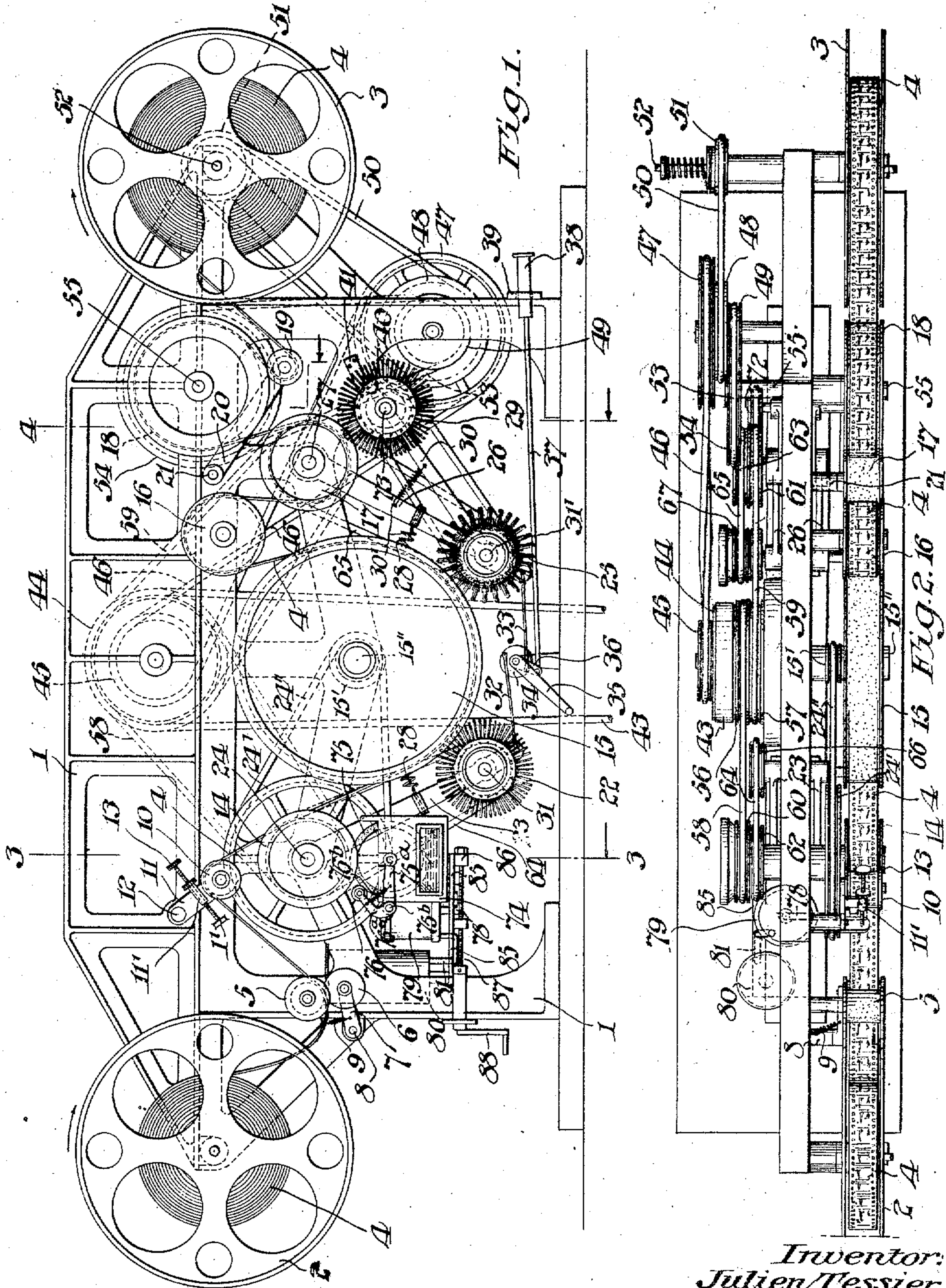


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 FILM CLEANING AND POLISHING MECHANISM.  
 APPLICATION FILED JULY 11, 1916.

1,205,583.

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 3 SHEETS—SHEET 1.



