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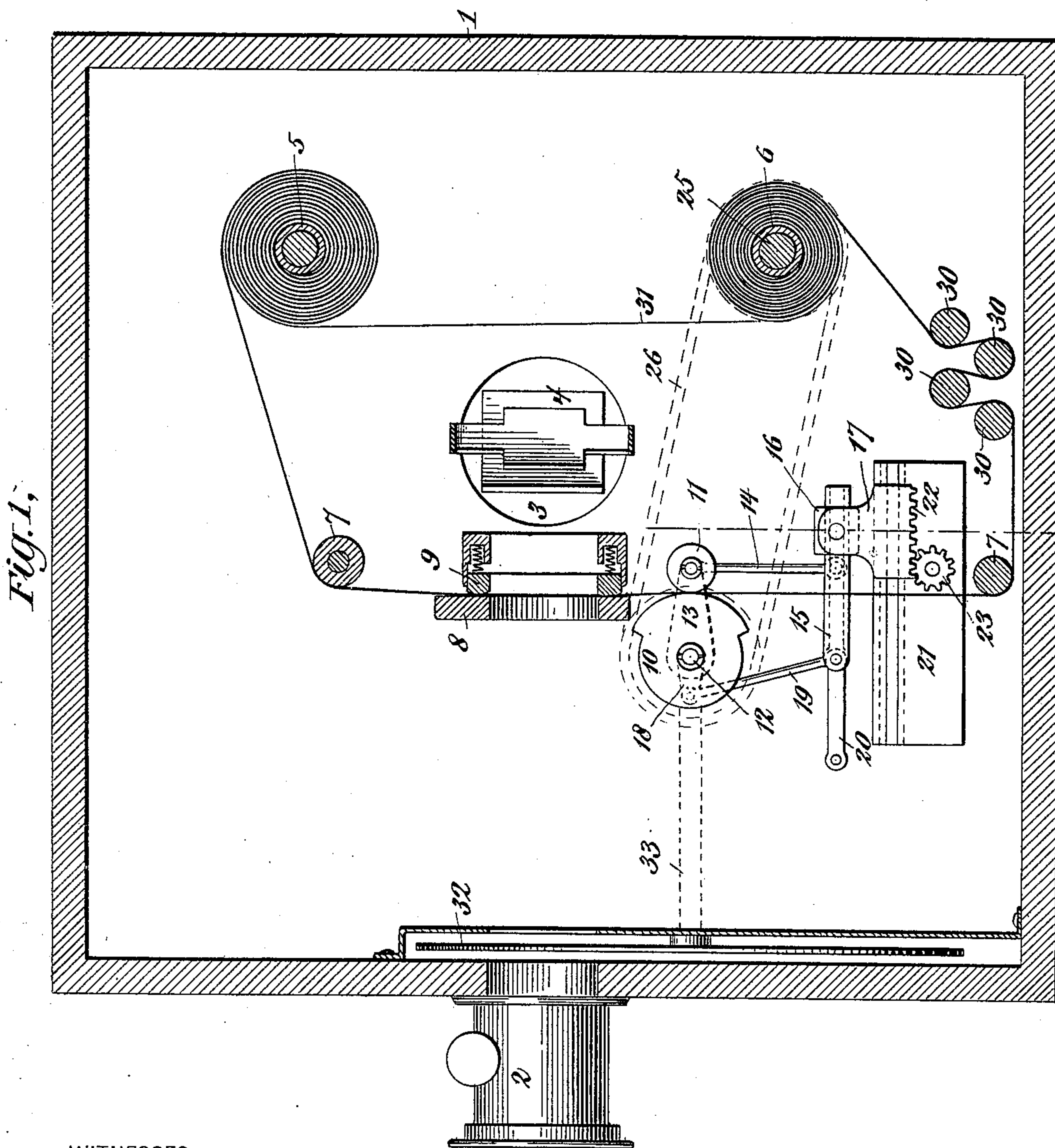
Patented Nov. 7, 1899.

H. CASLER.  
CONSECUTIVE VIEW APPARATUS.

(Application filed May 9, 1899.)

(No Model.)

