

914,729.

J. KELLER.  
KINETOSCOPE.  
APPLICATION FILED NOV. 4, 1907.

Patented Mar. 9, 1909.  
8 SHEETS—SHEET 1.

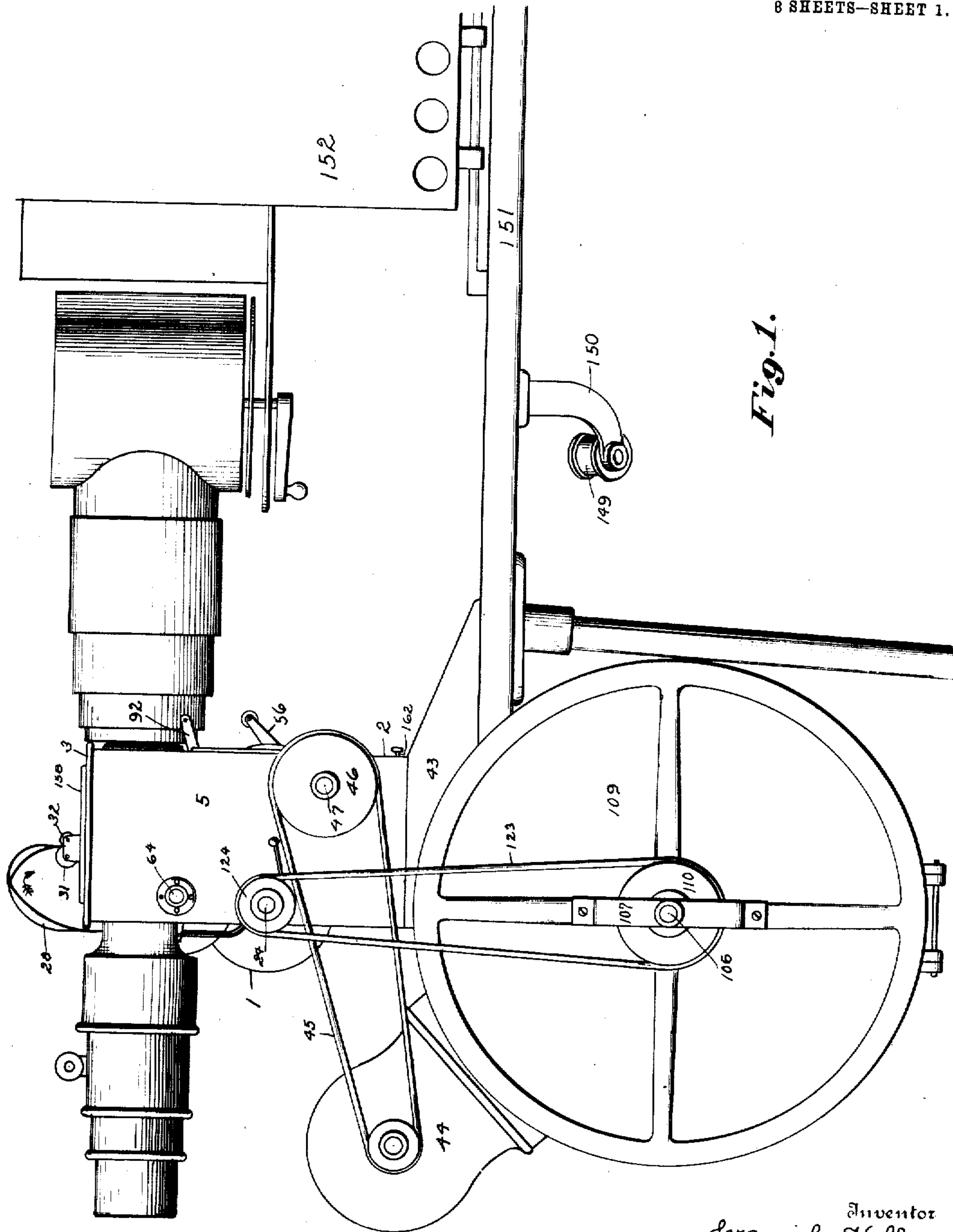


Fig. 1.

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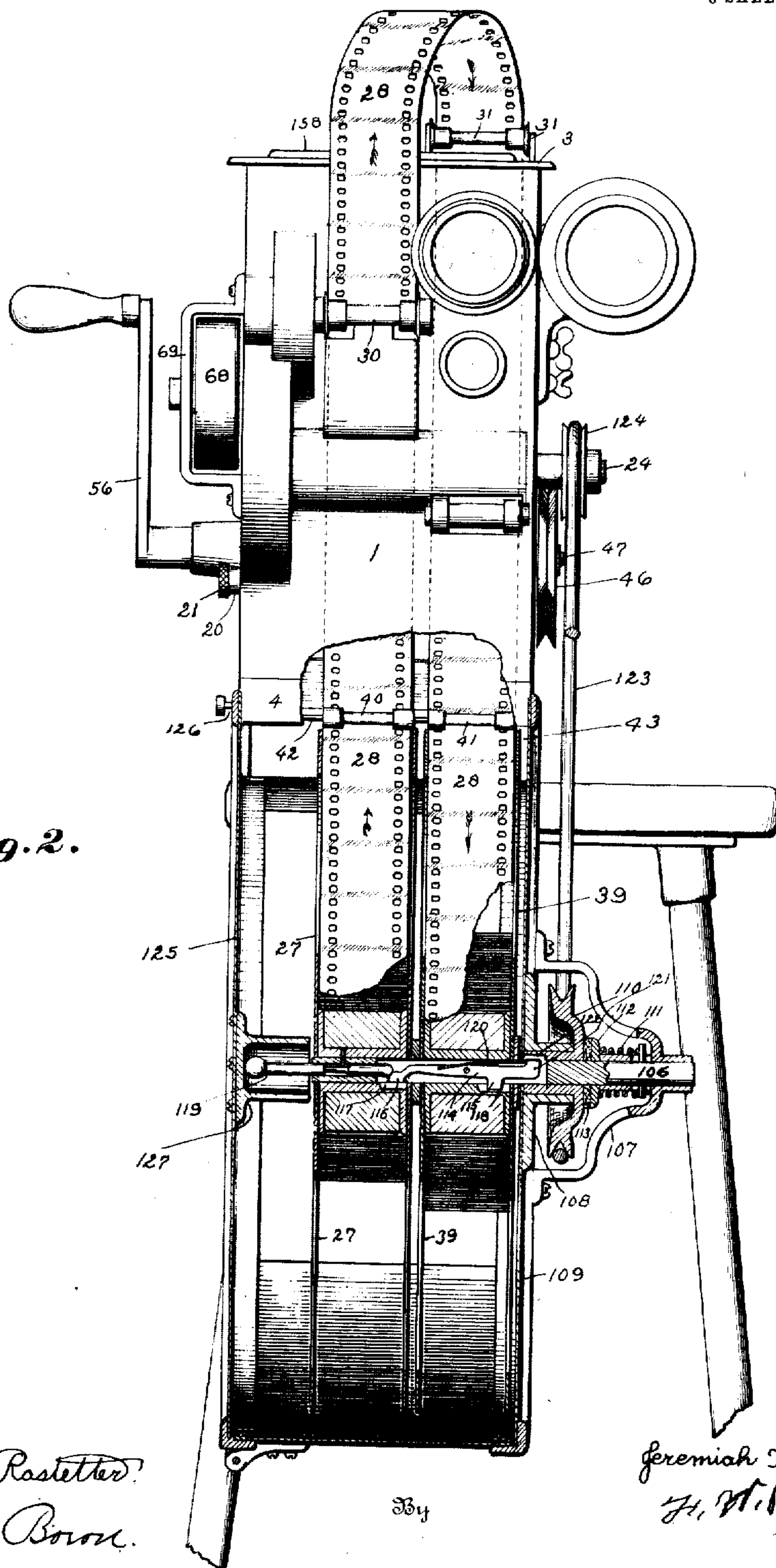
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8 SHEETS—SHEET 2.



*Fig. 2.*

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8 SHEETS—SHEET 3.

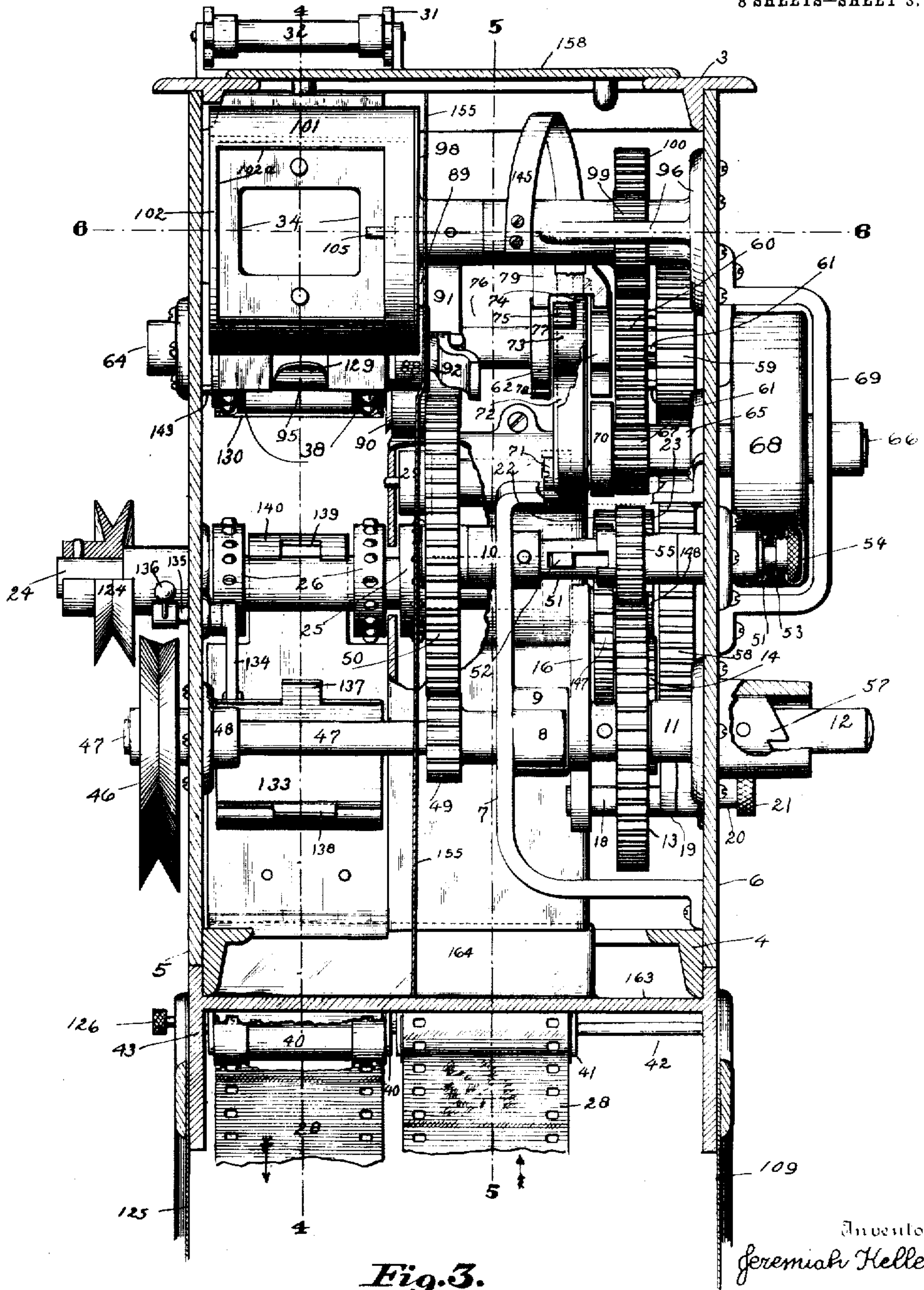


Fig. 3.

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8 SHEETS—SHEET 4.