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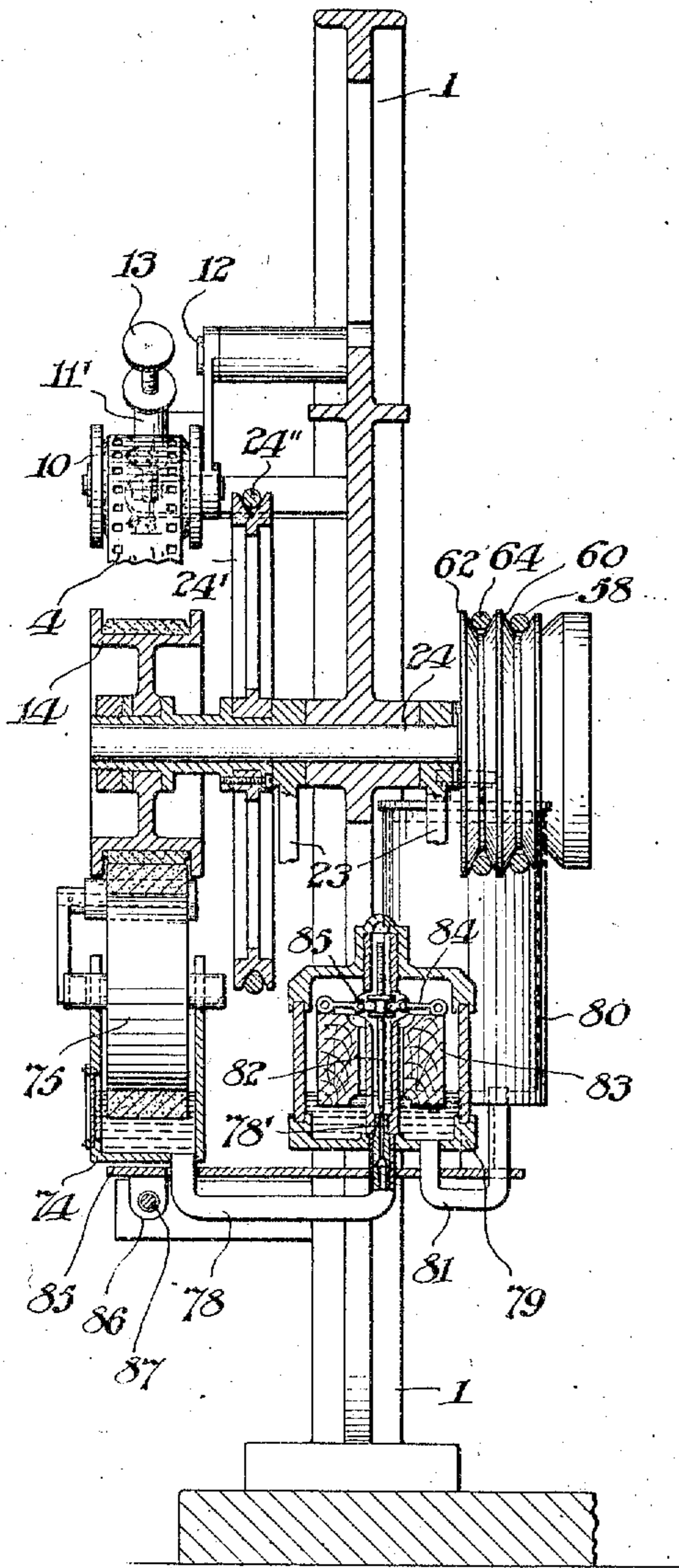


Fig. 3.