2 Sheets—Sheet 1.



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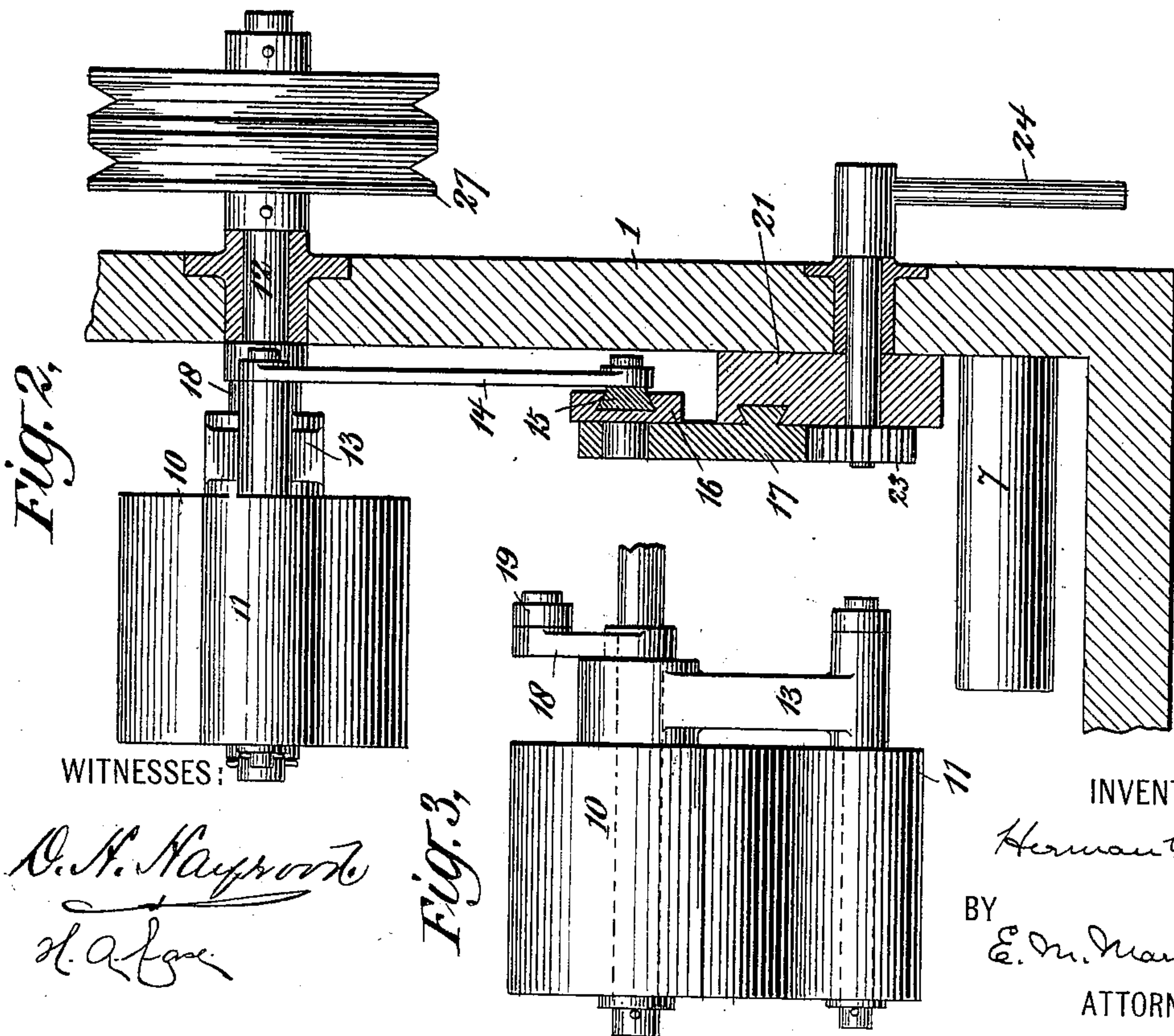
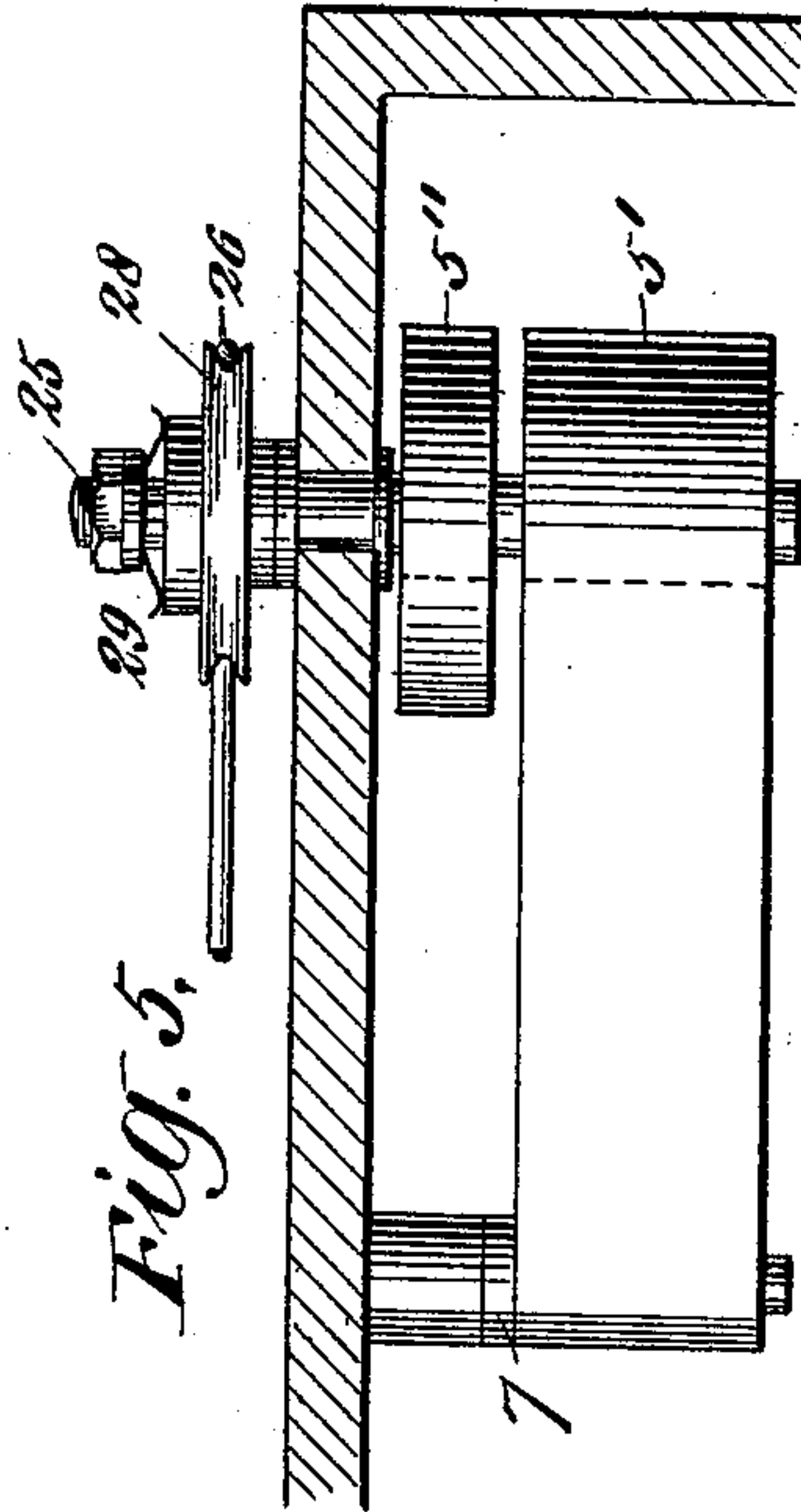
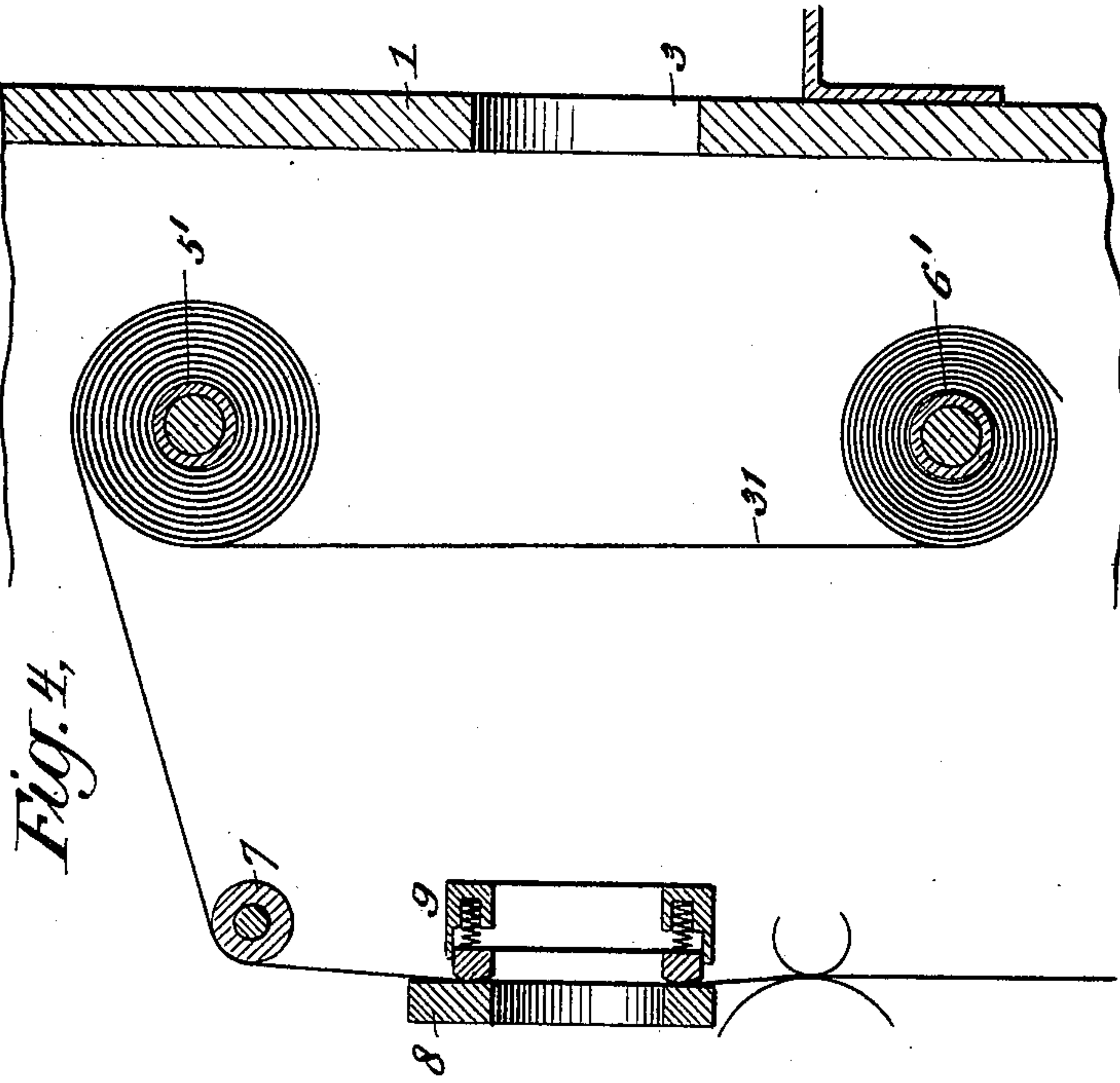
