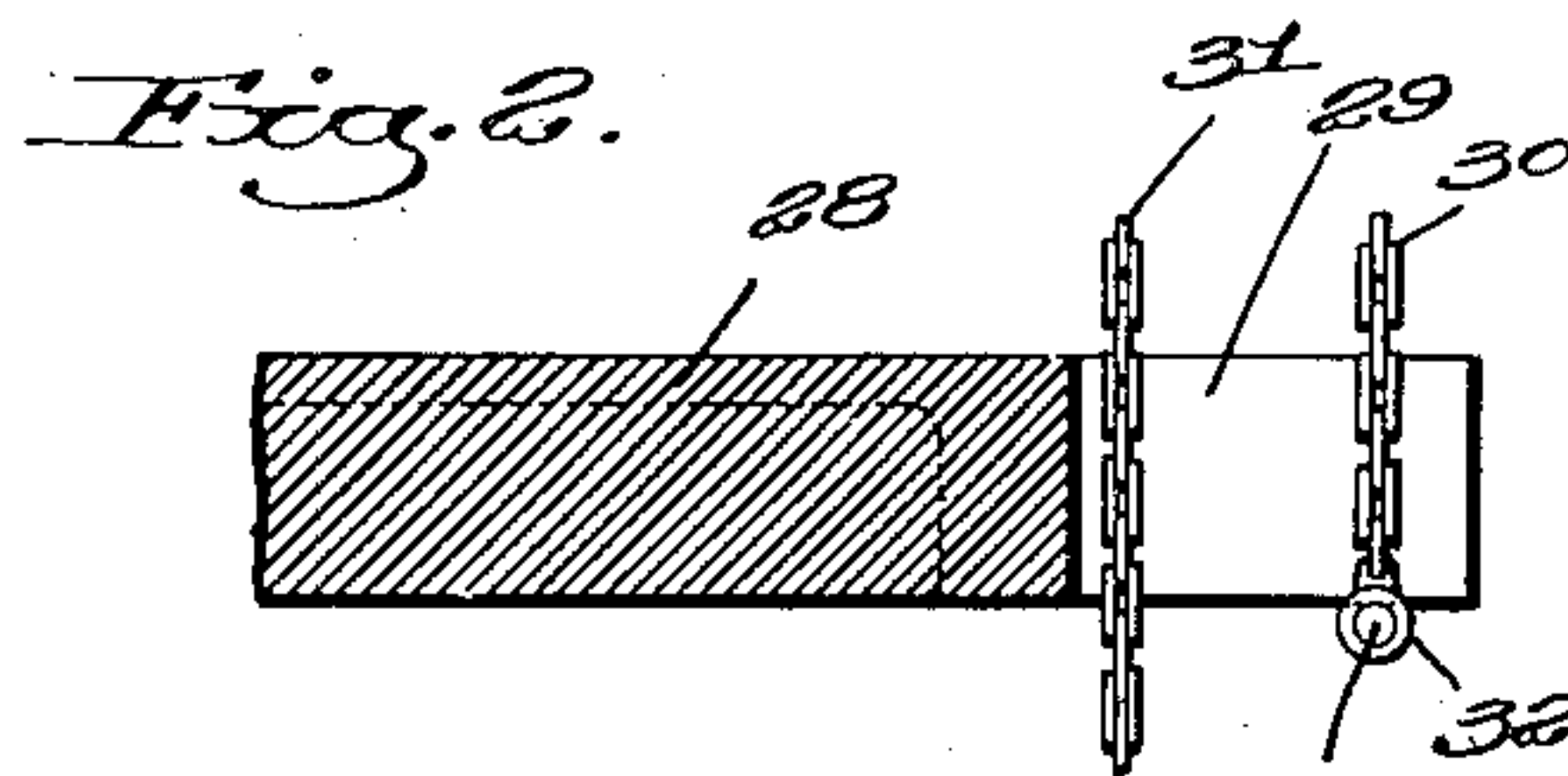