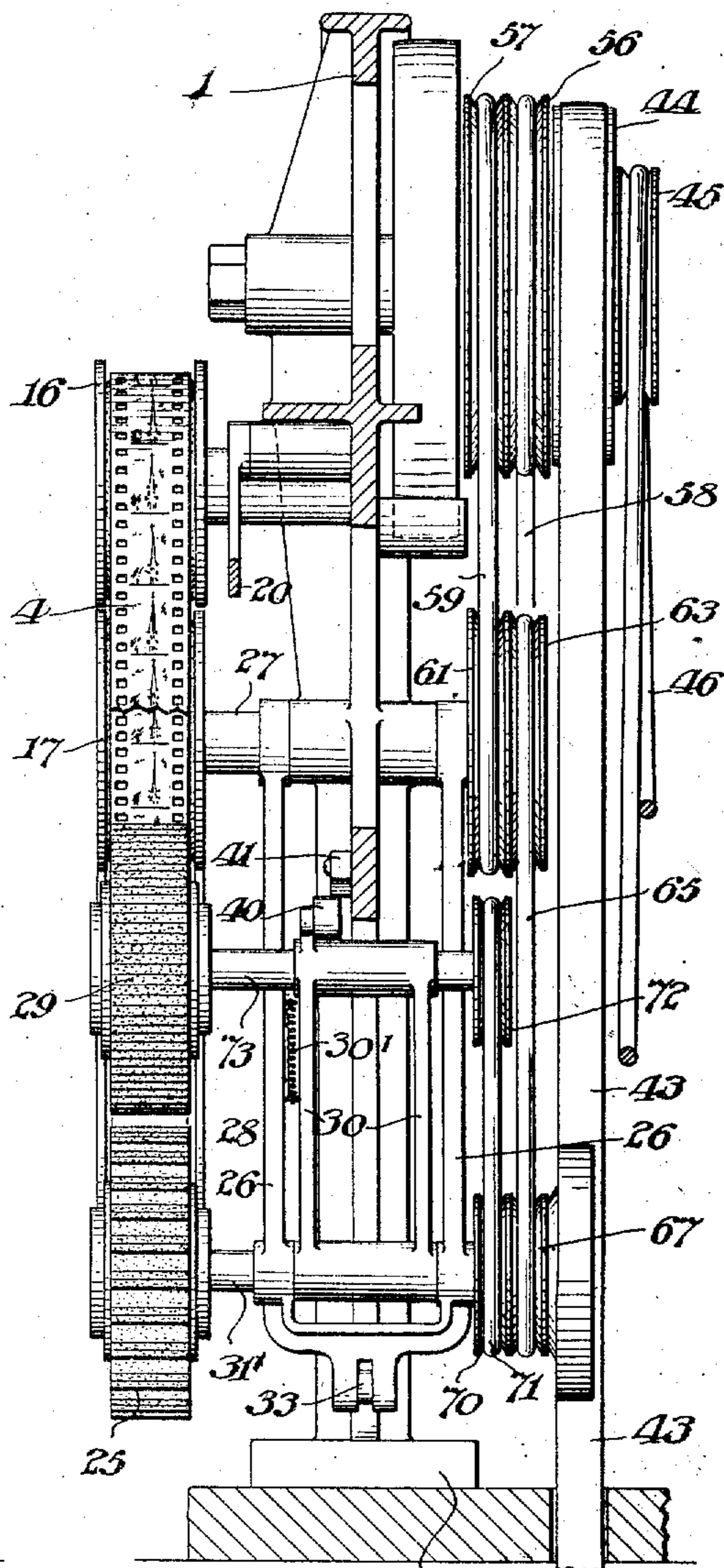