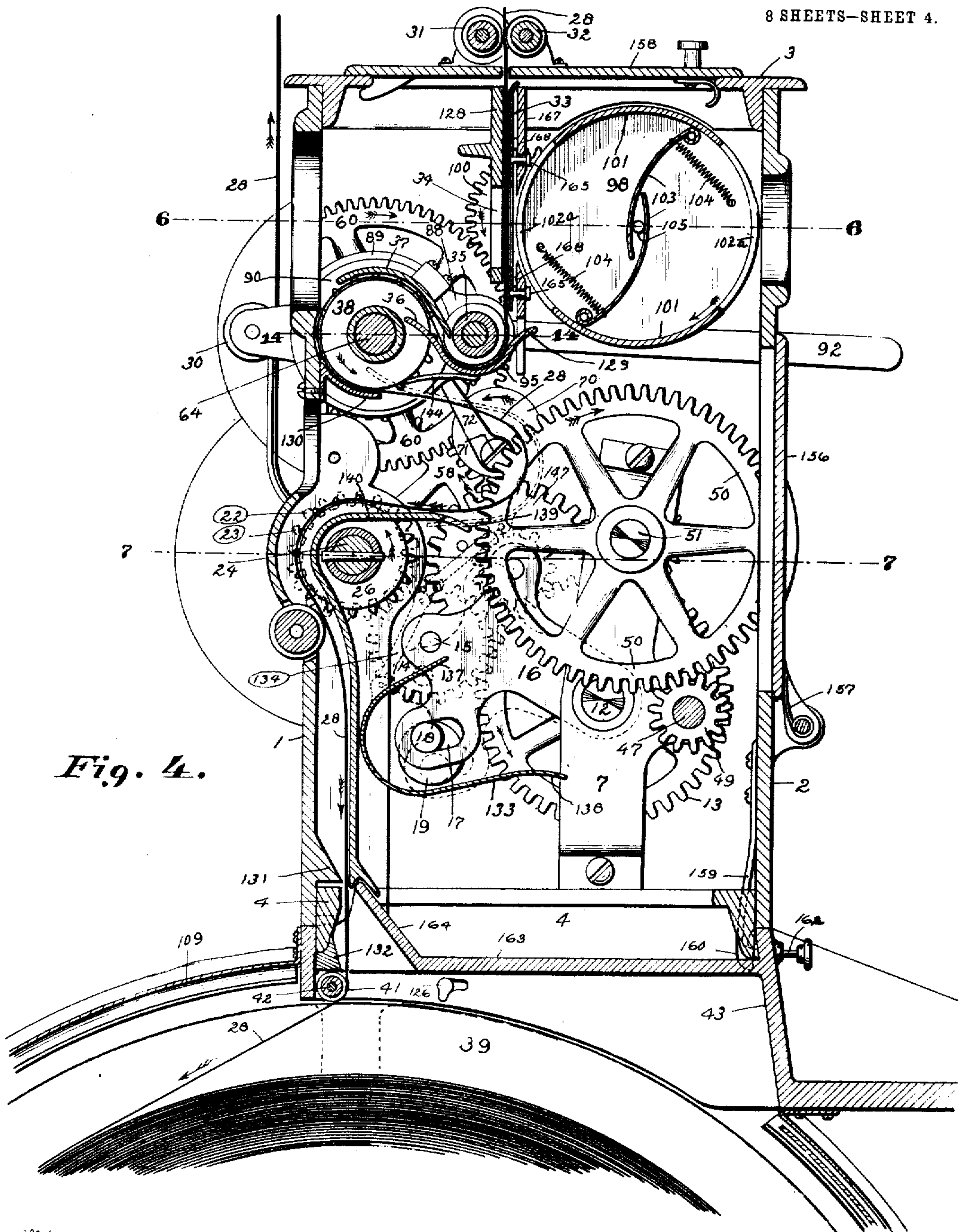


Fig. 4.

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8 SHEETS—SHEET 5.

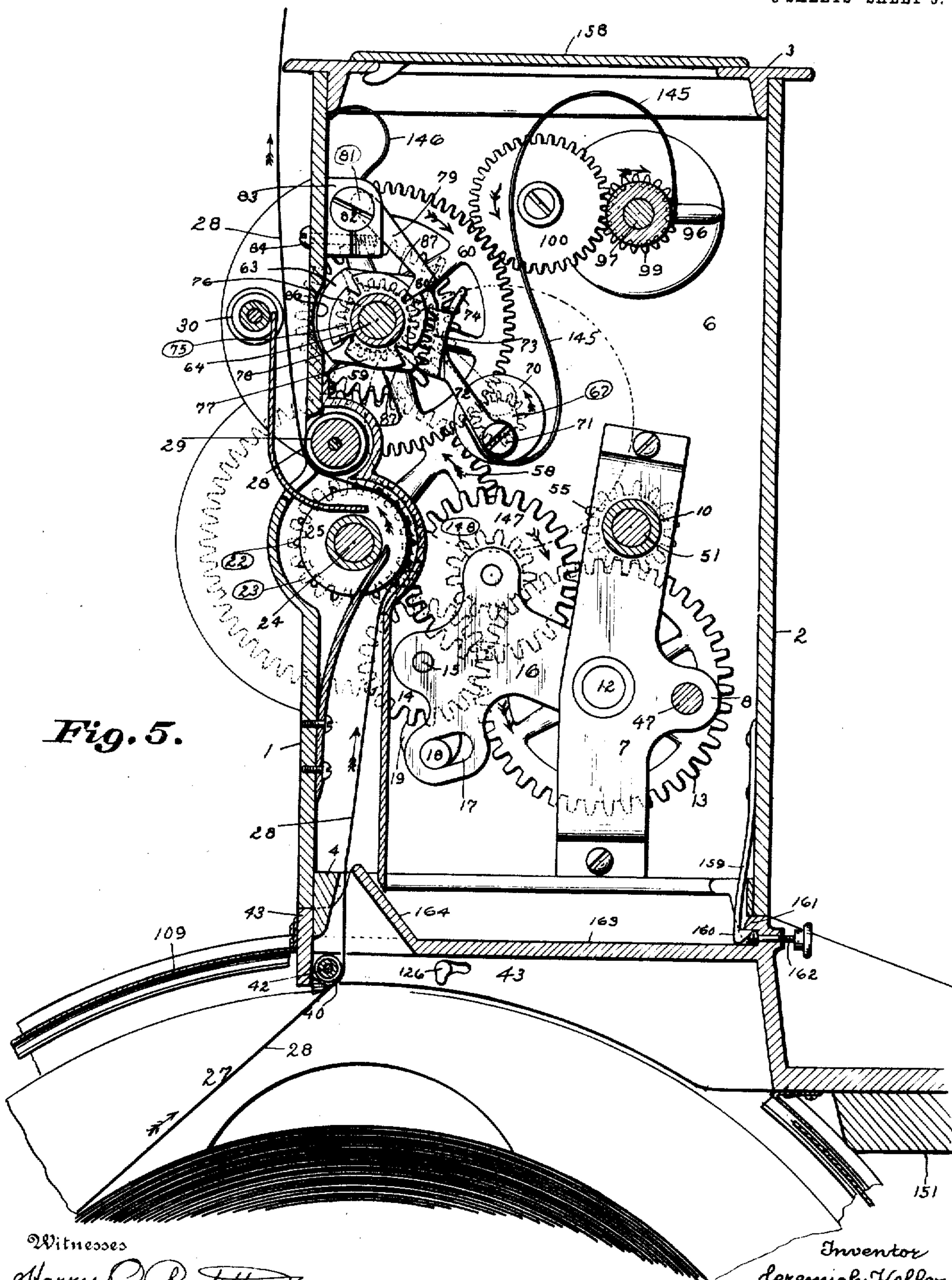


Fig. 5.

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8 SHEETS—SHEET 8.

Fig. 6.

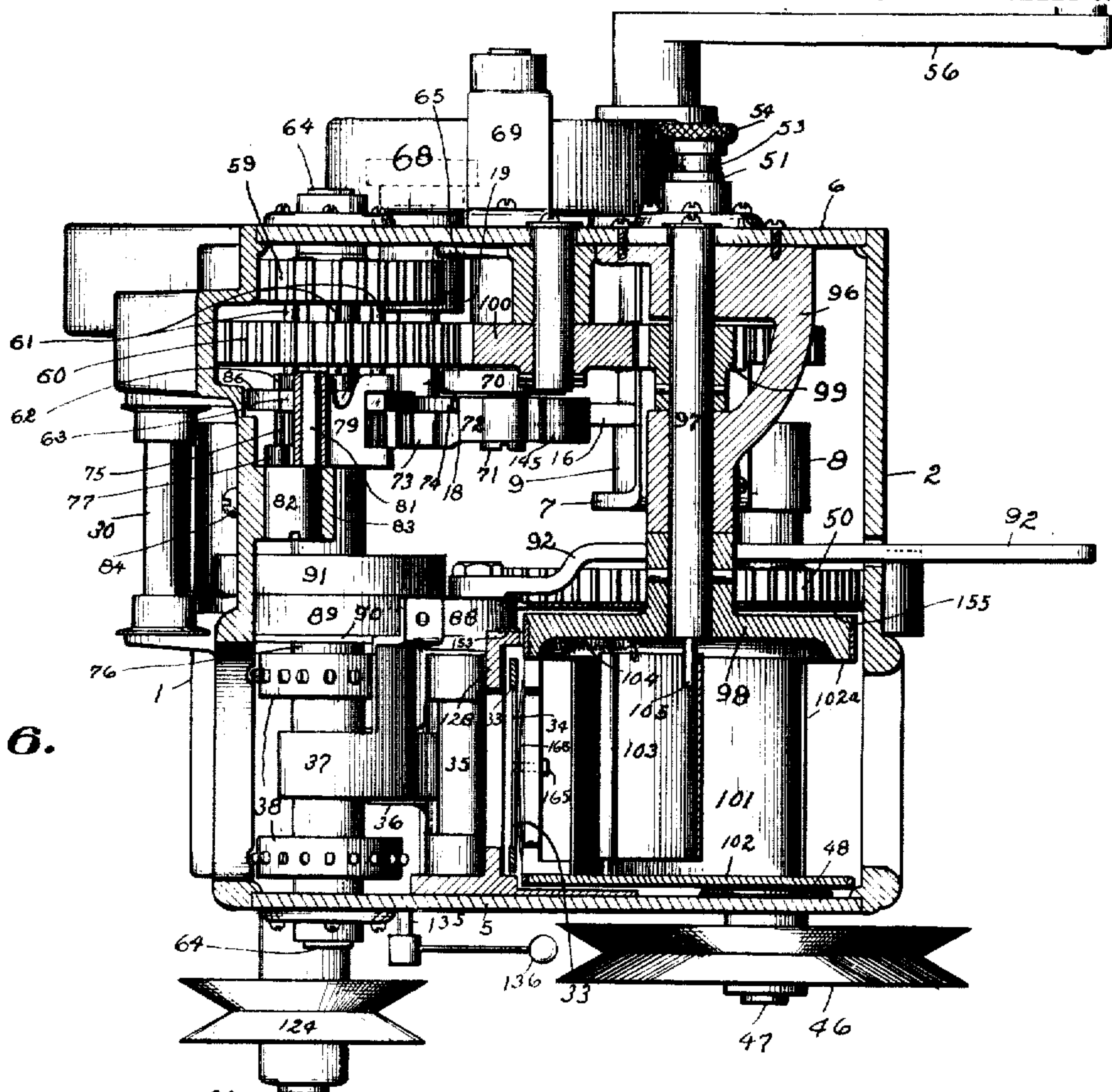
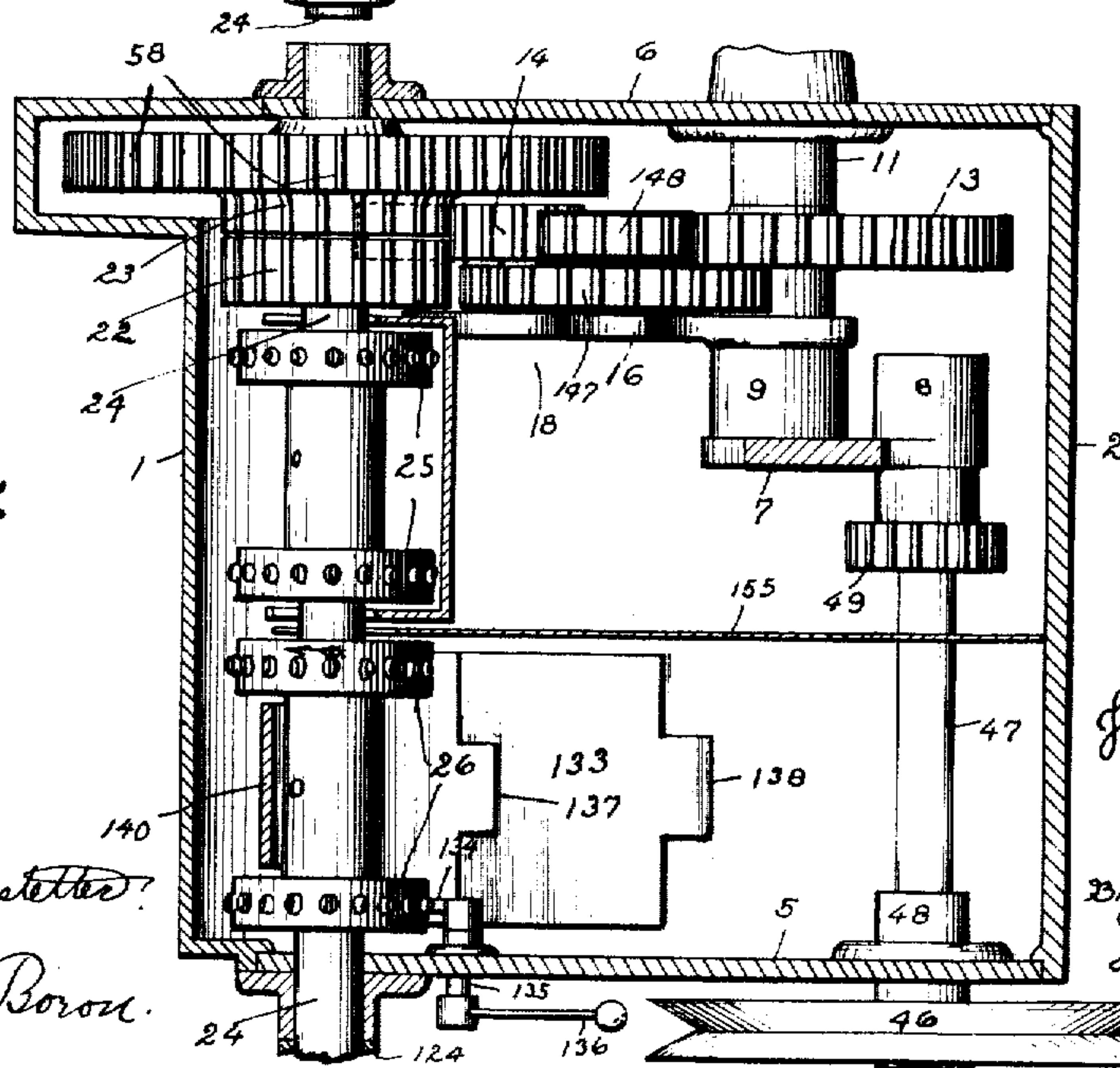