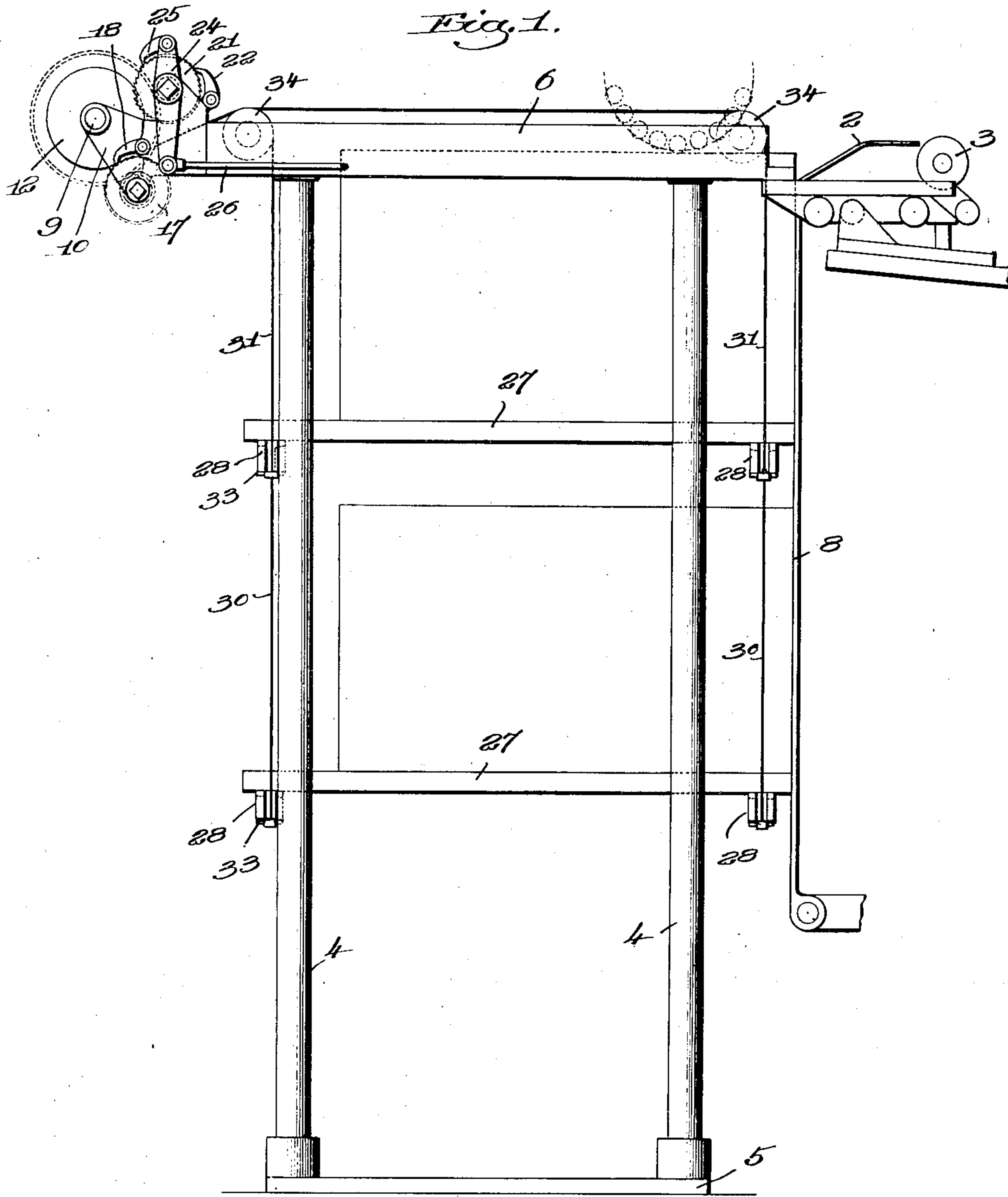