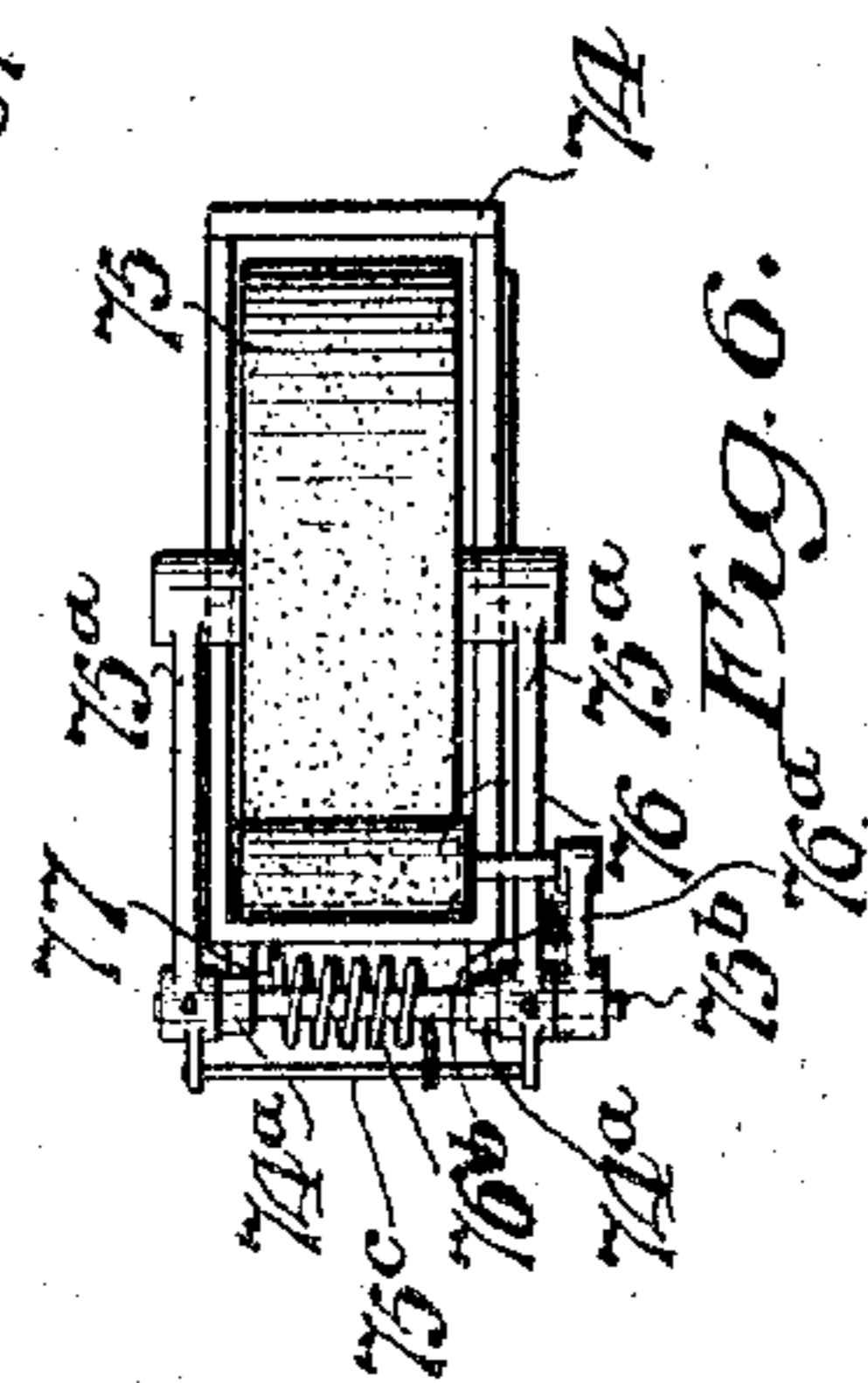
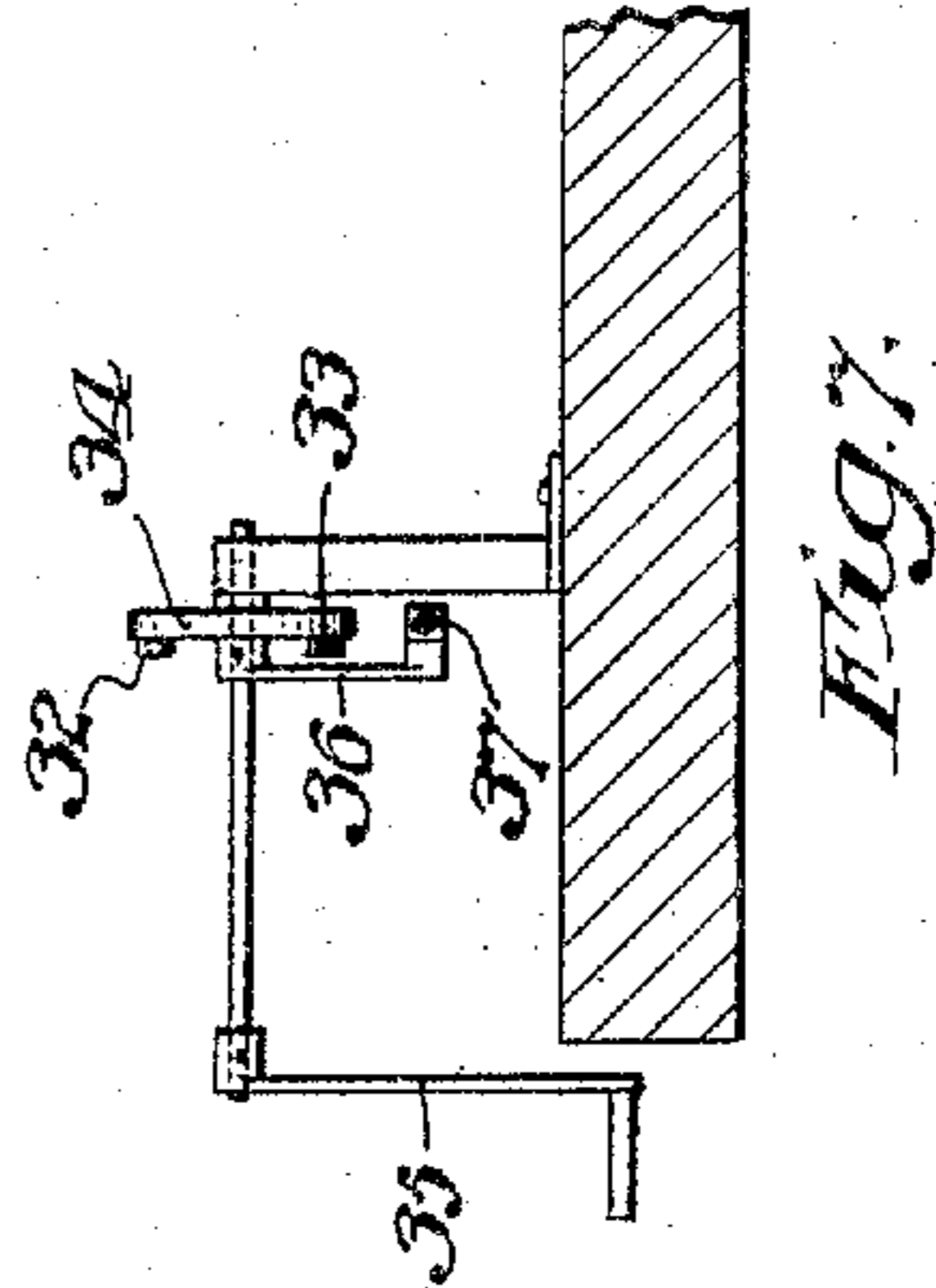
