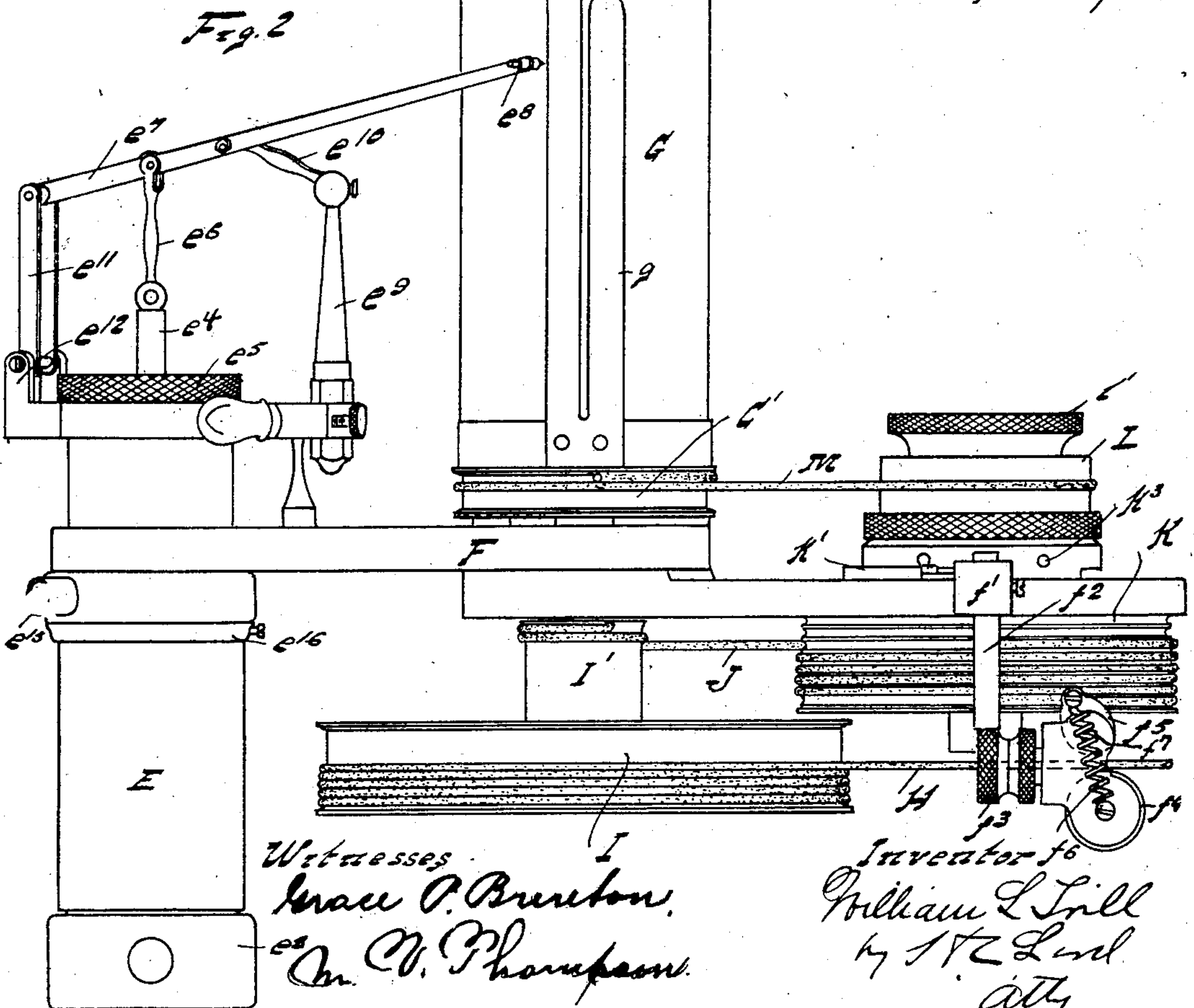