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 APPLICATION FILED SEPT. 18, 1908.

912,563.

Patented Feb. 16, 1909.

2 SHEETS—SHEET 1.



Witnesses:  
 Fred. S. Grunhuf.  
 Joseph M. Wand.

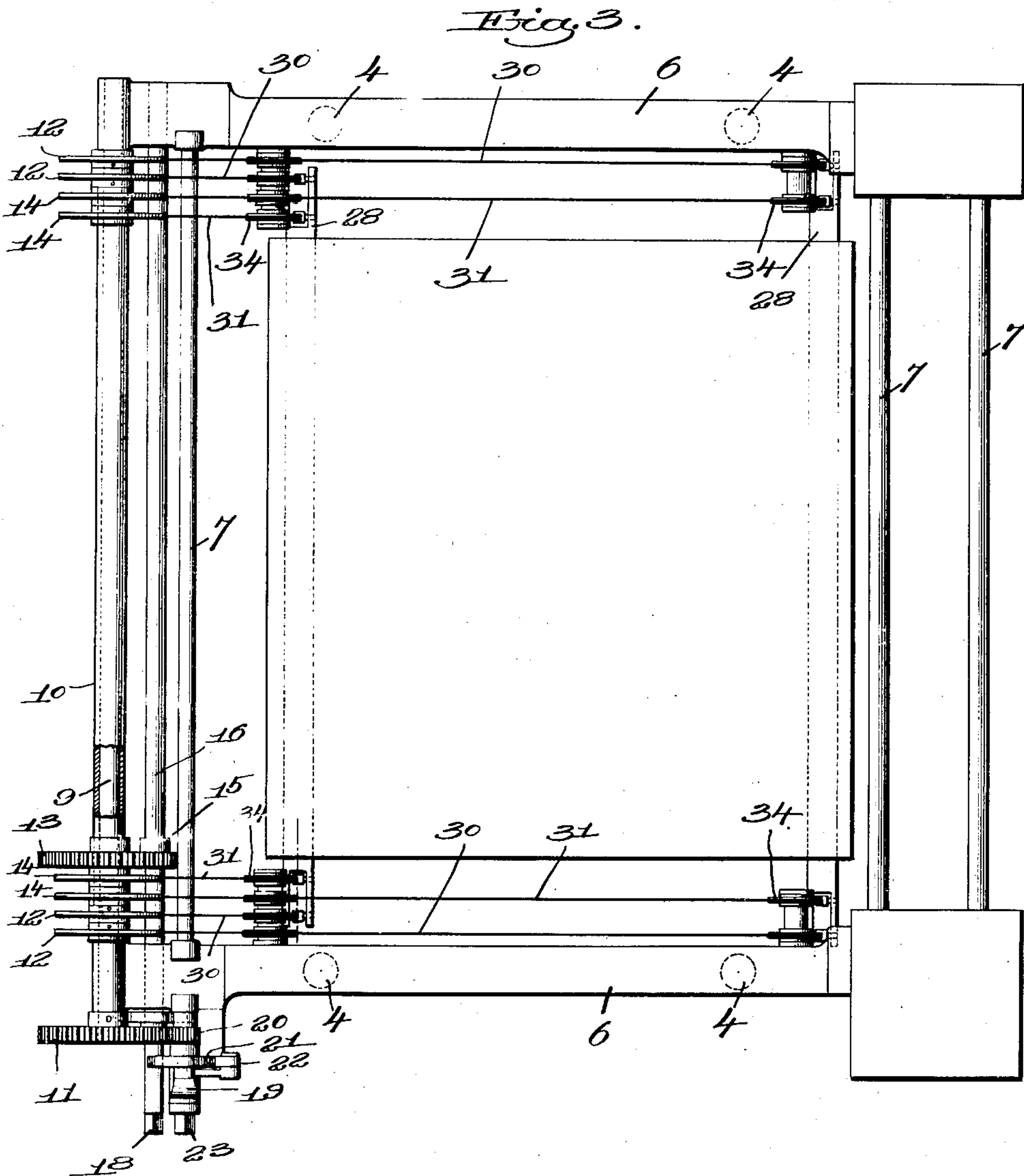
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 by Crosby & Gregory  
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# UNITED STATES PATENT OFFICE.