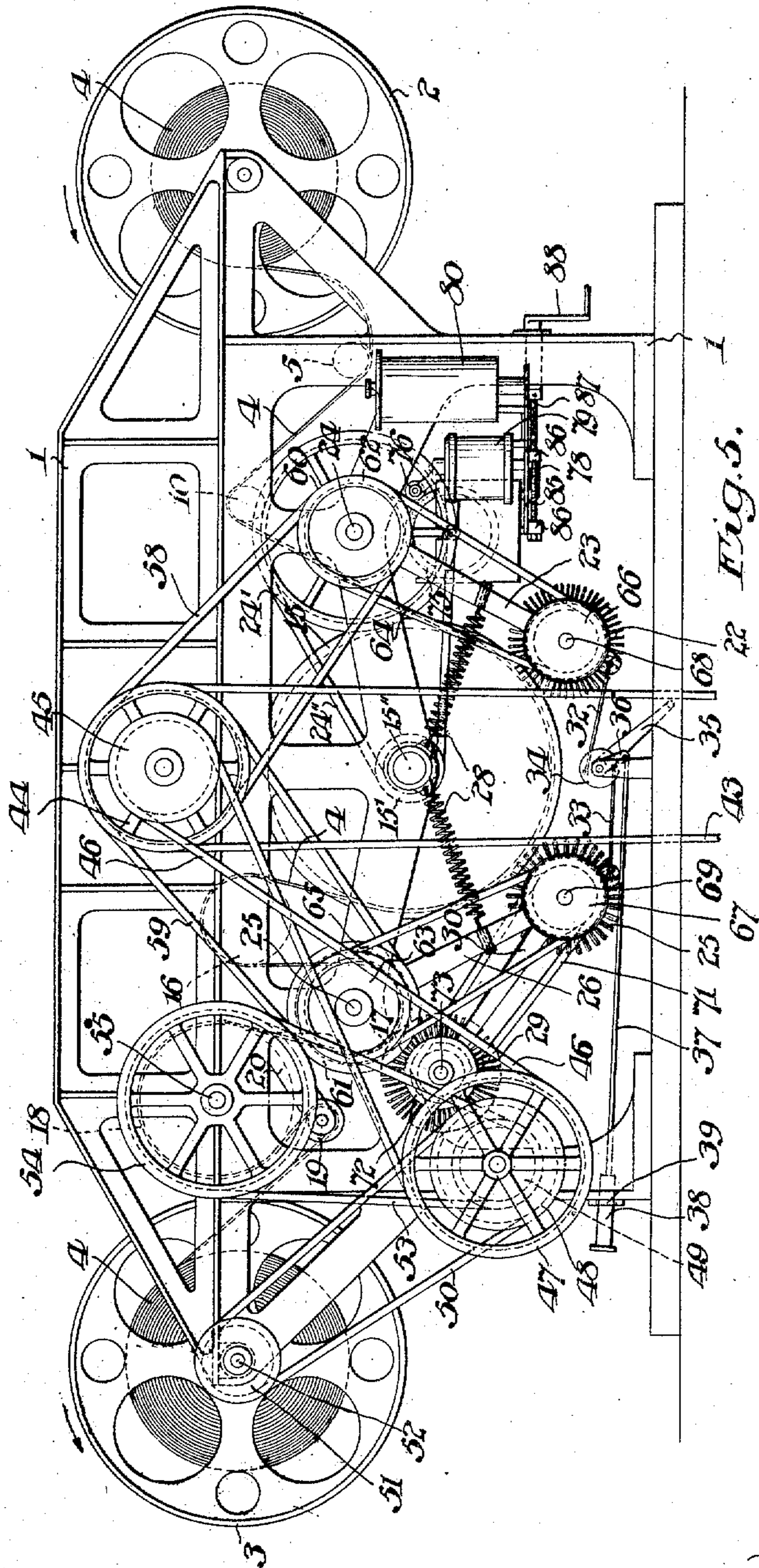
Fig. 4.

