

No. 657,920.

Patented Sept. 18, 1900.

A. B. DICK.

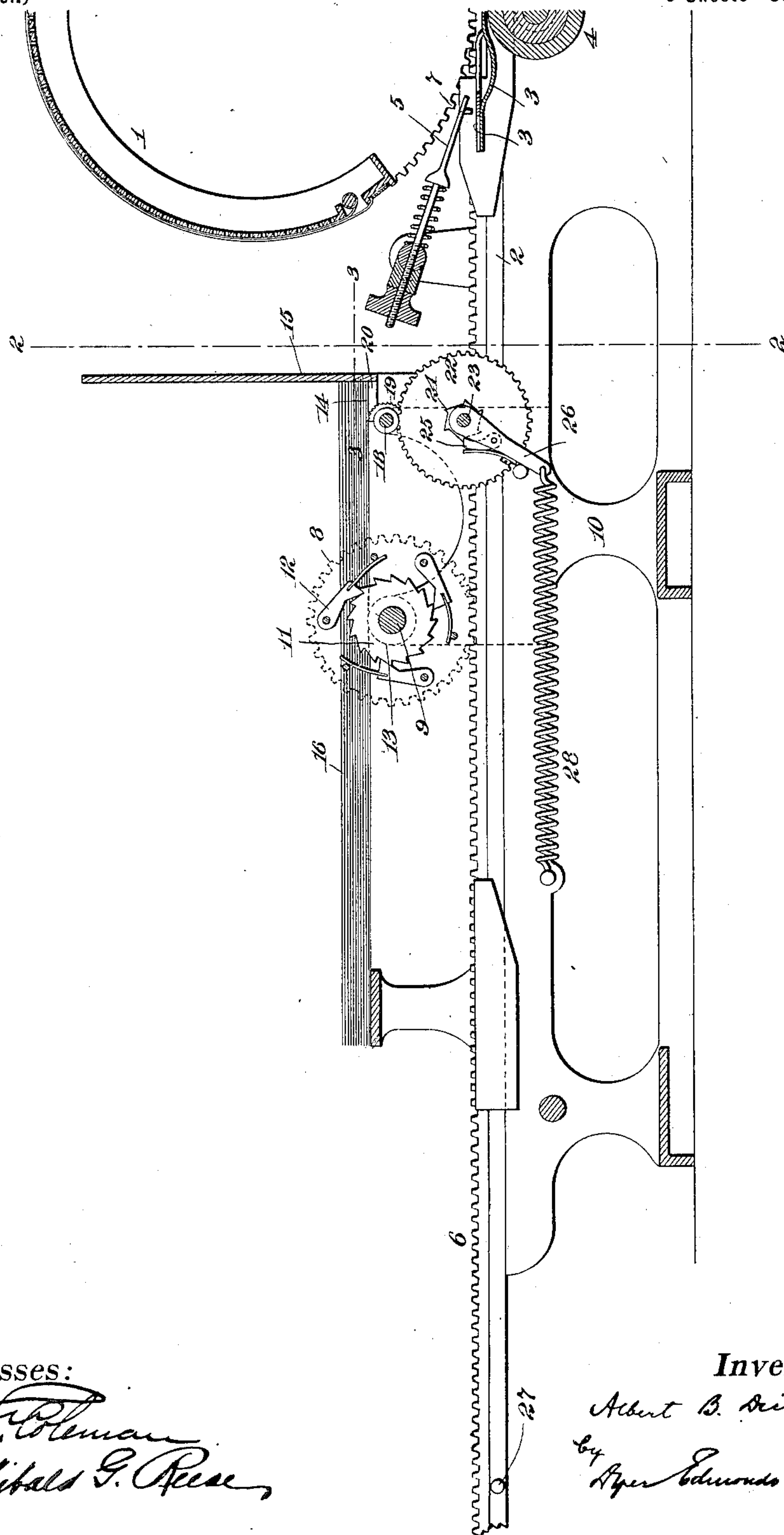
SHEET FEEDING ATTACHMENT FOR STENCIL PRINTING MACHINES.

(Application filed Apr. 5, 1900.)

(No Model.)

5 Sheets—Sheet 1.

Fig. 1



Witnesses:

Jas. F. Coleman
Archibald G. Reese

Inventor

Albert B. Dick
by *Hyman Edmunds & Hyman*
Att'ys.

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SHEET FEEDING ATTACHMENT FOR STENCIL PRINTING MACHINES.

(Application filed Apr. 5, 1900.)

5 Sheets—Sheet 2.

(No Model.)