BERNHARD GUSTAFSON, OF BOSTON, MASSACHUSETTS.

## PILE-ELEVATOR FOR SHEET-FEEDING MACHINES.

No. 912,563.

Specification of Letters Patent.

Patented Feb. 16, 1909.

Application filed September 18, 1908. Serial No. 453,636.

*To all whom it may concern:*

Be it known that I, BERNHARD GUSTAFSON, a citizen of the United States, residing at Boston, in the county of Suffolk and State of Massachusetts, have invented an Improvement in Pile-Elevators for Sheet-Feeding Machines, of which the following description, in connection with the accompanying drawing, is a specification, like numerals on the drawing representing like parts.

My invention relates to mechanism for feeding a pile of superimposed sheets into position to be acted upon by suitable sheet segregating devices of a sheet feeding device such as is used in connection with printing presses.

In that type of sheet feeding device where the sheets are placed in a pile and the pile moved upward to maintain the uppermost sheet in position to be taken by the segregating devices it is necessary to renew the pile of sheets, because from the inherent nature of the device it is impossible to have a continuous vertical pile of sheets. Various devices have been employed to present fresh supplies of sheets in the pile form, and maintain as nearly as possible a continuous supply. These devices are more or less complicated and expensive in construction and require considerable space, preventing ready access to the different sides of the pile supports.

It is the object of my invention to present a mechanism which shall be of simple construction, of comparatively small cost of manufacture and maintenance, which shall occupy a minimum amount of space, allow access to three sides of the pile support, and which shall enable the supply of sheets in pile form to be maintained so nearly continuous as to require the stoppage of the sheet feeding mechanism for but very brief periods of time. These advantages I obtain by providing two pile supports and two sets of elevating and suspending means either of which may be connected to either of the pile supports. One of these sets of elevating and suspending means is intended to be operated intermittently from a moving part of the printing press or sheet feeding mechanism to cause the gradual elevation of the pile and maintain its uppermost sheet in proper position to be seized by the segregating devices. The other set of elevating and suspending

means is intended to be operated independently and preferably manually. When the first pile support is elevated by the first set of elevating and suspending means to a position where the pile is nearly exhausted, the second pile support which meanwhile has been supplied with a pile of sheets is elevated manually by the second set of elevating and suspending means. When the sheets have been fed off from the upper or first pile support the sheet feeding machine is then stopped, the first or upper pile support removed, the first set of elevating and suspending means connected to the second pile support, the second set disconnected therefrom, and the sheet feeding mechanism again placed in operation.

No vertical guides are necessary other than the usual back-guide for the pile of sheets, and access is therefore had to three sides of the pile supports, thus allowing the entire mechanism to be placed in hitherto inconvenient and inaccessible locations, and enabling the sheets to be piled upon the pile supports at either of the three sides as convenience may determine.

The nature of the invention will more fully appear from the accompanying description and drawings, and will be particularly pointed out in the claims.

The drawings represent a preferred form of mechanism embodying my invention, only so much of the sheet feeding devices proper as is necessary for illustration being shown.

In the drawings, Figure 1 is a side elevation of the pile elevating devices with portions of the sheet feeding mechanism proper shown in relation thereto. Fig. 2 is a detail of construction showing a simple form of connection between the elevating and suspending chains and one of the pile supports. Fig. 3 is a top plan view of the pile elevating mechanism shown in Fig. 1.

It is unnecessary to show the sheet feeding mechanism proper, that is the devices which segregate the sheets at the top of the pile and deliver them one by one to the feed rolls and tapes by which they are conveyed to the printing press or other mechanism. I have, however, indicated at 1 a combing wheel, and at 2 an incline up which the sheets are passed by the combing wheel to feed rolls, the lower one of which is shown at 3.