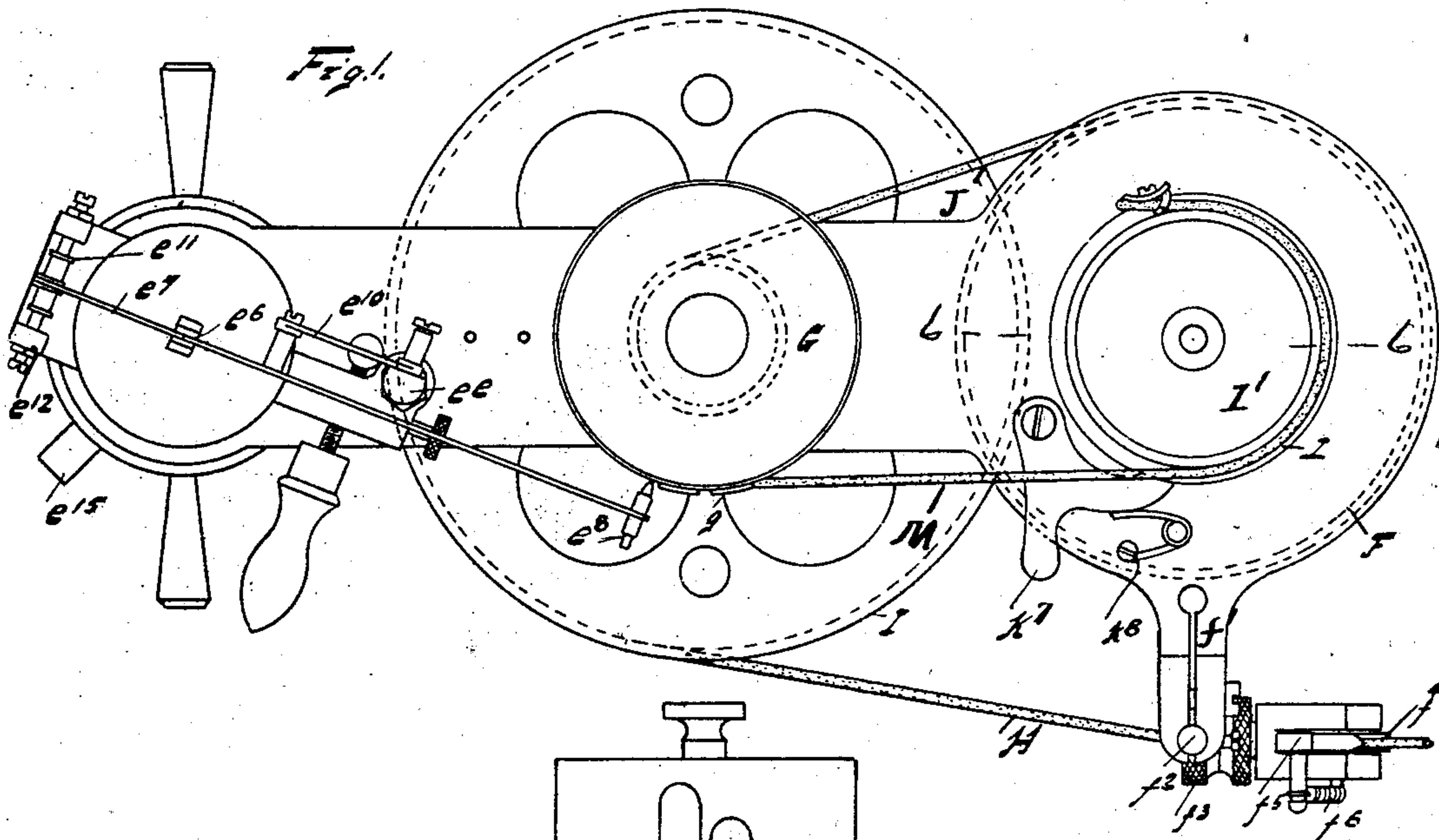