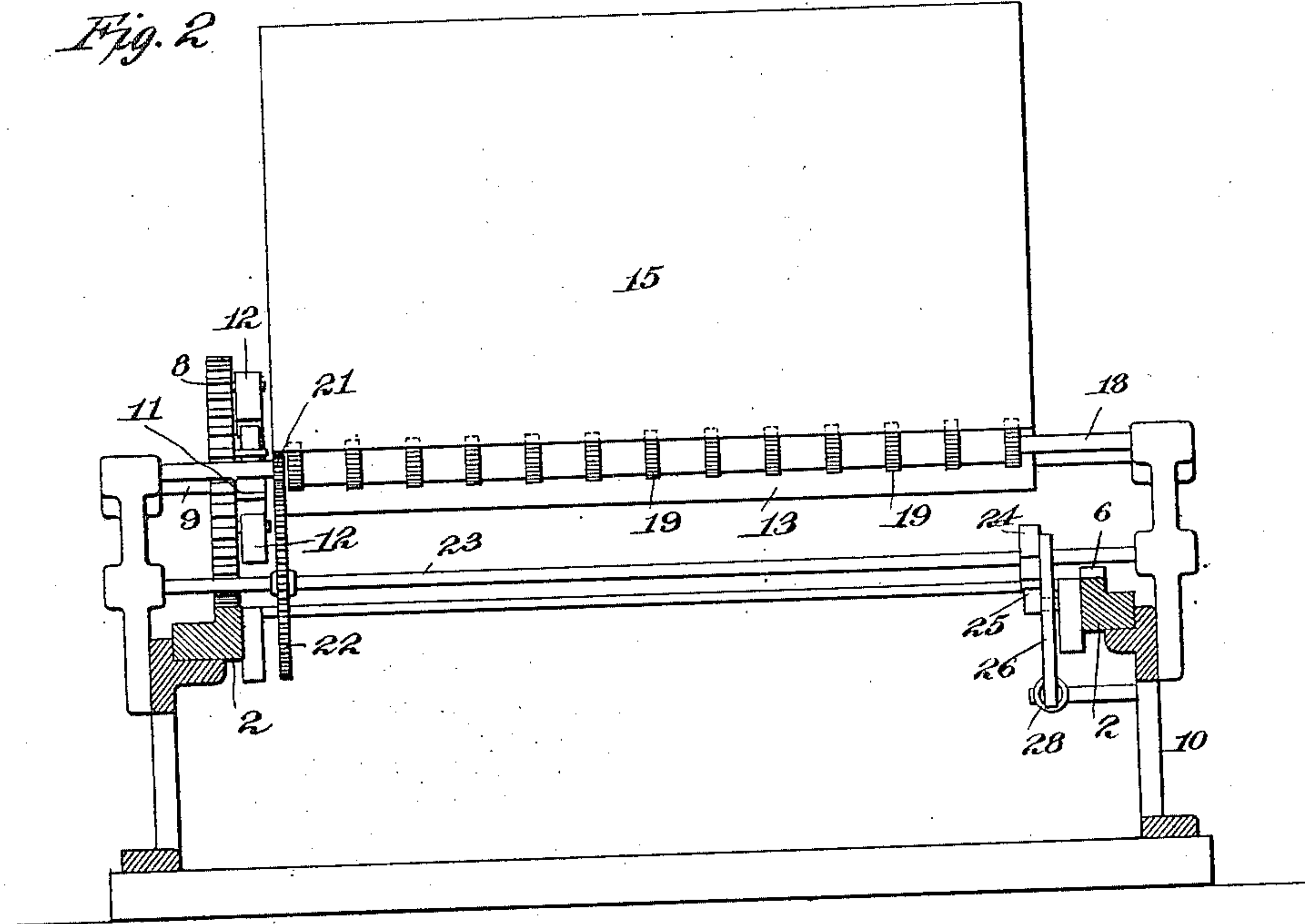
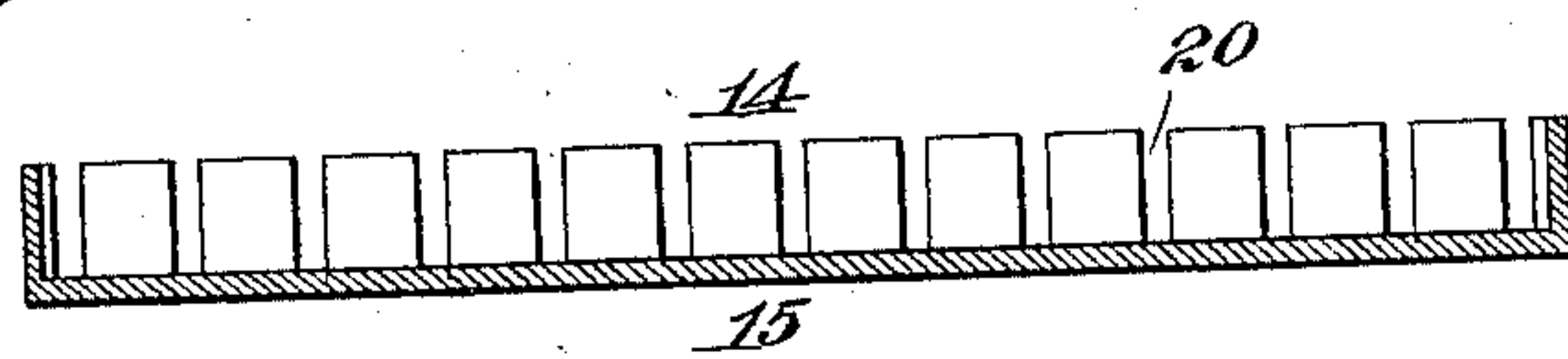


Fig. 3



Witnesses:

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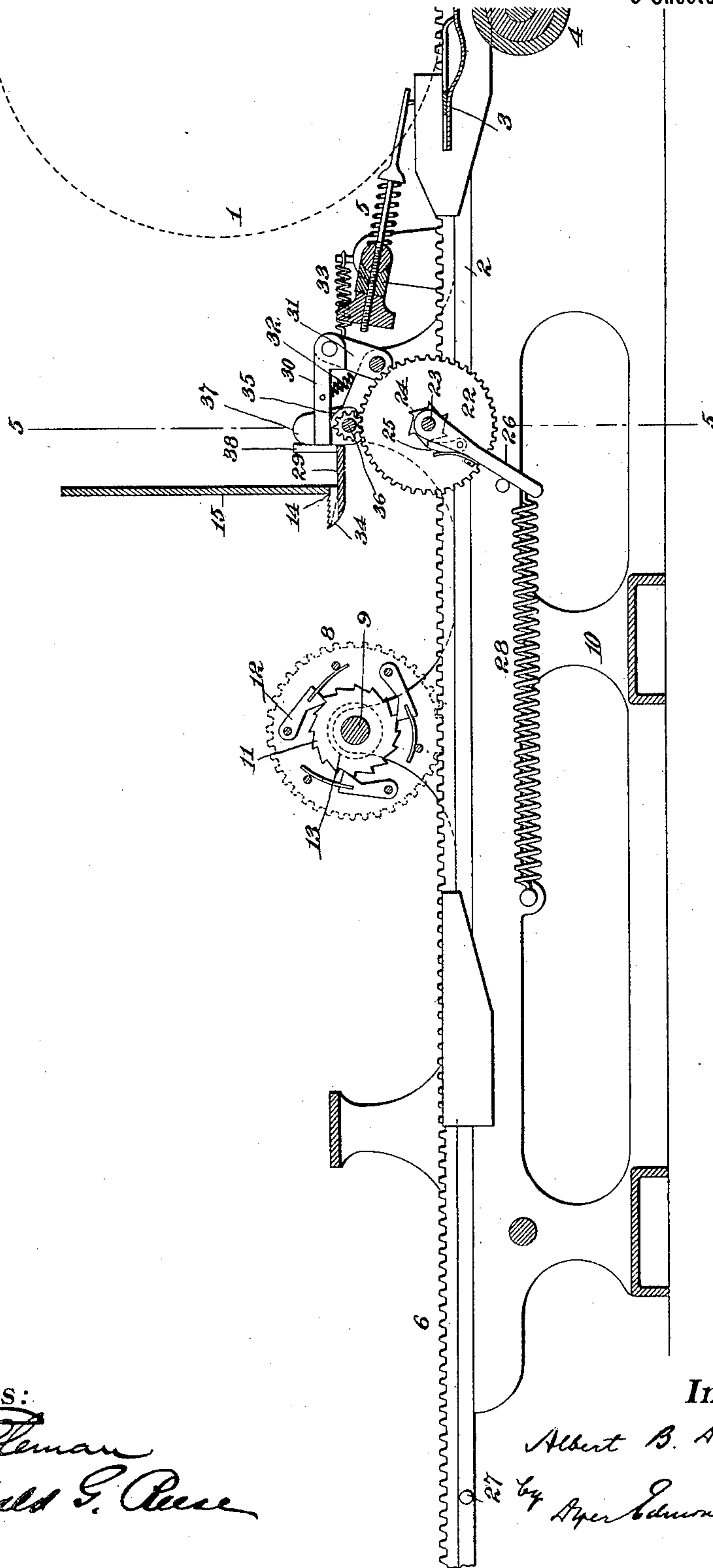
SHEET FEEDING ATTACHMENT FOR STENCIL PRINTING MACHINES.

