

No. 607,958.

Patented July 26, 1898.

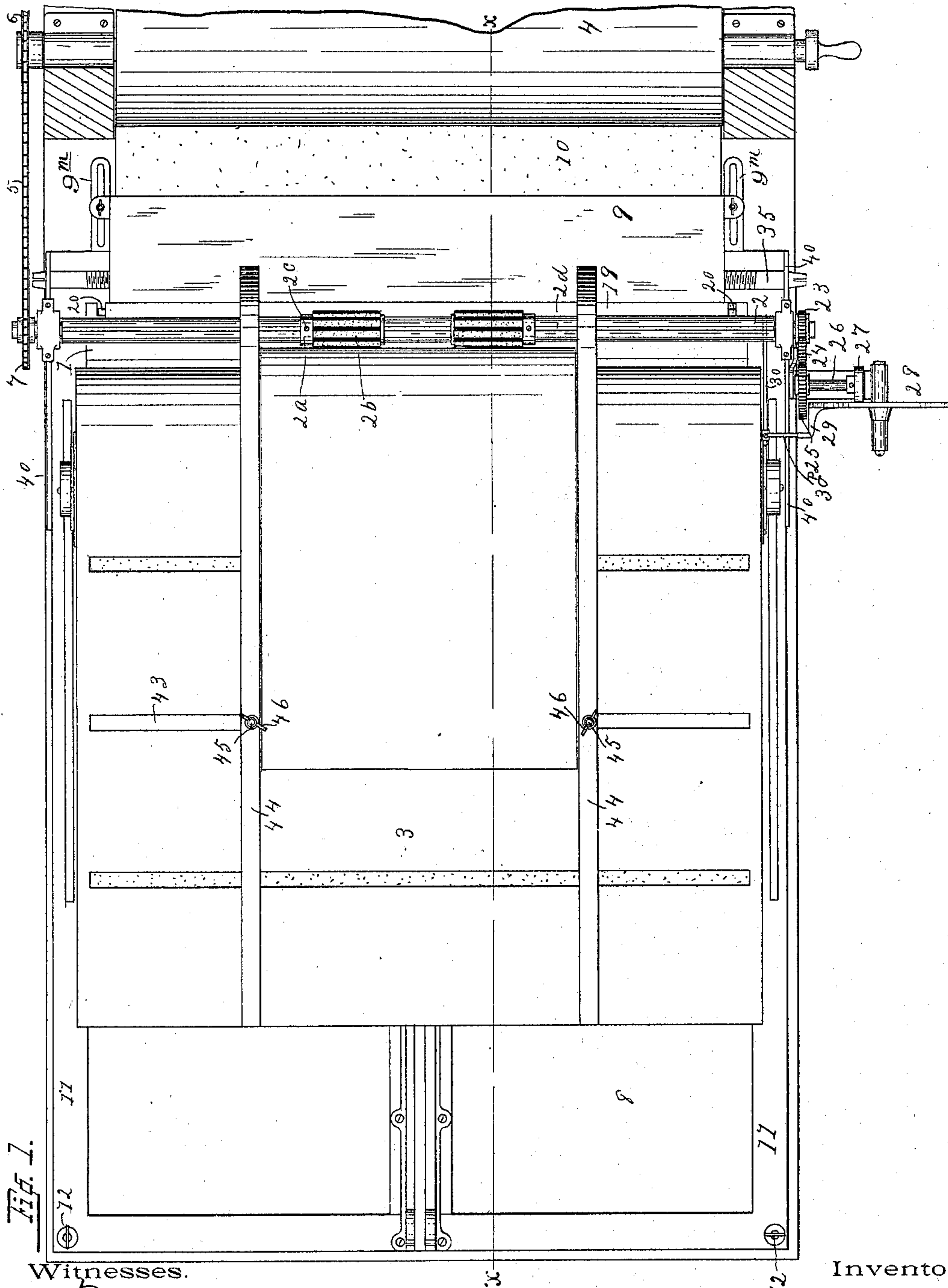
F. SCHILZ.

PAPER FEEDING DEVICE.

(Application filed June 28, 1897.)

(No Model.)

6 Sheets—Sheet 1.



Witnesses.

L. A. Otto
Witnessed Timlin.

Inventor.

