

No. 765,962.

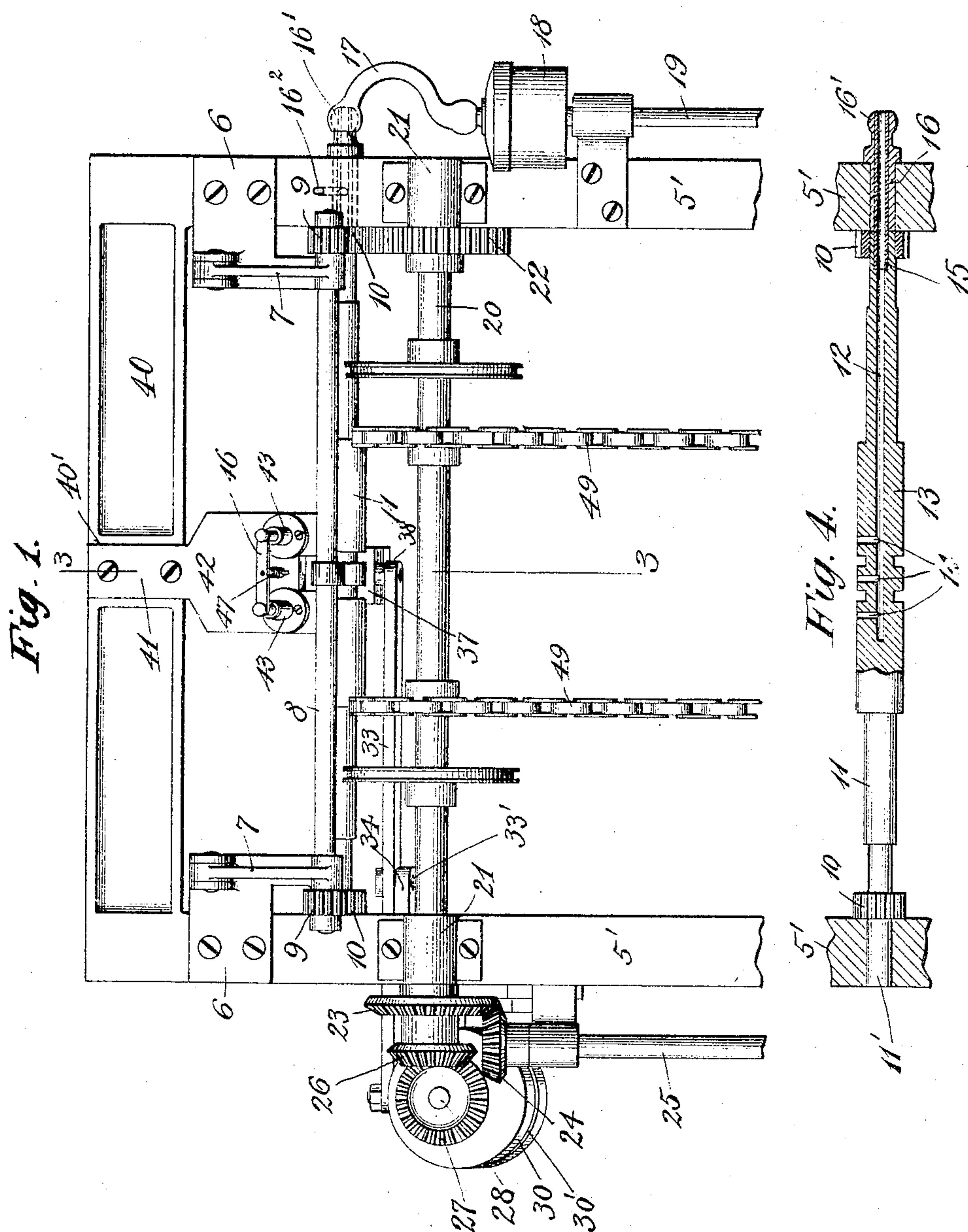
PATENTED JULY 26, 1904.

T. & S. EMERSON.  
FEEDER FOR SHEETS OF PAPER, &c.

APPLICATION FILED MAR. 25, 1904.

NO MODEL.

3 SHEETS—SHEET 1.



Witnesses:  
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3 SHEETS—SHEET 2.

Fig. 3.

