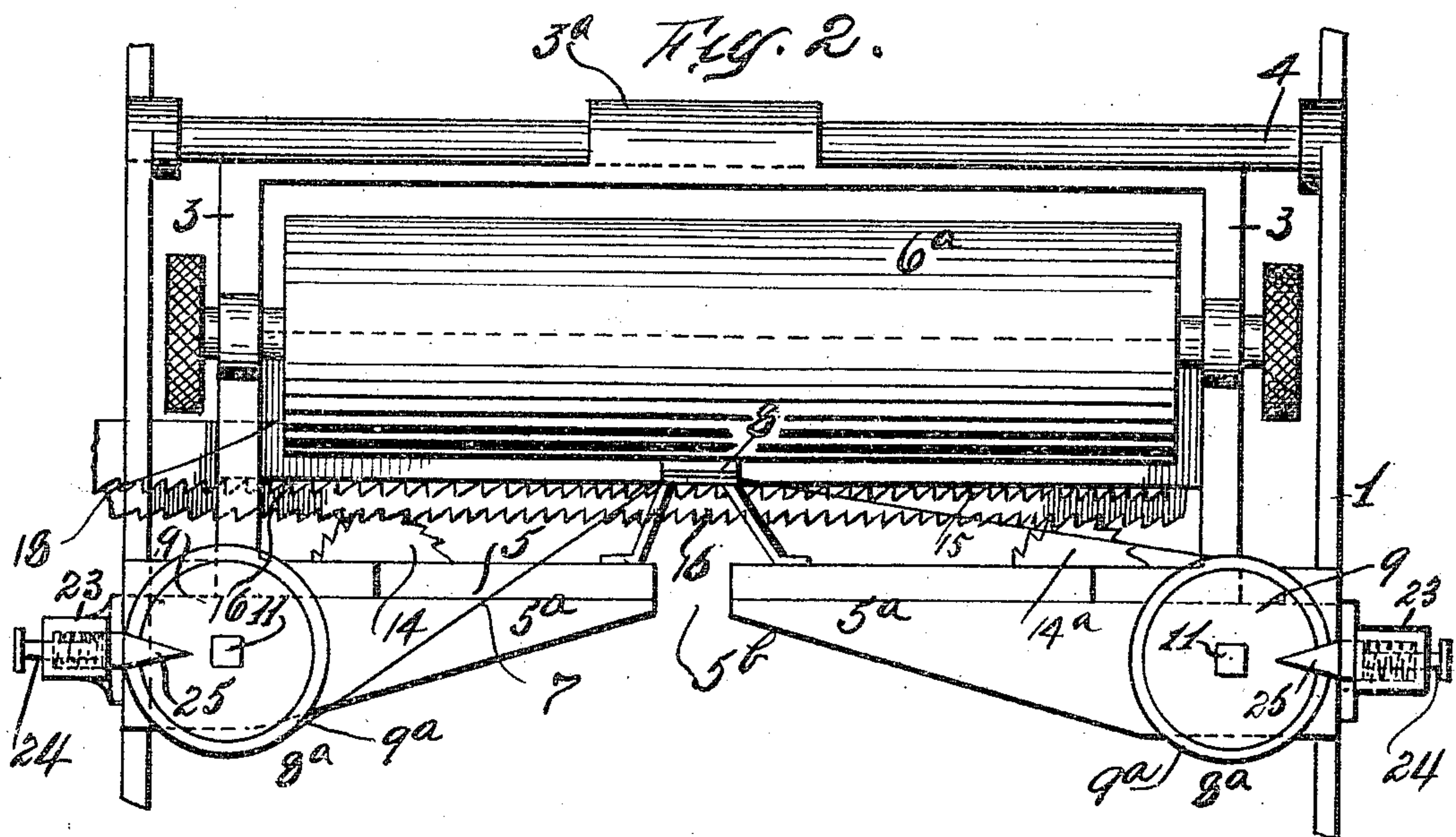
