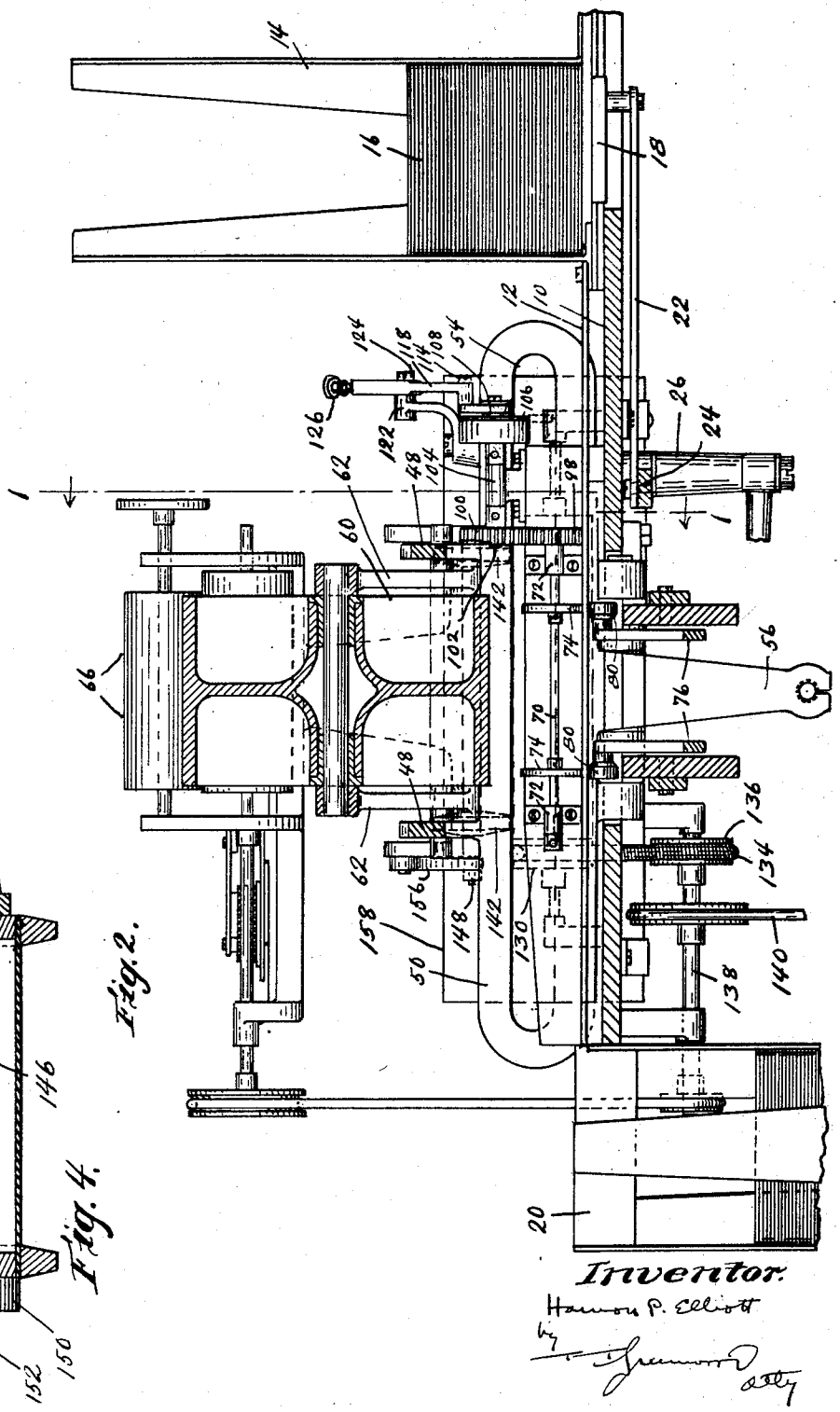


Fig. 2.

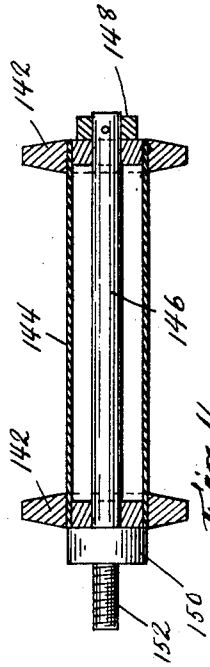


Fig. 4.