W. L. TRILL.
RECORD INDICATING DEVICE.

APPLICATION FILED FEB. 7, 1902.

NO MODEL.

2 SHEETS—SHEET 1.

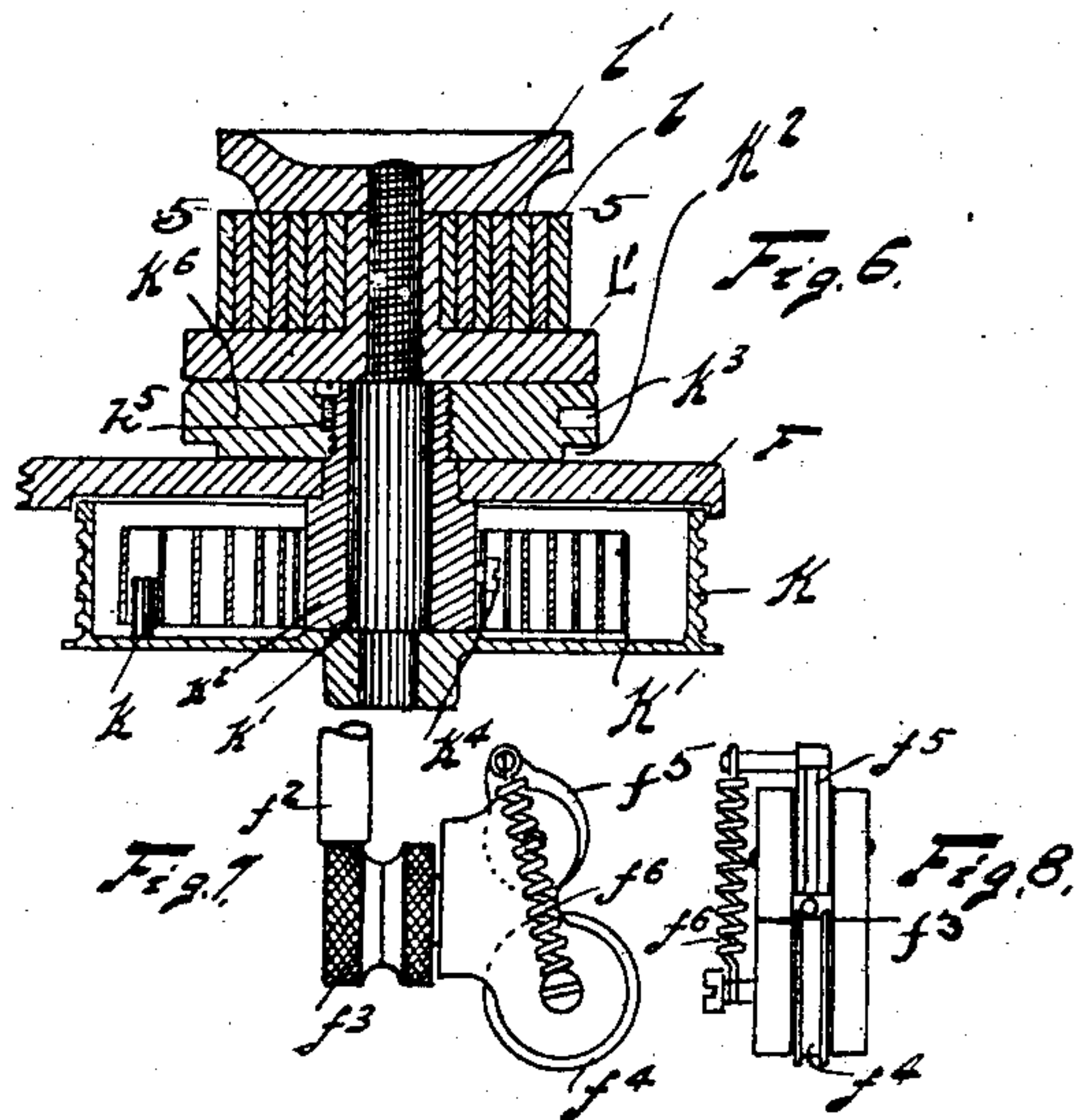
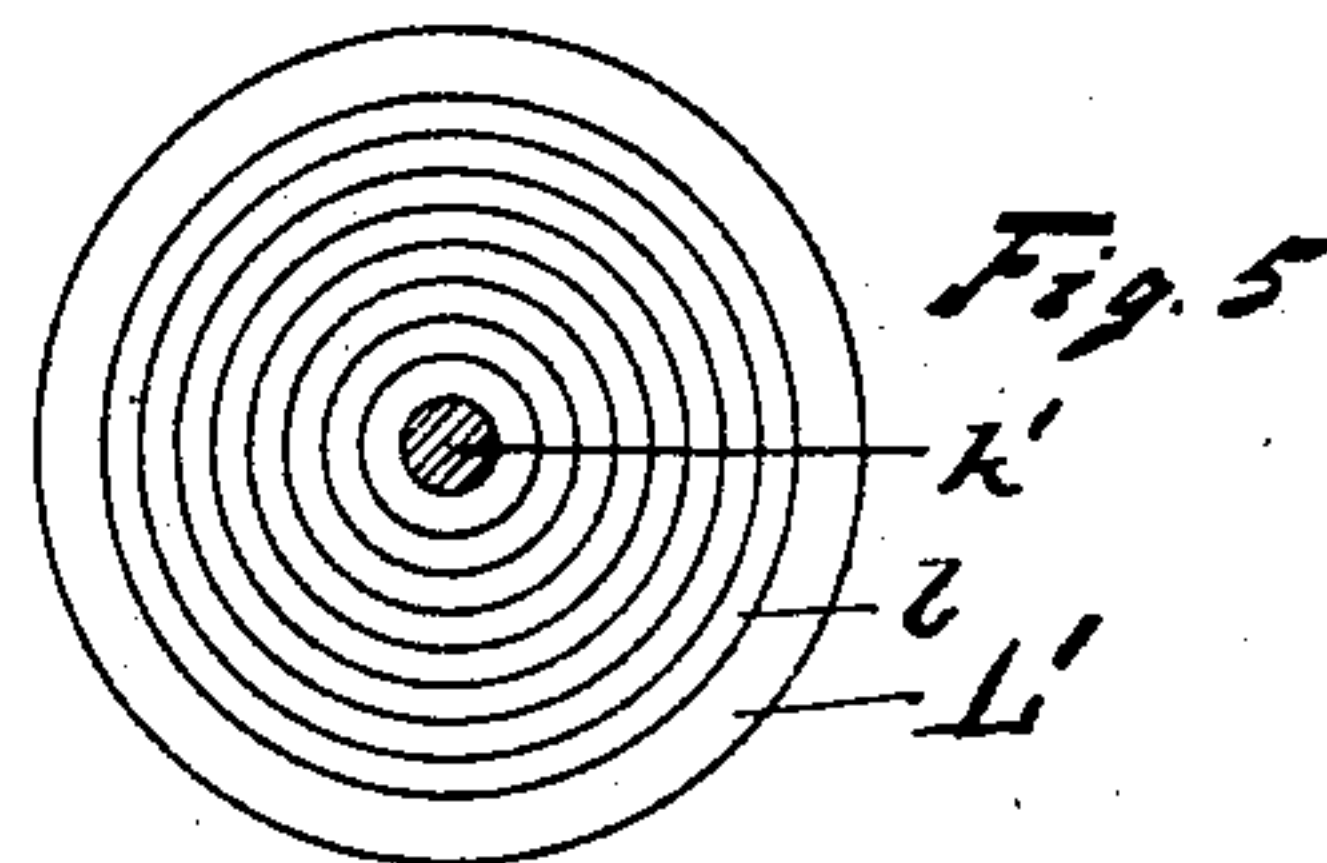