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# UNITED STATES PATENT OFFICE.

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## FILM CLEANING AND POLISHING MECHANISM.

1,205,583.

Specification of Letters Patent.

Patented Nov. 21, 1916.

Application filed July 11, 1916. Serial No. 108,605.

*To all whom it may concern:*

Be it known that I, JULIEN TESSIER, a citizen of the Republic of France, residing in the city of Philadelphia, county of Philadelphia, and State of Pennsylvania, have invented certain Improvements in Film Cleaning and Polishing Mechanism, of which the following is a specification.

This invention is an improved machine for cleaning and polishing motion picture films. Its primary object is to clean and polish such films in a more efficient, convenient and expeditious manner than has heretofore obtained.

It is characterized by its peculiar means for carrying the film, applying a cleaning fluid thereto and rubbing the moistened film, the film being translated between reels by carrying mechanisms that keep it in proper tension under differential conditions, the fluid being automatically supplied in the desired manner and the brushes being adjustable to and operable in various positions.

The nature of my improvements is fully set forth in the following description and the accompanying drawings.

In the drawings, Figure 1 is a side elevation of a machine embodying my invention; Fig. 2 is a top plan view of the same; Fig. 3 is a sectional view taken on the line 3—3 of Fig. 1; Fig. 4 is a sectional view taken on the line 4—4 of Fig. 1; Fig. 5 is an elevation of the side opposite that shown in Fig. 1; Fig. 6, is a plan view of detached means for applying cleaning fluid to the film; and Fig. 7 is a part sectional elevation of brush adjusting mechanism.

My improved machine, in the form thereof illustrated in the drawings, comprises the frame 1 having the reels 2 and 3 journaled in the ends thereof. A film 4 is carried from the reel 2 to the reel 3 under a roller 5 journaled in the frame and over a tension roller 6 journaled on the oscillatory arm 7 fulcrumed by means of the bearing 8 on the frame, the roller 6 pressing the film against the roller 5 due to the action of the spring 9 which connects the arm with the frame.

The film is carried, from the bight of the rollers 5 and 6, over the roller 10, which is journaled on the oscillatory arm 11 fulcrumed by means of the bearing 12 on the frame, the arm being adjusted by a set screw 13 movable through threaded sleeve

11' thereon and bearing against a lug 1' on the frame. The film passes from the roller 10 in adjustable contact with a roller 14, which applies a cleaning fluid thereto, and thence under the roller 15, over the roller 16, under the roller 17, over the roller 18 and around the differential tension roller 19 to the reel 3, the roller 19 being carried by an oscillatory arm 20 which rocks on the bearing 21 to compensate for the gradually increasing rate of winding on the reel 3.

A brush 22 is journaled by the arbor 31 in the arm 23 which is adapted to swing on the arbor 24 concentric with the roller 14, the brush being adapted to act against the film as it passes under the supporting roller 15. A second brush 25 is journaled on the arm 26 which is adapted to swing on the arbor 27 concentric with the roller 17, this brush being adapted to act on the film as it passes under the roller 15 and after the action thereon of the brush 22. Adjustable coiled springs 28 connect the respective arms 23 and 26 with the frame, drawing the brushes 22 and 25 toward the film.