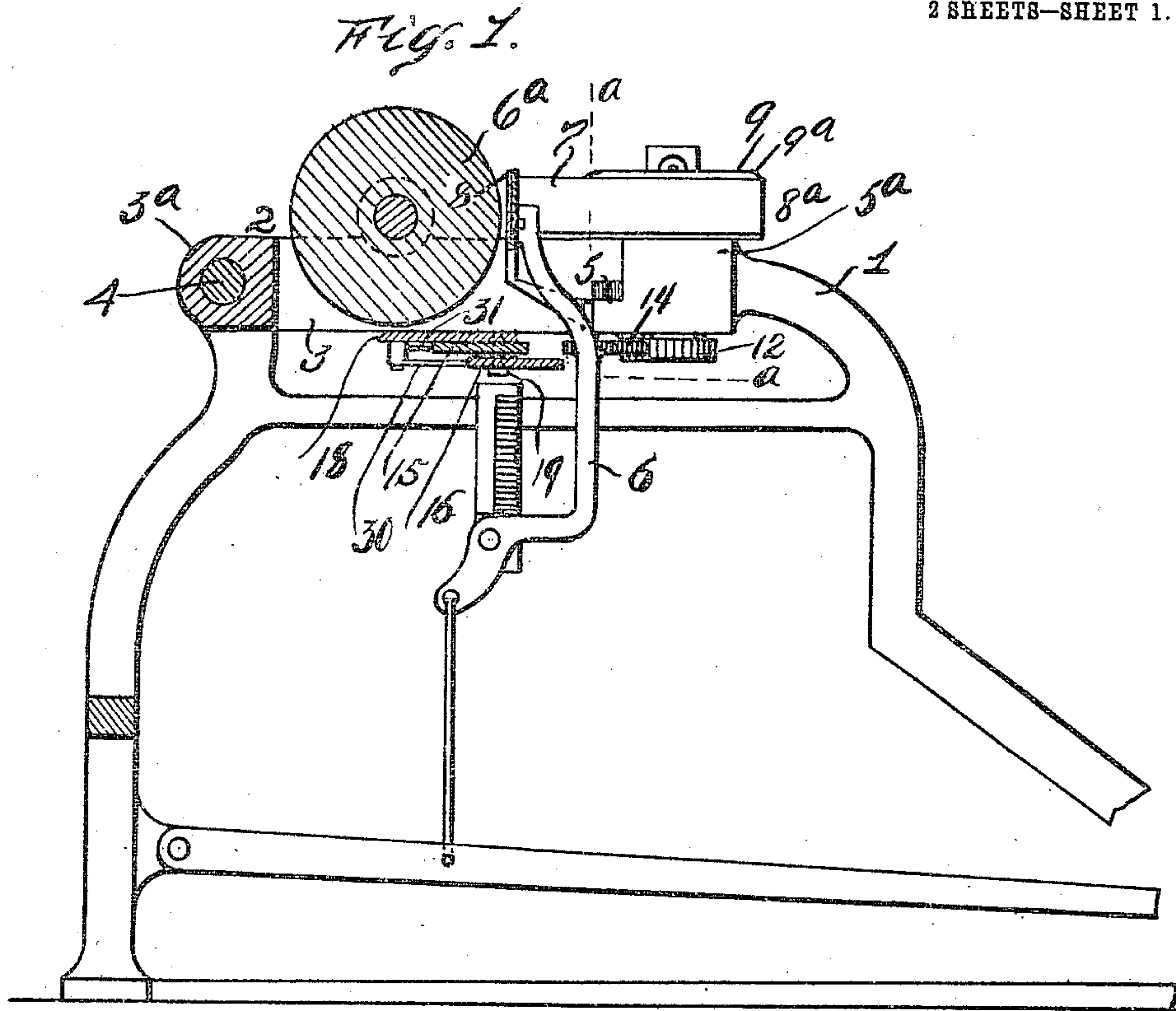