The pile elevating mechanism is supported



by a suitable frame, herein shown as of skeleton construction, comprising four upright posts 4, a base 5, cross-bars 6 connecting the posts at each side at the top, and suitable transverse braces 7. A common form of edge-guide for the pile of sheets is indicated at 8 on the side of the frame from which the sheets are fed. This construction of frame presenting below the top substantially nothing but four upright posts leaves the three sides away from the printing press or similar mechanism open and unobstructed. This enables the entire sheet feeding mechanism with the pile elevator to be set up in any location where access can be had to one of the three sides, although it is preferable that access should always be had to the side opposite the printing press, or what might be termed the rear, because at this side the sheets can most readily be handled and the pile supports to be described changed.

The top of the frame is provided with two transverse shafts which for simplicity and compactness of structure are herein shown as arranged concentrically, one shaft being indicated at 9 as solid, and the other being indicated at 10 as tubular and concentric with the former. The shaft 9 is journaled in bearings formed in projections 10 from the cross-bars 6. This shaft carries at one end a gear 11, and has mounted rigidly thereon near each end two winding drums 14.

A shaft 16, arranged parallel to the shaft 10, carries thereon a pinion 15 intermeshing with the gear 13, and also carries a ratchet wheel 17, cooperating with the detent pawl 18, pivoted on the cross-bar 6. This shaft 16 is also provided with a polygonal end 18 to receive a crank by means of which the shaft may be turned manually to cause the rotation of the shaft 10 with its winding drums carried thereby, the detent pawl 18 serving to prevent, when desired, backward rotation.

A stub-shaft 19, arranged parallel to the shaft 9, carries a pinion intermeshing with the gear 11, and also carries a ratchet wheel 21 cooperating with a detent pawl 22, pivoted on the frame. This shaft is provided with a polygonal end 23 by means of which it may be rotated manually, as in the case of the shaft 16. A lever 24 is pivoted on the shaft 19 and carries at its upper end a pawl 25 engaging the ratchet 21, while its lower end has connected thereto a rod 26 by means of which it is oscillated from some moving part of the sheet feeding mechanism or printing press. By this means a continuous intermittent rotary movement is given to the shaft 9 in time with the sheet feeding mechanism or printing press.

Two separate pile supports are provided, and each is herein shown as consisting of a board or table 27, and two bars 28, forked or bifurcated at each end to present an open-

ended slot 29, as shown more clearly in Fig. 2. The boards 27 rest upon these bars 28, but are not fastened thereto.

Each of the winding drums 12 and 14 is provided with a flexible elevating and suspending member, herein shown as consisting of a chain. The chains, which extend from the winding drums 12, are indicated at 30, and those extending from the winding drums 14 at 31. These chains are each provided with suitable means whereby they may be connected to either of the pile supports. As herein shown these means comprise a ring 32, on the end of the chain, and a pin 33 adapted to pass through the ring and serve as a rest for the bar 28.

At suitable points idler pulleys 34 are provided, mounted upon stub-shafts, and the suspending chains pass over the idler pulleys to their connections with the pile supports.

In the operation of the pile elevator the chains 31 are connected to the bars 28 supporting one of the tables 27, which is then supplied with the pile of sheets in the usual manner, the front edge of the pile resting against the guide 8, and to insure the proper position of the pile during its upward movement the table 27 is slightly inclined toward the guide. The sheet feeding mechanism is then set in motion, thus causing the movement of the rod 26 which, acting through the intermediate mechanism described, intermittently rotates the shaft 9 and winds the chains upon the winding drums 12, thus elevating the pile of sheets and maintaining the upper surface of the pile in the position desired for the proper action of the segregating devices. When the pile of sheets is nearing exhaustion the chains 31 are pulled down, and connected to the bars 28 of the other table 27 in a position as near the floor as desired. A fresh supply of sheets is then piled upon this second table 27, and by means of the crank attached to the shaft 10 the second table 27 with its new pile of sheets is elevated until the top of the pile is close to the preceding table 27. This loading and arranging of the fresh pile of sheets and its elevation takes place while the sheets are being fed off from the preceding table. Ample time is thus allowed without stopping the sheet feeding mechanism of the press for this purpose. When the first pile of sheets is exhausted the sheet feeding mechanism is stopped; the table 27 is removed; the bars are then removed from the chains 30 by pulling out the pins 33, and tipping the bars to release the forked ends; the second table 27 with its fresh pile of sheets is then elevated by manual operation of the shaft 10, the further slight distance required to bring its upper surface into position; the chains 30 are connected to the bars 28 supporting the second table; the chains 31 are then disconnected therefrom; the sheet feeding mechanism is