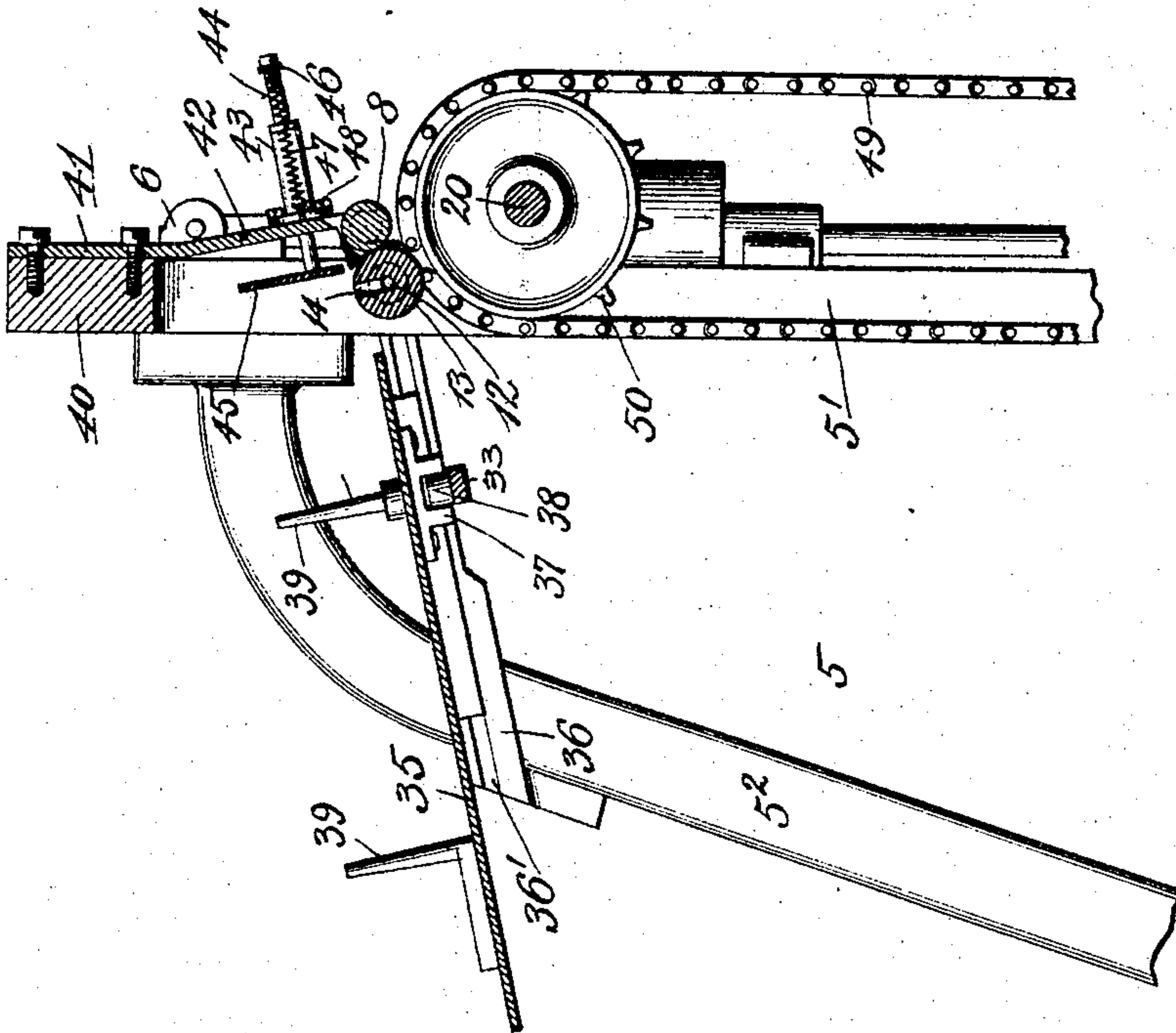