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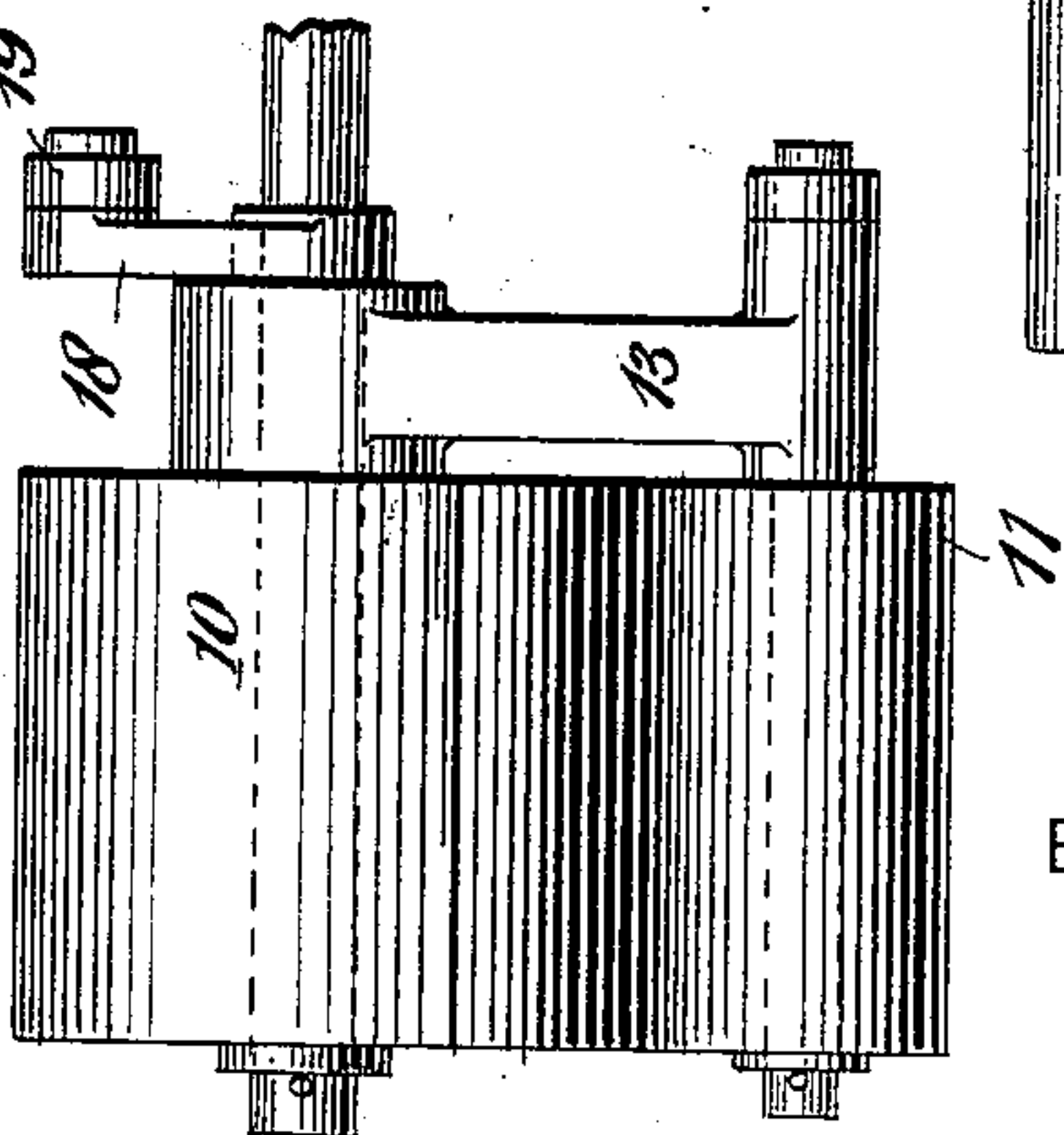
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*Fig. 3,*