Frank Schilz
By Edwin Wheeler Wheeler
Attorneys

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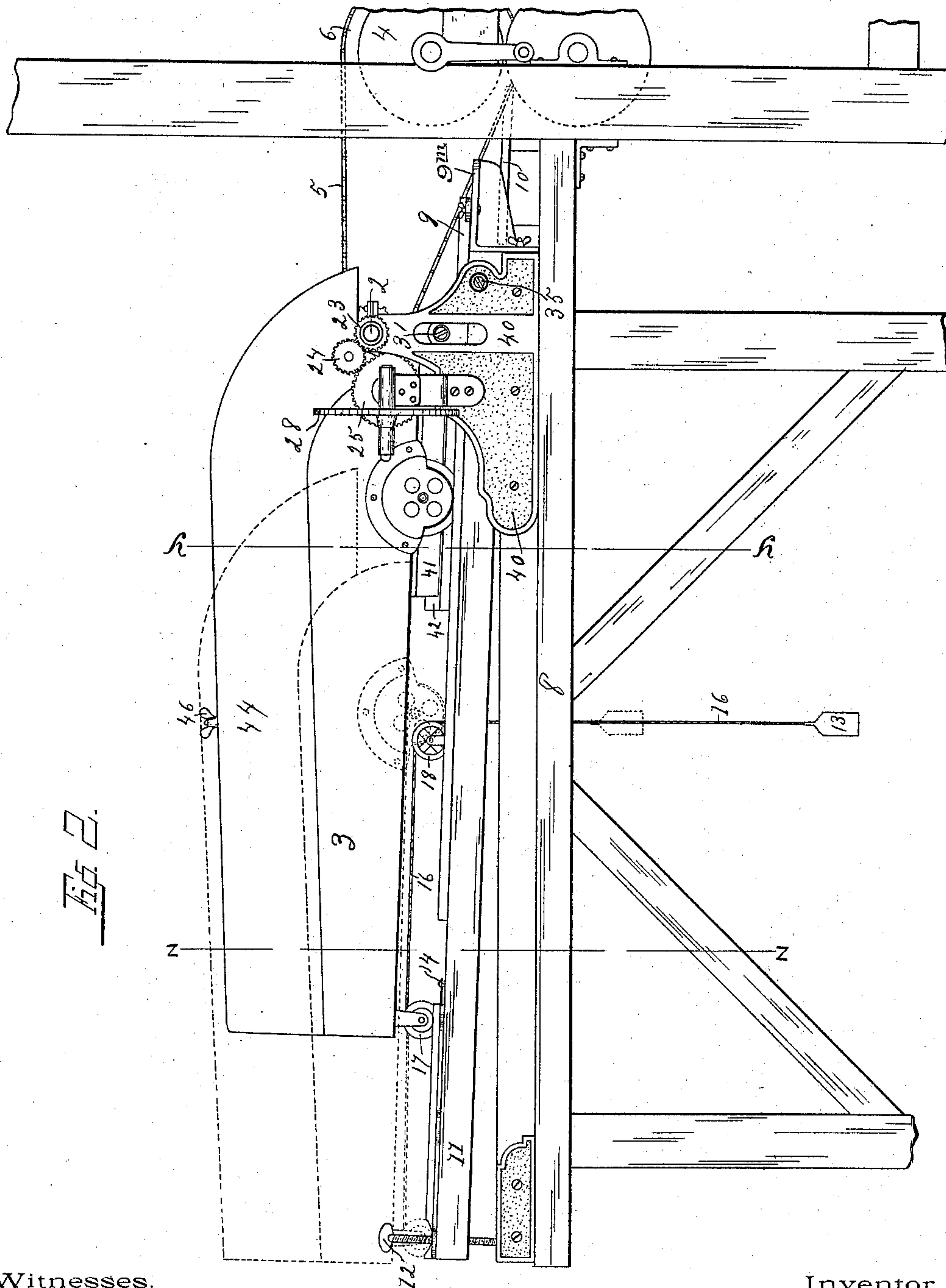
F. SCHILZ.

PAPER FEEDING DEVICE.

(Application filed June 28, 1897.)

(No Model.)

6. Sheets—Sheet 2.



Witnesses.

L.A.M.
Winifred Timlin

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No. 607,958.

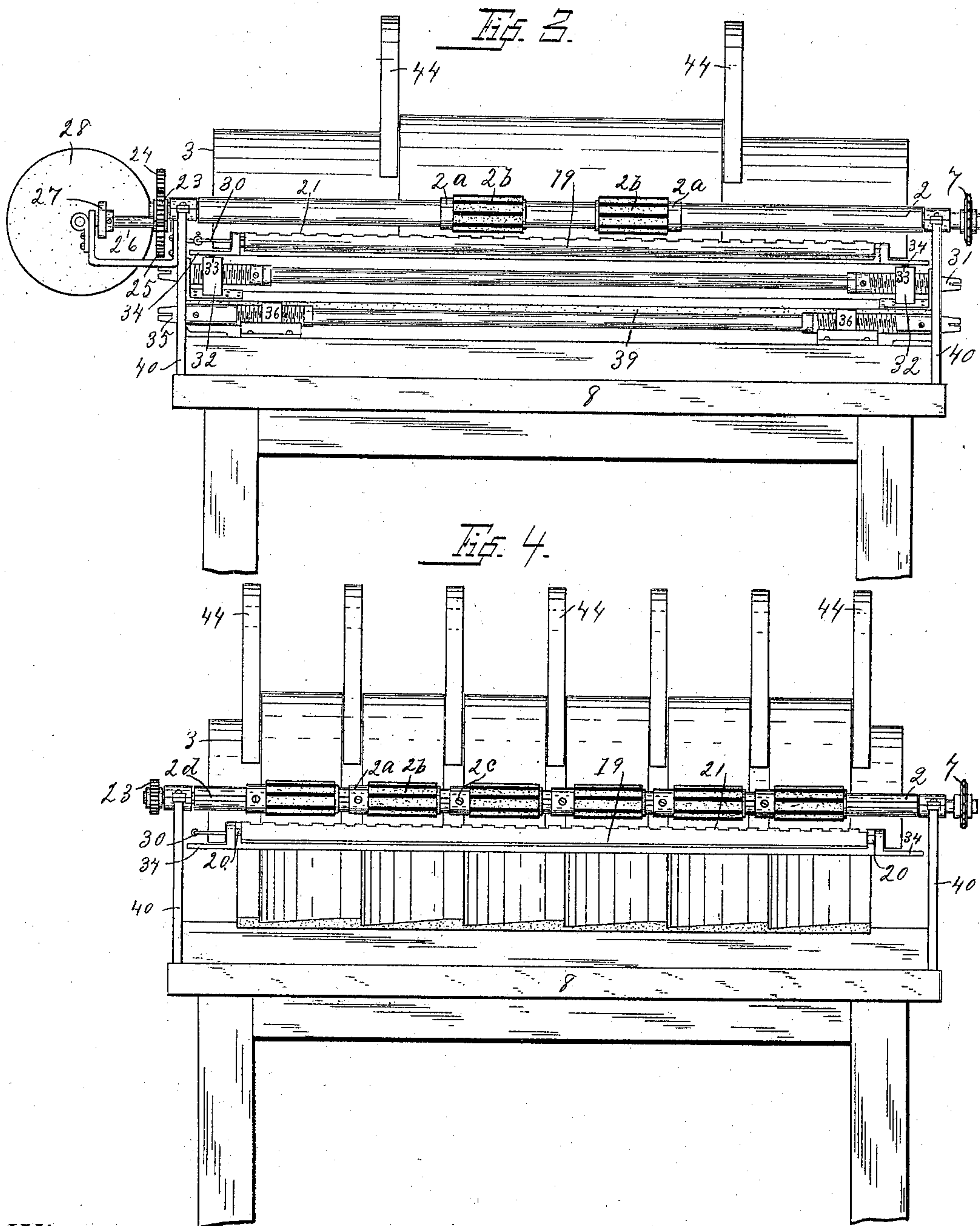
Patented July 26, 1898.