A brush 29 is journaled on the arm 30 which is mounted on the arbor 31 of the brush 25 and supported by the spring 30', the brush 29 acting in contact with the film as it passes under the supporting roller 17.

The brushes 22 and 25 are adjusted in relation to or moved into and out of contact with the film by the links 32 and 33 which connect the respective arms 23 and 26 to a journaled disk 34, the disk being turned by the crank 35. An arm 36 is connected with the disk 34 and with a rod 37 having an enlarged end section 38 movable through an aperture in a keeper 39. When the disk 34 is turned to move the arms 23 and 26 apart, the rod 37 is moved outwardly until the part 38 is beyond the keeper 39, when the rod will drop down and its inward movement will be prevented by the engagement of the forward shoulder of the part 38 with the keeper, whereby the brushes 22 and 25 are held out of engagement with the film.

The arm 30 is adjusted in relation to the film by the adjustment of the brushes 22 and 25, being provided with a roller 40 which engages a stationary cam 41 and shifts the brush 29 away from the film when the brushes 22 and 25 are withdrawn therefrom.

The mechanism is driven by a belt 43 which passes over a pulley 44 journaled on the frame and having fixed thereto a pulley 45. A twisted belt 46 is driven by the pulley 45 and drives the pulley 47 journaled on the frame and having the pulleys 48 and 49 fixed thereto. The pulley 48 drives a belt 50 which passes over a pulley 51 fixed to the reel 3 by an arbor 52 journaled in the frame, whereby the reel is turned to wind the film thereon. The pulley 49 drives a belt 53 which passes over a pulley 54 fixed on the arbor 55 journaled in the frame and carrying the roller 18. A pulley 24' fixed on the shaft 24 drives a belt 24'' which passes over a pulley 15' which is fixed on the arbor 15'' of the roller 15. Pulleys 56 and 57, fixed to the pulley 44 and revolved thereby, drive the respective belts 58 and 59 which pass over the respective pulleys 60 and 61 fixed to the respective arbors 24 and 27 which are journaled in the frame and carry the rollers 14 and 17. Pulleys 62 and 63 fixed to the respective pulleys 60 and 61 drive the respective belts 64 and 65 which pass over the respective pulleys 66 and 67 fixed to the arbors 31 and 31', the arbors being journaled in the arms 23 and 26 and carrying the brushes 22 and 25 which are driven thereby. A pulley 70 fixed on the arbor 31' drives the belt 71, which drives the pulley 72 fixed to the arbor 73, the latter being journaled in the arm 30 and driving the brush 29.

It will be understood from the described connections of the driving mechanism that the brushes are positively driven in contact with the film as the latter is drawn through the machine under tension and compensation provided by the swing permitted the hanging tension roller 19.

The fluid, as alcohol, for cleaning the film, is contained in a receptacle 74, in which revolves a roller 75 adapted for carrying the fluid to the roller 14, whereby it is applied to the surface of the film previously to the action thereon of the brushes, the rollers 14 and 17 being covered with a proper fluid carrying material, such as felt. The roller 75 is journaled in arms 75<sup>a</sup> fixed on a shaft 75<sup>b</sup> which is journaled in the brackets 74<sup>a</sup> on the receptacle 74, the arms being connected by a cross rod 75<sup>c</sup>. A spring 77, coiled on the rod 75<sup>c</sup>, has one end 77<sup>a</sup> in engagement with the receptacle 74 and the other end 77<sup>b</sup> in engagement with the rod 75<sup>c</sup>, whereby the roller 75 is held in the desired frictional engagement with the roller 14. A ductor roller 76, which acts against the roller 75, is journaled in an arm 76<sup>a</sup> adapted to rock on an extension of the shaft 75<sup>b</sup>, a coiled spring 76<sup>b</sup> connecting the arms 75<sup>a</sup> and 76<sup>a</sup> to maintain the desired pressure of the roller 76 on the roller 75.

The receptacle 74 is provided with a regu-

lated supply of fluid through a conduit 78 connecting its bottom with the bottom of a receptacle 79, which has its bottom connected with the bottom of a supply tank 80 by a conduit 81. The port 78' leading to the passage 78 is controlled by a valve 82 which is adjusted in position by a float 83, the latter being connected with the valve by the levers 84 having the stationary fulcrums 85.