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APPLICATION FILED JUNE 8, 1909.

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2 SHEETS—SHEET 1.



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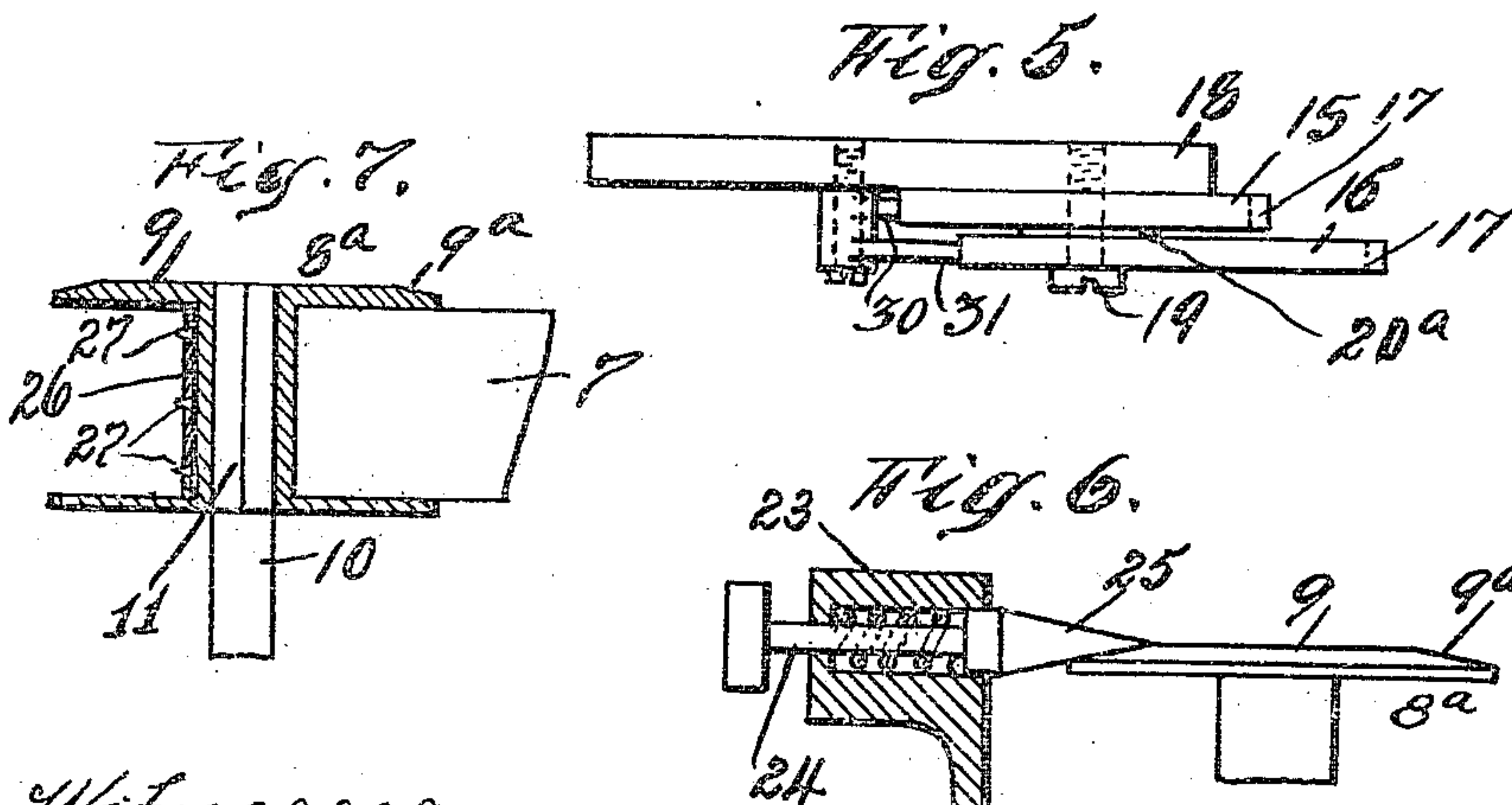