Inventor.
Harmon P. Elliott
by
Attorney

Dec. 1, 1931. H. P. ELLIOTT 1,833,938

STENCIL PRINTING MACHINE AND SHEET FEEDING DEVICE THEREFOR

Filed Dec. 31, 1928 3 Sheets-Sheet 3

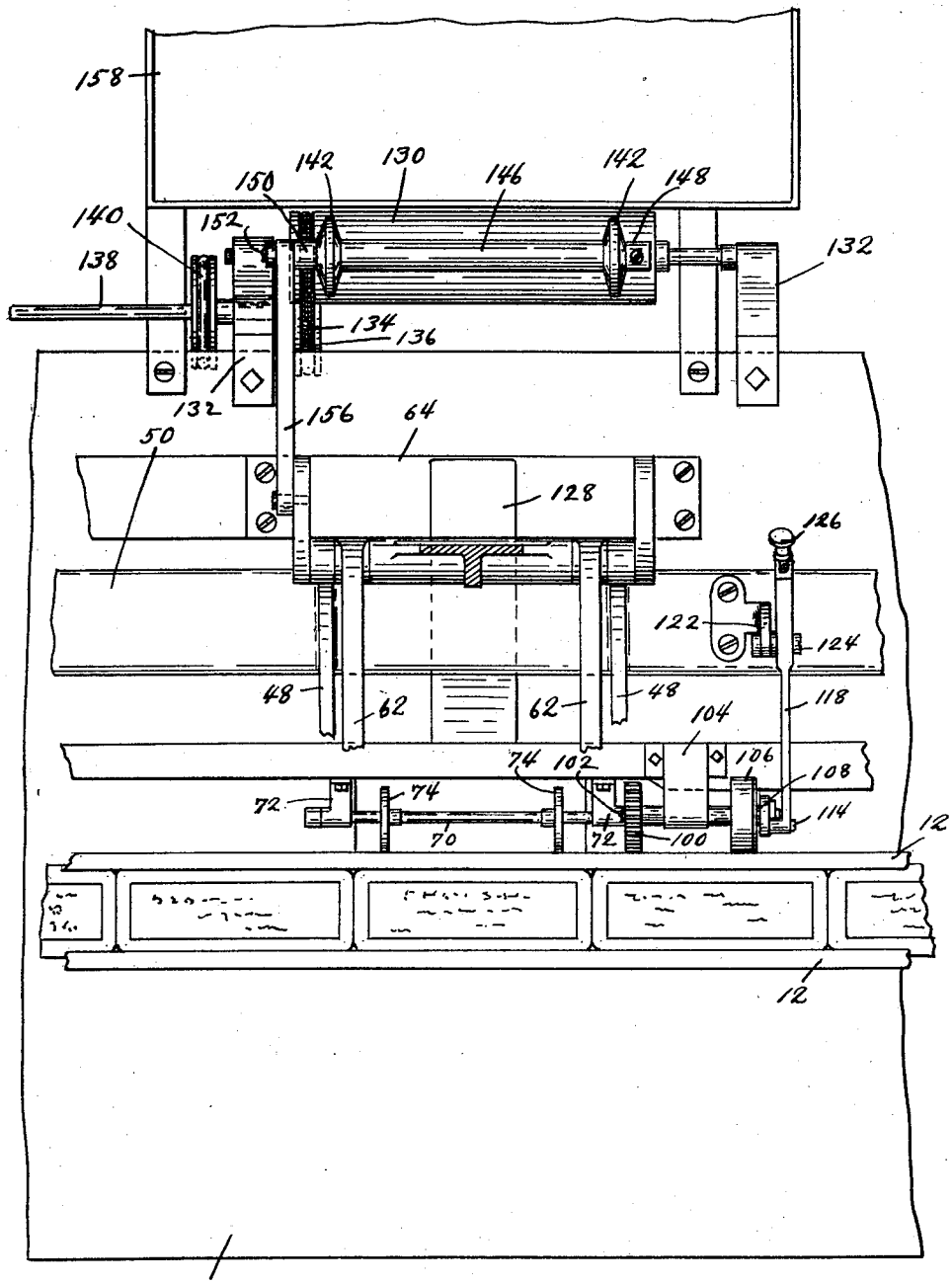


Fig. 3.

Inventor.
Harmon P. Elliott
by
Atty

Patented Dec. 1, 1931 1,833,938

UNITED STATES PATENT OFFICE

HARMON P. ELLIOTT, OF WATERTOWN, MASSACHUSETTS

STENCIL PRINTING MACHINE AND SHEET FEEDING DEVICE THEREFOR

Application filed December 31, 1928. Serial No. 329,472.