(Application filed Apr. 5, 1900.)

(No Model.)

5 Sheets—Sheet 3.

Fig. 4



Witnesses:

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SHEET FEEDING ATTACHMENT FOR STENCIL PRINTING MACHINES.

(Application filed Apr. 5, 1900.)

(No Model.)

5 Sheets—Sheet 4.

Fig. 5

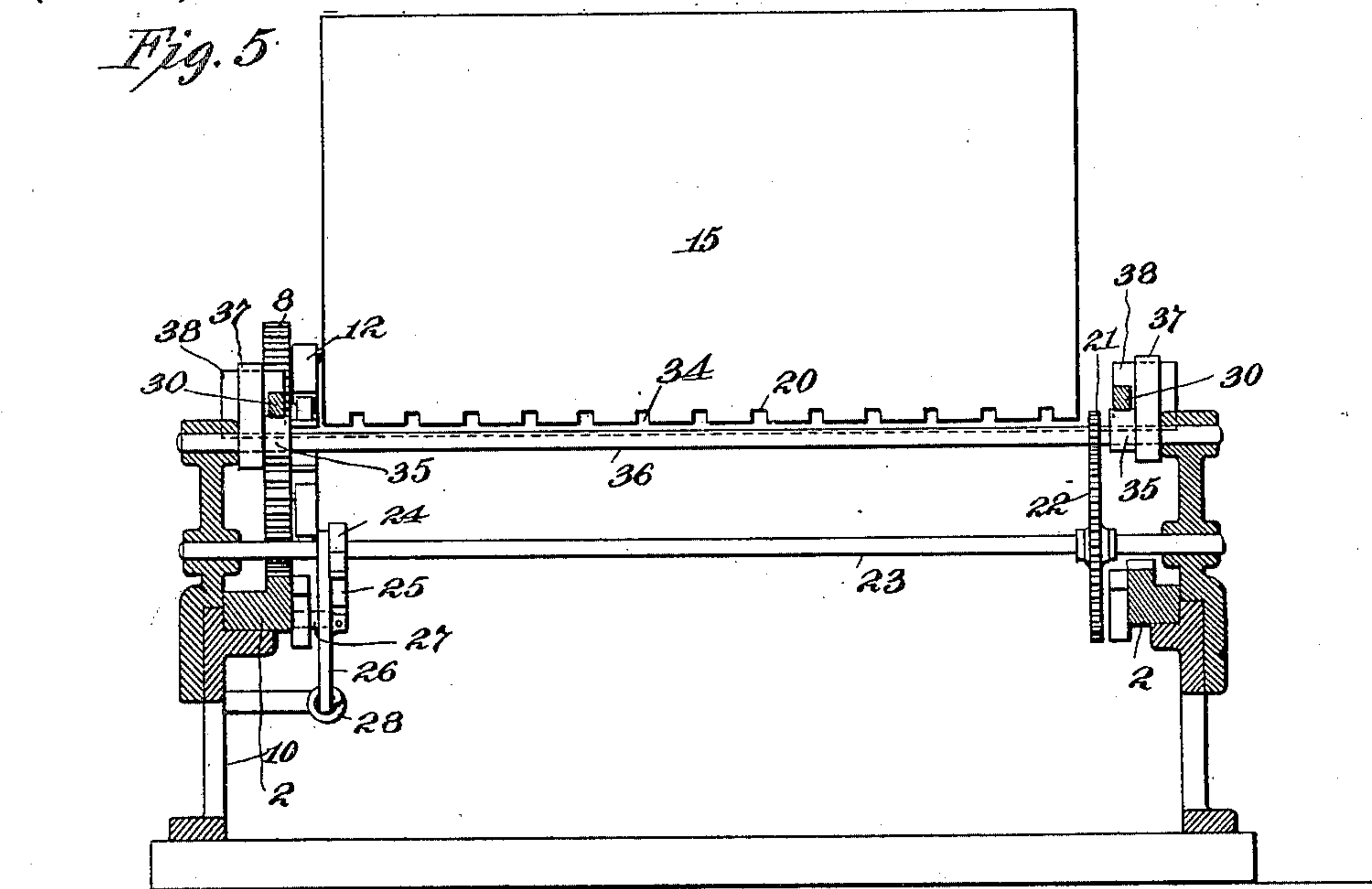
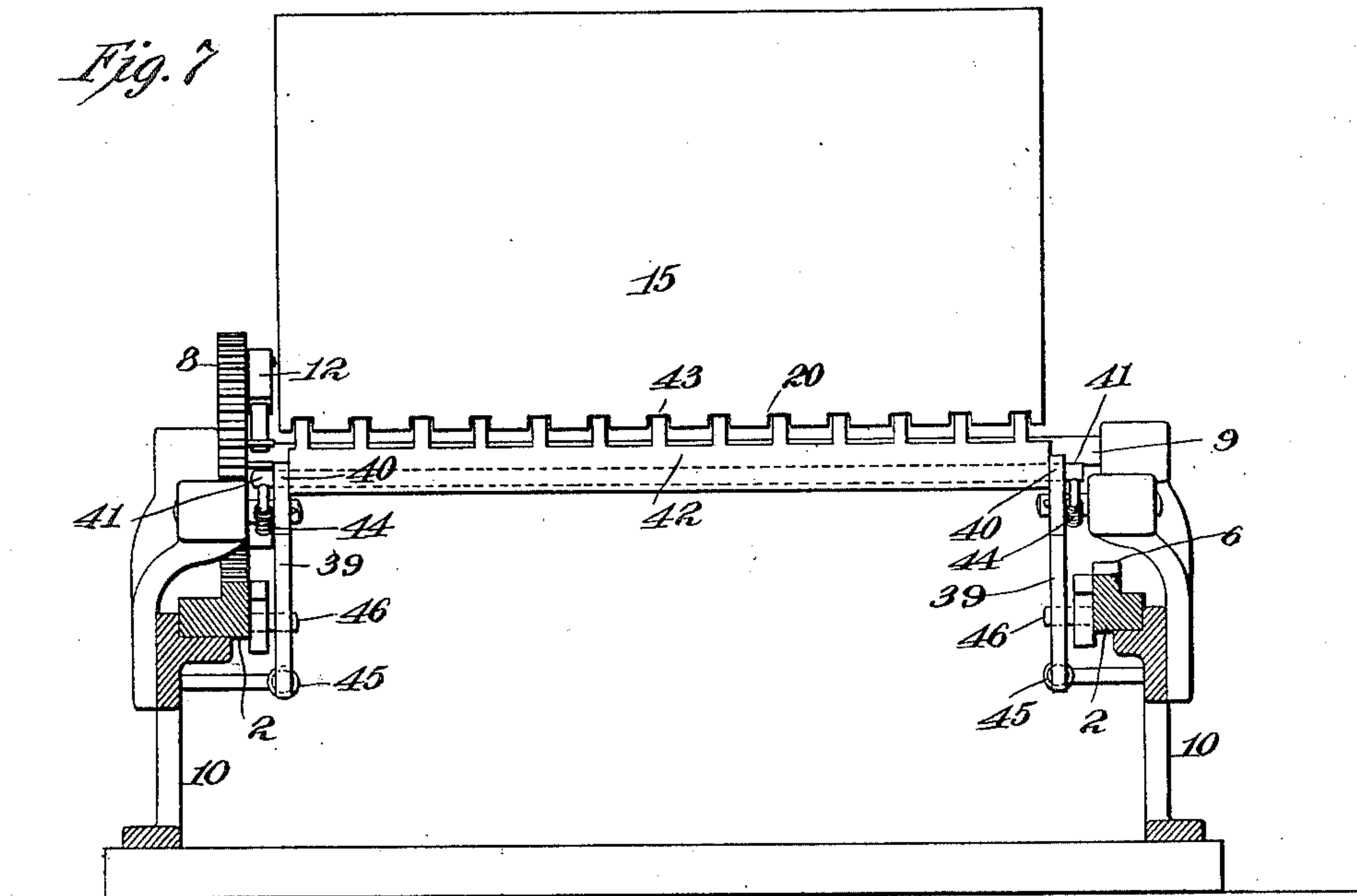