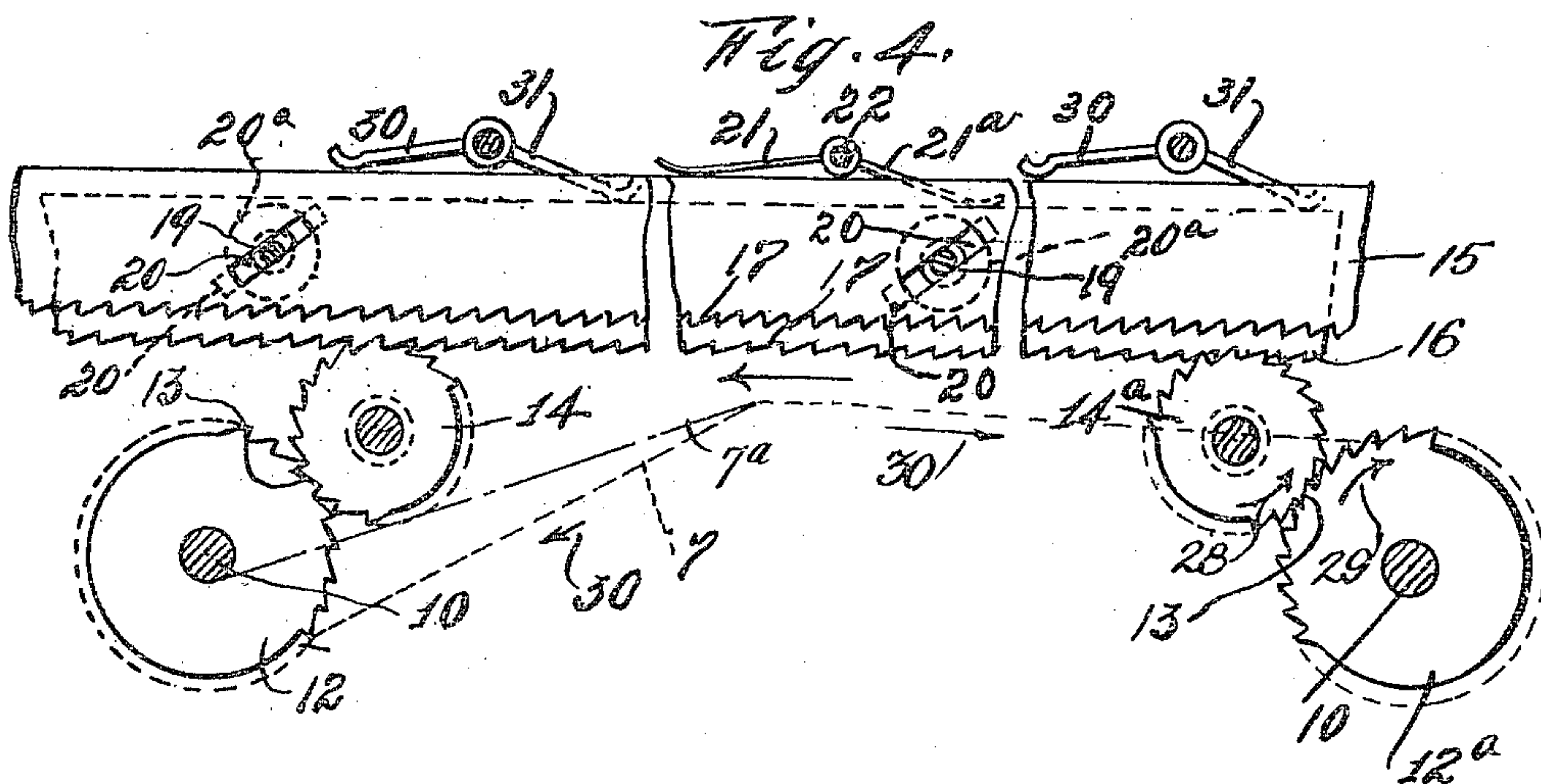
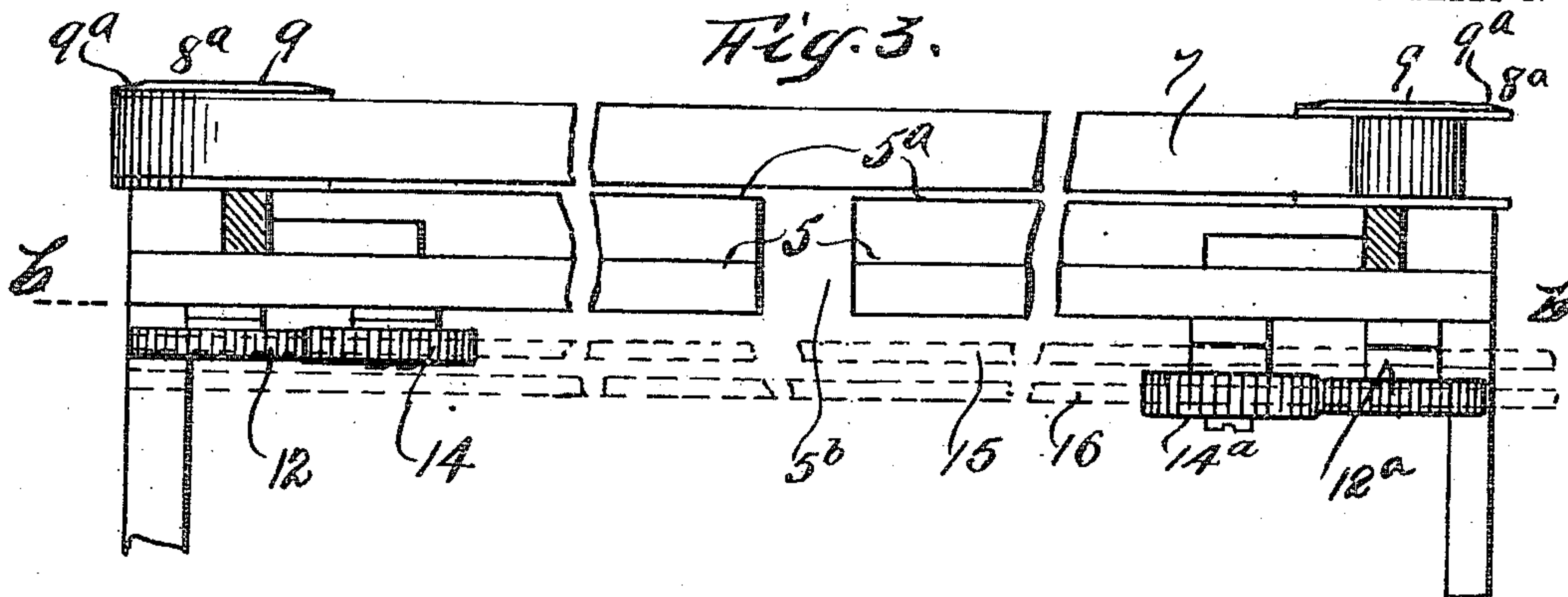
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Frederick Alexander  
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Inventor:  
Frederick Alexander  
by *Wm. B. Block*  
Attorney.