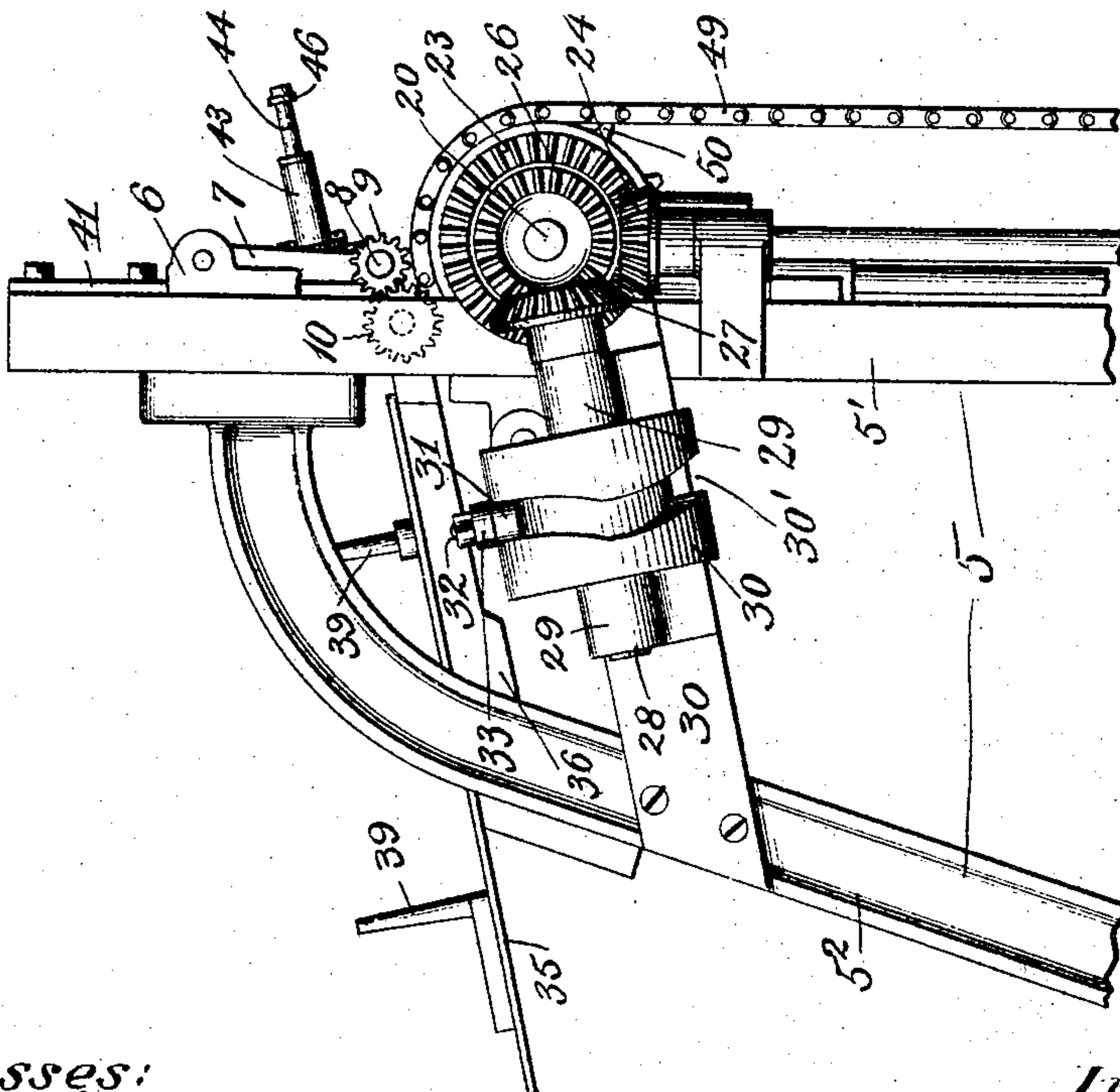