F. SCHILZ.
PAPER FEEDING DEVICE.

(No Model.)

(Application filed June 28, 1897.)

6 Sheets—Sheet 3.



Witnesses.

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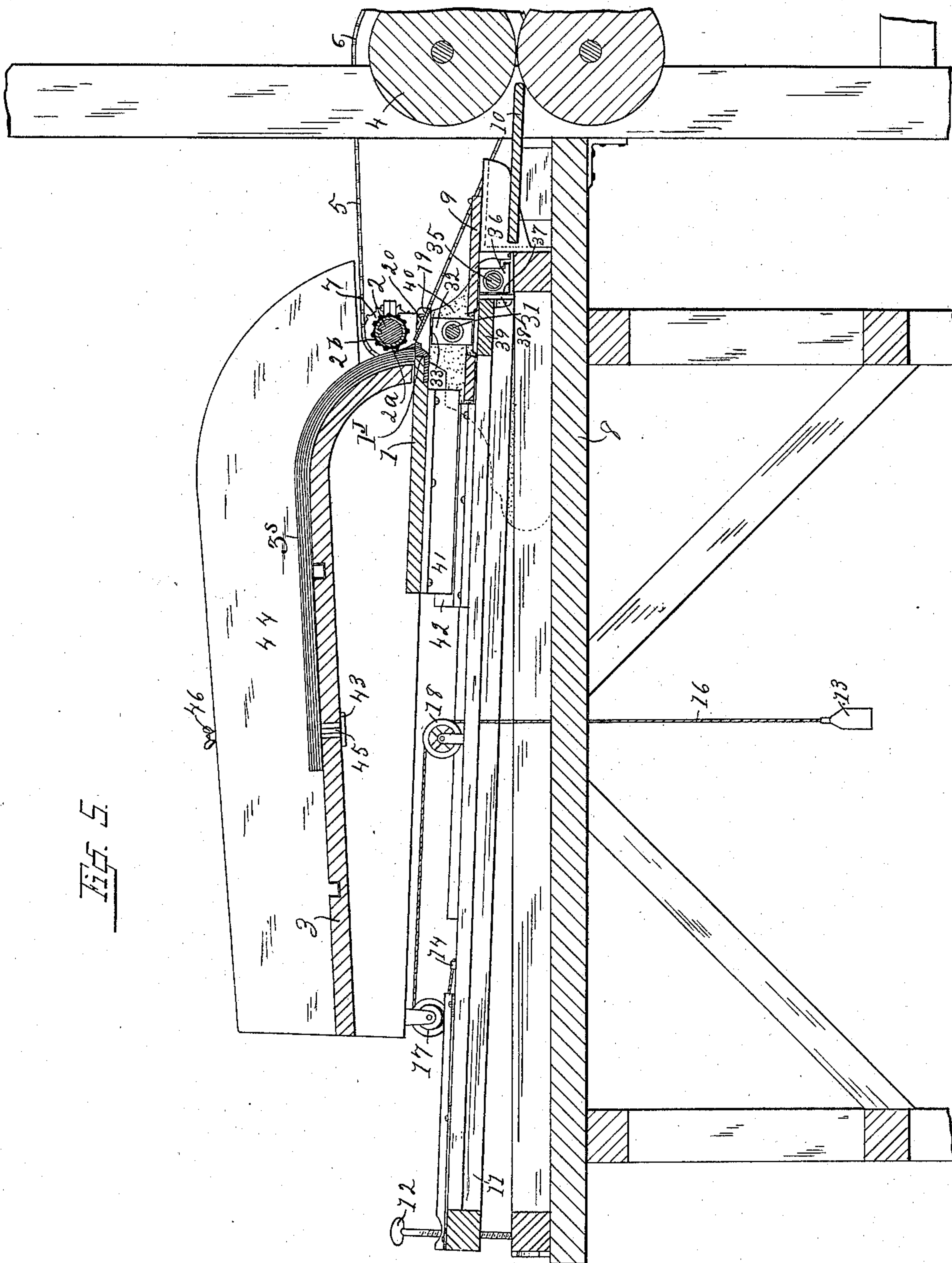
F. SCHILZ.
PAPER FEEDING DEVICE.