# UNITED STATES PATENT OFFICE.

FREDERICK ALEXANDER, OF NEW YORK, N. Y., ASSIGNOR OF ONE-HALF TO WILLIAM F. LASKOWSKI, JR., OF WEST HOBOKEN, NEW JERSEY.

## RIBBON-FEEDING MECHANISM FOR TYPE-WRITING MACHINES.

959,833.

Specification of Letters Patent.

Patented May 31, 1910.

Application filed June 8, 1909. Serial No. 500,890.

*To all whom it may concern:*

Be it known that I, FREDERICK ALEXANDER, a citizen of the United States, residing at New York city, borough of Brooklyn, Kings county, and State of New York, have invented certain new and useful Improvements in Ribbon-Feeding Mechanism for Type-Writing Machines, of which the following is a clear, full, and exact description.

This invention has for an object to provide a simple and efficient inking ribbon feeding device for typewriting machines. To carry out the object of my invention, I have so designed the ribbon feeding mechanism as to adapt it for operation by the carriage as it moves along the guides therefor. The device is also designed to be reversed by the movement of the carriage when the ribbon has reached the end of its length.

After having described my invention, I will finally claim the novel features thereof, reference being had to the accompanying drawings, wherein:—

Figure 1 is a transverse sectional view of a typewriting machine embodying my improvement; Fig. 2 is an enlarged top plan view thereof, certain parts being omitted; Fig. 3 is a vertical sectional view taken on a line *a—a* in Fig. 1, looking from the left; Fig. 4 is a diagrammatic sectional plan view of the ribbon feeding device, as shown in Fig. 2; Fig. 5 is an enlarged detail end view of the rack and support therefor which form part of my invention; Fig. 6 is an enlarged vertical sectional view of the device, which I employ to releasably retain the ribbon spools in position, certain parts being shown in elevation; and Fig. 7 is a vertical sectional view of one of the ribbon spools, the operating shaft being shown in elevation, one end of the ribbon being shown.