Fig. 7



Witnesses:

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No. 657,920.

Patented Sept. 18, 1900.

A. B. DICK.

SHEET FEEDING ATTACHMENT FOR STENCIL PRINTING MACHINES.

(Application filed Apr. 5, 1900.)

(No Model.)

5 Sheets—Sheet 5.

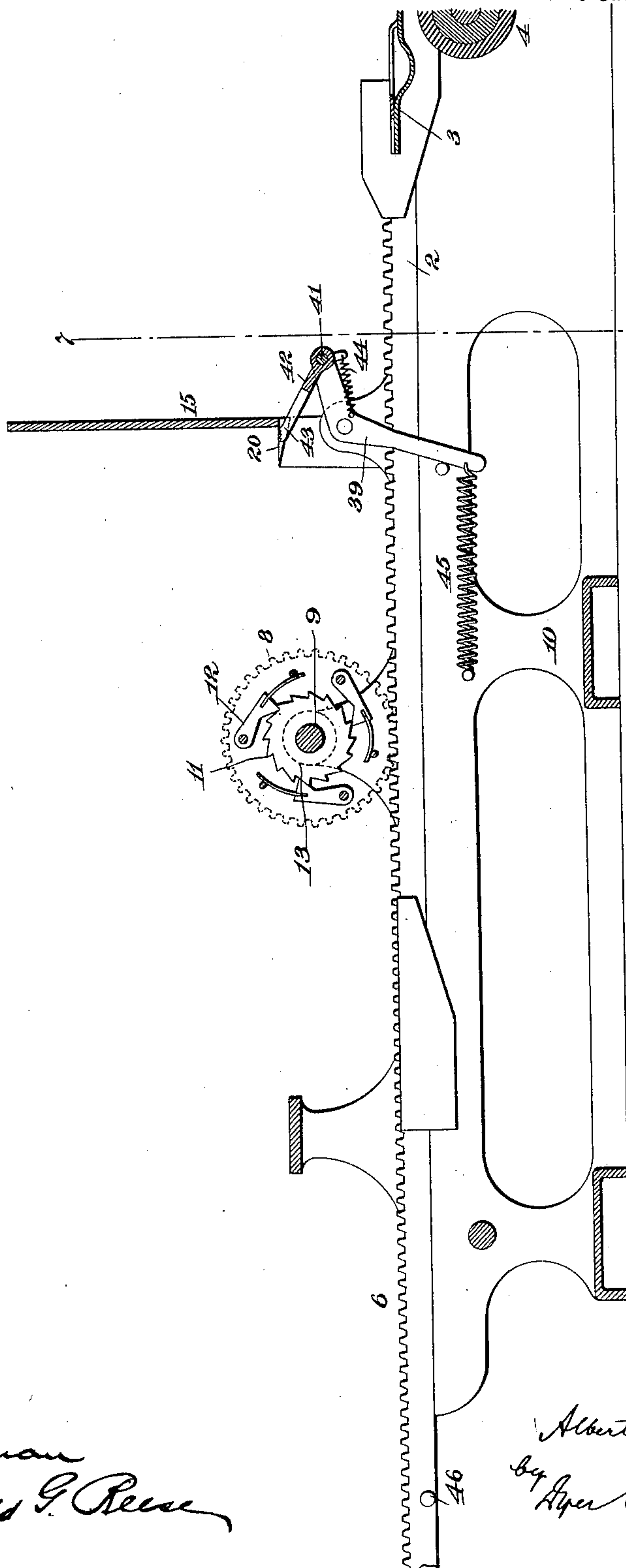


Fig. 6

Witnesses:

Jas. F. Coleman
 Archibald G. Reese

Inventor

Albert B. Sick
by Alger Edmunds 1888

Att'ys.

UNITED STATES PATENT OFFICE.

ALBERT B. DICK, OF CHICAGO, ILLINOIS, ASSIGNOR TO THE A. B. DICK COMPANY, OF SAME PLACE.

SHEET-FEEDING ATTACHMENT FOR STENCIL PRINTING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 657,920, dated September 18, 1900.

Application filed April 5, 1900. Serial No. 11,566. (No model.)

To all whom it may concern:

Be it known that I, ALBERT B. DICK, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a certain new and useful Improvement in Sheet-Feeding Attachments for Stencil Printing-Machines, of which the following is a description.

In machines for printing from stencil-sheets, whether of the rotary or reciprocating type, (an example of the latter being illustrated in my application for patent filed June 10, 1899, Serial No. 720,008,) it is the practice to feed the sheets to be printed by hand to the machine, whereby such sheets will be successively subjected to the stencil and an impression secured therefrom.

The object of my present invention is to provide a feeding attachment of simple construction which by proper mechanical modification can be applied to any stencil printing-machine and by which sheets from a single pile will be automatically and successively fed to the machine in the proper manner to receive an impression from the desired stencil.

My invention in its generic aspect comprises suitable supporting means for sustaining in a vertical pile, one above the other, the sheets which are to be printed from the stencil and suitable mechanical devices cooperating with the stencil printing-machine and working in the desired relation to the position of the stencil for feeding the sheets successively from the bottom of the pile. The means employed for effecting the successive feed of the sheets from the bottom of the pile may be varied within wide limits; but in the preferred embodiment of my invention such means comprise a feed-roller upon which the bottom sheet rests at any part of its surface, but usually at about the center thereof, a suitable ledge or shelf for supporting one edge of the bottom sheet, said ledge or shelf and said feed-roller thereby constituting the sustaining means for the pile of sheets to be printed, means for disengaging the bottom sheet only from the ledge or shelf by which its edge is supported, whereby the edge of the sheet will be permitted to drop below the ledge or shelf, and means for rotating the

feed-roller for feeding forward the released bottom sheet and directing it into the stencil printing-machine, by which an impression from the stencil will be secured. Although the feed-roller may be rotated continuously, I prefer to rotate it intermittently, as will be explained.

I shall illustrate and describe a number of forms of devices suitable for the purpose of disengaging the supported edge of the bottom sheet from the ledge or shelf; but preferably the devices for this purpose comprise a series of rotating concentric frictional feeding-fingers engaging the edge of the bottom sheet within slots or recesses formed in the ledge or shelf and rotated either continuously or intermittently to successively engage the bottom sheets and to remove them from the supporting ledge or shelf and downwardly free of the same. When my improved feeding attachment is used in connection with a reciprocating stencil printing-machine of the type described by me in my said application, I preferably provide a supporting ledge or shelf placed immediately behind the stencil-carrying frame and provided with a vertical guide to properly support and maintain the sheets comprising the pile in the desired position vertically one above the other, and I employ a friction feed-roller placed below the pile, at or about the center thereof, and with which the bottom sheet engages, an additional support being also provided for sustaining the pile of sheets on the opposite side of the feed-roller. Suitable connections are provided between the feed-roller and the reciprocating platen or between the feed-roller and the stencil-carrying frame for rotating the feed-roller during that movement of the stencil-carrier which returns the stencil into position for making a fresh impression, whereby the bottom sheet, having had its forward edge first released from engagement with the supporting ledge or shelf, will be fed downward and toward the stencil-carrier ready to be gripped by the gripping-fingers on the reciprocating platen. Mounted on a shaft located below the supporting ledge or shelf are a number of concentric frictional feeding-fingers adapted to engage with the forward edge

of the bottom sheet through slots cut in said ledge or shelf, so as to disengage the sheet therefrom, movement being imparted to the said shaft either from the reciprocating platen or from the stencil-carrier for giving movement thereto to operate said feeding-fingers preferably at the beginning of the negative stroke of the stencil-carrier, or that movement thereof by which the stencil is returned to its printing position. Thus when the stencil-carrier commences its negative movement the frictional feeding-fingers will be operated to release the bottom sheet from the supporting ledge or shelf, while as the stencil-carrier continues on its negative stroke the feed-roller will be operated to feed the bottom sheet into position to be engaged by the grippers of the reciprocating platen. This feed movement may be sufficient to entirely disengage the bottom sheet from the pile, or it may be only sufficient to move the forward edge of the sheet into engagement with the limiting devices of the machine ready to be engaged by the grippers, whereby the positive movement of the reciprocating platen will complete the withdrawal of the bottom sheet from the pile. The advantage of this construction is that it enables me to feed to a stencil printing-machine sheets of different length, it being only necessary with all sheets to feed them so far as the limiting devices of the machine, the completion of the feed of the bottom sheet from the pile being effected, as stated, by the movement of the reciprocating platen on its positive stroke.