It will be understood that the rise of fluid in the chamber 79 elevates the float 83 which acts through the levers 84 to lower the valve 82 and close or partially close the port 78', thereby maintaining a substantially constant level of the fluid in the receptacle 74.

The fluid supply mechanism is carried on a plate 85 provided with lugs 86 in which is threaded a screw 87 turned by a crank 88, whereby the relation of the supply mechanism, and particularly the roller 75, to the roller 14 can be regulated.

Having described my invention, I claim:

1. The combination with film carrying mechanism, of film polishing mechanism comprising a swinging member, a revoluble brush supported by said member, a journaled device, and a link connecting said device with said swinging member whereby said brush is positioned relatively to said film.

2. The combination with revoluble film carrying mechanism, of film polishing mechanism comprising a plurality of swinging arms movable about axes parallel with the axis of revolution of said film carrying mechanism, revoluble brushes carried by said arms, and means whereby said arms are simultaneously shifted in position and the relation of said brushes to film carried by said carrying mechanism adjusted.

3. The combination with film carrying mechanism, of film polishing mechanism comprising a plurality of swinging arms, revoluble brushes carried by said arms, a rocking device, links connecting said rocking device eccentrically with said arms, and means for holding said rocking device in position.

4. The combination of a frame provided with a winding reel and a roller for carrying a film, means for positively driving said reel and roller simultaneously independently of said film, differential tension mechanism acting on said film between said reel and roller, means for rubbing said film as it travels in contact with said roller, and a roller for applying a cleaning fluid to said film as it approaches said roller first named.

5. The combination of a frame, reels journaled at opposite ends of a frame, rollers for carrying said film between said reels, means for driving one of said reels and said rollers simultaneously, a revoluble brush for

engaging said film, swinging means for changing the relation of said brush to said film, and means connecting one of said rollers and said brush for revolving the latter.

5 6. The combination of a reel, tension rollers between which a film is carried from said reel, a roller for applying a cleaning substance to said film, an adjustable roller for  
10 controlling said film in passing from said tension rollers to said roller first named, a supporting roller, a revoluble brush for rubbing said film as it passes in contact with  
15 said supporting roller, and means comprising a reel for taking up said film passing from said supporting roller and brush.

7. The combination of a frame, reels journaled in the ends of said frame, means for carrying a film from one to the other of said  
20 reels, a roller for applying a cleaning fluid to said film, a roller for delivering said fluid to said roller first named, a receptacle for holding said cleaning fluid in which said  
25 roller second named revolves, means for delivering a regulated supply of fluid to said receptacle, and means for adjusting the position of said receptacle and said roller second named with relation to said roller first  
named.

8. The combination of film carrying mechanism comprising a supporting roller, a fluid applying roller, a brush having supporting means adapted to rock on the axis  
30 of said roller second named and to act upon a film in contact with said roller first named, an means for connecting and revolving together said brush and roller.  
35

9. The combination with film carrying mechanism comprising a roller, of film moistening mechanism comprising a roller, film  
40 polishing mechanism comprising a brush

having an arm adapted to turn on the axis of said moistening roller, a spring for drawing said brush toward said roller first named, and means for shifting said arm and holding said brush out of engagement with  
45 said film.

10. The combination of a reel, tension rollers between which a film is carried from said reel, a moistening roller engaging said  
50 film, a film adjusting roller between said tension and moistening rollers, a supporting roller, a swinging arm, a brush journaled relative to said arm, means for holding said brush in contact with a section of said film  
55 engaging said supporting roller, and means comprising a belt whereby said moistening roller and said brush are operated together.

11. The combination of a reel, rollers over which a film passes to said reel, a revoluble  
60 brush adapted to act upon a film in contact with one of said rollers, an arm adapted to rock on an axis of another of said rollers, said arm carrying said brush, wheels fixed to said rollers and brush, and belts whereby  
65 said wheels are revolved together.

12. The combination of a pair of rollers for carrying a film, an arm adapted to turn about an axis of one of said rollers, a journaled brush carried by said arm and adapted  
70 to act on a film section in contact with the other of said rollers, an arm adapted to rock about the axis of said brush, a brush carried by said arm second named and adapted to act on said film, wheels connected with  
75 said rollers and brushes, and belts for driving said wheels.

In testimony whereof I have hereunto set my name this 28th day of June, 1916.

JULIEN TESSIER.