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# UNITED STATES PATENT OFFICE.

HERMAN CASLER, OF CANASTOTA, NEW YORK.

## CONSECUTIVE-VIEW APPARATUS.

SPECIFICATION forming part of Letters Patent No. 636,717, dated November 7, 1899.

Application filed May 9, 1899. Serial No. 716,117. (No model.)

*To all whom it may concern:*

Be it known that I, HERMAN CASLER, a citizen of the United States, residing at Canastota, in the county of Madison and State of New York, have invented certain new and useful Improvements in Consecutive-View Apparatus; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates generally to improvements in consecutive-view apparatus such as employ a flexible picture-strip or film, and relates particularly to improvements in mechanism employed for varying the rate of feeding of such picture-strip or film and in the means employed for unwinding the strip or film from the supply-reel.

My invention consists in the novel means employed for varying the rate of feeding of the picture-strip or film and in the novel means employed for unwinding the strip or film from the supply-reel.

The objects of my invention are to improve the devices employed for varying the rate of feeding of films or picture-strips in consecutive-view apparatus, to render such mechanism as simple and effective as possible, and to improve the means employed for drawing the strip or film from the supply-reel and avoid undue strain upon such strip or film. These objects are attained in the invention herein described, and illustrated in the drawings which accompany and form a part of this specification, in which the same reference-numerals indicate the same or corresponding parts, and in which—

Figure 1 is a vertical longitudinal section of a consecutive-view-reproducing apparatus constructed in accordance with my invention, the section being taken through the optical axis. Fig. 2 is a transverse section of the variable-speed film-feeding mechanism on the line *x x* of Fig. 1 looking toward the front of the machine. Fig. 3 is a plan view of the feeding-rollers and connected parts. Fig. 4 is an elevation of the supply-reels and associated parts, illustrating a construction where- in the hereinafter-mentioned paper strip is placed beside the film-strip; and Fig. 5 is a plan view of the construction shown in Fig. 4.

In the drawings, 1 is the outer case of a consecutive-view-projecting apparatus; 2, the objective lens thereof; 3, a light-opening in the side of the case, outside of which a suitable projecting-lantern or other source of light may be placed, and 4 is a mirror which reflects the light entering through the aperture 3 into the lens 2.

5 is a supply-reel, revolubly mounted, from which the film may be drawn, and 6 is a winding-up reel, likewise revolubly mounted.

7 7 are guide-pulleys.

8 is a support located transversely of the path of the rays of light, and 9 is a spring-pressed frame surrounding the opening in the plate 8 and tending to press against said plate. The frame therefore serves to hold the film steady while being exposed and to offer some slight frictional resistance to the passage of the film across the optical field.

10 and 11 are two feeding-rollers for feeding the film forward intermittently. Roller 10 is segmental, having the greater portion of its face cut away, leaving a working surface extending through only a portion of the circumference. It is mounted upon the main driving-shaft 12. Roller 11 is mounted on a lever 13, likewise mounted on the shaft 12. A link 14 connects the frame 13 and a bar 15, supported by a pivoted block 16, pivoted to the carriage 17, and arranged to slide along bar 15 when the carriage is moved laterally. A crank 18 on the shaft 12 is connected by a connecting-rod 19 to the end of the bar 15. The bar 15 is restricted against longitudinal movement by a link 20. The carriage 17 is mounted upon a suitable guide 21 and is provided with a rack 22. A pinion 23, which may be rotated by means of the lever 24, engages this rack. By moving the lever 24, therefore, the lateral position of the carriage may be changed.

The effect of varying the position of the carriage 17 is to vary the amount of vibratory movement of the roller 11. The crank 18 communicates a vibratory movement to the bar 15, the center of vibration of said bar being at the pivot by which block 16 is pivoted to the carriage 17. If this center of vibration be coincident with the point of attachment of link 14 with bar 15, then obviously the motion of the bar 15 communicates no motion to the



roller 11. If the center of vibration be to the right of the said point of attachment of the link 14, then roller 11 vibrates in opposition to the movement of the working face of roller 10, while if the center of vibration be to the left of the said point of attachment roller 11 vibrates in unison with the movement of the working face of the roller 10, moving downward as said working face moves downward.

The degree of motion which the roller 11 receives depends upon the distance of the center of vibration to the right or to the left of the point of attachment of the link 14 to the bar 15.

Varying the degree of vibration of the roller 11 and changing the direction of such vibration with respect to the direction of motion of the working face of the roller 10 has the effect of varying the rate of feeding of the film, for it varies the time during which the working face of roller 10 and roller 11 are in contact during each revolution of roller 10.

The shaft 25, upon which the winding-up reel 6 is mounted, is driven from shaft 12 by a belt 26, running over a pulley 27 on shaft 12 and over a pulley 28 on shaft 25, Fig. 5, and by a frictional driving device 29, interposed between pulley 28 and shaft 25, which permits said pulley to slip upon said shaft when all of the slack in the film has been taken up. In order to prevent the strain upon the film produced by the tendency of the reel 6 to revolve from causing motion of the film through the field of the apparatus to occur during the intervals of exposure, when the film should be absolutely stationary, the film is passed about a series of snubbing-posts 30, which suffice to prevent the strain produced by the winding-up reel from reaching that portion of the film which passes through the optical axis.