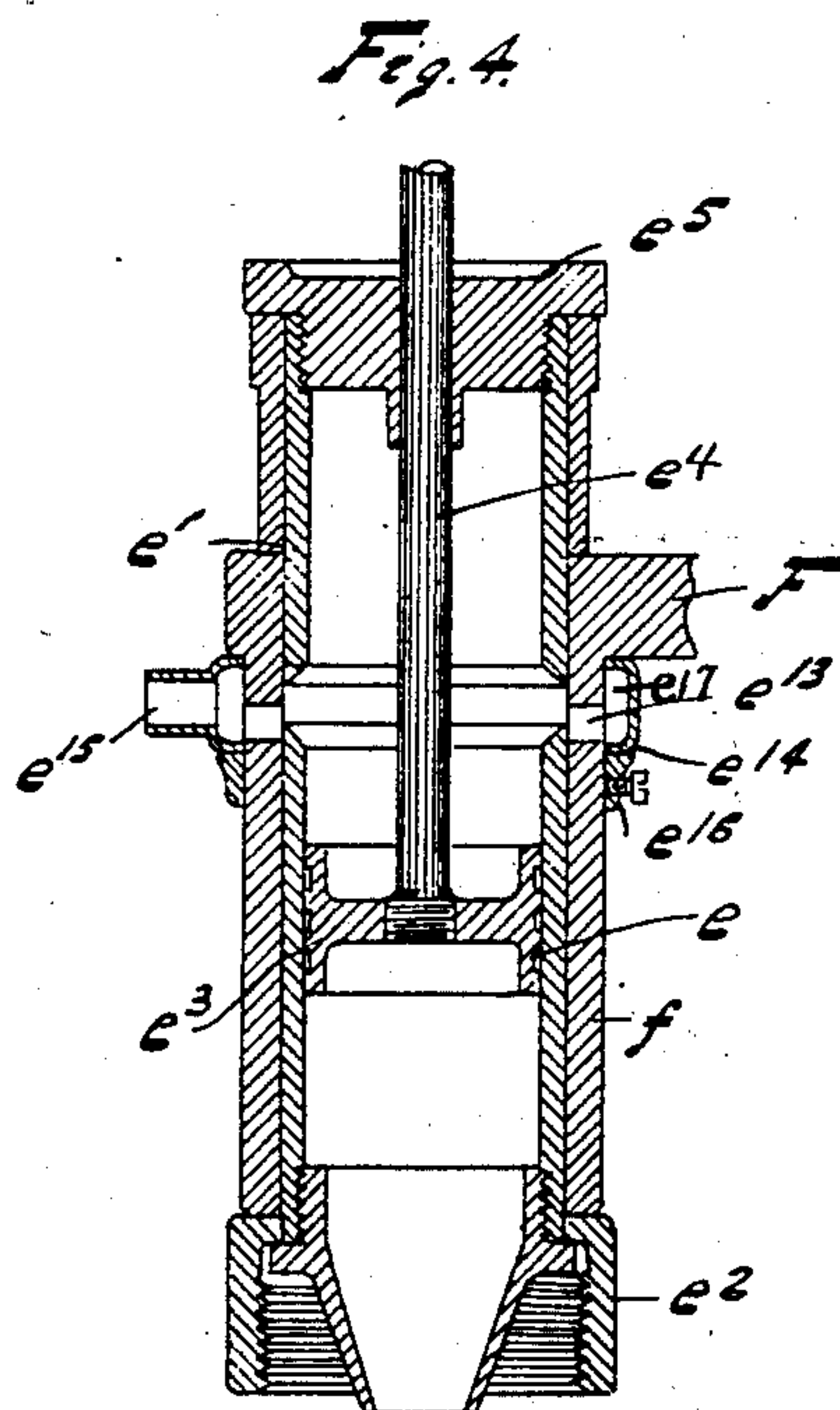
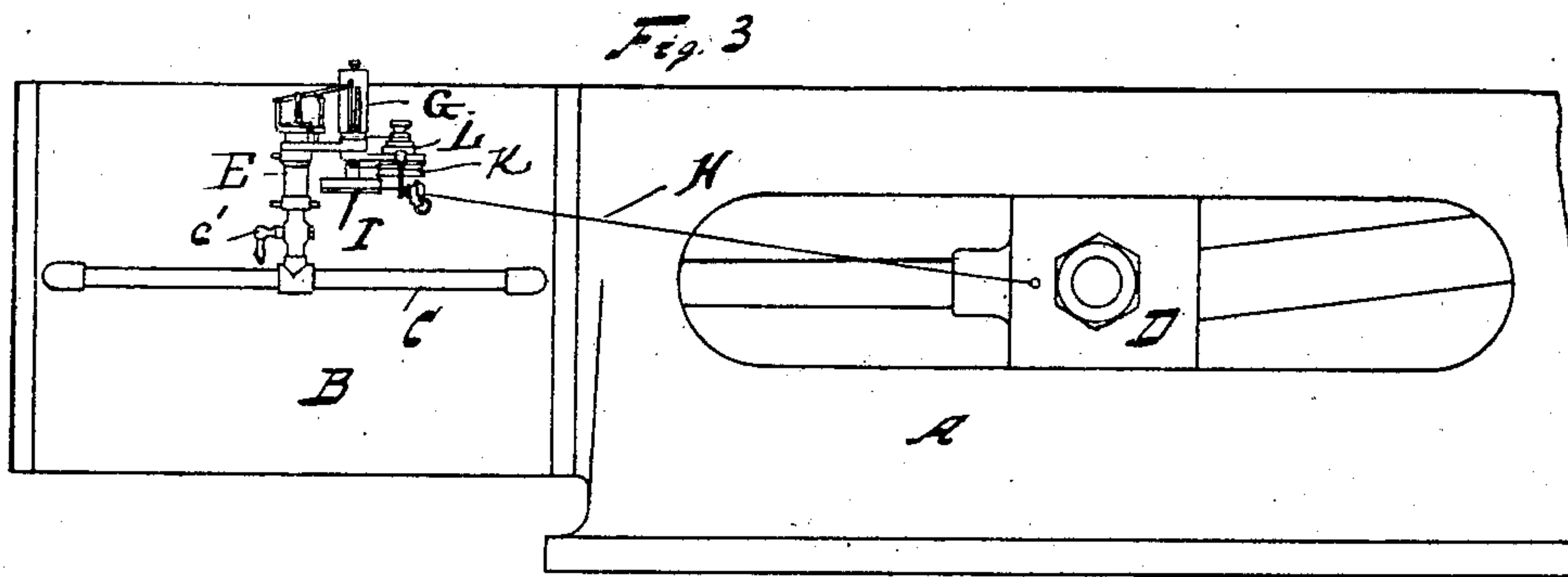