This invention relates to stencil printing machines.

For certain uses of a stencil printing machine, as for instance, in making up payroll sheets, the characters borne by the successive stencils are printed in successive order along the length of the sheet, herein termed a "transcript sheet", which is moved through the machine transversely to the line of stencil movement therethrough. When the sheet has been filled out, it has been necessary heretofore for the seated operative to rise and reach around in back of the machine to remove the sheet, thus incurring a considerable loss of time and trouble on the part of the operative.

It is an object of the present invention to provide means arranged automatically to move the transcript sheet through the machine and to discharge it automatically therefrom without the necessity for any especial attention on the part of the operative and also without loss of time.

A further object of the invention is the provision of means to feed a transcript sheet intermittently through the printing position, and other and continuously acting means to discharge the sheet from the machine when it is free from the intermittently acting means.

A further object is generally to improve the construction and operation of stencil printing machines and sheet moving devices.

Fig. 1 is a transverse sectional elevation of a stencil printing machine embodying the present invention taken along line 1—1 of Fig. 2.

Fig. 2 is a longitudinol sectional elevation taken along line 2—2 of Fig. 1.

Fig. 3 is a detail plan section taken along line 3—3 of Fig. 1, the printing and inking rolls being removed to illustrate more clearly the sheet moving mechanisms.

Fig. 4 is an enlarged sectional elevation of the continuously acting sheet moving rollers.

Fig. 5 is a detail partly in section of the intermittent sheet moving mechanism.

Fig. 6 is a perspective detail of the connection between the connecting rod of the intermittent sheet feeding mechanism and the printing roll carrier.

Fig. 7 is an enlarged sectional elevation of the clutch mechanism of Fig. 5 taken along line 7—7 of Fig. 5.

Fig. 8 is a section taken along line 8—8 of Fig. 7.

The stencil printing machine in which the present invention is embodied includes the bed or table 10 on which the objects to be printed are supported. A stencil track 12 is spaced thereabove and is extended thereacross and is adapted to support and guide the stencils in their movements into and out of printing position.

A stencil holder 14, see Fig. 2, is supported above the table and the track at one end thereof and is adapted to contain a pile of superimposed stencils 16. A pusher 18 is adapted to be reciprocated beneath the stencil holder to move the lowermost stencils successively therefrom into and along the stencil track and ultimately to deliver them into a stencil receiver 20 located at the other end of the track. The pusher is reciprocated by means of a connecting rod 22 which is pivotally connected with an arm 24 of a vertically pivoted hub 26, which hub is reciprocated by suitable mechanism not herein necessary to illustrate.

A platen 28, see Fig. 1, is located beneath the stencil track and is vertically reciprocable through an opening in the bed 10 into and away from a printing position wherein it is adapted to support the objects to be printed on immediately beneath a stencil in said track. Said platen is carried by an arm 30 which is pivoted to depending arms 32 of a bracket carried by the table. The platen is reciprocated by means of a cam member 34 which is pivoted to said arms 32 by means of a shaft 36. Said arm 34 has a cam face 38 at its upper end which engages a roller 40 carried by the platen whereby to control the movements of said platen and also to support it against the printing pressure. Said cam arm 34 is reciprocated by means of an arm 42 fixed thereto, which arm is reciprocated by a connecting rod 44 that extends to a suitable power mechanism not necessary to illustrate.

A printing roller 46 cooperates with the

platen 28 and is located above and is reciprocable toward and away from the stencils in the track 12. Said roller is journalled in rearwardly extended arms 48 which are carried by a horizontal frame 50 that is pivoted on the shaft 52 carried by said bracket-arms 32. Said bracket 50 has an horizontally elongated passage 54 therethrough through which the transcript sheet A is adapted to be moved. An arm 56 is integral with and depends from said frame below the table of the machine and is pivotally connected by means of a connecting rod 58 to a reciprocable arm 42 whereby to be reciprocated conjointly with the platen 28.

The printing roll 46 receives a supply of ink from a transfer roll 60 which is journalled in arms 62 pivoted to an upstanding bracket 64 carried by the table and disposed in the rear of the pivoted frame 50. Other inking mechanism 66 is located above and in the rear of said transfer roll 60 and is adapted to supply said transfer roll with ink. The printing machine thus far described is a well known construction and need not be described in greater detail.