In order that my invention may be better understood, attention is directed to the accompanying drawings, forming a part of this specification, and in which—

Figure 1 is a longitudinal sectional view of a part of a stencil printing-machine of the type described in my said application, showing the preferred construction of feeding device in connection therewith; Fig. 2, a section on the line 2 2 of Fig. 1 looking toward the left; Fig. 3, a section on the line 3 3 of Fig. 1 looking downwardly; Fig. 4, a section similar to Fig. 1, illustrating a modification in the devices for freeing the front edge of the sheet; Fig. 5, a section on the line 5 5 of Fig. 4; Fig. 6, a view similar to Fig. 4, showing a further modification; and Fig. 7, a section on the line 7 7 of Fig. 6.

In all of the above views corresponding parts are represented by the same numerals of reference.

Referring first to Figs. 1, 2, and 3, 1 represents a cylinder carrying the stencil and provided with the usual inking devices on its interior, by means of which the ink may be passed through the stencil, so as to effect an impression thereof on the sheet to be printed.

2 represents a reciprocating platen, as described in my said application, which coöperates with the stencil, whereby the stencil may be turned first in one direction and then in the

other to reciprocate the platen and to carry the sheets successively into engagement with the stencil. The platen 2 is provided with grippers 3 3, as described in my said application, which are adapted to engage the edge of the sheet, so as to draw the same along into contact with the stencil and over the impression-roller 4.

5 represents the limiting devices into engagement with which the sheets are brought successively and which are moved upward, as explained in said application, after the sheet has been gripped by the grippers.

The parts so far described are identical with the machine described in my said application and need not be explained in detail. The reciprocating platen 2, however, is extended rearwardly and is hence somewhat longer than the platen of my said application, in order that the paper-feeding devices may be operated therefrom, as I will explain. The said platen is provided on each side with a rack 6, which is engaged by teeth 7 on the stencil-carrier 1 and by which the platen will be reciprocated from the stencil. One of these racks engages with and drives a gear 8, loosely mounted on a shaft 9, carried in suitable bearings from the base 10 of the apparatus. This rack may be long enough to be always maintained in mesh with the teeth of the gear 8 to positively rotate the feed-roller on the forward or positive stroke of the machine to feed off from the bottom of the pile the entire length of the bottom sheet when the device is to be used always with sheets of the same size. If, however, it is desired to employ the device in connection with sheets of different lengths, the rack 6, which engages the teeth of the gear 8, will be only long enough to turn the feed-roller sufficiently to advance the forward edge of the bottom sheet into engagement with the limiting devices 5, the further movement of the bottom sheet from the pile being effected by the operation of the grippers, as will be explained. Rotation of the gear 8 in one direction drives the shaft 9, while in the opposite direction the shaft remains stationary. This may be effected by providing a ratchet-wheel 11, fast to said shaft, and with which one of a series of pawls 12 on the gear 8 may engage. By stepping the pawls a third of a tooth apart, as shown, lost motion between the gear 8 and shaft 9 will be reduced to one-third of the extent of one ratchet-tooth, as will be obvious.

Mounted on the shaft 9 is a feed-roller 13, made, preferably, of rubber or analogous material. Arranged substantially in the same horizontal plane with the top of the feed-roller 13 is a ledge or shelf 14, having a vertical front wall 15, whereby a pile of sheets 16 may be placed on said feed-roller and be supported at their forward edges upon the ledge or shelf 14. The rear edges of the pile of sheets may be supported by a supporting-shoulder 17. Mounted beneath the ledge or shelf 14

is a shaft 18, carrying a series of concentric frictional feeding-fingers 19, which are adapted to work within slots or recesses 20, formed in the ledge or shelf, as shown particularly in Fig. 3. Preferably these concentric feeding-fingers are of metal, provided with fine gripping-teeth on their peripheries, as shown. By giving a complete rotation to the shaft 18 it will be observed that the feeding-fingers will project slightly up through the slots 20 to engage the bottom sheet and to carry said bottom sheet off of the ledge or shelf and downwardly below the shaft 18, ready to be advanced toward the limiting-devices 5 by the rotation of the feed-roller 13. This movement of the concentric frictional feeding-fingers 19 may be effected by providing a pinion 21 on the shaft 18, as shown in Fig. 2, with which a gear 22 on a counter-shaft 23 may engage. The counter-shaft is provided with a ratchet-wheel 24, fast thereon, with which may engage a pawl 25, carried by a swinging arm 26, movable radially with respect to the counter-shaft 23. In the drawings I illustrate the pinion 21 as being one-sixth the diameter of the gear 22 and the ratchet-wheel 24 as being provided with six teeth, so that the movement of said ratchet-wheel to the extent of one tooth will give to the shaft 18 one complete turn, as will be understood. A pin 27 is carried by the reciprocating platen and engages the arm 26 near the end of the positive stroke of the platen, or that stroke thereof by which the printing is effected, to move the arm against the tension of a spring 28 and to enable the pawl 25 to engage with the next tooth on the ratchet-wheel 24. At the commencement of the negative stroke of the machine, or that stroke wherein the platen is returned to allow the grippers 3 to engage a fresh sheet, the spring 28 will return the arm 26 to its former position, advancing the ratchet-wheel 24 one tooth and giving to the shaft 18 a complete turn.

The operation of this the preferred form of my invention when applied to a stencil printing-machine of the type described is as follows: At the end of the positive stroke of the platen, by which an impression from the stencil has been effected, the pin 27 thereon will engage the swinging arm 26 to move the same against the tension of the spring 28 and to advance the pawl 25 into engagement with the succeeding tooth of the ratchet-wheel 24. On the commencement of the negative stroke of the platen as the grippers 3 return to their starting-point to engage a new sheet the shaft 18 will be given a complete turn, causing the feeding-fingers 19 to engage within the slots 20 of the ledge or shelf and to remove the forward edge of the bottom sheet therefrom, carrying such edge of the sheet around and beneath the shaft 18. On this movement of the platen the turning of the gear 8 by the rack 6 will cause one of the pawls 12 to rotate the ratchet-wheel 11 and the shaft 9, turning the

feed-roller 13 and forcing the bottom sheet toward the limiting-fingers 5. These parts will preferably be so proportioned that at the end of the negative stroke of the platen the sheet will have been fed forward until its front edge engages the limiting devices 5, so that the sheet so presented will be engaged by the grippers 3, and on the positive stroke of the machine the sheet will be fed forward to receive the impression from the stencil. On this stroke the grippers will withdraw the bottom sheet from the pile, the feed-roller 13 obviously being turned by the movement thereof. When the machine is to be used in connection with sheets of different sizes, the length of the rack 6 will be so proportioned as to turn the gear 8 positively only to an extent sufficient to advance the forward edge of the sheet into substantial contact with the limiting devices 5, after which the rack will leave the teeth of the gear 8 and will not re-engage them until the corresponding position on the negative stroke is reached. The rack may, however, be long enough to be always kept in mesh with the teeth of the gear 8 when the machine is employed in connection with sheets always of the same size, whereby the bottom sheet will be fed off of the pile by the joint action of the grippers 3, moving with the platen, and the turning of the feed-roller 13 from the movement of the platen.