Fig. 7.



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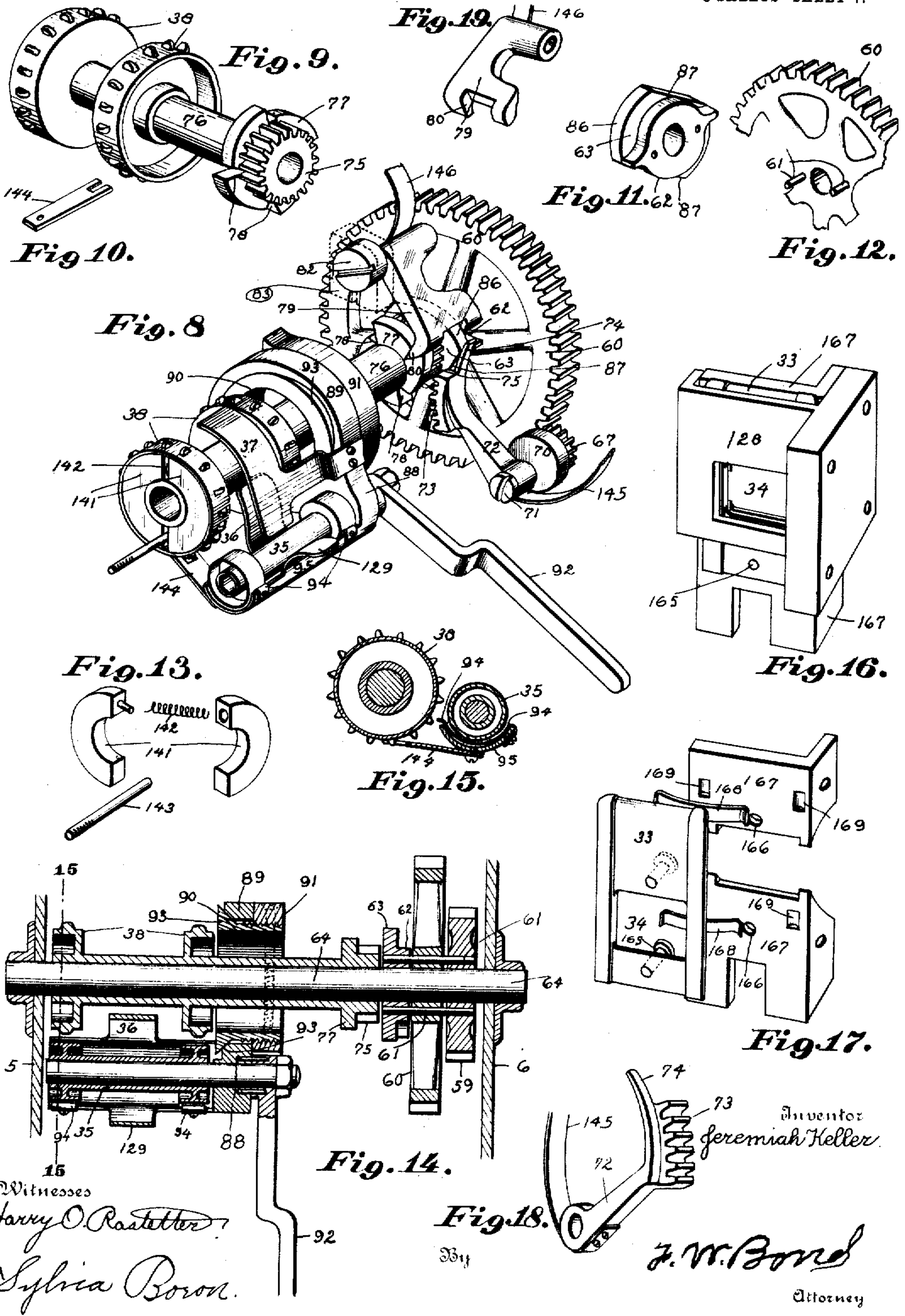
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8 SHEETS—SHEET 7.



Witnesses  
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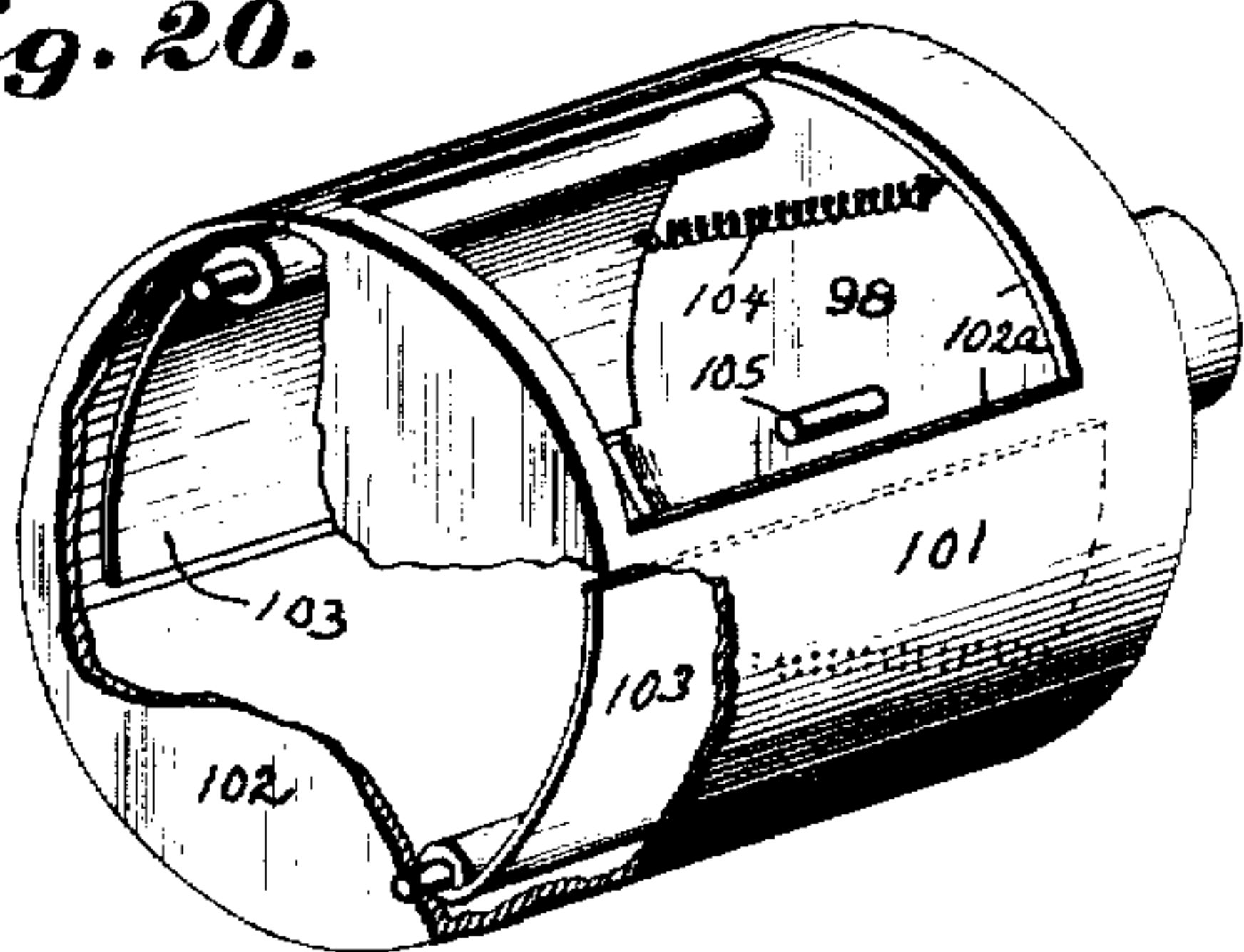