(Application filed June 28, 1897.)

(No Model.)

6 Sheets—Sheet 4.

Fig. 5.



Witnesses.

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No. 607,958.

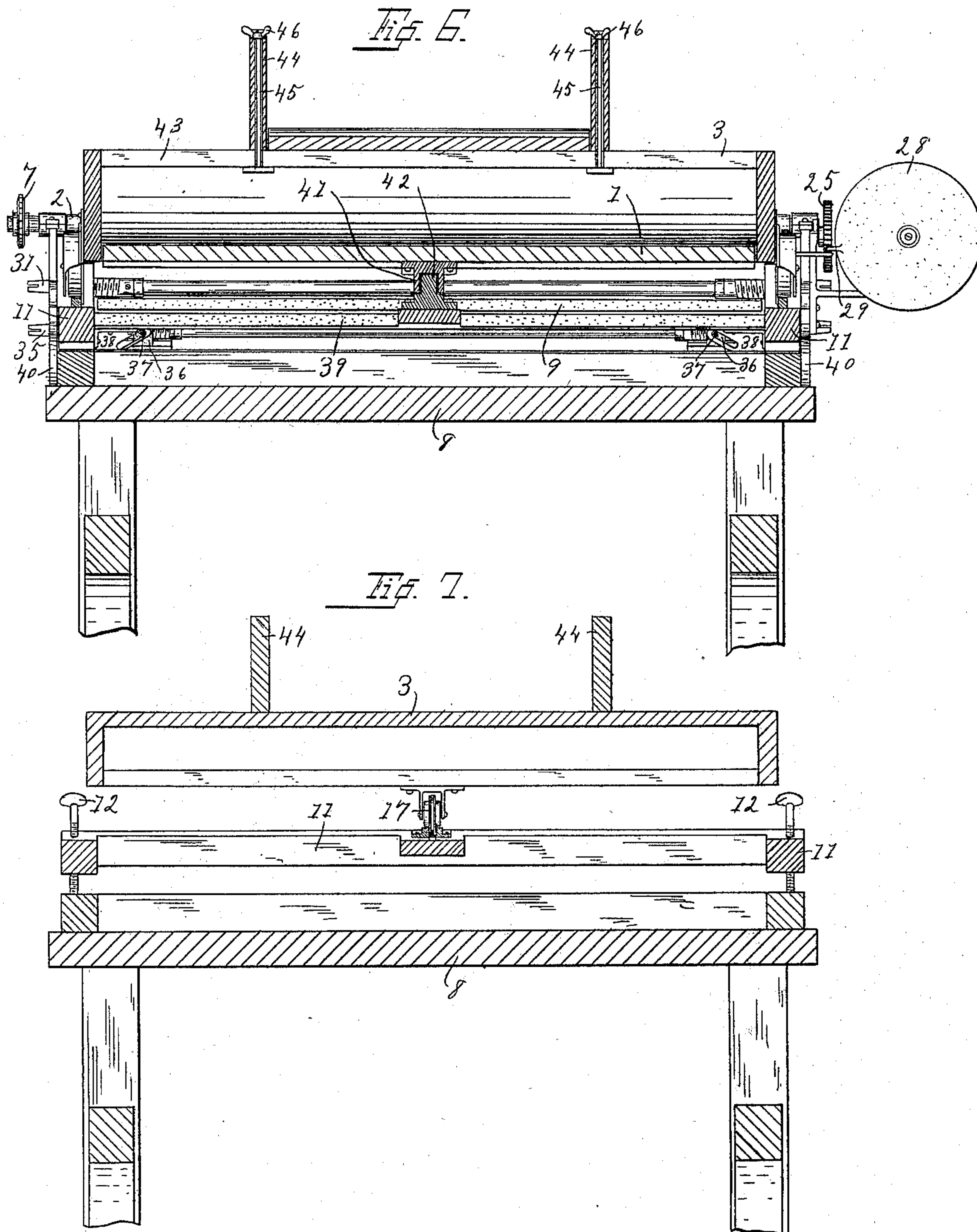
Patented July 26, 1898.

F. SCHILZ.
PAPER FEEDING DEVICE.

(Application filed June 28, 1897.)

(No Model.)

6 Sheets—Sheet 5.



Witnesses.

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Kenneth Timlin

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No. 607,958.

Patented July 26, 1898.