Referring to Fig. 4, I illustrate a modification in the construction and operation of the frictional feeding-fingers for dislodging the forward edge of the bottom sheet from the slotted shelf or ledge 14. A plate 29 is carried on arms 30, hinged to pivoted links 31. The plate 29 is normally impelled downward in any suitable way—as, for instance, by a spring 32, connecting each arm 30 with the corresponding pivoted link 31—and said plate is impelled normally forward, for instance, by a spring 33, engaging each of said pivoted links. The plate 29 carries a series of frictional feeding-fingers 34, preferably provided with fine feed-teeth on their upper faces and working within the slots 20 of the ledge or shelf 14, so as to engage the bottom sheet of the pile. The feeding-fingers 34 are elevated to engage the bottom sheet by means of cams 35, carried on a cam-shaft 36, and after being elevated they are moved rearwardly to free the bottom sheet from the ledge or shelf by means of cams 37, which are carried on the shaft 36, and which engage the vertical extensions 38 on the plate 29. A complete rotation of the shaft 36 may be secured by identical mechanism to that shown in Fig. 1 for securing a complete rotation of the shaft 18 at the commencement of the negative stroke of the platen. The operation of this modification will be obvious. At the commencement of the negative stroke the cam-shaft 36 will be given a complete rotation, the cams 35 elevating the plate 29 and causing the feeding-fingers 34 to engage the bottom sheet, and

the cams 37 forcing the plate rearwardly to withdraw the bottom sheet from engagement with the ledge or shelf. The further movement of the cams 35 will permit the feeding-fingers 34 to be moved below the plane of the ledge or shelf, while the cams 37 will be disengaged from the extensions 38, whereupon the spring 33 will return the plate 29 to its former position, freeing the bottom sheet and permitting the latter to be fed forward by the turning of the feed-roller.

In Figs. 6 and 7 a still further modification is shown. With this modification a lever 39 is mounted at each side of the machine, and carried in bearings 40 in the upper ends of said levers is a rock-shaft 41. The rock-shaft 41 carries a plate 42, provided with a series of frictional feeding-fingers 43 thereon, which work within the slots 20 of the supporting ledge or shelf 14, said fingers being preferably formed with fine feeding-teeth for engagement with the bottom sheet. The fingers 43 are maintained in constant engagement with the bottom of the pile by means of a spring 44, and each of the levers 39 is normally maintained in position to engage the feeding-fingers 43 with the bottom sheet near its forward edge by springs 45. The platen is provided at each side with a pin 46, which engages simultaneously both levers 39 near the completion of the positive stroke of the platen. With this modification the movement of the levers 39, which takes place near the end of the positive stroke of the platen, forces the feeding-fingers 43 rearwardly and withdraws the bottom sheet from the pile. At the commencement of the negative stroke the springs 45 return the levers 39 to their former position, allowing the fingers 43 to slide over the bottom sheet, which thus becomes disengaged and drops below the ledge or shelf, whereby the sheet will be fed forward into engagement with the limiting devices by the rotation of the feed-roller 13 on the negative stroke of the machine.

Having now described my invention, what I claim as new, and desire to secure by Letters Patent, is as follows:

1. The combination with a reciprocating stencil printing-machine having a reciprocating platen and stencil-carrier, of supporting devices for sustaining a number of sheets to be printed in a vertical pile, and means cooperating with the stencil-carrier for effecting the commencement of the feed of the bottom sheet on the negative stroke of the stencil-carrier, substantially as set forth.

2. The combination with a stencil printing-machine, of a slotted or recessed ledge or shelf and a feed-roller for sustaining the sheets to be printed in a vertical pile, a series of friction-fingers working in the slots or recesses of the ledge or shelf to engage the bottom sheet and withdraw it from the ledge or shelf, means for operating said fingers, and means for rotating the feed-roller subsequent to the

operation of said fingers for moving the bottom sheet toward the printing position, substantially as set forth.

3. The combination with a stencil printing-machine having a reciprocating platen and stencil-carrier, the platen being provided with grippers for engaging the sheets to be printed, of a feed-roller upon which the sheets to be printed are sustained in a vertical pile, means for sustaining the forward edge of the pile, means for releasing the forward edge of the bottom sheet, and means cooperating with the platen and carrier for rotating the feed-roller to feed the bottom sheet into position to be engaged by the gripping-fingers, substantially as set forth.

4. The combination with a stencil printing-machine having a reciprocating platen and stencil-carrier, the platen being provided with grippers for engaging the sheets to be printed, of a feed-roller upon which the sheets to be printed are sustained in a vertical pile, means for sustaining the forward edges of the pile, means for releasing the forward edge of the bottom sheet, means cooperating with the platen and carrier for rotating the feed-roller to feed the bottom sheet into position to be engaged by the gripping-fingers, and a ratchet connection for permitting the feed-roller to turn independently of its driving mechanism, substantially as set forth.

5. The combination with a stencil printing-machine having a reciprocating platen and stencil-carrier, the platen being provided with grippers for engaging the sheets to be printed, of a feed-roller upon which the sheets to be printed are sustained in a vertical pile, means for supporting the forward edge of the pile, means for releasing the forward edge of the bottom sheet, and means for rotating the feed-roller on the negative stroke of the carrier, substantially as set forth.