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2 SHEETS—SHEET 2.



Witnesses
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Inventor
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Atty.

UNITED STATES PATENT OFFICE.

WILLIAM L. TRILL, OF CORRY, PENNSYLVANIA.

RECORD-INDICATING DEVICE.

SPECIFICATION forming part of Letters Patent No. 724,525, dated April 7, 1903.

Application filed February 7, 1902. Serial No. 93,105. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM L. TRILL, a citizen of the United States, residing at Corry, in the county of Erie and State of Pennsylvania, have invented certain new and useful Improvements in Record-Indicating Devices; 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.

This invention relates to record-indicating devices; and it consists in certain improvements in the construction thereof, as will be hereinafter fully described, and pointed out in the claims. Devices of this character have heretofore been made along the same general lines as the record-indicator contained in my invention.

The object of my invention is to obviate certain objectionable features which exist in the present structures.

The invention is illustrated in the accompanying drawings, as follows:

Figure 1 is a plan view of the indicator; Fig. 2, a side elevation; Fig. 3, a view showing the indicator connected to an engine; Fig. 4, a section of the pressure-cylinder; Fig. 5, a section of one of the reducing-wheels on the line 5 5 in Fig. 6; Fig. 6, a section on the line 6 6 in Fig. 1; Fig. 7, a side elevation of the locking device; Fig. 8, an end view of the same mechanism.

A marks the engine-bed; B, the engine-cylinder; C, a pipe connection with the ends of the cylinder; e' , a cock controlling said connection with the pressure-cylinder E. The pressure-cylinder is provided with the working portion e , which is placed in the sleeve f , extending from the frame F of the recording-indicator. A union-joint e^2 is provided, by which the cylinder is connected to the pipe C. Extending above the frame F is a portion of the cylinder e' . The plunger or piston e^3 is arranged to work in the cylinder e and is provided with the stem e^4 , which extends from the piston through the cylinder-head e^5 . This piston-stem is connected with the ordinary pencil device, which is as follows: A connecting-rod e^6 connects the stem e^4 with the pencil-lever e^7 . The pencil-lever has the pencil e^8 , arranged to contact a record that

may be placed upon the record-cylinder G. A post e^9 extends upwardly from the frame F and has the link e^{10} , connecting its upper end with the pencil-lever e^7 . The post and connecting-link, in connection with the link e^{11} at the rear end of the lever e^7 , form an actuating means for the pencil-lever e^7 , so that the pencil moves in substantially a vertical line. The link e^{11} is connected to the post e^{12} . The mechanism so far as described is similar to that now in common use.