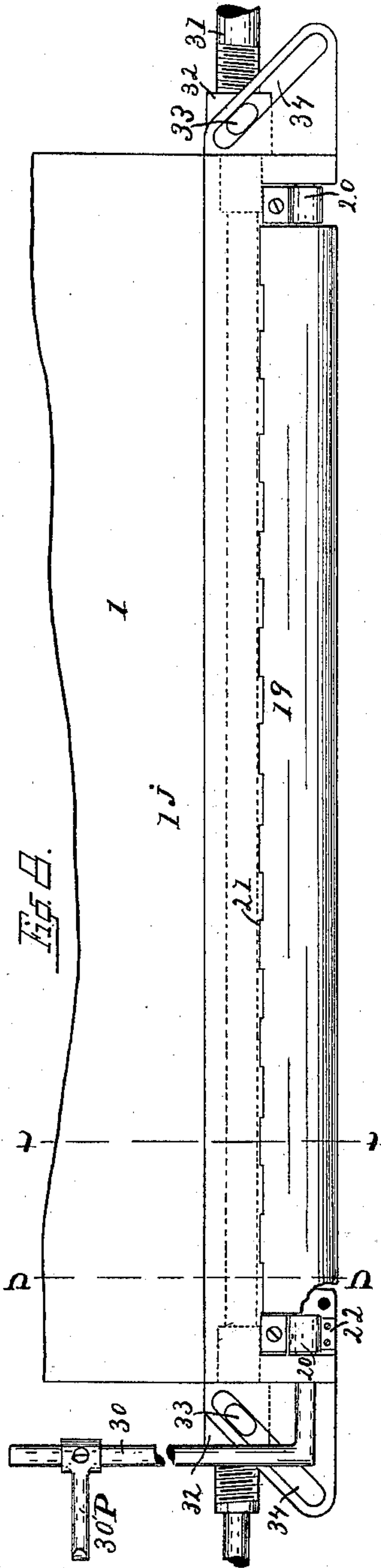
F. SCHILZ.

PAPER FEEDING DEVICE.

(Application filed June 28, 1897.)

(No Model.)

6 Sheets—Sheet 6.



Witnesses.

F. D. Otto
N. J. Austin

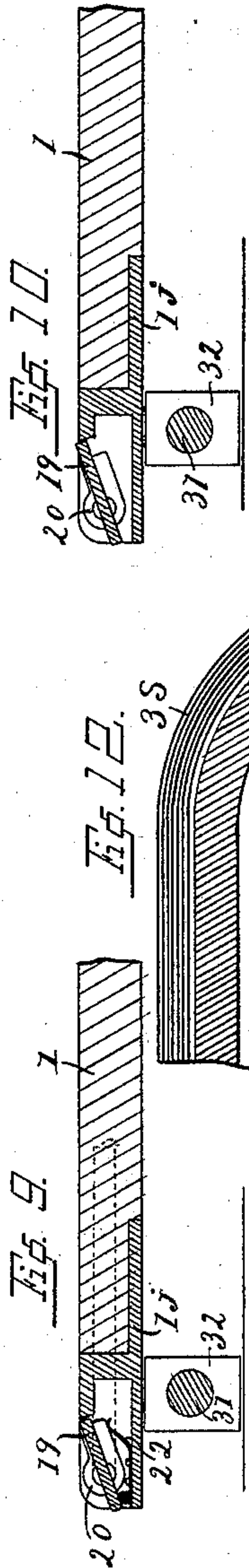
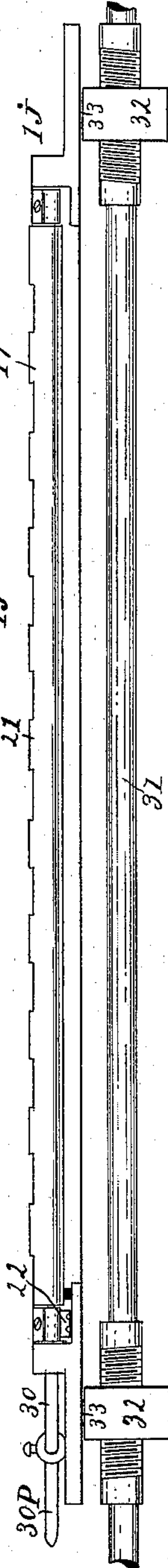


Fig. 11.



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UNITED STATES PATENT OFFICE.

FRANK SCHILZ, OF MILWAUKEE, WISCONSIN, ASSIGNOR TO HUGO LOEWENBACH, OF SAME PLACE.

PAPER-FEEDING DEVICE.

SPECIFICATION forming part of Letters Patent No. 607,958, dated July 26, 1898.

Application filed June 28, 1897. Serial No. 642,579. (No model.)

To all whom it may concern:

Be it known that I, FRANK SCHILZ, a citizen of the United States, residing at Milwaukee, in the county of Milwaukee and State of Wisconsin, have invented new and useful Improvements in Paper-Feeding Devices, of which the following is a specification.

My invention relates to improvements in paper-feeding devices.

The objects of my invention are, first, to provide means for feeding sheets of paper singly and in succession from a pack; second, to provide means for regulating the escape of the sheets, so that they will be discharged at regular intervals; third, to provide means for adjusting the feed mechanism for sheets of different thicknesses.

In the following description reference is had to the accompanying drawings, in which—

Figure 1 is a plan view of my invention, showing the same as it is connected with the feed-rollers of a ruling-machine. Fig. 2 is a side view of the same. Fig. 3 is a front elevation of my invention. Fig. 4 is a similar view showing my invention as it is adjusted for feeding envelopes or narrow sheets of paper. Fig. 5 is a section view drawn on line xx of Fig. 1. Fig. 6 is a cross-section drawn on line yy of Fig. 2. Fig. 7 is a cross-section drawn on line zz of Fig. 2. Fig. 8 is a detail showing a plan of the detention-plate, showing also a portion of the adjusting apparatus. Fig. 9 is a cross-section drawn on line uu of Fig. 8. Fig. 10 is a cross-section drawn on line tt of Fig. 8. Fig. 11 is a detail view showing the detention-plate and of the adjusting-shafts in front elevation. Fig. 12 is an enlarged detail view showing the friction-roller pack and front end of the carriage in section drawn transversely of the roller to show the manner in which the sheets are separated.