Fig. 2.



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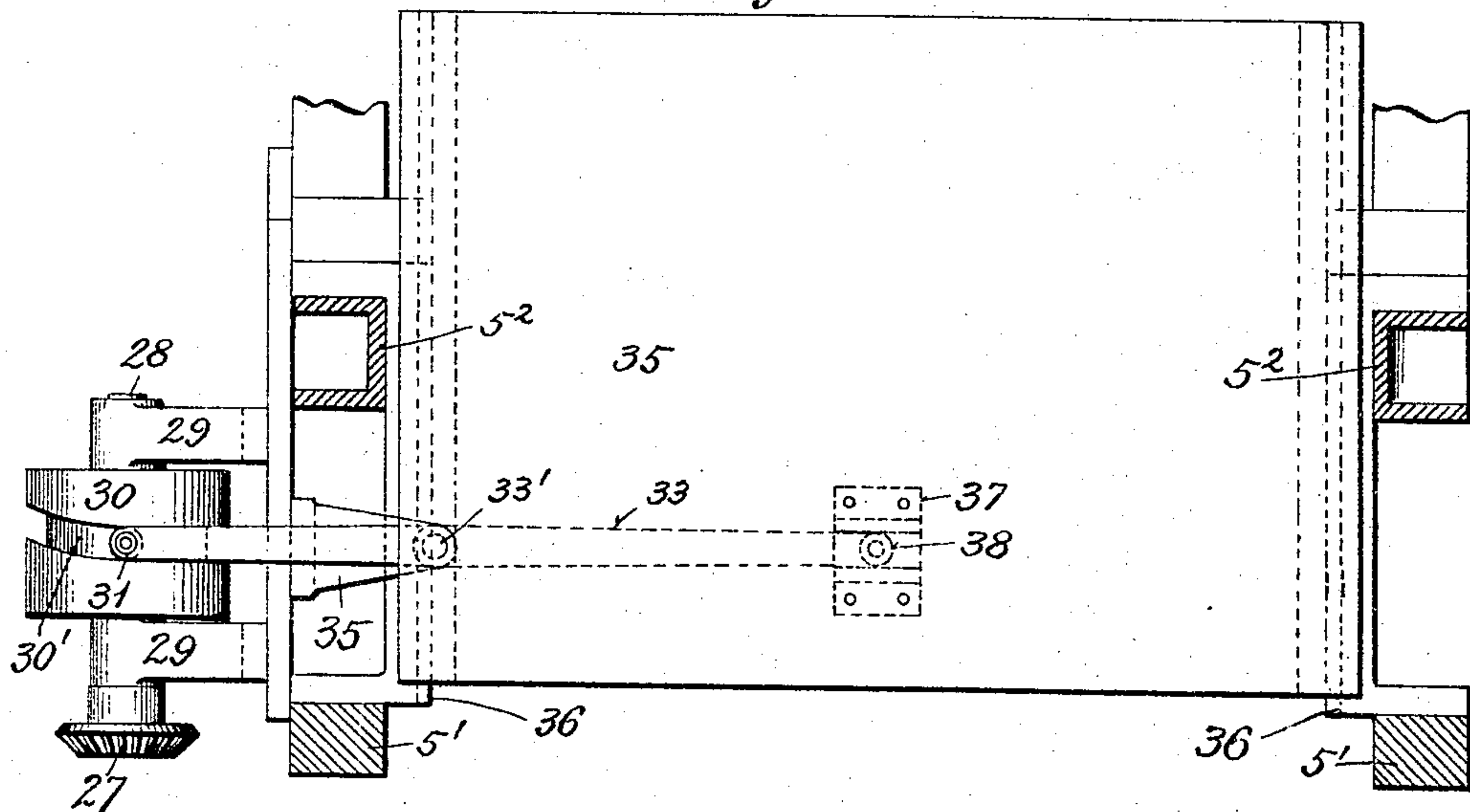
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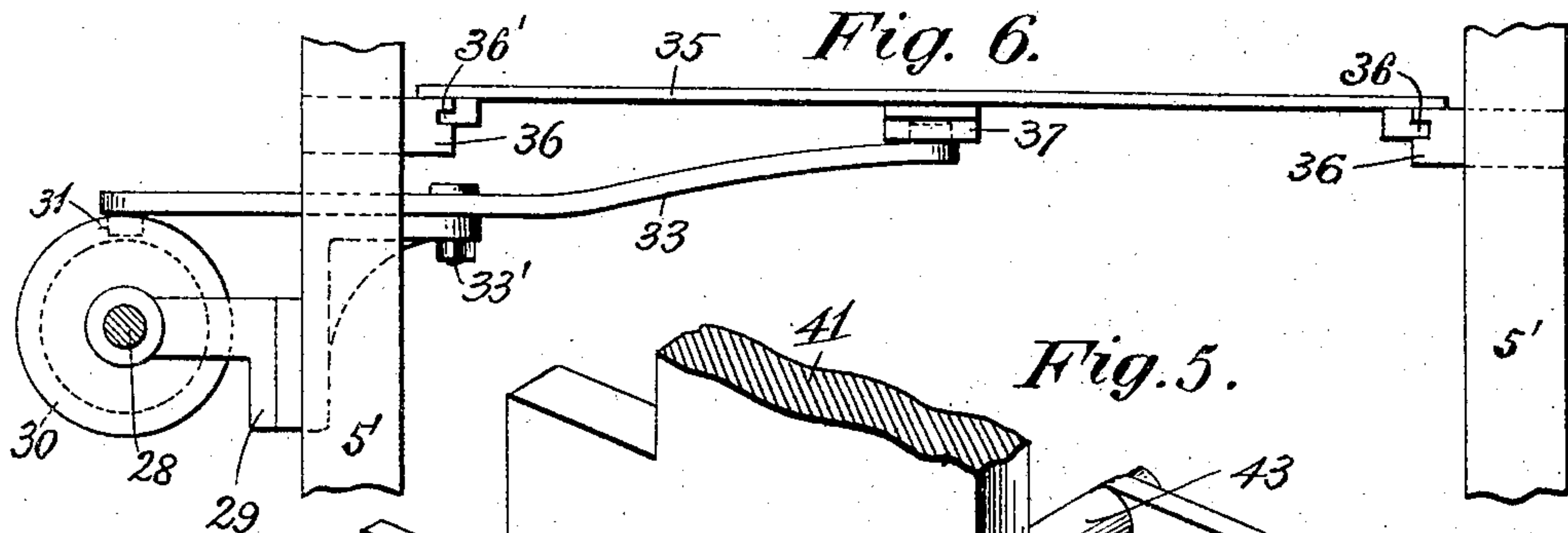
NO MODEL.