It is customary to provide an opening to the cylinder above the piston e^3 to permit the escape of any waste of steam or water by the piston. In the present instance an opening e^{13} is provided for this purpose. The escape of steam from these openings is often so directed as to make the manipulation of the device inconvenient. To obviate this, I have provided the annular ring e^{14} , having the annular groove e^{17} , with the opening e^{15} . This ring is held in place by the ring e^{16} , which is fixed on the cylinder. The openings e^{13} all open in the groove e^{17} , and steam is conducted around this groove to the opening e^{15} . As the ring e^{14} may be turned on the cylinder, the opening e^{15} may be placed in any direction most convenient.

The record-cylinder G is of the usual construction. It has the clips g for securing the record-paper upon the cylinder. A flexible connection H operates upon a wheel I and is connected to a cross-head D or some other reciprocating part of the engine, so as to be drawn in one direction by the reciprocating part in unison with the piston of the engine, a record of which is to be taken. The hub I' above the pulley I forms a reduced pulley, on which operates the cord J. The cord J passes from the pulley I to the pulley K. The pulley K is spring-actuated, so as to keep the cords H and J under tension and give a return movement to the pulleys as the cross-head D moves toward the cylinder B. The pulley K is connected with and drives a pulley L. This is connected by the cord M with the pulley C' at the bottom of the cylinder G. Spring mechanism (not shown) is arranged in the cylinder G, as in common construction. Heretofore the record movement has been stopped by stopping the cylinder G. The cords H, J, and K were therefore loosened

and were liable to tangle. To obviate this is one of the principal features of my invention, and to accomplish it I provide the following mechanism: A lug f' extends from the frame
 5 F, and a post f^2 extends from this lug and is adjustable in the lug. An actuating mechanism is carried by the bracket f^3 , through which extends a hole for actuating the cord
 10 H. A pulley f^4 is arranged in this bracket to relieve the cord of some friction. Opposite this pulley I place the cam f^5 , which is pivoted in the bracket at f^7 . The spring f^6 is secured to this cam and extends in a direction to be carried past the pivot f^7 when the
 15 cam is in its outer position, thus locking the cam in this position. When the cam is pressed inwardly past the pivot f^7 , the spring f^6 instantly draws the cam into contact with the cord H and so engages it as to overcome
 20 the action of the springs in the spring-pulleys on the cord, so that while the cord may be pulled out through the guide by movement of the cross-head or reciprocating part its return movement is locked by the cam. Thus all
 25 the cords or flexible connections of the device are kept under the tension of the springs and all tangling avoided. In operation when it is desired to take a record the cam is placed in engagement and the engine immediately
 30 pulls the cord out to its extreme length. As the cross-head continues to reciprocate the cord H simply runs loosely, but does not actuate the indicator mechanism. When an indication is desired, the cam is moved out
 35 of engagement with the cord, so that the springs of the pulleys are brought into action and the cord H is kept taut. Thus the engine pulls the recording-cylinder G in one direction and the springs return it. The spring
 40 should be of sufficient tension to keep the cord H taut, so that the movement of the cylinder on the return movement will be in unison with the movement of the piston of the engine, and consequently the record correctly
 45 made. It is desirable that the spring tension operating against the cord H should be only sufficient to keep the cord taut during the operation with the engine, so that the parts of the indicator may be subjected to as little
 50 strain as possible. Whether the cord is kept taut or not can be readily ascertained by observation as the apparatus is in operation. It is desirable, therefore, that the spring tension may be varied while the apparatus is being
 55 operated. I provide a mechanism whereby this may be accomplished, as follows: The spring-pulley K is fixed on a shaft or pin k' . This shaft extends through the hollow post k^2 . Its upper end is threaded and a disk L' ,
 60 forming the base of the pulley L, screwed onto it and locks with it by the thumb-screw l' , so that as the pulley K is driven the pulley L is driven with it. The post k^2 is journaled in the frame F and has its upper end threaded. A disk K^6 is screwed onto this end and keyed with it by the screw-key k^5 . This disk is provided with the ratchet-notches K^2