Like parts are identified by the same reference-figures throughout the several views.

The feed-controlling platform 1, friction-roller 2, and carriage 3 are arranged in such relation to each other as to support the pack of paper with its forward or lower end engaged between the friction-roller and the carriage, with the edges of the sheets in sub-

stantially vertical frictional contact with the platform and the roller bearing upon the sheets along a horizontal line above the edges of the sheets and above the edge of the platform.

The pack of sheets 3^s is pressed firmly against the roller by the carriage, and the roller by its resistance indents the pack along the line of contact, thus causing the front sheets to bulge outwardly above and below the point of contact, while the friction of the platform tends to retain the edges of the sheets in their original position. With the sheets in this position it is evident that a slight jar or push, such as is imparted by the movement of the roller or the forward push of the carriage after the withdrawal of a preceding sheet, will individualize the front or uppermost sheets along their lower edges by causing them to spring away from the pack. As the friction of the sheets upon the platform tends to detain them, it is also evident that as soon as the edge of the front sheet springs away it escapes from contact with the platform and separates positively from the remaining sheets, which remain in contact therewith and are detained thereby, while the front sheet is drawn downwardly over the edge by the friction of the roller and discharged from the pack.

It sometimes happens that two or more sheets will individualize; but in such case they will also separate from each other, for the sheet in contact with the roller will spring farthest away, while each of the remaining sheets will separate to a less distance from that which precedes it and will, when the device is properly adjusted, remain in contact with the platform until the first sheet is nearly or completely discharged.

Where the sheets are of sufficient length to be bent over upon the carriage, as shown in several of the views, the bent position of the sheets facilitates the tendency of the first sheet to spring away from the pack, and it is possible in such case to effectively feed the sheets with the roller located directly above the platform without reference to the edge of the latter, as the first sheet will in such case

spring away so far as to cause its front edge to project underneath the roller sufficiently to feed along the surface of the platform, and thus permit the roller to remove it from the
 5 pack as effectively as if the sheets projected over the edge. The roller is preferably formed of a metallic shaft provided with sleeves 2^a, covered with corrugated rubber 2^b and secured to the shaft by means of set-
 10 screws 2^c, which engage in a longitudinal channel 2^d in the shaft. The front edge of the platform is preferably provided with a metal bar or angularly-shaped casting 1^z, which can more easily be made to conform to
 15 a uniform standard of shape and size than if the edge were wood.

Where my invention is used in connection with ruling-machines or other printing machinery; the roller 2 may be actuated from the
 20 feed-roller 4 of such machinery by means of a sprocket-chain 5 and gear-wheels 6 and 7. I also find it convenient in such cases to support the feed mechanism from a stand or table 8, with the feed mechanism in a posi-
 25 tion near to and somewhat above the feed-rollers of the machinery to be supplied with paper.

In feeding paper to ruling-machines it is desirable that the front end of each sheet be
 30 lapped over upon the rear end of the one preceding it, as such machines are provided with a device commonly termed "a gate," which is calculated to temporarily engage with and detain the overlapped sheet in or-
 35 der to separate the sheets to a uniform distance from each other. I have therefore provided a shelf 9, adjustably secured to a slotted bracket 9^m by means of thumb-screws 9ⁿ, and a lower fixed shelf 10, the shelves being so
 40 arranged that the sheets are fed by the roller 2 downwardly and forwardly over the shelves 9 and 10 to the ruling-machine. The roller 2 is geared to feed the sheets at a more rapid rate than that at which they are taken by the
 45 ruling-machine feed-rollers, and it is therefore obvious that as one sheet is being drawn into the ruling-machine from the shelf 10 its successor will be fed down over shelf 9 with a more rapid movement, but its front end
 50 will be temporarily held up by the shelf, so as to cause it to lap over the rear end of the preceding sheet on shelf 10. As shelf 9 is longitudinally adjustable, its position can readily be shifted to facilitate the discharge
 55 over it of sheets of different lengths and flexibility.

The carriage is supported from the stand 8 by a track-frame 11, which is preferably ad-
 60 justably inclined, with its rear end supported by one or more screws 12. 13 is a weight attached to a tie-bar 14 of the track-frame 11 by a rope 16, which is passed over the de-
 65 pending carriage-pulley 17 and track-frame pulley 18 in such a manner that the weight exerts a forward pull upon the carriage-pulley 17 and actuates the carriage.

In order that the sheets of paper may be fed at regular intervals, I have provided a rocking detent-bar 19, supported on trun-
 70 nions 20 in a position parallel with the front edge of the platform 1 and having a notched edge 21, the projecting portions of which fit into counterpart notches in the edge of the platform. The notched edge of the bar is
 75 normally held in a position with the projections slightly above the surface of the platform by means of springs 22, and the bar is rocked or oscillated to depress the projections below the surface of the platform when-
 80 ever it is desired to permit the discharge of one of the sheets. The object of the notches is to prevent the edge of the sheet from getting caught in the joint between the bar and platform. To oscillate the bar, motion is
 85 communicated thereto from the shaft of the friction-roller 2 through the gear-wheels 23, 24, and 25, shaft 26, and adjustable friction-pinion 27, friction gear-wheel 28, striker or arm 30^p, and lever 30. The lever 30 is rig-
 90 idly secured to the bar 19, and as the striker-pin 29, which projects from the gear-wheel 28, engages the arm 30^p the lever 30 is thereby depressed to rock the bar, and thus lower its notched edge to or below the surface of the platform. When the lever 30 is depressed,
 95 the pin 28 escapes from its engagement with the arm 30^p and continues its revolution.