3 SHEETS—SHEET 3.

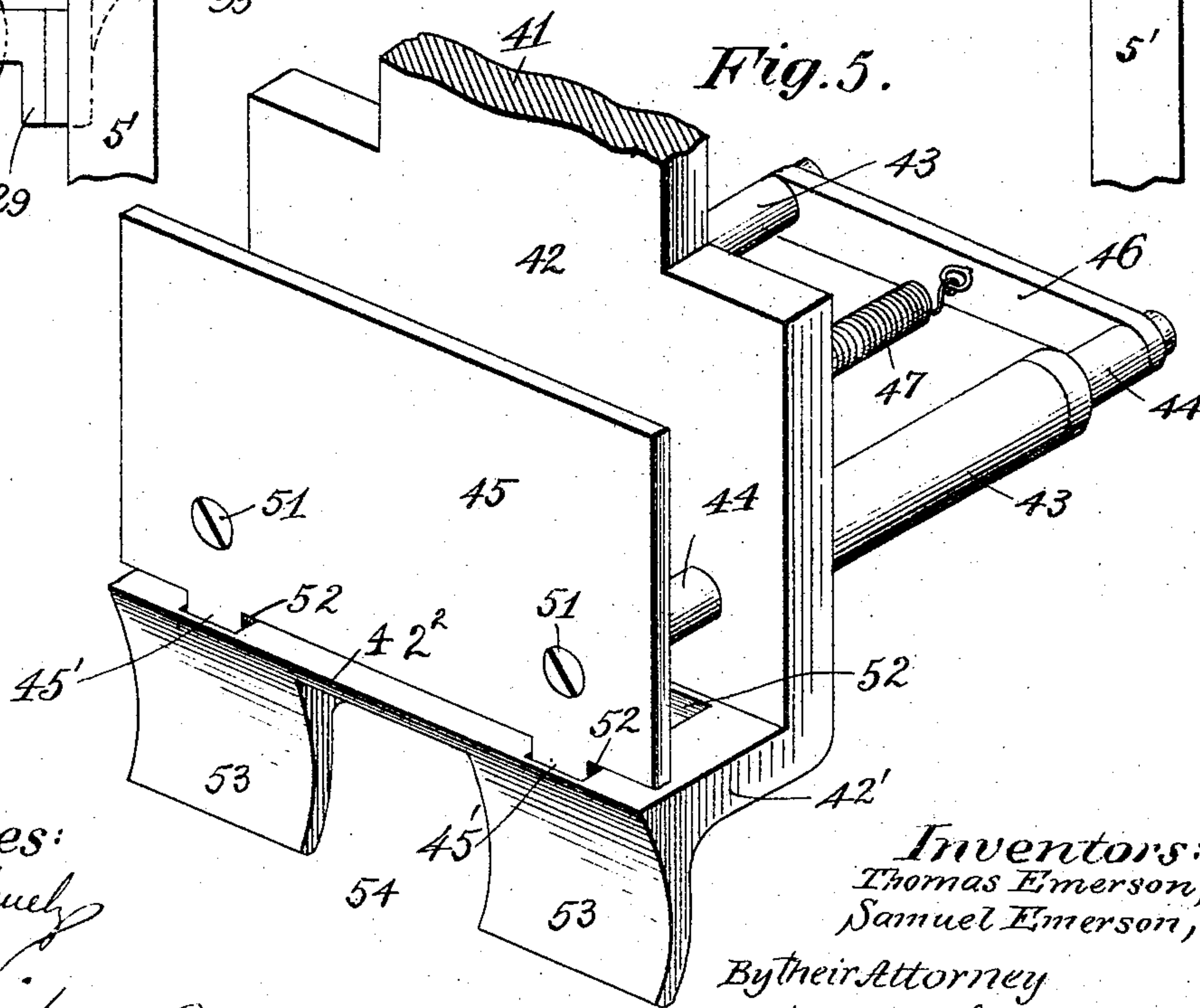
*Fig. 7.*



*Fig. 6.*



*Fig. 5.*



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# UNITED STATES PATENT OFFICE.

THOMAS EMERSON AND SAMUEL EMERSON, OF KENSINGTON, CONNECTICUT, ASSIGNORS TO THE AMERICAN PAPER GOODS COMPANY, OF KENSINGTON, CONNECTICUT, A CORPORATION OF NEW JERSEY.

## FEEDER FOR SHEETS OF PAPER, &c.

SPECIFICATION forming part of Letters Patent No. 765,962, dated July 26, 1904.

Application filed March 25, 1904. Serial No. 199,928. (No model.)

*To all whom it may concern:*

Be it known that we, THOMAS EMERSON and SAMUEL EMERSON, citizens of the United States, residing at Kensington, in the county of Hartford and State of Connecticut, have jointly invented certain new and useful Improvements in Feeders for Sheets of Paper, &c., of which the following is a specification.