In accordance with the present invention, means are provided to feed the transcript sheet A automatically by successive steps through the printing position and under the stencil track and to discharge the printed sheet from the machine.

In accordance with this invention, a horizontal feed-roll shaft 70 is located immediately above and at the rear of the stencil track behind and below the printing roll and is journalled in suitable brackets 72, see especially Figs. 2 and 3. Feed-rolls 74 are fixed to said shafts and are adapted to engage the transcript sheet A on opposite sides of the line of printing thereon. Connected arms 76 are located beneath the stencil track and are pivoted to brackets 78 and extend rearwardly therefrom and upwardly under said shaft 70. Idler or press rollers 80 are journalled on the ends of said arms and are disposed beneath the feed rolls 74 and are adapted to press the transcript sheet against said rolls. Said arms 76 are connected to a forwardly extended arm 82 which is constantly urged downwardly by means of a compression spring 84 that encircles a rod 86 pivoted to a bracket 88 and slidably extended through the end of said arm, thereby to hold the press rollers in cooperative relation with the feed rolls. The action of the spring on said rollers is relatively heavy so that the transcript sheet is pressed strongly against the feed rolls.

Means are provided to disengage said rolls 80 from cooperative relation with the feed rolls 74 when desired. Said means includes a hand-lever 90 which also is pivoted to the bracket 88 and has a rearwardly and downwardly inclined projection 92 formed with an elongated slot 94 therein in which a pin 96 carried by said arm 82 is received. By moving said lever 90 rearwardly the arm 82 is caused to be raised against the compression spring 84 thus to lower the arms 76. The construction of the lever 90 is such that it is adapted to be locked automatically in roll-release position until moved therefrom.

The shaft 70 and the feed rolls 74 are adapted to be rotated in a step by step manner in one direction between printing operations. To this end, the shaft 70 has a small pinion gear 98 fixed to one end thereof. Said gear meshes with a larger pinion gear 100 fixed to the end of a drive shaft 102 that is journalled in a fixed bracket 104. The other end of said shaft is connected with the driven member 106 of a one-way clutch mechanism, see especially Figs. 7 and 8. Said clutch mechanism can be of any desirable type and is here constructed essentially as shown in Patent No. 1,550,893, issued August 25, 1925, to Sterling Elliott.

Said driven member consists essentially of a drum which is fixed to said shaft 102 and encloses a driving member or disc 108 which is loose on said shaft and is disposed within said drum. Said driving member is formed with a plurality of inclined cam faces 110 on its outer periphery on which clutch balls 112 are received. When said driving clutch member 108 is moved in a clockwise direction, said balls roll outwardly along said inclined cam faces and establish driving connections with said driven drum 106. Movement of said driving member in the reverse direction can take place without a corresponding movement of the driven member.

Said driven clutch member 108 is pivotally connected by means including the screw 114 with the forward end of a connecting rod 118. Said rod is inclined rearwardly and upwardly over the pivoted frame 50 and has an elongated slot 120 at its upper end. A bracket 122 is fixed to the upper end of said pivoted frame 50 and has a horizontal extension, as the screw 124, that is pivotally received in said slot. An adjusting screw 126 is screw threaded into the upper end of said connecting rod and longitudinally into said slot and serves as means to vary the effective length of said slot and consequently the stroke of said connecting rod and the amount of movement imparted to the transcript sheet at each feeding operation.

As thus arranged, the pivoted frame 50 can move forward on a printing stroke without moving the feed-rolls. During the movement of said frame in the opposite direction, however, the screw 124 engages the end of the screw 126 and thus moves the connecting rod and consequently actuates the clutch mechanism to move the feed-rolls 74. The transcript sheet is thus moved rearwardly by a suitable amount as the inking roll 46 is

moved upwardly. By reason of the meshing gears 98 and 100 the extent of peripheral movement of the feed-rolls 74 is greater than that imparted to the clutch mechanism.

A guide plate 128 is extended through the elongated opening 54 in the pivoted frame 50 and serves to guide the transcript sheet through said frame from the intermittent feed mechanism above described and to present said sheet to the action of a continuously operable sheet feeding or moving mechanism.

Said continuously operable mechanism is located at the rear of the table 10 behind the frame 50 and includes a horizontal feed roll 130 which is journalled in fixed brackets 132 and is driven continuously by means of a belt 134 from a pulley 136 that is fixed to a shaft 138, which shaft is driven continuously by means of a belt or equivalent device 140 from the power mechanism not shown. Preferably the peripheral speed of the feed roll 130 is somewhat greater than the peripheral speed of the intermittently operated feed-rolls 74.