and perforations K^3 . The ratchet-dog K^7 is arranged to operate in these notches. It is thrown into position by the spring K^8 . The
 70 spring K^8 is of the clock-spring type. Its outer end is placed on the post k , extending upwardly from the inner face of the pulley K. Its inner end is secured by the screw k^4 with the post k^2 . This spring is tensioned to
 75 operate in opposition to the outward movement of the cord H and the movement of the cord J to the pulley I'. By placing a small pin in the perforations k^3 the disk K^6 may be turned, thus adjusting the tension of the
 80 spring, and the spring may be locked in its adjusted position by the ratchet-dog K^7 . This adjustment may be accomplished while the device is in operation. In order that the record-cylinder may make one complete oscil-
 85 lation with each reciprocation of the engine, the pulley L may be enlarged or reduced in size, said pulley being made up of a series of rings l . The diameter of the pulley L may be varied by varying the number of rings
 90 used. These are secured in place by the nut l' .

The device as shown is adapted to what is known as a "reducing-wheel;" but it will be understood that the ring e^{14} is adapted to any
 95 indicator devices using the pressure-cylinder and that the locking device for the cord H may be used where no intermediate wheels are used.

What I claim as new is—

1. In a record-indicating device, the combination with the recording means; of a flexible means for connecting said recording means with the reciprocating part and for actuating
 100 said recording means in one direction; means for actuating the recording means to effect a return movement; and means for engaging said flexible means to lock the mechanism against said return movement.

2. In a record-indicating device, the combination with the recording means; a flexible
 110 means for connecting said recording means with the reciprocating part and for actuating it in one direction; a spring mechanism for actuating the recording means to effect a return movement; and means for engaging said flexible means to lock the mechanism against
 115 said return movement.

3. In a record-indicating device, the combination of an oscillating recording means; a
 120 pulley arranged to actuate said recording means; a flexible means arranged on said pulley adapted to be connected to a reciprocating part; a spring mechanism actuating said pulley to effect a return movement; and
 125 a locking device arranged to engage said flexible means and lock the mechanism against a return movement.

4. In a record-indicating device, the combination with the recording means; a flexible
 130 means for connecting said recording means with a reciprocating part and for actuating it in one direction; means for actuating the recording means to effect a return movement;

and means for engaging said flexible means to lock the mechanism against said return movement, said engaging means arranged to permit of a primary movement of said flexible means.

5. In a record-indicating device, the combination with an oscillating recording means; a pulley arranged to actuate said recording means; a flexible means arranged on said pulley and adapted to be connected to an engine; a spring mechanism for actuating said pulley to effect a return movement of the pulley; and a locking device arranged to engage said flexible means to lock the mechanism against said return movement, said locking device being arranged to permit of a primary movement of said flexible means.

6. In a record-indicating device, the combination with the recording means; of a flexible means for connecting said recording means with a reciprocating part and for actuating said recording means in one direction; means for actuating the recording means to effect a

return movement; means for engaging said flexible means to lock the mechanism against said return movement; and a spring arranged to actuate said engaging means and to hold it both in and out of engaging position.

7. In a record-indicating device, the combination with the recording means; a flexible means for connecting said recording means with the reciprocating part and for actuating said recording means in one direction; means for actuating the recording means to effect a return movement; the guide-bracket f^3 , for said flexible means; the cam f^5 , arranged to operate upon said flexible means; and a spring f^6 , arranged to be thrown by the pivot of the cam f^5 , to lock said cam in and out of engaging position.

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

WILLIAM L. TRILL.

Witnesses:

GERRY T. KINCAID,
C. H. KENNEDY.