It is evident that the speed of the gear-wheel 28 may be so regulated by adjusting its actuating-pinion 27 upon the shaft 26 that
 100 the successive engagements of the striker-pin with arm 30^p will correspond with the intervals at which it is desired to release the sheets.

In order to adapt my device for feeding sheets of paper of different thicknesses and
 105 quality, I have provided means for adjusting the platform 1 both longitudinally and vertically. The longitudinal movement is communicated directly to the platform from a right and left screw-threaded shaft 31, pro-
 110 vided with screw-blocks 32, having pins 33, projecting into diagonally-slotted guide-yokes 34, connected with the platform, as best shown in Fig. 8. It is obvious that as the shaft is turned the blocks will be forced to the right
 115 and left, respectively, and the movement of the pins in the yokes will crowd the platform to the front or rear, according to the movement of the blocks inwardly or outwardly upon the shaft. In order to raise the plat-
 120 form 1, it is, however, necessary to lift also the track-frame and carriage, and for this purpose I have provided an adjusting-shaft 35 with right-and-left screw-blocks 36, having pins 37 projecting into the diagonally-
 125 slotted yokes 38, located on the cross-bar 39 of the lower end of the track-frame 8. With this construction the movement of the blocks inwardly or outwardly is communicated to the track-frame to raise or lower it, together
 130 with the carriage and feed-controlling platform. As the friction-roller 2 is supported

from the stand by the fixed brackets 40, it is evident that the movement of the platform 1 will increase or diminish the space between the edge of the latter and the roller. This space is increased for heavy or highly-elastic paper and diminished for thin or soft paper.

In order to prevent the platform 1 from shifting laterally, I have provided it with a depending inverted-U-shaped channel-iron 41, disposed longitudinally and adapted to fit over a flange 42, projecting upwardly from the track-frame.

For feeding sheets of different widths I have provided the carriage with a transverse slot 43, in which side guards 44 are secured by means of a bolt 45 and thumb-screw 46. The guards are adapted to hold the sheets in a compact block and prevent them from shifting laterally.

It will be understood that while in the foregoing description I have used the term "carriage" for the device which forces the paper against the friction-roller I do not limit my claims to (include) a wheeled vehicle, nor to a device adapted to support the sheets in a bent position, nor to any particular style of device for pressing the paper forwardly; nor do I limit my invention to include a weight-actuated carriage, as any suitable means for pressing the paper against the roller is, in the sense of the term as I have used it, a carriage. It will also be understood that the adjusting mechanism may be omitted when the device is used for feeding sheets of substantially uniform size, quality, and thickness and also that the detent-bar may be omitted where it is not necessary to discharge the sheets at precise intervals.

The operation of my device is described as follows: The carriage is drawn backwardly and the pack of sheets placed on end between it and the roller, the carriage being then permitted to press forwardly to engage the sheets between it and the roller, and the sheets, if of sufficient length, being bent over and permitted to rest upon the carriage. The feed-roller 2 is then actuated to draw out a few sheets and the platform adjusted longitudinally with reference to the elasticity of the paper until it is observed that the front sheet will spring away from the platform promptly as soon as the detent-bar is lowered, leaving the second sheet still in engagement with the platform. The platform is advanced for the more elastic grades of paper and retracted for those which possess little elasticity. If the paper is comparatively inelastic, the platform may also be adjusted vertically to bring it closer to the feed-roller, thus bringing the line of roller-pressure nearer to the edges of the sheets and increasing within certain limits the tendency of the sheets to spring away. Care must be taken, however, not to adjust the platform too closely to the roller, for if the latter bears upon the sheets in close proximity to their edges it will prevent them from

springing away at all. When the platform is properly adjusted, the sheets are discharged in succession by turning the roller.

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

1. The combination of a feed-controlling platform, a friction-roller located in proximity to one edge thereof, means for actuating the roller, and a carriage adapted to engage sheets of paper between it and the roller, with their lower edges in frictional contact with the platform, and with the roller bearing upon the sheets along a line above their lower edges, whereby the carriage coöperates with the platform and with the roller acting at a point above the lower edges of the sheets, to cause the latter to separate at their lower edges and spring away successively from contact with the platform.

2. The combination of a feed-controlling platform, a friction-roller located in proximity thereto, and a carriage adapted to engage sheets of paper between it and the roller, with the upper ends of the sheets bent over and supported horizontally upon said carriage, and their lower edges in frictional contact with the platform, whereby the sheets are caused to successively spring away from contact with the platform, into a position to be withdrawn by said friction-roller.

3. The combination of a feed-controlling platform, a friction-roller located in proximity thereto, a carriage adapted to engage sheets of paper between it and the roller, with their lower edges in frictional contact with the platform, a detent projecting above the surface of the platform and adapted to retain the sheets thereon, and means for temporarily depressing said detent at regular intervals to successively release the sheets.

4. The combination of a feed-controlling platform, a friction-roller located in proximity thereto, a carriage adapted to engage sheets of paper between it and the roller, with their edges in frictional contact with the platform, a detent-bar located at the front edge of the platform, and means for actuating said bar to raise and lower the same in relation to the surface of the platform.