Our invention relates to paper-feeding mechanism generally, and, among various uses, may be employed with bag, envelop, and analogous machines or with printing or other mechanism for operating upon sheets of paper.

Primarily the object of the invention is the provision of improvements whereby the machine is simplified and is rendered more efficient in operation.

A further object of the invention is the provision of an improved buffer or stop for the pile of sheets on the reciprocatory table of the machine whereby all of the sheets of the pile will be sustained by said buffer while the lowermost sheet is being selected from the pile by a suction-roller or other device employed for feeding it to the coöperating parts of the machine.

A further object of the invention is the provision of improvements in means for sustaining and in means for actuating the table or platform upon which the pile of sheets is placed.

A further object of the invention is the provision of improvements in the suction-roller and in the manner of connecting the same with the pipe leading to the air-exhausting apparatus.

Other objects of the invention will be set forth in the following description.

In the accompanying drawings, Figure 1 is a view in elevation of part of a machine with which our improvements may be employed. Fig. 2 is a side elevation. Fig. 3 is a longitudinal vertical section taken on line 3 3 of Fig. 1. Fig. 4 is a view, partially in longitudinal vertical section, of the suction-roller and the improved support for the same. Fig. 5 is a perspective view of the buffer-carrier

and its parts detached; and Figs. 6 and 7 are detail views of the platform, illustrating the manner in which it is supported and the means by which it is reciprocated.

Like numerals designate similar parts throughout the several views.

Referring to the drawings, the numeral 5 designates in a general way the framework of the machine, which may be of any suitable construction, form, and proportions. To uprights 5' of said framework are secured brackets 6, having depending hangers 7, in which is journaled a feed-roll 8, carrying gears 9 at its extremities, the latter meshing with gears 10 on a suction-roller 11. This roll 11 is provided with a longitudinal bore 12 and with an enlarged central portion 13, communicating with said bore by ports 14, and, as shown in Fig. 4, has a journal 11' at one end mounted in a bearing of one of the uprights 5' of the frame. At its opposite extremity the bore of the suction-roller is enlarged to receive a tube 15, said tube being journaled in a sleeve or hollow plug 16, inserted in the other upright 5', and having a knob or bulb 16' for the reception of the end of a flexible tube 17, leading to a suction-pump 18, the piston-rod of which is designated by 19. (See Fig. 1.)

In the bearing of the upright 5', in which the tubular journal 15 is mounted, and passing through the sleeve 16 is the usual port 16<sup>2</sup> for the introduction of liquid, and the latter, which may be of any kind, forms a thin coating or film between the parts which aids in sealing the joint to produce an air-tight connection and prevent the loss of suction.

For driving the rolls 8 and 11 any desired means may be employed, that shown being a shaft 20, journaled in bearings 21 of the uprights and carrying a gear 22 at one end in mesh with one of the gears 10 of roll 11 and a bevel-gear 23 at its opposite extremity, said bevel-gear being driven by a pinion 24 on a shaft 25, to which rotary motion may be imparted in any desired way. A bevel-gear 26 is secured to the outer end of the shaft 20, and said gear is in mesh with a complemental



gear 27, attached to the extremity of a shaft 28, journaled in bearings 29 of a brace 30, connecting the parts of the framework, as shown in Fig. 2. On shaft 28, intermediate the bearings 29, is mounted a cam 30, in the groove 30' of which is fitted a roller 31, carried by a stud 32, secured in the end of a lever 33, pivoted at 33' to a bracket 34, extending inwardly from the outer upright 5', as illustrated in Figs. 1, 6, and 7.

Designated by 35 is a table or platform which is fitted in ways 36' of cross-plates 36, connecting the uprights 5' 5<sup>2</sup>, said table having on its under side a plate 37, provided with a groove for the reception of a roller 38, carried by a pin projecting from the lever 33. Posts 39 are carried by the table, and between said posts the pile of paper sheets to be converted into bags, envelops, or similar articles or to be printed or otherwise treated is placed, so that when the table is reciprocated said pile will be carried over the suction-roller 11, and the bottom sheet thereof will be held by said roller and will be carried by it to the point where it will be engaged by roll 8, thus insuring a positive feed of said sheet to the other parts of the machine.

A cross-bar 40 connects the uprights 5', and at an intermediate part in said cross-bar is formed a groove 40' for the reception of a stem or tang 41 of a buffer-carrier 42, having in one form of our invention tubular posts 43. Fitted for sliding movement in these posts are rods 44, projecting from a buffer-plate 45 and united at their outer ends by a cross-strip 46, said plate being connected by a suitable spring 47 (shown as of the coiled variety) to a pin 48, projecting from the carrier 42, so that the buffer-plate 45 will normally be held in the forward position shown in Fig. 3 in readiness to receive the impact of the end of the pile of sheets supported between the posts of the table 35. As shown more clearly in Figs. 2 and 3, the work-supporting table travels in an inclined path, and to enable the plate 45 squarely to engage the ends of all sheets of the pile the end of the buffer-carrier 42 is inclined to the perpendicular, as shown in Figs. 3 and 5. While the means shown for supporting and guiding the buffer in a rectilinear path are preferred, it is distinctly to be understood that the invention is not limited to the exact devices illustrated for accomplishing said result, nor is it limited to a single buffer, for two or more may be employed, each having a rectilinear movement, as substitutes for the one shown.