again set in operation, and the fresh supply of sheets fed up intermittently as before. While the sheets are being fed off from the second table 27 the chains 31 are drawn downwardly, the first table 27 is set up in position and the operation proceeds as before.

It will thus be seen that I have provided a mechanism which is of exceedingly simple construction and which can be built at a low cost, thus enabling it to be used in connection with a large variety of sheet feeding machines for printing presses and other work. The period of time during which the sheet feeding machine is stopped is very slight, being only that required for the removal of one pile supporting table, the elevation for a short distance of the second pile supporting table, and the connection thereto of the intermittently operated chains.

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

1. A pile elevator for sheet feeding machines, comprising two separate pile-supporting means, two sets of elevating and suspending means, and means to connect either of said sets to either of said pile supporting means.

2. A pile elevator for sheet feeding machines, comprising two separate pile supporting means, two sets of elevating and suspending means, means for independently operating said sets, and means to connect each of said sets to each of said pile supporting means.

3. A pile elevator for sheet feeding machines, comprising two separate pile-supporting means, two sets of elevating and suspending means, means for operating one set automatically and intermittently, means for operating the other set manually, means to connect either of said sets to either of said pile supporting means.

4. A pile elevator for sheet feeding machines, comprising two independently operated sets of winding drums, two sets of flexible elevating and suspending members adapted to wind respectively upon the two sets of drums, two pile supports, and means to connect either of said sets of members to either of said supports.

5. A pile elevator for sheet feeding machines, comprising two independent sets of winding drums, two sets of flexible elevating and suspending members adapted to wind respectively upon the two sets of drums, means for operating one set of drums automatically and intermittently, means for operating

the other set manually, two pile supports, means to connect either of said sets of members to either of said supports.

6. A pile elevator for sheet feeding machines, comprising a vertical frame, two shafts mounted at the top of said frame, a set of winding drums mounted upon each of said shafts, means for rotating one shaft automatically and intermittently, means for operating the other shaft manually, two sets of flexible elevating and suspending members adapted to wind respectively upon the two sets of drums, two pile supports, means to connect either of said sets of members to either of said supports.

7. A pile elevator for sheet feeding machines, comprising a vertical frame, a shaft mounted at the top thereof, a second hollow shaft mounted upon and concentric of said first shaft, means for operating one of said shafts automatically and intermittently, means for operating the other shaft manually, a set of winding drums mounted upon each of said shafts, two sets of flexible elevating and suspending members adapted to wind respectively upon the two sets of drums, two pile supports, means to connect either of said sets of members to either of said supports.

8. A pile elevator for sheet feeding machines, comprising a vertical frame, two shafts mounted at the top of said frame, a set of winding drums mounted upon each of said shafts, means for independently operating the said shafts, two pile supports, two sets of chains adapted to wind respectively upon the two sets of drums, means to connect either of said sets of chains to either of said supports.

9. A pile elevator for sheet feeding machines, comprising a vertical frame, two shafts mounted at the top of said frame, a set of winding drums mounted upon each of said shafts, means for independently operating the said shafts, two pile supporting tables, a pair of supporting bars having forked ends for each table, two sets of chains adapted to wind respectively upon the two sets of drums, one member of both sets passing through the forked ends of each bar, means to connect either set of chains to either pair of bars.

In testimony whereof, I have signed my name to this specification, in the presence of two subscribing witnesses.

BERNHARD GUSTAFSON.

Witnesses:

MABEL PARTELOW,  
FREDERICK S. GREENLEAF.