To obviate the necessity of the great number of parts usually employed in a standard typewriter for operating and reversing the ribbon, I employ the direct movement of the carriage to operate or feed the ribbon both forwardly and backwardly. The frame 1 in Fig. 1 is an arbitrary form of frame, which is provided with a transversely movable carriage 2 having end members 3 con-

nected by bored member 3<sup>a</sup> through which a guide rod 4 is adapted to pass. The front end of the end members 3 of the carriage travels in a rabbet 5 in the front member 5<sup>a</sup> of the frame, the said front member being open as at 5<sup>b</sup> for the passage of the type-bars 6. The carriage 2 carries a platen 6<sup>a</sup>, adjacent which a ribbon 7 is adapted to move, the said ribbon passing through a fork 8, as is usual.

To adapt the ribbon for movement, I wind the same on rotatable spools 8<sup>a</sup>, having a top 9 provided with a beveled edge 9<sup>a</sup>. The spools 8<sup>a</sup> are removably supported by shafts 10, having an upper squared portion 11 (see Fig. 7). The lower ends of the shafts 10 carry gears 12 and 12<sup>a</sup>, having ratchet teeth 13 which are adapted to mesh with similar teeth carried by pinions 14 and 14<sup>a</sup>, same being rotatably secured to the under side of the front member 5<sup>a</sup> of the frame 1 (see Fig. 3). The function of the gears 12 and 12<sup>a</sup> and pinions 14 and 14<sup>a</sup> is to operate the ribbon spools 8<sup>a</sup>. To operate the said pinions, which in turn operate the said gears, I provide two racks 15 and 16, having ratchet teeth 17. The racks 15 and 16 are in this instance slidably mounted on a plate 18 (see Fig. 1) which extends from one side member 3 of the carriage to the other (see also Fig. 5). The racks 15 and 16 are slidably secured to the plate 18 by machine screws 19, which pass through aligned slots 20 angularly disposed relative to the movement of the carriage. Washers 20<sup>a</sup> are interposed between the racks to keep them slightly apart. To keep the racks 15 and 16 normally engaged with their respective gears, I provide springs 21, 21<sup>a</sup> which are secured to a post 22, carried by the plate 18.

To keep the spools 8<sup>a</sup> in position upon the shafts 10, I provide a block 23, which is secured to the end members of the frame, the said block being provided with a spring opposed keeper 24, having a tapered end adapted to contact with the tapered edge 9<sup>a</sup> of the top 9 of the spools 8<sup>a</sup>. As long as the keeper 24 is in the position shown, the spools 8<sup>a</sup> will remain on the shafts 10. Should I desire to remove the spools I pull



out the keepers 24, against the tension of the springs, until the end 25 clears the tops 9 of the spools. I can then remove the spools from the shafts 10.

5 I will now describe the operation of the ribbon feeding mechanism. When the ribbon is wound upon the spools 8<sup>a</sup>, the ends 26 of the ribbon are secured by points 27 (see Fig. 7) in order that the said ribbon  
10 will not pull off the spools when it has reached the end of its forward or backward movement.