6. The combination with a stencil printing-machine having a reciprocating platen and stencil-carrier, the platen being provided with grippers for engaging the sheets to be printed, of a feed-roller upon which the sheets to be printed are sustained in a vertical pile, means for supporting the forward edge of the pile, means for releasing the forward edge of the bottom sheet at the commencement of the negative stroke of the carrier, and means for rotating the feed-roller on such negative stroke, substantially as set forth.

7. The combination with a stencil printing-machine having a reciprocating platen and stencil-carrier, the platen being provided with grippers for engaging the sheets to be printed, of a feed-roller upon which the sheets to be printed are sustained in a vertical pile, a ledge or shelf for supporting the forward edge of the pile, means for disengaging the bottom sheet from said ledge or shelf, and means cooperating with the platen and carrier for rotating the feed-roller to move the forward edge of the bottom sheet into posi-

tion to be engaged by the gripping-fingers, substantially as set forth.

8. The combination with a stencil printing-machine having a reciprocating platen and stencil-carrier, the platen being provided with grippers for engaging the sheets to be printed, of a feed-roller upon which the sheets to be printed are sustained in a vertical pile, a ledge or shelf for supporting the forward edge of the pile, means for disengaging the bottom sheet from said ledge or shelf, and means cooperating with the platen and carrier and operated on the negative stroke thereof for rotating the feed-roller to move the forward edge of the bottom sheet into position to be engaged by the gripping-fingers, substantially as set forth.

9. The combination with a stencil printing-machine having a reciprocating platen and stencil-carrier, the platen being provided with grippers for engaging the sheets to be printed, of a feed-roller and a ledge or shelf on which the sheets to be printed are sustained in a vertical pile, a friction device for withdrawing the bottom sheet from said ledge or shelf, means cooperating with the platen and carrier for operating said friction device, and means for rotating the feed-roller to move the bottom sheet into position to be engaged by the gripping-fingers, substantially as set forth.

10. The combination with a stencil printing-machine having a reciprocating platen and stencil-carrier, the platen being provided with grippers for engaging the sheets to be printed, of a feed-roller and a ledge or shelf on which the sheets to be printed are sustained in a vertical pile, a friction device for withdrawing the bottom sheet from said ledge or shelf, means cooperating with the platen and carrier for operating said friction device, and means for rotating the feed-roller subsequent to the operation of the friction device for moving the bottom sheet into position to be engaged by the gripping-fingers, substantially as set forth.

11. The combination with a stencil printing-machine having a reciprocating platen and stencil-carrier, the platen being provided with grippers for engaging the sheets to be printed, of a feed-roller and a supporting ledge or shelf for sustaining the sheets to be printed in a vertical pile, a friction device for withdrawing the bottom sheet from said ledge or shelf, means cooperating with the platen and carrier for operating said device at the commencement of the negative stroke of the carrier, and means for rotating the feed-roller to move the bottom sheet into position to be engaged by said gripping-fingers, substantially as set forth.

12. The combination with a stencil printing-machine having a reciprocating platen and stencil-carrier, the platen being provided with grippers for engaging the sheets to be printed, of a feed-roller and a supporting

ledge or shelf for sustaining the sheets to be printed in a vertical pile, a friction device for withdrawing the bottom sheet from said ledge or shelf, means cooperating with the platen and carrier for operating said device at the commencement of the negative stroke of the carrier, and means for rotating the feed-roller on the negative stroke of the carrier for moving the bottom sheet into position to be engaged by said gripping-fingers, substantially as set forth.

13. The combination with a stencil printing-machine having a reciprocating platen and stencil-carrier, the platen being provided with grippers for engaging the sheets to be printed, of a feed-roller and a supporting ledge or shelf for sustaining the sheets to be printed in a vertical pile, slots or recesses in said ledge or shelf, a plurality of feeding-fingers working within said slots or recesses for engaging the bottom sheet to withdraw it from the ledge or shelf, means cooperating with the platen and carrier for moving said fingers, and means for rotating the feed-roller to move the bottom sheet into position to be engaged by said grippers, substantially as set forth.

14. The combination with a stencil printing-machine having a reciprocating platen and stencil-carrier, the platen being provided with grippers for engaging the sheets to be printed, of a feed-roller and a supporting ledge or shelf for sustaining the sheets to be printed in a vertical pile, slots or recesses in said ledge or shelf, a plurality of feeding-fingers working within said slots or recesses for engaging the bottom sheet to withdraw it from the ledge or shelf, means cooperating with the platen and carrier for moving said fingers, and means for rotating the feed-roller subsequent to the movement of the feeding-fingers for moving the bottom sheet into position to be engaged by said grippers, substantially as set forth.

15. The combination with a stencil printing-machine having a reciprocating platen and stencil-carrier, the platen being provided with grippers for engaging the sheets to be printed, of a feed-roller and a supporting ledge or shelf for sustaining the sheets to be printed in a vertical pile, slots or recesses in said ledge or shelf, a plurality of feeding-fingers working within said slots or recesses for engaging the bottom sheet to withdraw it from the ledge or shelf, means cooperating with the platen and carrier for actuating said fingers near the completion of the positive stroke of the carrier to withdraw the edge of the bottom sheet from said ledge or shelf, and means cooperating with the platen and carrier for rotating said feed-roller to move the bottom sheet into position to be engaged by the grippers, substantially as set forth.

16. The combination with a stencil printing-machine having a reciprocating platen and stencil-carrier, the platen being provided

with grippers for engaging the sheets to be
printed, of a feed-roller and a supporting
ledge or shelf for sustaining the sheets to be
printed in a vertical pile, slots or recesses in
5 said ledge or shelf, a plurality of feeding-
fingers working within said slots or recesses
for engaging the bottom sheet to withdraw
it from the ledge or shelf, means coöperating
with the platen and carrier for actuating said
10 fingers at the beginning of the negative stroke
of the carrier to withdraw the edge of the

bottom sheet from said ledge or shelf, and
means for rotating the feed-roller on the nega-
tive stroke of the carrier for moving the bot-
tom sheet into position to be engaged by the 15
grippers, substantially as set forth.

This specification signed and witnessed this
2d day of April, 1900.

ALBERT B. DICK.

Witnesses:

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JNO. R. TAYLOR.