In consecutive-view apparatus it is desirable that the film shall be drawn from the supply-reel by some means which operates more gently and uniformly than the intermittently-operating feeding mechanism by which the film is moved intermittently and with extreme rapidity through the field of exposure or illumination, both in order that possible injury to the film may be avoided and in order that the movement of the film through the field of exposure or illumination may be as rapid as possible. It is common to provide a separate feeding mechanism operating uniformly for drawing the film from the supply-reel. To accomplish this purpose more simply, however, by employing a flexible strip 31, wound upon the supply-reel 5 with the film, so that it is interposed between the successive layers of the film, and which passes directly to the winding-up reel 6 and is wound upon said reel 6 with the film. This strip 31 may be of paper. As it is wound up by the winding-up reel it causes the supply-reel to rotate and so to unwind both the strip 31 and the film.

The operation of the apparatus is as follows: When the driving-shaft 12 is rotated, the

feeding-roll 10 is rotated, and during each revolution its working face presses the film against the roller 11, thus feeding the film intermittently through the field of the apparatus. The film thus fed forward is wound upon the reel 6 by the revolution of said reel, which slips upon its shaft when the slack in the film has been taken up; but the rate at which shaft 25 is driven is such that the rotation of reel 6 is nearly continuous. As reel 6 rotates it winds up the paper strip 31, which connects said reel and the supply-reel 5, thus causing the supply-reel to rotate and unwind the strip 31 and the film-strip. If the pivotal point of the block 16 be to the right of the point of attachment of link 14 to bar 15, then roller 11 vibrates up and down as the roller 10 revolves in opposition to the motion of the working face of roller 10, thus rendering the period of contact between the rollers 11 and 10 and the film of shorter duration than would be the case were roller 11 stationary, while if the pivot of block 16 be to the left of the point of attachment of link 14 to bar 15 the said period of contact is longer than if the roller 11 were stationary, the roller 11 vibrating up and down in conjunction with the movement of the working face of roller 10. By moving the block 16 along the bar 15 by means of the lever 24, therefore, the rate of feeding of the film may be varied at will.

A shutter 32 may be driven from the shaft 12 by means of a shutter-shaft 33 and suitable gearing.

The strip 31, by which the film is unwound from the supply-reel, need not be wound between the layers of the film-strip, but may be to one side of the film-strip. In such case both the supply and the winding-up reel may be in two sections, one for the film and the other for strip 31. This is illustrated in Figs. 4 and 5, in which 5' and 5'' are the sections of the supply-reel, and 6' one section of the winding-up reel. The two sections of each reel are connected together by being keyed to the shaft upon which they are mounted in common.

When the paper strip 31 is placed to one side of the film-strip, as in the construction shown in Figs. 4 and 5, the light-opening 3 may be in the rear end of the case 1, directly in line with the axis of the objective lens. The mirror 4 is not required.

When the construction shown in Figs. 4 and 5 is employed, the strip 31 should have the same thickness as the film-strip, so that the effective diameters of both sections of the winding-up reel may increase at the same rate.

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

1. In a consecutive-view apparatus, the combination, with a segmental feed-roller and means for rotating the same, of a second feed-roller, adapted to coact with said segmental feed-roller in feeding a film or picture-strip, means for vibrating said second roller,



and means for varying the amplitude of vibration.

2. In a consecutive-view apparatus, the combination, with a segmental feed-roller, and means for rotating the same, of a second feed-roller, adapted to coact with said segmental feed-roller in feeding a film or picture-strip, a support therefor pivoted concentrically with the segmental feed-roller, means for vibrating said second feed-roller, and means for varying the amplitude of vibration.

3. In a consecutive-view apparatus, the combination, with a segmental feed-roller, and means for rotating the same, of a second feed-roller, adapted to coact with said segmental feed-roller in feeding a film or picture-strip, and means for vibrating said second roller in unison with, or in opposition to, the movement of the working face of the segmental roller, at will.

4. In a consecutive-view apparatus, the combination, with a segmental feed-roller, and means for rotating the same, of a second feed-roller, adapted to coact with said segmental feed-roller in feeding a film or picture-strip, means for vibrating said second roller in unison with, or in opposition to, the movement of the working face of the segmental roller, and means for varying the amplitude of vibration, at will.