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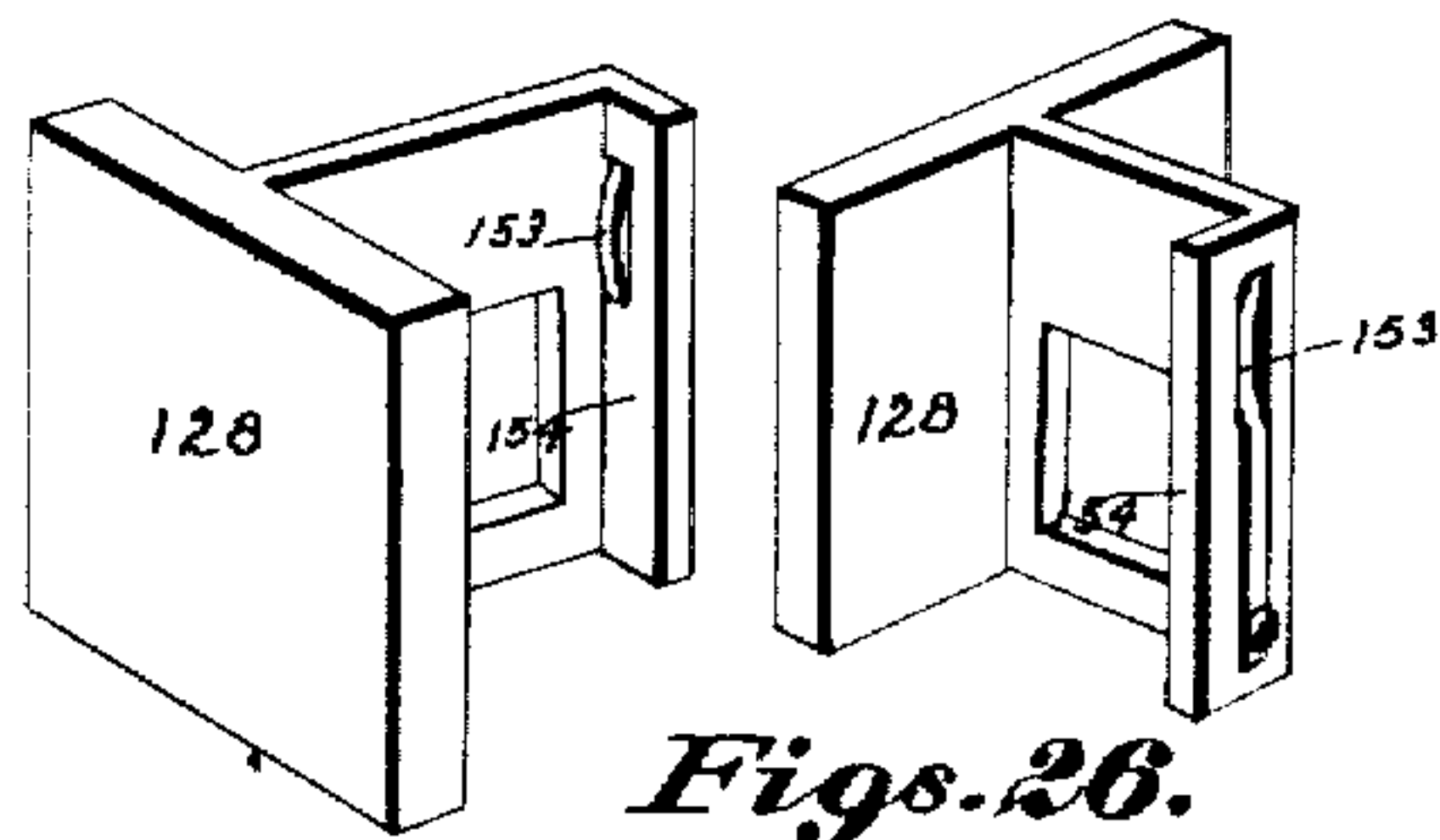
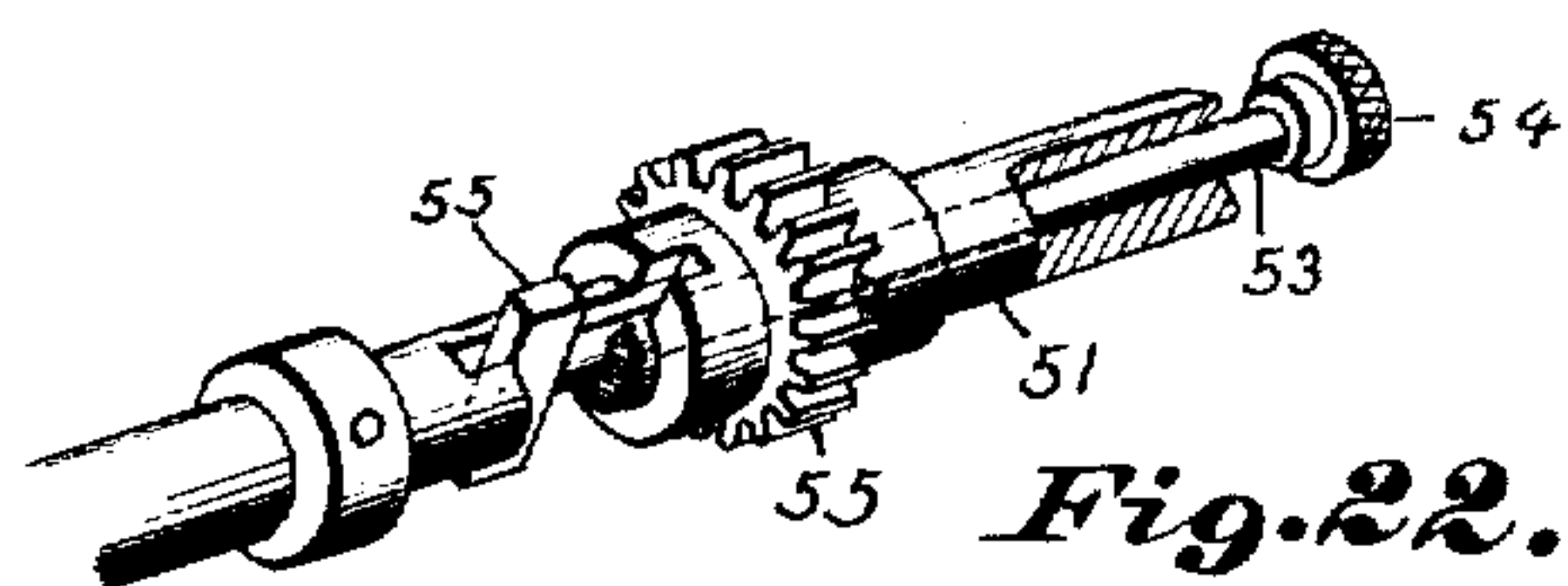
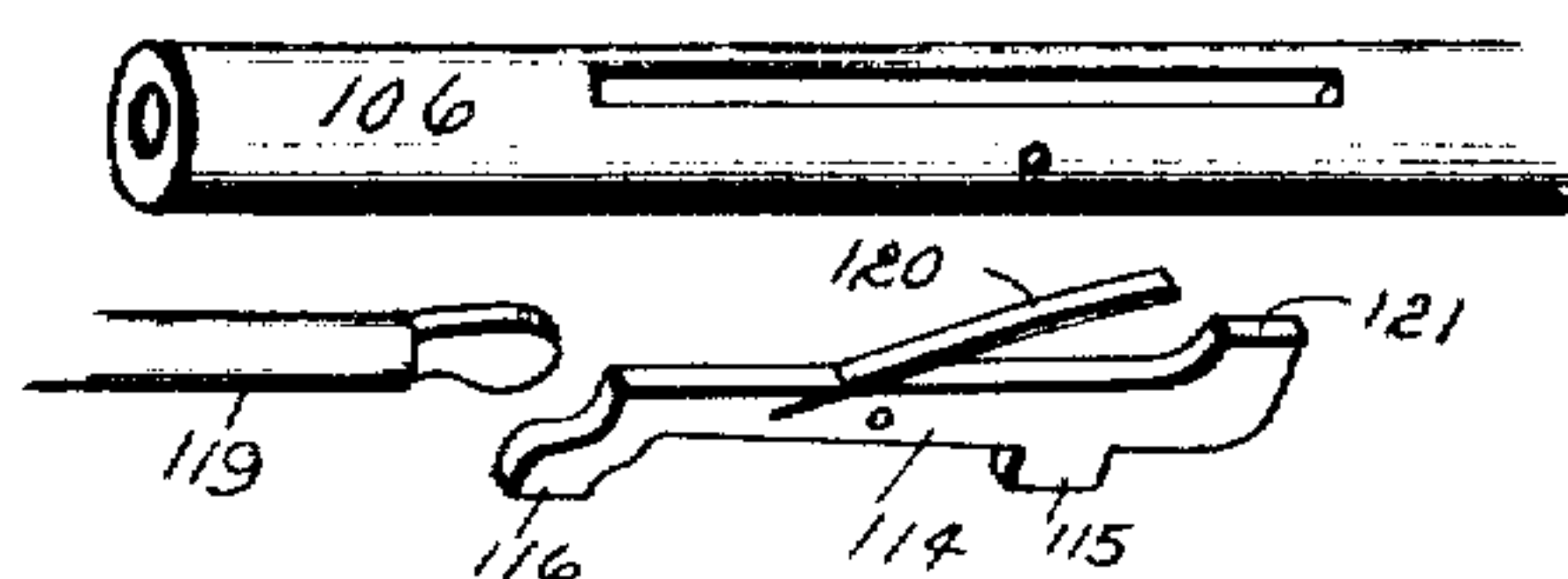
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8 SHEETS—SHEET 8.