Endless chains 49, carrying the usual grippers (not shown) for conveying the sheet to the folders and parts coöperating therewith in the formation of the article for which the machine is designed, are provided in the exemplification given, and these chains are driven by sprocket-wheels 50, carried by the shaft

20. These details constitute no part of our present invention and are shown merely as exemplifications of one type of machine with which our improvements may be employed.

Heretofore in machines of which we are aware swinging buffers have been employed, and as these buffers move in the arc of a circle they do not afford a full bearing-surface for sheets, especially the lower ones of the pile, and consequently a poor connection is sometimes made by the suction-roller with the lower sheet. To avoid this and other objections in the practical working of the feeding mechanism of the machine, the plate 45 bears against the ends or portions of the ends of each and all of the sheets of the pile with yielding pressure, and said plate receives the shock of the pile, cushions the blow thereof at each reciprocation of the table, and moves on a line parallel to the path of movement of said table, so that the pile, whether large or small, is firmly held at the time the lowermost sheet is withdrawn therefrom by the suction-roller 11. Furthermore, the table 35 reciprocates in the ways 36 and is positively actuated in both directions by the cam 30 and lever 33, thus avoiding chattering or lost motion incident to the employment of pivoted links for supporting said table, as in the old constructions, and affording a positive motion, which is a great desideratum in the class of machines to which our invention relates.

By reference to Fig. 5 it will be seen that the plate 45 is detachably secured by screws 51 to the rods 44 and that said plate carries lugs 45', working in guide-slots 52 of an angular extension 42' of the carrier 42. This angular extension is provided with a sharp edge 42<sup>2</sup>, and depending from said extension are curved plates 53, separated by a slot 54, to receive the roller 8, said plates serving as guides to aid in separating the lowermost sheet from the pile and to direct it between the rollers 8 and 11, as shown in Fig. 3.

In the operation of the machine the parts are so "timed" that the platform carrying the pile of sheets advances toward the suction-roller at a rate about equal to the peripheral speed of said roller, the end of the pile being forced against the buffer, which fits squarely against the same, and the sharp edge 42<sup>2</sup> of the angular extension 42' serving to aid in separating the lowermost sheet from the pile. Exhaust is applied to the suction-roller by the pump, and as the platform is reciprocated in a forward direction the end of the pile strikes the buffer and the bottom sheet thereof is carried over the roller 11, is caused immediately to adhere thereto, is directed by the curved plates 53 between the rollers 8 and 11, and is fed by said rollers to a position where it will be engaged by the grippers of the chains or other mechanism with which the feeder may be employed.



In virtue of the peculiar construction of the suction-roller a tight joint is always maintained between the flexible tube 17 and the bulb 16' on the end of sleeve 16, and as the tube 15 constitutes a journal for the roller 11, said journal rotating within the sleeve 16, a reliable and simple connection is formed whereby the force of the exhaust may be efficiently applied to the sheet to be fed.

While our invention is shown applied to a particular kind of machine, it is distinctly to be understood that it is not limited thereto, for it is equally applicable as a feeder for any class of machines in which paper is to be fed for various purposes.

Changes may be made in the form and proportions of the various parts without departure from the invention, which is not limited in many of its details to the precise construction described.

Having thus described our invention, what we claim is—

1. The combination, with a reciprocatory platform carrying a pile of sheets, of a buffer having a bearing-surface against which the pile is fed; means for sustaining the buffer so that it will move in a straight path; and means for withdrawing one of the sheets from the pile.

2. In a machine of the class described, the combination with a suction-roller, of a tube secured to and forming a prolongation of said roller; and a fixed sleeve surrounding said tube and forming a bearing therefor, a suction device; and means for connecting said suction device with the sleeve.

3. The combination, with feed mechanism, of a suction-roller having a port and a passage leading from said port, said passage being enlarged at its end to form a chamber; a tubular journal fitted in said chamber; a stationary sleeve surrounding said journal; an exhaust device; and means for connecting said exhaust device with the sleeve.

4. The combination, with roller feed mechanism, of a table fitted in ways of the machine-frame; a pivoted lever connected to said table; a cam for positively actuating said lever; and a buffer movable in a rectilinear path, and with which material supported by the table is adapted to engage.