5. The combination of a feed-controlling platform, a friction-roller located in proximity thereto, a carriage adapted to engage sheets of paper between it and the roller, with their edges in frictional contact with the platform, a detent located at the front edge of the platform, means for automatically raising the same above the platform, and means operated from the friction-roller for depressing the detent at regular intervals to permit the discharge of the paper.

6. The combination of a feed-controlling platform, a friction-roller located in proximity thereto, a carriage adapted to engage sheets of paper between it and the roller, with their edges in frictional contact with the platform,

- a detent-bar located at the front edge of the platform, and provided with a notched edge fitted to counterpart notches in the edges of the platform, means for automatically raising the notched edge of the bar above the surface of the platform, and means operated from the friction-roller for depressing the notched edge of the bar below the surface of the platform at regular intervals.
7. The combination of a feed-controlling platform, a friction-roller located in proximity thereto, a carriage adapted to engage sheets of paper between it and the roller with their edges in frictional contact with the platform, a bar located at the front edge of the platform, springs for automatically raising one edge of said bar above the edge of the platform, a lever connected with said bar, variable-speed gearing arranged to be actuated from the friction-roller and a striker-pin carried by said gearing for intermittently actuating said lever.
8. The combination of a feed-controlling platform, a friction-roller located in proximity to one edge thereof, a carriage adapted to engage sheets of paper between it and the roller, with the edges of the sheets in frictional contact with the platform, a bar located at the front or discharge end of the platform with one edge above the surface of the latter, means for depressing said bar at intervals to permit the discharge of the sheets, and a shelf for holding up the ends of the sheets as they are discharged from the roller, whereby they are caused to lap over the preceding sheets.
9. The combination of a feed-controlling platform, a friction-roller located in proximity to one edge thereof, a carriage adapted to engage sheets of paper between it and the roller, with the edges of the sheets in frictional contact with the platform, and the upper ends bent over and supported upon the carriage, a bar located at the front or discharge end of the platform with one edge above the surface of the latter, means for depressing said bar at intervals to permit the discharge of the sheets, a shelf for holding up the ends of the sheets as they are discharged by the roller, and a second shelf for receiving the discharged sheets, whereby the sheets escaping from the first shelf are lapped over those upon the second shelf.
10. The combination of a feed-controlling platform, a friction-roller located in proximity to one edge thereof, a carriage adapted to engage sheets of paper between it and the roller with the edges of the sheets in frictional contact with the platform, a shelf located at the discharge end of the platform, and a second shelf located in front of and below said first-mentioned shelf and adapted to receive the sheets discharged over the first-mentioned shelf, whereby the sheets are successively lapped over each other at their rear ends.
11. The combination of a feed-controlling platform, a friction-roller located in proximity to one edge thereof, a carriage adapted to engage sheets of paper between it and the roller with the edges of the sheets in frictional contact with the platform, a shelf located at the discharge end of the platform, means for adjusting said shelf with reference to the length of the sheets, and a second shelf located in front of and below said first-mentioned shelf and adapted to receive the sheets discharged over the first-mentioned shelf, whereby said sheets are successively lapped over each other at their rear ends.
12. The combination of a feed-controlling platform, a friction-roller located in proximity thereto, means for actuating the roller, a carriage adapted to engage sheets of paper between it and the roller, with their edges in frictional contact with the platform, a vertically-adjustable frame for supporting said carriage and platform, and means for independently adjusting the platform longitudinally.
13. The combination of a feed-controlling platform, a friction-roller located in proximity thereto, means for actuating the roller, a carriage located upon an adjustably-inclined track and adapted to engage sheets of paper between it and the roller, with their edges in frictional contact with the platform, an independently-supported right and left screw-threaded shaft running transversely of the track-frame, and screw-blocks located on said shaft and provided with pins engaging in diagonally-slotted yokes attached to a vertical surface on the track-frame, whereby the motion of the shaft is adapted to impart a vertical movement to the track-frame.
14. The combination of a feed-controlling platform, a friction-roller located in proximity thereto, means for actuating the roller, a carriage located upon an adjustably-inclined track and adapted to engage sheets of paper between it and the roller, with their edges in frictional contact with the platform, an independently-supported adjusting-shaft and connections for raising the lower end of the track-frame, and a second shaft supported in the track-frame and provided with connections for adjusting the feed-platform longitudinally.
15. The combination of a feed-controlling platform, a friction-roller located in proximity thereto, means for actuating the roller, and a carriage adapted to engage sheets of paper between it and the roller with their edges in frictional contact with the platform, an adjusting screw-threaded shaft running underneath said platform, right-and-left screw-blocks located on said shaft, diagonally-slotted guides located on the under side of said platform, and pins projecting from the screw-blocks and engaged in the slots of said guides whereby the movement of said shaft imparts motion to the platform at right angles thereto.
16. The combination of a feed-controlling

platform, a friction-roller located in proximity thereto, means for actuating the roller, a carriage adapted to engage sheets of paper between it and the roller with their edges in frictional contact with the platform, an inverted-U-shaped channel-iron attached in a longitudinal position to the under side of the platform, a flange projecting upwardly from the carriage-supporting frame, and engaged

in the channel of said bar, and means for adjusting the platform longitudinally of the track-frame.

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

FRANK SCHILZ.

Witnesses:

L. C. WHEELER,
JAS. B. ERWIN.