5. In a consecutive-view apparatus, the combination, with a segmental feed-roller, and means for rotating the same, of a second feed-roller, adapted to coact with said segmental feed-roller in feeding a film or picture-strip, means for vibrating said second roller in a path concentric with said segmental feed-roller, and means for varying the amplitude of vibration.

6. In a consecutive-view apparatus, the combination, with a segmental feed-roller, and means for rotating the same, of a second feed-roller, adapted to coact with said segmental feed-roller in feeding a film or picture-strip, a vibrating member adapted to vibrate about a center of vibration, means for vibrating such member about such center in unison with the revolution of the segmental feed-roller, means for moving such center of vibration at will, and means for movably supporting the second feed-roller and for connecting it to said vibrating member.

7. In a consecutive-view apparatus, the combination, with a segmental feed-roller, and means for rotating the same, of a second feed-roller, adapted to coact with said segmental feed-roller in feeding a film or picture-strip, a pivoted guide-block, a bar adapted to slide within said pivoted guide-block, a movable carriage to which said guide-block is pivoted, means for moving said carriage, means for vibrating said bar in unison with the revolution of the segmental feed-roller, and means for movably supporting the second feed-roller and for connecting it to said bar.

8. In a consecutive-view apparatus, the

combination, with a segmental feed-roller, and means for rotating the same, of a second feed-roller, adapted to coact with said segmental feed-roller in feeding a film or picture-strip, a pivoted guide-block, a bar adapted to slide within said pivoted guide-block, a movable carriage to which said guide-block is pivoted, means for moving said carriage, means for vibrating said bar in unison with the revolution of the segmental feed-roller, a support for said second feed-roller pivoted concentrically with the segmental feed-roller, and means for connecting said support and vibrating bar, substantially as described.

9. In a consecutive-view apparatus, the combination, with supply and winding-up reels for a suitable film or picture-strip, and means for driving the winding-up reel, of a flexible strip, other than said film or picture-strip, wound upon the supply-reel, and connecting said reel to, and arranged to be wound upon, the winding-up reel, and serving to rotate the supply-reel and unwind the film or picture-strip as the winding-up reel rotates, and feeding mechanism for feeding the film intermittently through the field of the apparatus, acting upon the film, but not upon said other flexible strip.

10. In a consecutive-view apparatus, the combination, with supply and winding-up reels for a suitable film or picture-strip, means for driving the winding-up reel, and means for feeding the film or picture-strip through the field of the apparatus, of a flexible strip, other than said film or picture-strip, wound upon the supply-reel, and connecting said reel to, and arranged to be wound upon, the winding-up reel, and serving to rotate the supply-reel and unwind the film or picture-strip as the winding-up reel rotates, and feeding mechanism for feeding the film intermittently through the field of the apparatus, acting upon the film, but not upon said other flexible strip.

11. In a consecutive-view apparatus, the combination, with supply and winding-up reels for a suitable film or picture-strip, and means for driving the winding-up reel, of a flexible strip, other than said film or picture-strip, wound upon the supply-reel between the layers of the film or picture-strip, and connecting said supply-reel to, and arranged to be wound upon, the winding-up reel, and serving to rotate the supply-reel and unwind the film or picture-strip as the winding-up reel rotates, and feeding mechanism for feeding the film intermittently through the field of the apparatus, acting upon the film, but not upon said other flexible strip.

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

HERMAN CASLER.

Witnesses:

HARRY M. MARBLE,  
H. J. COLLINS.



It is hereby certified that Letters Patent No. 636,717, granted November 7, 1899, upon the application of Herman Casler, of Canastota, New York, for an improvement in "Consecutive-View Apparatus," were erroneously issued to said Casler, as sole owner of the invention; whereas said Letters Patent should have been issued to *the American Mutoscope Company, of New Jersey*, said American Mutoscope Company being assignee of the entire interest in said invention as shown by the assignment of record in this Office; and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed, countersigned, and sealed this 21st day of November A. D., 1899.

[SEAL.]

WEBSTER DAVIS,  
*Assistant Secretary of the Interior.*

Countersigned:

C. H. DUELL,  
*Commissioner of Patents.*