The transcript sheet A is maintained in light engagement with said continuously operable feed-roll 130 by a pair of driving rolls 142, see more particularly Fig. 4. Said rolls are fixed to the ends of a tube or hollow cylinder 144 that is journalled on a horizontal shaft 146 between collars 148 and 150 that are fixed on said shaft at the ends of said tube. Said shaft has a screw threaded end 152 that is received in and is clamped rigidly by means including the nut 154 to the rear end of an arm 156 which is pivoted to a part of the bracket 64. As thus arranged, the weight of the arm 64 and the rollers 142 and associated structure is sufficient to maintain said rollers in light continuous pressure-engagement with the transcript sheet A whereby to hold it lightly in engagement with the feed-roll 130. The driving action of said roll 130 on the transcript sheet is arranged to be less than the driving action of the intermittently operated feed-rolls 74 so that while said sheet is in the grip of said feed-rolls 74, the roll 130 will slip in engagement with the transcript sheet, when it is stationary. Thus the transcript sheet will be solely under control of the intermittently operated rolls while it is in engagement therewith. When, however, the transcript sheet leaves the engagement of said feed-rolls, the roll 130 then can move the transcript sheet from the machine and discharge it into a convenient receptacle 158. With this arrangement, the removal of the transcript sheet is automatic and is effected without any attention on the part of the operative and the successive sheets are deposited one on top of the other in the holder 158.

I claim:

1. A stencil printing machine having printing mechanism located at a printing position, means to move successive stencils through the printing position, an intermittently operated feed-roll adapted to move a sheet in a series of steps through the printing position wherein it is subjected to the action of said printing mechanism and stencils, a pivoted arm carrying a press roll that supports the sheet in driving engagement with said intermittently operated roll, means acting on said lever to maintain said rolls normally in the aforesaid relation, manually-controlled means to move said lever and said roll out of coacting position, and also to lock said lever in such position, a continuously operated roll disposed in position to receive the sheet from said intermittently operated roll while it is yet in driving engagement with said latter roll, and a roll to press the sheet lightly against said continuously rotated roll whereby said latter roll will be effective to move the sheet freely only when it is out of driving engagement with said intermittently operated roll.

2. A stencil printing machine having a stencil track along which successive stencils are moved into and out of a printing position, a printing device disposed above and movable toward and away from said track having a pivoted supporting bracket which is located in the rear of said track, intermittently operated sheet feeding mechanism disposed between said track and bracket having means to move a sheet through the printing position and beyond said bracket, and continuously operated sheet feeding means located in the rear of said bracket arranged to receive the sheet from said intermittently operated means and having means effective to move the sheet freely only after the sheet has passed beyond the action of said intermittently operated means, and means located in front of said stencil track arranged to disable said intermittently operated sheet feeding means.

3. A stencil printing machine having a stencil track along which successive stencils are moved into and out of a printing position, printing mechanism including a reciprocable printing arm located above and extended rearwardly of said track, a pivoted printing frame carrying said arm and having a horizontally elongated passage therethrough, intermittently operated sheet feeding means located between said track and frame having means to move a sheet in series of steps through the printing position and through the passage in said frame, a continuously operated sheet moving means disposed in the rear of said frame having means to engage the sheet while it is in the engagement of said sheet feeding means and to move the sheet freely only after it is disengaged from said sheet feeding means.

4. A stencil printing machine having means to guide successive stencils through a printing position, printing mechanism located at the printing position including a

pivotally-supported reciprocable printing frame, sheet feeding mechanism disposed adjacent the printing position including a sheet feeding roll, a driving mechanism therefor including a one way clutch having driving and driven elements, means establishing a driving connection between said driven element and said roll, and a lost motion driving connection between said driving element and said reciprocable printing frame.

5. A stencil printing machine having means to guide successive stencils through a printing position, printing mechanism located at the printing position including a reciprocable printing frame, sheet feeding mechanism arranged to move a sheet in a step by step manner through the printing position including an intermittently rotated feed roll, means including a one-way clutch mechanism for driving said roll in a step by step manner in the same direction, a connecting rod connecting said clutch mechanism and said reciprocable printing frame, said rod having an elongated slot therein in which a part of said printing frame is located, and means to vary the effective length of said slot whereby to vary the throw of said clutch mechanism.

In testimony whereof, I have signed my name to this specification.

HARMON P. ELLIOTT.