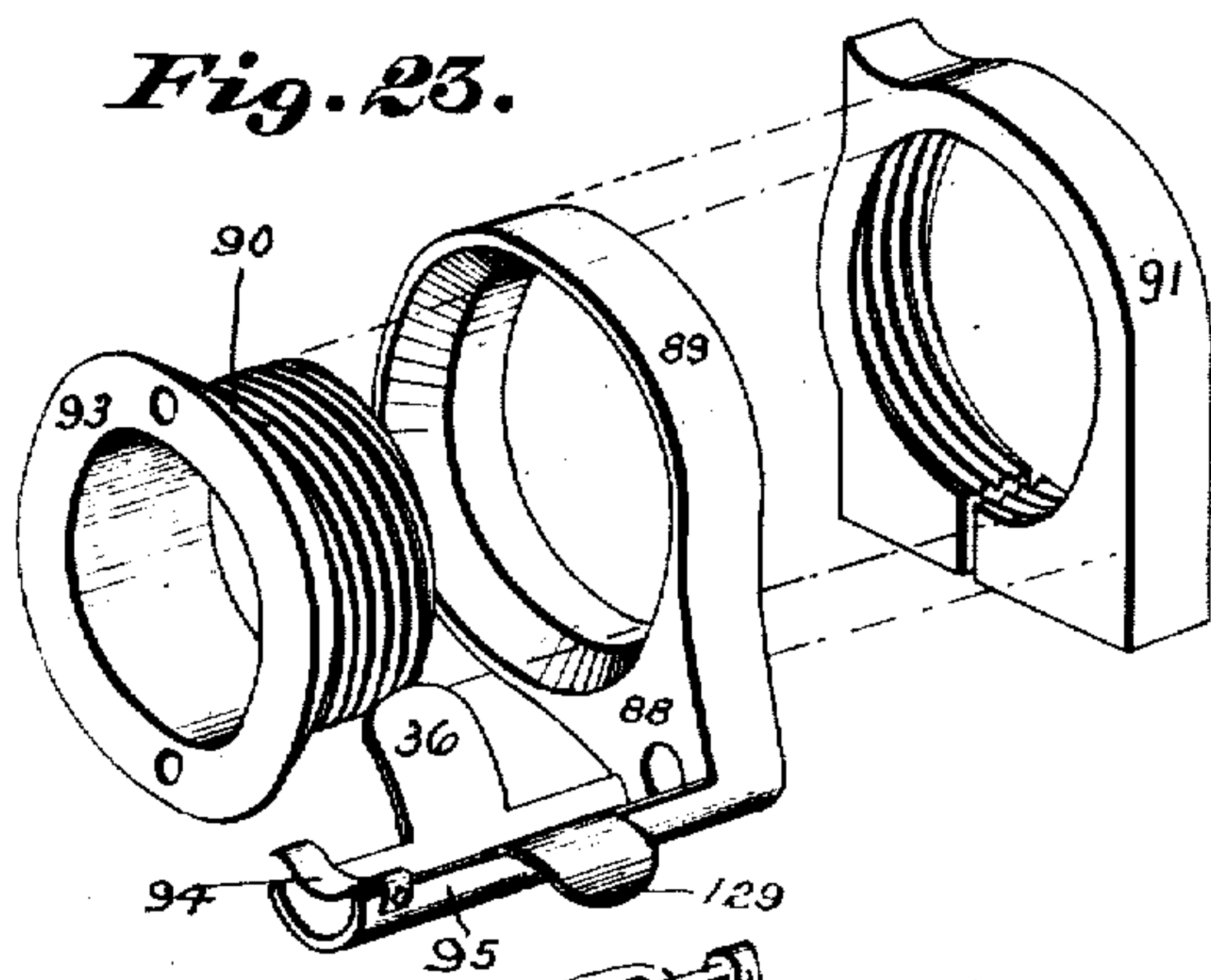
*Fig. 20.*



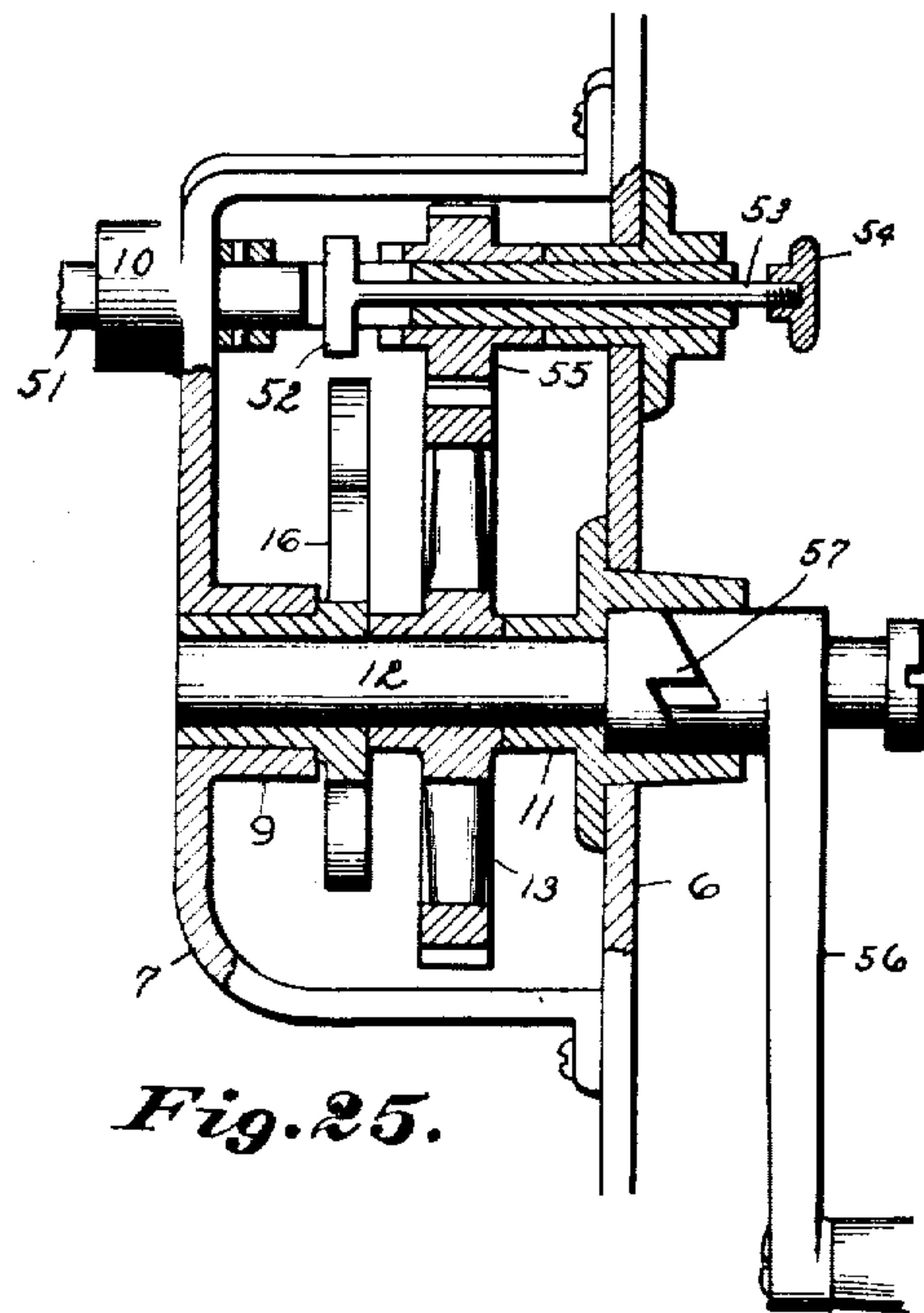
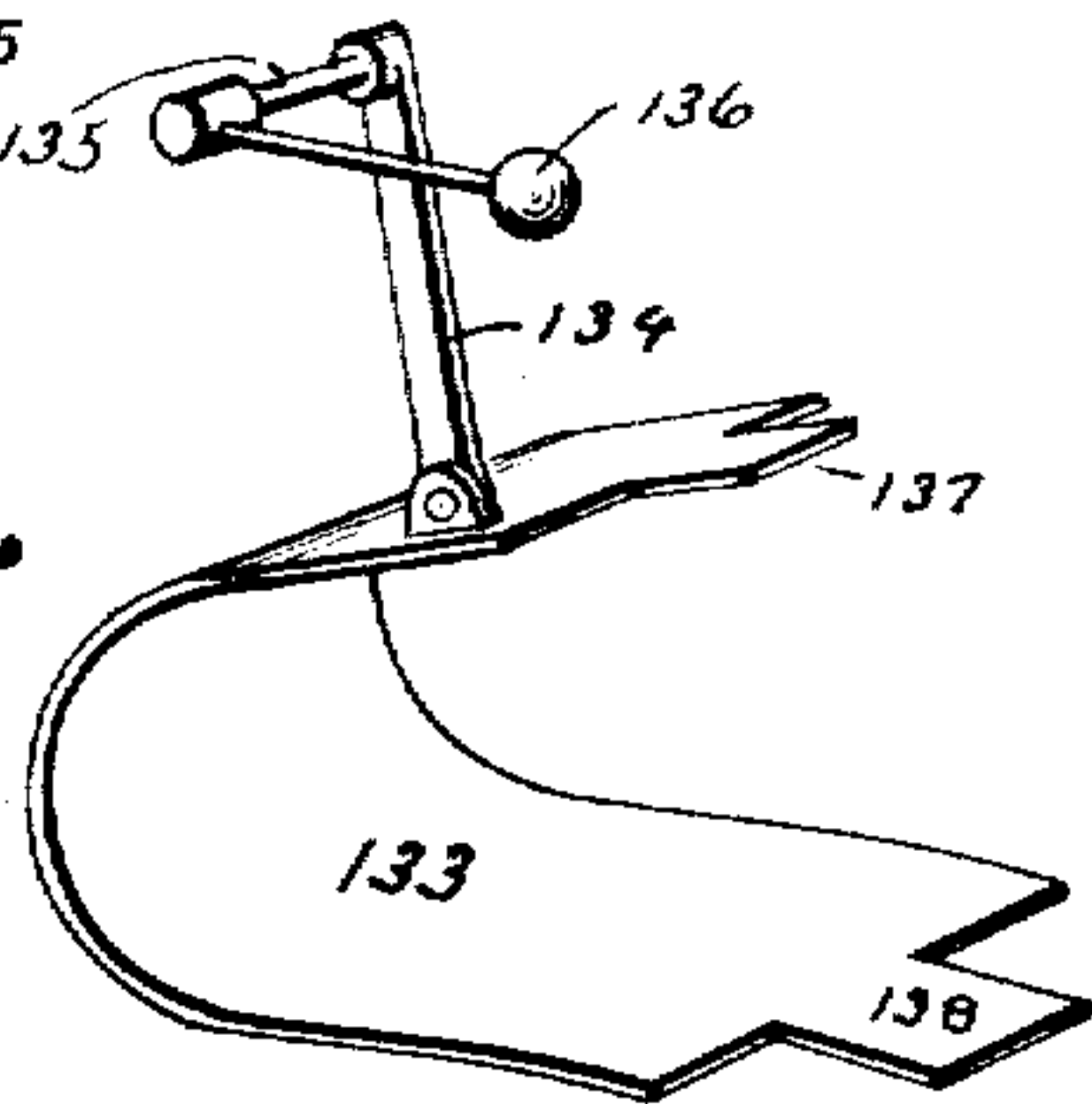
*Fig. 21.*



*Fig. 23.*



*Fig. 24.*



*Fig. 25.*

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# UNITED STATES PATENT OFFICE.

JEREMIAH KELLER, OF CANTON, OHIO.

## KINETOSCOPE.

No. 914,729.

Specification of Letters Patent.

Patented March 9, 1909.

Application filed November 4, 1907. Serial No. 400,663.

*To all whom it may concern:*

Be it known that I, JEREMIAH KELLER, a citizen of the United States, residing at Canton, in the county of Stark and State of Ohio, have invented new and useful Improvements in Kinetoscopes, of which the following is a specification.

My present invention relates to certain new and useful improvements in kinetoscopes or machines designed for exhibiting a series of pictures, representing successive phases of motion in such manner and order of succession as to produce the illusion of a moving picture.

My invention belongs to that class of picture-exhibiting machines in which a continuous film is employed or used by a series of pictures of successive phases of motion, which pictures are successively brought into view or into the field of a lens and by rays of light are thrown or projected upon a screen or other surface in a manner and by means well known in the art.

The essential objects of the present invention are:—1st. To provide means for automatically opening a cut off when the machine is in motion and automatically closing the light aperture when the machine stops from any cause and thereby protecting the stationary film from injurious effects from intense heat to which it may be subjected. 2nd. To provide means to expose for an instant that portion of the film containing a single phase or picture whereby the picture may be centered or framed relative to the light aperture. 3rd. To provide an improved rotary shutter consisting of a cylinder having open and closed portions and blades located within the cylinder and adapted to close the open portions when the cylinder is at rest. 4th. In providing mechanism wherein the film is easily threaded or placed in proper position to be actuated by the various parts hereinafter described.

With these and other objects in view my invention consists of the parts and the construction and combination of parts which are hereinafter described and claimed.

In the accompanying drawing forming part of this specification and in which similar reference numerals indicate corresponding parts in the several views: Figure 1 is a side elevation showing the device properly located with reference to the lens and the casing. Fig. 2 is a front elevation showing

parts broken away and parts in section showing the film properly threaded. Fig. 3 is a rear view showing the different parts properly arranged with reference to each other showing the frame in section and the back plate removed. Fig. 4 is a vertical section on line 4—4, Fig. 3. Fig. 5 is a vertical section on line 5—5, Fig. 3. Fig. 6 is a horizontal section on line 6—6, Fig. 3, and Fig. 4. Fig. 7 is a horizontal section on line 7—7, Fig. 4. Fig. 8 is a perspective view of the intermittent rotating film sprocket wheel, the device for imparting the intermittent rotary motion to said sprocket, the framing roller and its operating lever. Fig. 9 is a detached view of the intermittent rotary film sprocket wheel, its hollow shaft, showing the pinion and detent engaging disk properly located thereon. Fig. 10 is a detached view of one of the scraper blades. Fig. 11 is a detached view of the detent actuating cam, and the segment actuating cam. Fig. 12 is a view of the gear wheel designed to actuate the segment shaft and its pinion. Fig. 13 is a view showing the friction blocks and their different parts. Fig. 14 is a horizontal section of the intermittent rotary film sprocket wheel and the different parts for imparting rotary motion. Fig. 15 is a section on line 15—15, Fig. 14. Fig. 16 is a view of the film friction plates. Fig. 17 is a detached view of the inner film friction plate and its holding brackets and spring. Fig. 18 is a detached view of the arm and toothed segment. Fig. 19 is a detached view of the disk locking detent. Fig. 20 is a detached view of the shutter showing parts broken away. Fig. 21 is a view showing a portion of the reel shaft, its pivoted bar and the push bar. Fig. 22 is a detached view of the motor clutch. Fig. 23 is a view of the framing roll holding and adjusting devices. Fig. 24 is a detached view of the film threading guide and its different parts. Fig. 25 is a vertical section of the crank shaft bearings, the main driving wheel and the motor clutch. Figs. 26 are detached perspective views of the film guiding plates.

Similar numerals of reference indicate corresponding parts in all the figures of the drawing.

In the accompanying drawing 1 represents the front plate, and 2 the back plate, which plates are spaced from each other by means of the top plate 3 and the bottom plate 4, to which parts are attached the side plates 5



and 6, said plates being connected together in any convenient and well known manner and constitute the frame or housing of the kinetoscope. To the side plate 6 is attached  
 5 the bar 7, which bar is substantially of the form shown in Fig. 3 and carries the bearings 8, 9 and 10. The bearing 11 is connected to the side plate 6 in which bearing is journaled one end of the crank-shaft 12, the opposite  
 10 end of said crank-shaft being journaled in the bearing 9. Upon the crank-shaft 12 is securely mounted the main gear wheel 13. The main gear wheel 13 meshes with the pinion 14, which pinion is journaled upon the  
 15 stud 15, said stud being secured to the pivoted bracket 16, said bracket being pivotally mounted upon the crank-shaft 12 or its equivalent. The bracket 16 is provided with the elongated slot 17, through which  
 20 slot passes the pin 18, which pin is formed integral or made separate and attached to the disk 19, which disk is securely mounted upon the short shaft 20, said shaft being provided with the knurled knob 21 by means of which  
 25 the bracket 16 is moved up and down for the purpose hereinafter described.

In Fig. 4 the bracket 16 is moved into an elevated position which brings the pinion 14 into mesh with the pinions 22 and 23, the  
 30 pinion 22 being rigidly mounted upon the shaft 24, said shaft being properly journaled in suitable bearings carried by the side members 5 and 6. At the time the pinion 14 is in mesh with the pinions 22 and 23, both of said pinions will rotate in unison, and rotary motion  
 35 will be imparted to the two pairs of film sprocket wheels 25 and 26. The pair of sprocket wheels 25 are the film feed or unwinding ones; that is to say the pair of sprocket  
 40 wheels 25 remove the film from the spool or reel 27, which is the reel, upon which the film is wound, and said film unwound from said reel when the machine is in action for showing pictures. From the pair of feed sprockets  
 45 25 the film 28 extends, first under the guide roll 29 and against the guide roll 30, from whence the film is extended and moves upward, and thence downward between the guide rolls 31 and 32, and in contact with the  
 50 film pressure plate 33 located just above the exposure aperture 34. From whence the film is extended under the framing roll 35, which framing roll will be explained as to detail construction and arrangement hereinafter.  
 55 after.