Referring to Figs. 2 and 4, and presuming that the carriage is moving toward the  
15 left, it will be seen that the lower rack 16 is in engagement with the pinion 14<sup>a</sup>. As the carriage continues to move toward the left it will rotate the pinion 14<sup>a</sup> as shown by the arrow 28, and the gear 12<sup>a</sup> as per the  
20 arrow 29; this movement will feed the ribbon 7 as shown by the arrow 30. When the carriage reaches the end of its stroke the rack 16 will jump the teeth of the pinion 14<sup>a</sup> when the carriage is forced to its extreme right position for a new line. The  
25 rack 16 will engage the teeth of the pinion 14<sup>a</sup> until the ribbon reaches the end of its movement, as shown in Fig. 7. Should the ribbon 7 reach the end of its length, as shown by dot and dash lines 7<sup>a</sup> (Fig. 4)  
30 when the carriage reaches half of its travel, the ribbon will pull taut, thereby preventing further rotation of the spools 8<sup>a</sup>, pinion 14<sup>a</sup> and gear 12<sup>a</sup>. When the ribbon is pulled  
35 taut, and as the carriage continues its movement, the racks 15 and 16 will also tend to move, but as the pinion 14<sup>a</sup> cannot turn, the pressure upon the rack 16, due to the taut ribbon, will move it angularly upwardly,  
40 due to the slots 20, whereby the lever-arms 30, 31, which are rotatably mounted on the plate 18, will be moved, as pressure is exerted by the upward movement of the rack 16, due to the taut ribbons; that is to say,  
45 the levers 31 will move up and the levers 30 down, whereby the upper rack 15 will be forced into mesh with the pinion 14. The spring 21 will act to force the rack 15 into engagement with the teeth of the pinion 14  
50 when the teeth of the rack 16 leave the teeth of the pinion 14<sup>a</sup>, while the spring 21<sup>a</sup> will be forced upwardly. When the rack 15 engages the teeth of the pinion 14, the movement of the ribbon will be reversed, and  
55 will continue to move in the latter direction until the opposite end of the ribbon is reached. At such a time the ribbon movement will be reversed again in a manner above mentioned.

60 By referring to Fig. 3 it will be seen that the lower rack 16 is in alinement with the pinion 14<sup>a</sup>, while the upper rack 15 is in alinement with the pinion 14, which is positioned nearer the bottom of the member 5<sup>a</sup>

than the pinion 14<sup>a</sup>. In Fig. 3, the racks 65 15 and 16 are shown in dotted lines to show their position relative to the pinions which they operate.

Having now described my invention, what I claim and desire to secure by Letters Pat- 70 ent is:—

1. In a typewriting machine, a movable carriage, a platen on said carriage, a plurality of spools, an inking ribbon carried by said spools, gears adapted to rotate said 75 spools, a plurality of racks carried by said carriage, one of said racks being adapted to mesh with one of said gears to operate the ribbon in one direction, the other of said racks being adapted to mesh with the other 80 of said gears to operate the ribbon in the opposite direction, only one of said racks being in mesh with its respective gear at a time, and means adapted to throw the disengaged rack in mesh with its coöperating gear when 85 the ribbon has reached the end of its length, the engaged rack being adapted to automatically leave its engaging gear.

2. In a typewriting machine, a movable carriage, a platen carried thereby, a plu- 90 rality of spools, an inking ribbon carried thereby, gears adapted to rotate said spools, a plurality of racks slidably mounted on said carriage, one of said racks being adapted to mesh with one of said gears to operate said 95 ribbon in one direction, the other of said spools being adapted to mesh with the other of said gears to operate said ribbon in the opposite direction, only one of said racks being in mesh with its respective gear at a 100 time, and means operated by the engaged rack adapted to cause the disengaged rack to mesh with its coöperating gear when the ribbon has reached the end of its length, the engaged rack being adapted to automatically 105 leave its engaging gear.

3. In a typewriting machine, a movable carriage, a platen carried thereby, a plu- 110 rality of spools, an inking ribbon carried thereby, gears adapted to rotate said spools, a plurality of racks slidably mounted on said carriage, one of said racks being adapted to mesh with one of said gears to operate said ribbon in one direction, the other of said spools being adapted to mesh with the other 115 of said gears to operate said ribbon in the opposite direction, only one of said racks being in mesh with its respective gear at a time, and levers operated by the engaged rack adapted to cause the disengaged rack to 120 mesh with its coöperating gear when the ribbon has reached the end of its length, the engaged rack being adapted to automatically leave its engaging gear.

4. In a typewriting machine, a movable 125 carriage, a platen carried thereby, a plurality of rotatable spools, an inking ribbon carried thereby, and a plurality of coöp-



erating devices carried by said carriage adapted to rotate said spools, one of said devices being adapted to operate one of said spools in one direction, the other of said de-  
5 vices being adapted to operate the other of said spools in the opposite direction, said devices being adapted to automatically change their position to rotate their re-

spective spools, whereby the movement of the ribbon is reversed at intervals.

Signed at New York city, N. Y., on this 10  
7th day of June 1909.

FREDERICK ALEXANDER.

Witnesses:

WM. F. LASKOWSKI, Jr.,

EDWARD A. JARVIS.