5. The combination, with a reciprocatory table carrying a pile of sheets to be fed, of a pneumatic feeder arranged below the path traversed by the bottom sheet of said pile, and adapted to seize and remove said sheet at each feeding operation; and a yielding buffer movable in a rectilinear path and against which said pile is fed by the table.

6. The combination, with a reciprocatory table carrying sheets to be fed arranged in a pile, of a pneumatic feeder arranged below the path traversed by the bottom sheet of said pile and adapted to seize and remove a sheet at each feeding operation; a reciprocatory buffer; and

means for causing said buffer to move in a line parallel with the movement of the table.

7. In a machine of the class described, the combination, with a table movable in ways of the frame and upon which the pile of sheets is placed, of a lever pivoted to the frame and having a connection at one end with said table; a cam having a groove for actuating said lever; a buffer movable in a line parallel to that of the table; and means for selecting the lowermost sheet from the pile on said table.

8. The combination, with a reciprocatory table, of a pivoted lever for actuating said table; a cam having a groove for controlling the movement of said lever; a buffer movable in a line parallel to the movement of the table; and suction and feed rollers for detaching the lowermost sheet from the pile upon the table.

9. The combination, with a reciprocatory table carrying the sheets to be fed, of guides on the framework in which said table reciprocates; a pivoted lever loosely connected at one end to the table; a cam having a groove for the reception of a projection on the other end of said lever; means for rotating the cam; a buffer with which the end of the pile engages; means for guiding the buffer in a line parallel to the path of movement of the table; and suction and feed rollers for detaching the bottom sheet from the pile.

10. In a machine of the class described, the combination, with framework, and with suction and feed rollers journaled therein, of a carrier secured to said framework and having guides; rods mounted in said guides; a buffer-plate carried by said rods; a spring for normally holding said buffer-plate in a forward position; a table adapted to receive sheets arranged in a pile; and means for reciprocating said table in a line parallel with the movement of the buffer-plate.

11. The combination, with framework, of a carrier secured thereto; rods mounted for sliding movement in the carrier; a cross-bar for connecting said rods at one end; guides for the rods secured to the carrier; a buffer-plate attached to the other ends of the rods; a spring for normally holding said buffer-plate projected; suction and feed rollers; a reciprocatory table movable in a line parallel to that of the buffer-plate, said table carrying the sheets arranged in a pile; and means for reciprocating said table.

12. In a machine of the class described, the combination, with suction and feed rollers journaled in said framework, of a carrier secured to said framework; tubular posts projecting from the carrier; rods mounted in said posts; a buffer-plate secured to the inner ends of the rods; a cross-bar connecting the outer ends of said rods; a spring connected to said cross-bar and to the carrier; a reciprocatory table movable in a path parallel to that of the buffer-plate; and means for actuating said table.



13. In a machine of the class described, the combination, with framework, of a carrier secured thereto and having strippers at its lower end; guides projecting from the carrier; rods  
 5 movable in said guides; a cross-bar connecting the inner ends of the rods; a spring attached to said cross-bar and to the carrier; a buffer-plate secured to the inner ends of the rods; a table for carrying sheets arranged in  
 10 a pile; and means for reciprocating said table in a line parallel with the path of movement of the buffer-plate.

14. The combination, with framework, of a carrier supported thereby; suction and feed  
 15 rollers; a buffer movable in a rectilinear path; a table for carrying the sheets arranged in a pile; and means for reciprocating said table.

15. The combination, with framework having standards connected by a cross-bar, said  
 20 cross-bar provided with a groove, of a carrier detachably secured in said groove, and having a pair of separated guides at its lower end; tubular guide-posts projecting from the carrier; rods mounted in said guide-posts; a cross-  
 25 bar connecting said rods at one end; a spring attached to said cross-bar and the carrier; a buffer-plate carried by the inner ends of said rods; a reciprocatory table upon which sheets

arranged in a pile are mounted; and means for actuating said table. 30

16. The combination, with framework comprising a pair of standards connected by a cross-bar, of a carrier secured to said cross-bar and having guides at its lower end; suction and  
 35 feed rollers; rods mounted on the carrier; a buffer-plate secured to the inner ends of said rods; means for connecting the outer ends of said rods; a spring for normally projecting the rods and buffer-plate; a reciprocatory table for receiving the pile of sheets; and means  
 40 for actuating said table.

17. The combination, with framework, of suction and feed rollers; a carrier projecting from the framework, and having curved guides located between said rollers and an edge for  
 45 aiding in separating the sheet to be fed from the pile; a buffer mounted on the carrier; a table; and means for reciprocating said table in a rectilinear path.

In testimony whereof we affix our signatures in presence of two witnesses. 50

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SAMUEL EMERSON.

Witnesses:

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