For the purpose of properly guiding the film, the guide plates 36 and 37 are provided, said guide plates being for the purpose of guiding the film when the machine is  
 60 threaded; but said guide plates perform no special function when the film is moved to throw the pictures upon the screen. The film is taken direct from the framing roll 35 upon the pair of intermittent rotating  
 65 sprocket wheels 38, from whence the film

passes down and upon the pair of take up sprocket wheels 26, and thence down and upon the take up reel 39.

For the purpose of guiding the film as it is taken from the unwinding reel through the  
 70 machine and to the take up reel the guide rolls 40 and 41 are provided, which rolls are loosely mounted upon the shaft or bar 42, said shaft or bar being fixedly connected to the base 43.  
 75

The parts just above described are the ones designed and arranged to impart proper movement to the film at the time the crank shaft 12 is rotated except such parts as impart intermittent rotary movement to the  
 80 pair of sprocket wheels 38. In use it is desirable to operate the machine proper by motor and by providing means and mechanism for imparting the proper movement to the film prior to the time the machine proper  
 85 is brought into action by the motor the crank mechanism is employed. After the machine is in proper motion the motor 44 is employed from whence a belt 45 or other propelling device leads to the pulley 46, which pulley is  
 90 securely mounted upon the power driven shaft 47, said shaft being journaled in the bearings 48 and 8, said parts being best illustrated in Figs. 3 and 7. Upon the power driven shaft 47 is mounted the pinion 49,  
 95 which pinion meshes with the gear wheel 50, said gear wheel is securely mounted to the clutch shaft 51, which clutch shaft is brought into action and out of action by means of the clutch 52, which clutch is operated by the  
 100 push rod 53, said push rod being provided with the knurled knob 54. When the motor is brought into action and the clutch shaft 51 connected to the pinion 55 said pinion drives the main gear wheel 13, which  
 105 was driven by the crank shaft 12 prior to the time the motor was brought into action and the film operated in the manner above described when the crank shaft is operated.

It will be understood that after the motor  
 110 has been brought into action the crank 56 should be moved outward so as to properly disengage it from the shoulder 57 or its equivalent. The feature of disconnecting the crank or in other words bringing the crank  
 115 into proper connection with the shaft 12 and disconnected, said shaft is mechanical and needs no detailed description. At one side of the pinion 23 is located the gear wheel 58, said pinion and gear wheel being formed integral  
 120 and rotate in unison. The gear wheel 58 meshes with the gear wheel 59, said gear wheel being connected to the gear wheel 60 by means of the pins 61, which pins also connect the detent and segment actuating cams  
 125 62 and 63, respectively, said gear wheels 59, 60 and the cams being loosely mounted upon the spindle 64 carried by the side plates 5 and 6.

To the side plate 6 is connected the bracket 130



65, (see Fig. 3) which forms one of the bearings for the shaft 66 upon which shaft is securely mounted the pinion 67, which pinion meshes with the gear wheel 60. Upon the shaft 66 is mounted the balance wheel 68, which balance wheel is for the purpose of giving proper momentum when intermittent rotary motion is imparted as hereinafter described. The outer end of the shaft 66 is journaled in the yoke 69, which yoke is securely attached to the side plate 6 or its equivalent. To the shaft 66 is attached the crank wheel 70, which crank wheel is provided with the wrist pin 71, to which wrist pin is connected the arm 72, which arm is provided at the opposite end with the toothed segment 73 and the upward extending finger 74. The toothed segment 73 is for the purpose of imparting intermittent rotary movement to the pinion 75, which pinion is securely mounted upon the hollow shaft 76, to which hollow shaft are securely attached the pair of intermittent rotating and film moving sprocket wheels 38.

It will be understood that the film should be moved very quickly at the time a new picture is brought into position to be exposed to view and in order to provide for this rapid movement the gear wheel 60 is formed quite large and the pinion 67 quite small. In the present instance the gear wheel 60 and the pinion 67 are geared six to one, but for the purpose of exposing the film a sufficient length of time between the rapid movements of the film the toothed segment 73 is held out of engagement with the pinion 75 by means of the cam 63 mounted upon the hollow shaft 76, said cam being so formed that the arm 72 and its toothed segment is permitted to come into engagement with the pinion 76 twice for one revolution of the gear wheel, by which arrangement three full revolutions will be imparted to the crank disk 70 but only one action out of three revolutions will be given to the toothed segment 73, which actuates the pinion 75 and the pair of intermittent rotating film actuating sprocket wheels 38.

It will be understood that the pair of sprocket wheels 38 should be locked against rotation, except at such times that the film is to be moved, and in order to so lock the sprocket wheels against rotation, the disk 77 is provided, which disk is securely mounted upon the shaft 76, said disk being provided with the notches 78, which notches receive the free end 80 of the detent 79.

For the purpose of causing the detent to properly engage and securely lock the notched disk 77 the notches 78 are V shaped and the engaging end 80 of the detent 79 formed blunt so that its extreme end will not engage or come in contact with the bottom of any notch prior to the time that the detent engages the walls of the notches, and at the same time providing for the taking up of the

wear, as between the engaging portion of the detent and the walls of the V shaped notches 78 so that at no time can there be any loose motion of the hollow shaft 76 and the intermittent film actuating sprocket wheels 39.

It will be understood that the pinion 75 cannot rotate until the detent has been lifted so as to disengage the same from the notches 78. In order that the detent may be lifted at the proper time the cams 62 are provided, which cams are so shaped that they rotate with the gear wheel 60, the detent 79 will be lifted and allow the pinion 75 to be actuated by the movement of the toothed segments 73.

For the purpose of stopping the pinion 75 at such points so as to prevent the teeth of said pinion and the teeth of the toothed segments 73 from coming together or against each other at their outer ends or in other words to provide for the proper meshing of the teeth of the toothed segment 73 of the pinion 75, the detent is pivotally connected or mounted upon the pin 81, which pin 81 is formed integral with the head 82 and is eccentrically located with reference to said head. After the detent 79 has been properly adjusted for the purpose just above described the head 82 is locked against rotation by means of the split clamp 83 and the screw 84.

For the purpose of holding the toothed segments out of engagement with the pinion 75, except at such times that said segment is to engage said pinion the finger 74 is provided which finger rides upon the curved portions 86 of the cam 63 but when the cut away or flat portions 87 come into proper position with reference to the finger 74, said toothed segment 73 is permitted to engage the pinion 75. In Fig. 8 the cam 63 is nearly in such a position that the toothed segment will be permitted to engage the pinion. In machines of this class it is of the utmost importance that the division of the film containing the picture to be exposed comes in proper position with reference to the exposure aperture 34, and in order that this result may be accomplished the framing roll 35 is carried by the arm 88, which arm is preferably formed integral with the ring 89, which ring is rotatably mounted upon the sleeve 90, which sleeve is connected to the bracket 91 by means of screw threads or their equivalents, the bracket 91 is securely attached to the frame and held in fixed position. To the arm 88 is securely attached the lever 92 by means of which the framing roll 35 is adjusted with reference to the exposure aperture 34, that is to say the framing roll 35 is brought to or from the lower edge of the exposure aperture 34. It will be understood that after the framing roll 35 has been brought into proper adjustment it will be held firmly in the desired adjustment and in order to provide for the proper pressure, the sleeve 90 is provided with the flange 93,



which flange comes in contact with the ring 89. The lever 92 is extended beyond the frame as illustrated in Fig. 4.

For the purpose of holding the film in close  
5 contact with the framing roll, the springs 94 are provided, which springs are connected to the curved plate 95, which curved plate is connected to the arm 88 and moves with the movement of the framing roll 35. To the  
10 side member 6 or its equivalent is securely attached the bracket 96, which bracket forms a support for the shutter shaft 97, which shutter shaft is properly journaled in the bracket 96. To the shutter shaft is se-  
15 curely attached the end member 98 of the shutter proper, which member constitutes one end of the shutter proper. Upon the shutter shaft 96 is securely mounted the pinion 99, which pinion meshes with the idler  
20 100, which idler meshes with the gear wheel 60 by which arrangement a rapid rotary movement is imparted to the shutter proper. The shutter casing 101 is connected to the head 98 and the opposite end of the casing  
25 provided with the head 102, said parts constituting a cylinder closed at its ends by the shelf or casing 101 which is provided with the apertures 102<sup>a</sup> located diametrically oppo-  
30 site each other. Each aperture is formed of such a size that it will occupy or take up about one-fourth of the circumference of the casing 101, so that during the time the film is moved by the intermittent rotating sprocket wheels 38, the movement will not be visible  
35 thereby taking away what is termed the flicker during the time the film is passing in front of the exposure aperture 34.

It will be understood that by the rapid rotation of the shutter proper the apertures  
40 102<sup>a</sup> and the intervening periphery of the shutter proper are brought into alinement with the exposure aperture 34 thereby cutting the rays of light in a very rapid manner and in such a manner that the flicker is re-  
45 moved. It will be understood that when the machine is brought to a stand still the rays of light should be cut off and in order to provide for this the pivoted blades 103 are provided, which blades are curved substan-  
50 tially as shown in Fig. 1 and Fig. 4, and when rapid movement is imparted to the shutter proper, said blades will be thrown by centrifugal force toward the inner periphery of the shutter casing 101, but when said shutter  
55 cylinder is brought at rest, said blades will be brought into position illustrated in Fig. 4 by means of the springs 104, said springs being so formed as to strength that the centrifugal force will expand said springs and permit  
60 them to move upon their pivotal points.

For the purpose of stopping the blades in proper position so as to close the apertures 102<sup>a</sup> when the cylinder is brought at rest the pin 105 is provided, which pin may be a re-  
65 duced portion of the shutter shaft 97.

It will be understood that the pivoted shutter plates carried by the rotating shutter cylinder are drawn outward against the inner periphery of the cylinder by centrifugal force, thereby opening the exposure aperture  
70 in the cylinder, but during the time the speed of the shutter cylinder is being reduced the shutter plates will be drawn away from the periphery of the shutter cylinder, thereby  
75 closing the aperture in said shutter cylinder and protecting the film from the rays of light.

It will be understood that the springs connected to the shutter plates must be of such a tension that when a rapid rotary move-  
80 ment or normal rotary movement of the shutter cylinder is taking place, the centrifugal force will be such that the tension of the springs will be overcome.

The film 28 is taken up upon the take up  
85 reel 39, which is mounted upon the shaft 106, said shaft being properly journaled in the bracket 107 and the flanged bracket 108, which flanged bracket is connected to the  
90 reel casing 109.

It will be understood that as the convolutions of the film accumulate upon the reel, the diameter of the body of the film will increase so that if no provision was made for the increased diameter of the various convo-  
95 lutions of the film, the speed of the take up reel would be increased but to overcome this objection and to provide for the taking up of the film as it is moved by the intermittent rotating sprocket wheels 38 the driving pul-  
100 ley 110 is loosely mounted upon the shaft 106, and is frictionally held upon the shaft 106 by means of the spring 111 and the disk 112, said wheel being clamped between the  
105 flanged bracket 108 and the fiber washer 113, by which arrangement the pulley 110 will rotate upon the shaft 106 independent of said shaft when an overdue pull is exerted upon the film 28, but the reel 39 will rotate  
110 when no strain is upon the film.

It will of course be understood that when the film is being wound upon the take up reel 39 it must be unwound from the reel 27 so that some provision must be made for loosely  
115 mounting the reel 27 upon the shaft 106 at this time, but when the film is wound upon the reel 27 said reel must be rotatably connected with the shaft 106. In order to provide for this emergency the shaft 106 is provided with the pivoted bar 114, which pivoted  
120 bar is provided with the lugs 115 and 116, which lugs engage the recesses 117 and 118, the recesses 117 being formed in the hub of the reel 27. In Fig. 2 the bar 114 is shown in position to couple the reel 39 with the  
125 shaft 106 and uncouple the reel 27 from said shaft. When it is desired to rotate the let off reel 27 with the shaft 106 the push bar 119 is moved inward, the inner end of which forces the pivoted bar 114 downward so as to con-  
130



nect the lug 116 with the recess 117, the inner end of said pin 119 riding upon the outer free end of the pivoted bar 114.

For the purpose of automatically elevating the outer end of the pivoted bar 114 when the pin 119 is withdrawn the spring 120 is provided. It will be understood that when the take up reel 27 is to be rotatably connected to the shaft 106 the pulley 110 should also be rotatably connected and in order to do this the pivoted bar 114 is provided with the lug 121, which lug engages the slot or recess 122 formed in the hub of the pulley 110. The pulley 110 together with the different parts rotatable therewith is driven by the belt 123, which belt extends around the pulley 124, which pulley is mounted upon the shaft 24, which is the shaft upon which the take up and feed sprocket wheels are mounted.

For the purpose of giving access to the push bar 119 and also for the purpose of removing the reels the reel casing 109 is provided with the door 125, which door is held in a closed position by means of the turn button 126 or its equivalent.

For the purpose of holding the reels in proper relative position the door is provided with the flange 127 by means of which the reels are prevented from any sliding or lateral movement upon the shaft 106 when the door is closed as illustrated in Fig. 2. When it is desired to bring the film into position to be actuated by the various parts above described the film is taken from the let off reel 27 passed upward and brought into engagement with the pair of sprocket wheels 25 and thence upward around the roll 29 past the roll 30 and brought down and threaded between the rolls 31 and 32, and passed downward between the plates 33 and the plate 128, in front of the exposure aperture 34 coming in contact with the guide lip 129, which guide lip guides the film under the framing roll 35 from whence it is guided upward by the guide flange 36 upon the intermittent rotary sprocket wheels 38 and held upon said intermittent rotating sprocket wheels by the guide plate 37 passing the guide 130, and extended laterally to form a loop and thence on to the pair of take up sprocket wheels 26, and thence downward to the take up reel 39. The film being guided to the roll 41 by means of the guide flanges 131 and the guide flange 132. In order to form the loop in the film shown in Fig. 4 the guide plate 133 is provided, which guide plate is provided with the arm 134, said arm being fixed to the rock shaft 135, which rock shaft is journaled in the side plate 5 and is provided with the operating handle 136. When the guide plate is brought into use it is placed in the position illustrated in dotted lines Fig. 4, but when it is thrown out of use it is placed in the position illustrated in full lines Fig. 4. The arm con-

nected to said plate being illustrated in dotted lines Fig. 4.

It will be understood that the guide plate is located at one side of the various parts designed to actuate the film so that it is free to move into the different positions illustrated. This feature being best brought out in Fig. 7. The loop guiding plate 133 is provided with the narrowed extensions 137 and 138, which extensions are for the following purposes: The extension 137 enters the notch 139 formed in the guide plate 140, which guide plate is best illustrated in Fig. 4, and the extension 138 enters between the intermittent rotary sprocket wheels 38. The object and purpose of forming a loop in the film between the intermittent rotating sprocket wheels 38 and the take up sprocket wheels 26 is to provide against any injury to the film by reason of the take up sprocket wheels having a continuous rotary motion and the sprocket wheels just above having an intermittent rotary movement.

For the purpose of better holding the intermittent sprocket wheels 38 against any movement during the time the detent 79 is coming into engagement with the proper notches 78, the friction blocks 141 are provided, which are held against the inner periphery of one of the intermittent rotating sprocket wheels 38 by means of the spring 142 and the friction blocks 141 held against rotation by means of the pin 143, which pin is located between said friction blocks and is secured to the side member 5 in any convenient manner.

For the purpose of keeping the film clean so that there is no dust to interfere in any manner or in other words removing the dust from the intermittent sprocket wheels 38, the scraper blades 144 are provided, which scraper blades are preferably attached to the curved plate 95, and should be formed of spring material, so that there will be a slight frictional contact as between the intermittent rotating sprocket wheels 38 and the springs.

For the purpose of assisting in causing the toothed segment 73 to mesh with the pinion 75 the spring 145 is provided, which spring is connected one end to the arm 72 and the opposite end to the bracket 96, which spring is so arranged, that it has a tendency to move the toothed segment downward or against the cam 63, and in contact with the face 86.

For the purpose of giving the detent 79 a quick action the spring 146 is provided, which spring is connected to the pivoted end of the detent in any convenient and well known manner. The exact construction and arrangement of the springs 145 and 146 is immaterial so far as the detailed construction is concerned, as their only object is to give a spring action to the arm 72 and the detent 79.



It will be understood that after the film has been removed from the feed reel 27 and is wound upon the take up reel 39, it is necessary to rewind the film upon the feed reel 27 and in order to do this without running the mechanism necessary for the exposing of the pictures, provision must be made for throwing such mechanism out of gear and in order to save time in the rewinding the speed of the shaft 106 should be increased by connecting the pulley 110 direct upon said shaft by the reel clutch above described. In order to bring this about the bracket 16 is brought into a lowered position or in the position shown in Fig. 5, by means of the pin 18 and the slot 17, which movement disengages the wheel 14 from the wheels 22 and 23 and brings into mesh the wheel 147 with the wheel 22, which wheel is rigidly mounted upon the shaft 24 and upon which shaft the pulley 124 is fixed, which pulley drives the pulley 110 by means of the belt 123. The power wheel 13 meshes with the pinion 148, which pinion is rigidly connected with the wheel 147, thereby greatly increasing the speed of the pulley 124. The wheels 58 and 23 are loosely mounted upon the shaft 24, by which arrangement one movement of said wheels takes place during the time the film is rewound and consequently the moving mechanism for exhibiting the pictures is out of action.

In order to guide the film upon the reel 27 the idle spool 149 is provided, which is carried by the arm 150, which arm may be connected to the table 151 or its equivalent as the only purpose is to form a guide for the film.

It will be understood that the reel casing should be provided with a suitable opening so as to allow the film to be placed upon the reel 27.

It will be understood that when the film is being wound upon the reel 27 the reel 39 should be loose upon the shaft 106 so that it can rotate in the opposite direction. This feature has heretofore been brought out in the full description of the reel clutch proper.

In Fig. 1, I have illustrated the arrangement of the lamp casing 152 and the different parts pertaining to said lamp casing arranged so as to throw the rays of light upon the film back of the shutter proper and the shutter located between the light producing device and the film or in other words, the film is located in front of the shutter, by which arrangement the film is protected from the heat produced by the light during the time the film is moving and pictures are being thrown upon the screen and when the film stops moving the shutter blades 103 assume the position illustrated in Fig. 4, by which arrangement the heat is entirely cut off from the film and the film protected. Heretofore shutters have been located in

front of the film and the light thrown direct upon the film at all times, but by locating the shutter back of the film only a portion of the light is thrown upon the film during the time of its movement and entirely cut off when the film is brought at rest. During the operation of the kinetoscope and while the film is moving and pictures are being thrown upon the screen it is of importance that there be no lateral movement or vibration of the film, and in order to prevent any vibration or lateral movement the spring 153 is provided, which is attached to the flange 154 formed upon the plate 128.

For the purpose of protecting the film from dust and at the same time prevent the same from becoming contaminated in any manner the division plate 155 is provided, which division plate is located substantially as shown in the drawings, and is attached in any convenient and well known manner. In some instances it may be necessary to have access to the reels during the time the machine is in action or at some interval while a strip of film is being released and taken up or while pictures are being thrown upon the screen and to provide for this emergency one of the members of the frame proper is provided with the door 156, said door being normally held in a closed position by means of the ordinary spring 157.

For the purpose of giving access to the top or upper portion for any purpose the removable door 158 is provided. These parts just above described are of common structure and need no detail description.

In use it is sometimes desirable to remove the machine proper consisting of the various parts designed to impart movement to the film from the base 43, and in order to provide for securely connecting the machine proper to the base so that there can be no relative movement or what might be termed loose motion as between the base and the structure and stationary frame located on the base the side member 2 or its equivalent is provided with the spring 159, which spring is provided with the hook 160 which hook is adapted to engage the shoulder 161 formed upon the base 43.

For the purpose of disconnecting the hook 160 from the shoulder 161 the push bar 162 is provided. For the purpose of collecting the oil dropping from the various moving parts contained in the stationary frame which oil is used for lubricating purposes, the base 43 is provided with the chamber 163 and for the purpose of preventing any oil or other substance from coming in contact with the film the flange 164 is provided, which flange is of sufficient height to protect the film.

For the purpose of steadying the film as it is moved and at the same time frictionally holding said film the pressure plate 33 is provided.



vided, which pressure plate is supported by means of the pins 165, which pins are located through the apertures 166, which apertures are formed in the connecting plates 167, said plates being connected to the attaching plate 128.

For the purpose of providing a yielding movement for the pressure plate 33 the springs 168 are provided, which springs are seated in the recesses 169.

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

1. In a kinetoscope, a frame, a power shaft journaled therein, a main gear wheel mounted upon said power shaft, a pivoted bracket carrying a pinion, a shaft, a pinion and film sprocket wheels fixed thereto, sprocket wheels located above the first-mentioned sprocket wheels, let-off and take-up reels, a plate provided with an exposure aperture, a framing roll adapted for contact with the film, means for adjusting the framing roll, means for guiding the film, and a shutter.

2. In an apparatus of the class described, a suitable frame, a crank shaft and a motor shaft, intermediate gear wheels located between the crank shaft and the motor shaft a clutch shaft carrying one of said intermediate gear wheels, the main or driving gear being carried by said crank shaft, feed, take up, and intermittent rotating sprocket wheels, means for imparting rotary movement to the feed and take up sprocket wheels, means for imparting intermittent rotary movement to the intermittent rotating sprocket, a plate carried by the frame and provided with an exposure aperture, means for guiding the film and let off and take up reels, substantially as and for the purpose specified.

3. In an apparatus of the class described, a suitable frame, a spindle fixed to said frame, a hollow shaft mounted upon said fixed spindle, said hollow shaft provided with a pinion, a notched disk and a pair of sprocket wheels mounted upon said hollow shaft, a pinion, and gear wheel connected together and rotatably mounted upon the fixed spindle, means adapted to rotate the pinion, a pinion meshing with the gear wheel rotatably mounted upon the fixed spindle, an arm actuated by said pinion, said arm provided with a toothed segment, and said toothed segment adapted to mesh with the pinion upon the hollow shaft and a detent adapted to engage the notched disk upon the hollow shaft, substantially as and for the purpose specified.

4. In an apparatus of the class described, a frame, a motor shaft and a pinion thereon, a crank shaft provided with a main driving gear wheel and driven from said motor shaft, a bracket pivotally mounted on said crank shaft, means for oscillating said bracket, a

pinion carried by said bracket and moving with said gear wheel, a film sprocket shaft, a loosely mounted pinion, a film feed and a take up sprocket wheel on said sprocket shaft, a gear wheel on said sprocket shaft, a gear wheel rigidly connected to said loosely mounted pinion, a fixed spindle, a pinion and gear wheel rigidly connected together and loosely mounted on said spindle, the latter pinion meshing with the gear wheel on said sprocket shaft, a balance wheel shaft, a pinion thereon, a toothed segment, an arm connected thereto, the toothed segment adapted to impart intermittent rotary movement to a pinion on said spindle, and a film feeding sprocket connected to said intermittently rotated pinion.

5. In a device of the character described, a suitable frame, a fixed spindle thereon an intermittent rotating hollow shaft mounted upon said spindle and having mounted thereon a pair of sprocket wheels adapted to impart intermittent movement to the film, a pinion fixed to said hollow shaft, a toothed segment adapted to intermittently mesh with the pinion, an arm carrying said toothed segment, means for reciprocating said arm and for imparting movement to the segment, substantially as and for the purpose specified.

6. In a device of the character described, a suitable frame, an intermittent rotating shaft provided with a pair of intermittent film actuating sprocket wheels, a pinion mounted upon said shaft, a toothed segment adapted to mesh with said pinion, an arm carrying said toothed segment, means for imparting reciprocating movement to said arm, and said toothed segment a spring adapted to depress said arm, a finger carried by the toothed segment and a cam adapted for engagement with the finger extended from the toothed segment, substantially as and for the purpose specified.

7. In an apparatus of the character described, a stationary frame, a spindle held in fixed position with reference to said frame, a hollow shaft mounted upon said spindle, a pair of intermittent rotating sprocket wheels adapted to impart intermittent rotary movement to a film, cams loosely mounted upon said fixed spindle and a notched disk fixed to the hollow shaft, a detent actuated by one of the cams loosely mounted upon the fixed spindle and adapted to lock the hollow shaft against rotation and means for imparting movement to the hollow shaft when the notched disk is released, substantially as and for the purpose specified.

8. In an apparatus of the character described, a stationary frame, a spindle held in fixed position with reference to said frame, a hollow shaft mounted upon said spindle, a pair of intermittent rotating sprocket wheels adapted to impart intermittent rotary movement to a film, a framing roll located adja-



cent said intermittent rotating sprocket wheels and mounted for adjustment cams loosely mounted upon said fixed spindle and a notched disk fixed to the hollow shaft, a  
 5 detent actuated by one of the cams loosely mounted upon the fixed spindle and adapted to lock the hollow shaft against rotation and means for imparting movement to the hollow shaft when the notched disk is released, sub-  
 10 stantially as and for the purpose specified.

9. In an apparatus of the character described, a stationary frame, a spindle held in fixed position with reference to said frame, a hollow shaft mounted upon said spindle, a  
 15 pair of intermittent rotating sprocket wheels adapted to impart intermittent rotary movement to a film, cams loosely mounted upon said fixed spindle and a notched disk fixed to the hollow shaft, a detent actuated by one of  
 20 the cams loosely mounted upon the fixed spindle and adapted to lock the hollow shaft against rotation and means for imparting movement to the hollow shaft when the notched disk is released the detent being  
 25 pivotally connected to an adjustable bearing, substantially as and for the purpose specified.

10. In an apparatus of the class described, a pair of intermittent film rotating actuating sprocket wheels, means for imparting inter-  
 30 mittent rotary motion to said sprocket wheels, friction blocks located against the inner periphery of one of said intermittent rotating sprocket wheels and means for holding said friction blocks against rotation with the  
 35 intermittent rotation of the film rotating sprocket wheels, substantially as and for the purpose specified.

11. In an apparatus of the class described, a frame, a spindle secured to said frame, a  
 40 hollow shaft rotatably mounted upon said spindle, intermittent sprocket wheels carried by the hollow shaft, a pinion fixed to said hollow shaft, cams loosely mounted upon said fixed spindle, a detent adapted to be ac-  
 45 tuated by one of the cams and a notched disk adapted for engagement with the detent, a toothed segment adapted to mesh with the pinion fixed to the hollow shaft, a cam adapted to intermittently hold the toothed seg-  
 50 ment out of engagement with said pinion located upon the hollow shaft, and means for imparting movement to the toothed segment, substantially as and for the purpose specified.

12. In an apparatus of the character de-  
 55 scribed, a stationary frame, a motor shaft journaled in the frame, a crank shaft journaled in said frame, a shaft carried by the frame, said shaft having fixed thereto film feed and take up sprocket wheels and a pin-  
 60 ion, intermittent rotating sprocket wheels located above said feed and take up sprocket wheels, intermediate gear located between the crank and motor shaft gear a rotary shutter mounted upon a rotary shaft, a pin-  
 65 ion mounted upon said rotary shutter shaft,

and an intermediate gear located between the crank shaft and the pinion on the rotary shutter shaft, said gear adapted to actuate the rotary shutter, substantially as and for the purpose specified. 70

13. In an apparatus of the character de-  
 scribed, a stationary frame, a motor shaft journaled in the frame, a crank shaft jour-  
 75 naled in said frame, a shaft carried by the frame, said shaft having fixed thereto film feed and take up sprocket wheels and a pin-  
 ion, intermittent rotating sprocket wheels located above said feed and take up sprocket wheels, intermediate gear located between  
 the crank and motor shaft gear and a rotary 80 shutter mounted upon a rotary shaft, and a pinion mounted upon said rotary shutter shaft, an intermediate gear located between the power shaft and the pinion on the rotary  
 shutter shaft, said gear adapted to actuate 85 the rotary shutter, and the rotary shutter located between the lamp and the film, sub-  
 stantially as and for the purpose specified.

14. In an apparatus of the class described, a stationary frame, a shaft journaled in the 90  
 frame, a rotary shutter mounted upon said shaft, said shutter consisting of a casing pro-  
 vided with apertures, pivoted plates located within the casing and adapted to close the  
 apertures of the shutter casing, said plates 95 being rotatable with the shutter casing, and means for rotating said shutter casing, sub-  
 stantially as and for the purpose specified.

15. In an apparatus of the class described, a stationary frame, a shaft journaled in the 100  
 frame, a rotary shutter mounted upon said shaft, said shutter consisting of a casing pro-  
 vided with apertures, pivoted curved plates located within the casing and adapted to  
 close the apertures of the shutter casing 105 said plates being rotatable with the shutter casing, means for rotating said shutter cas-  
 ing and shutter plates, and springs connected to said shutter plates and shutter casing,  
 substantially as and for the purpose specified. 110

16. In an apparatus of the character de-  
 scribed, a stationary frame, a motor shaft journaled therein, a pinion mounted upon  
 said motor shaft, a clutch shaft having 115 mounted thereon a gear wheel, said gear wheel adapted to mesh with the pinion on the motor shaft, a crank shaft provided with a gear wheel, said crank shaft and clutch  
 shaft geared together, a bracket concen- 120 trically pivoted with the crank shaft, said bracket provided with a pinion and a gear wheel, a gear wheel rigidly mounted upon the clutch shaft provided with take up and  
 feed film sprocket wheels, said shaft pro- 125 vided with a pulley, a reel shaft having mounted thereon a pulley, said pulley held upon said shaft and adapted to be clutched thereon, and a feed reel clutched to said shaft, substantially as and for the purpose  
 specified. 130



17. In an apparatus of the character described, a stationary frame, a motor shaft journaled therein, a pinion mounted upon said motor shaft, a clutch shaft having  
5 mounted thereon a gear wheel, said gear wheel adapted to mesh with the pinion on the motor shaft, a crank shaft provided with a gear wheel, said crank shaft and clutch shaft geared together, a bracket concentrically piv-  
10 oted with the crank shaft, said bracket provided with a pinion and a gear wheel, a gear wheel rigidly mounted upon the clutch shaft provided with a take up and feed film sprocket wheels, said shaft provided with a pulley,  
15 a reel shaft having mounted thereon a pulley, said pulley held upon said shaft and adapted to be clutched thereon, a feed reel clutched to said shaft, and a take up reel detachably connected to said shaft.

20 18. In an apparatus of the class described, a frame, a reel shaft provided with clutch mechanism, let off and take up film reels mounted upon said shaft, a pulley adapted to be clutched upon the reel shaft, a crank  
25 shaft means for driving the pulley, said means located intermediate the crank shaft and the reel shaft, substantially as and for the purpose specified.

30 19. In an apparatus of the class described, a frame and a reel shaft journaled therein, said reel shaft having mounted thereon feed and take up reels, and a driven pulley, a clutch adapted to simultaneously clutch the driven pulley and the feed reel and release  
35 the take up reel, substantially as and for the purpose specified.

40 20. In an apparatus of the class described, a frame and a reel shaft journaled therein, said reel shaft having mounted thereon feed and take up reels and a driven pulley, a clutch adapted to simultaneously clutch the driven pulley and the feed reel and release  
45 the take up reel, and a film guiding spool, substantially as and for the purpose specified.

50 21. In an apparatus of the character described, a stationary frame, a spindle held in fixed position with reference to said frame, a hollow shaft mounted upon said spindle, a pair of intermittent rotary film sprocket  
55 wheels adapted to impart intermittent movement to the film cams loosely mounted upon said fixed spindle and a notched disk fixed to said hollow shaft, a detent actuated by one of the cams loosely mounted upon the fixed spindle and adapted to lock the hollow shaft against rotation, a gear wheel and a pinion  
60 loosely mounted upon the fixed spindle, means for driving the pinion loosely mounted upon the fixed spindle, a shaft provided with a pinion adapted to mesh with the gear wheel loosely mounted upon the fixed spindle and a balance wheel, a toothed segment actuated by a crank wheel driven by the gear wheel  
65 loosely mounted upon the fixed spindle and a

pinion fixed to the hollow shaft, substantially as and for the purpose specified.

22. In an apparatus of the class described, a frame, a film carrying reel and a film take  
70 up reel, a rotatable shaft carrying said reels, a crank shaft provided with a gear wheel, a pivoted bracket concentrically mounted upon the crank shaft, a shaft having fixed thereto film feed and take up sprocket wheels  
75 intermittently rotating sprocket wheels located above the feed and take up sprocket wheels and guide plates, and guide rolls adapted to guide the upward movement of the film, substantially as and for the purpose  
80 specified.

23. In an apparatus of the class described, a frame, a film carrying reel and a film take  
85 up reel, a rotatable shaft carrying said reels, a crank shaft provided with a gear wheel, a pivoted bracket concentrically mounted upon the crank shaft, a shaft having fixed thereto film feed and take up sprocket wheels  
90 intermittently rotating sprocket wheels located above the feed and take up sprocket wheels and guide plates, and guide rolls adapted to guide the upward movement of the film, and a protecting plate, substantially  
95 as and for the purpose specified.

24. In an apparatus of the class described, a frame, a film carrying reel and a film take  
100 up reel, a rotatable shaft carrying said reels, a crank shaft provided with a gear wheel, a pivoted bracket concentrically mounted upon the crank shaft, a shaft having fixed thereto film feed and take up sprocket wheels  
105 intermittently rotating sprocket wheels located above the feed and take up sprocket wheels and guide plates, and guide rolls adapted to guide the upward movement of the film, a lamp and a protecting plate, oper-  
110 atively connected with the motor shaft and a rotary shutter located back of the film and in front of the lamp, substantially as and for the purpose specified.

25. In an apparatus of the character de-  
115 scribed, a crank shaft provided with a main gear wheel, a clutch shaft provided with a pinion, said pinion adapted to mesh with the main gear wheel, a pivoted bracket carrying a gear wheel, a shaft having mounted there-  
120 on feed and take up film sprocket wheels, pinions mounted upon the shaft carrying the film sprocket wheels, one of said pinions rigidly mounted upon said shaft and the other loosely mounted thereon, the pin-  
125 ion carried by the pivoted bracket being adapted to mesh with the fixed and loosely mounted pinions, intermittent film actuating sprocket wheels coöperatively arranged with relation to said loose pinion and means  
130 for imparting intermittent rotating movement to the intermittent rotating sprocket wheels, substantially as and for the purpose specified.

26. In an apparatus of the class described, 130



a frame, a plate carried by the frame, said plate provided with an exposure aperture, intermittently rotating sprocket wheels located below the film exposure aperture, a framing roll, an adjustable arm carrying said framing roll, a film guide plate carried by said adjustable arm and located adjacent the framing roll, said guide plates provided with springs adapted for engagement with the film, and means for holding the framing roll in fixed adjustment, substantially as and for the purpose specified.

27. In an apparatus of the class described, a stationary frame, a loop plate carried by the frame, an arm connected to said loop plate said arm being pivotally attached to a fixed part of the frame and an operating lever, film feed and take up sprocket wheels and intermittent rotating sprocket wheels the loop plate being adapted for adjustment, intermediate the aforesaid sprocket wheels, substantially as and for the purpose specified.

28. In an apparatus of the class described, a stationary frame, a rotary shutter consisting of a cylindrical shell, and ends or heads, said cylindrical shell provided with exposure apertures curved shutter blades carried by the heads, springs connected to the shutter and to the blades respectively, and a pin adapted to limit the inward movement of the shutter blades, substantially as and for the purpose specified.

29. In an apparatus of the class described, a stationary frame, a rotary shutter consisting of a cylindrical shell and ends or heads, said cylindrical shell provided with exposure

apertures curved shutter blades carried by the heads, springs connected to the shutter and to the blades respectively and a pin adapted to limit the inward movement of the shutter blades, a film exposure plate and the shutter located in the rear of said exposure plate, substantially as and for the purpose specified.

30. In an apparatus of the class described, a frame, provided with a film exposure plate, a framing roll located below said exposure plate, a film guide plate located adjacent the framing roll, said guide plate and framing roll carried by a pivoted arm, intermittent rotating film actuating sprocket wheels and a scraper plate adapted for contact with the film actuating sprocket wheels, substantially as and for the purpose specified.

31. In an apparatus of the character described, a frame, mechanism for actuating a film, a rotary shutter casing, blades carried by said rotary shutter casing and rotatable therewith, a film guide plate provided with an exposure aperture, a lamp, and the rotary shutter and blades being located between the lamp and the guide plate provided with exposure apertures, substantially as and for the purpose specified.

In testimony that I claim the above, I have hereunto subscribed my name in the presence of two witnesses.

JEREMIAH KELLER.

Witnesses:

JOHN H. SPONSELLER,  
F. W. BOND.