

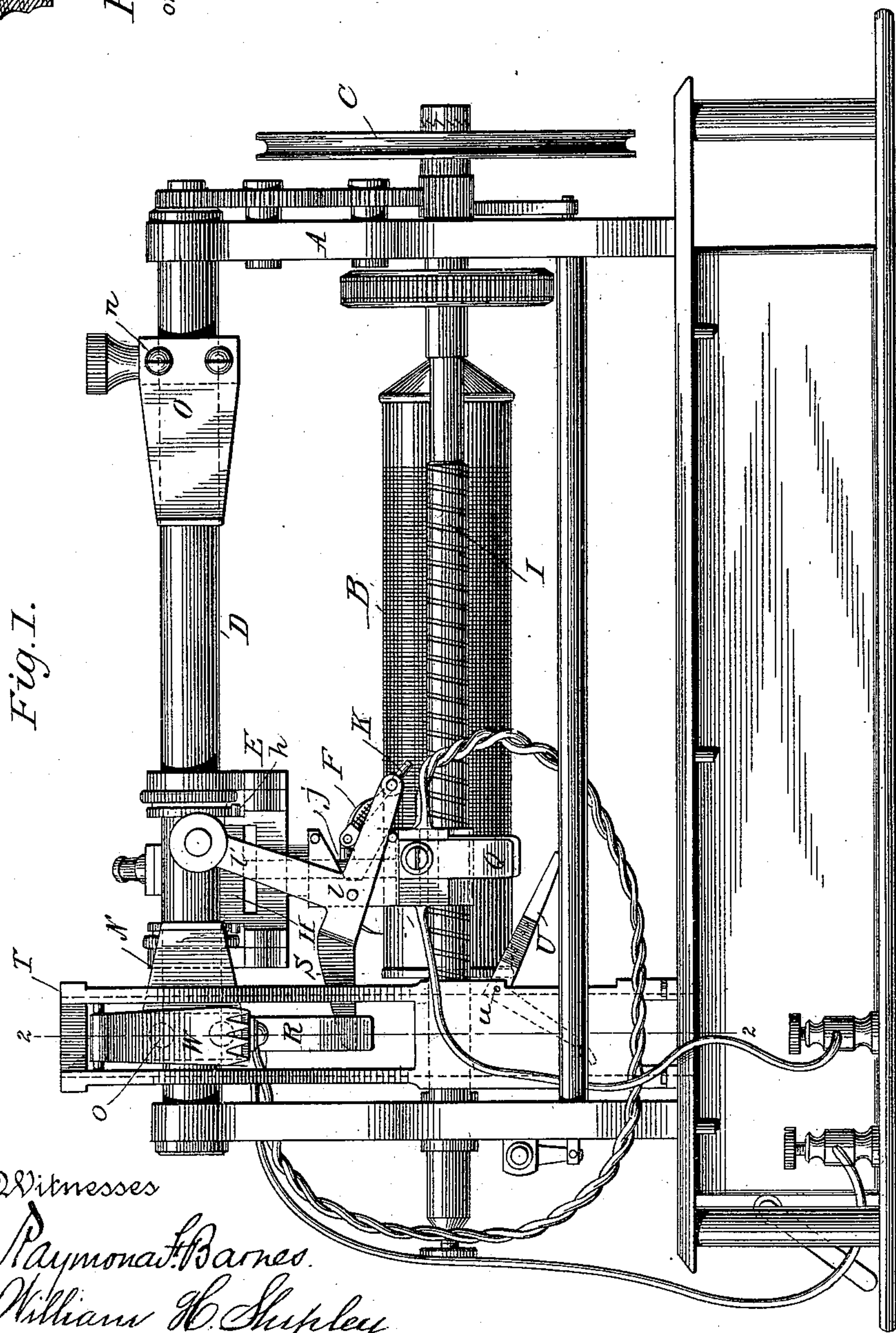
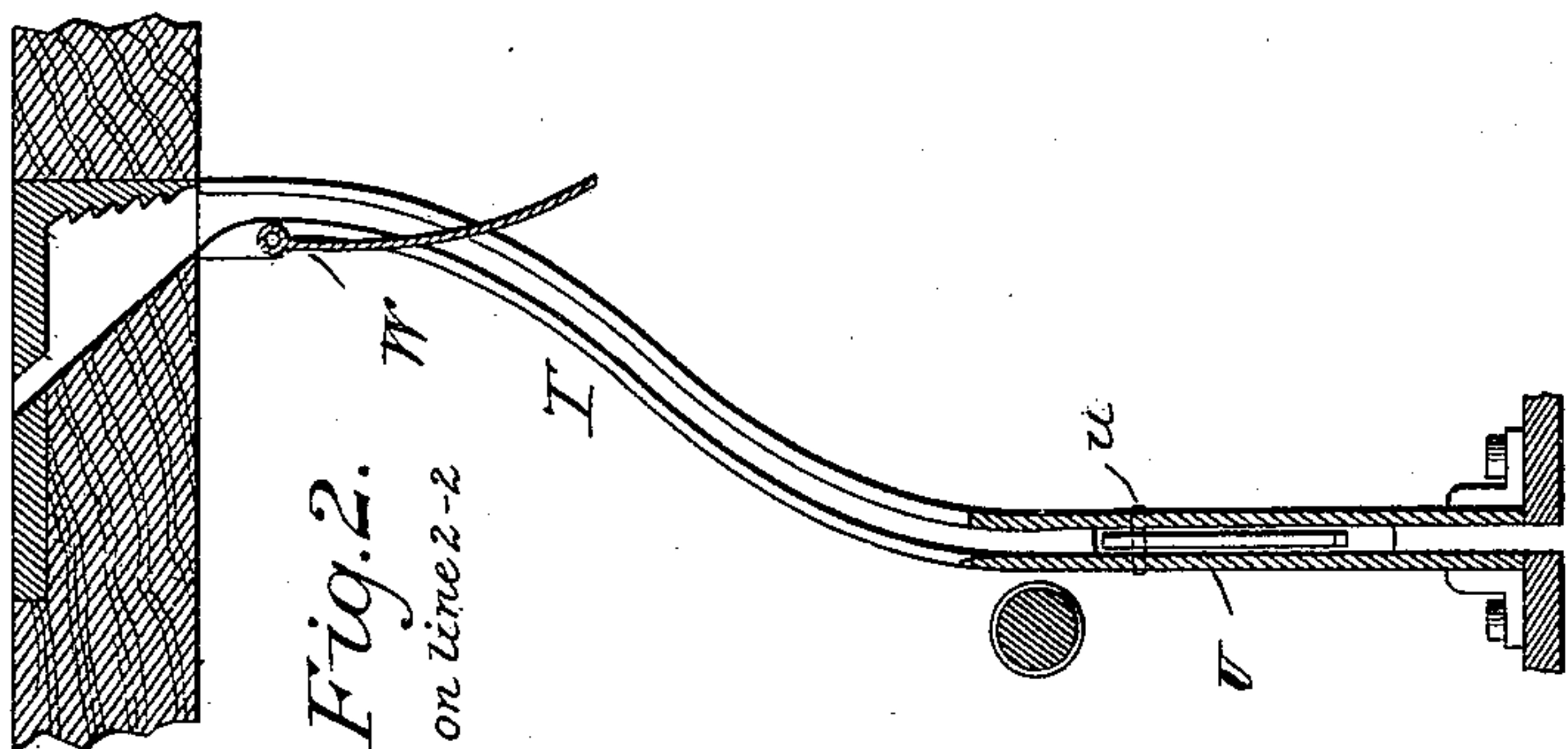
(No Model.)

2 Sheets—Sheet 1.

T. H. MACDONALD.
COIN CONTROLLED PHONOGRAPH.

No. 523,748.

Patented July 31, 1894.



Witnesses

Raymond H. Barnes.
William H. Shipley.

Inventor
T. H. Macdonald.
By P. T. Lodge
Attorney

(No Model.)

2 Sheets—Sheet 2.

T. H. MACDONALD.
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Fig. 3.

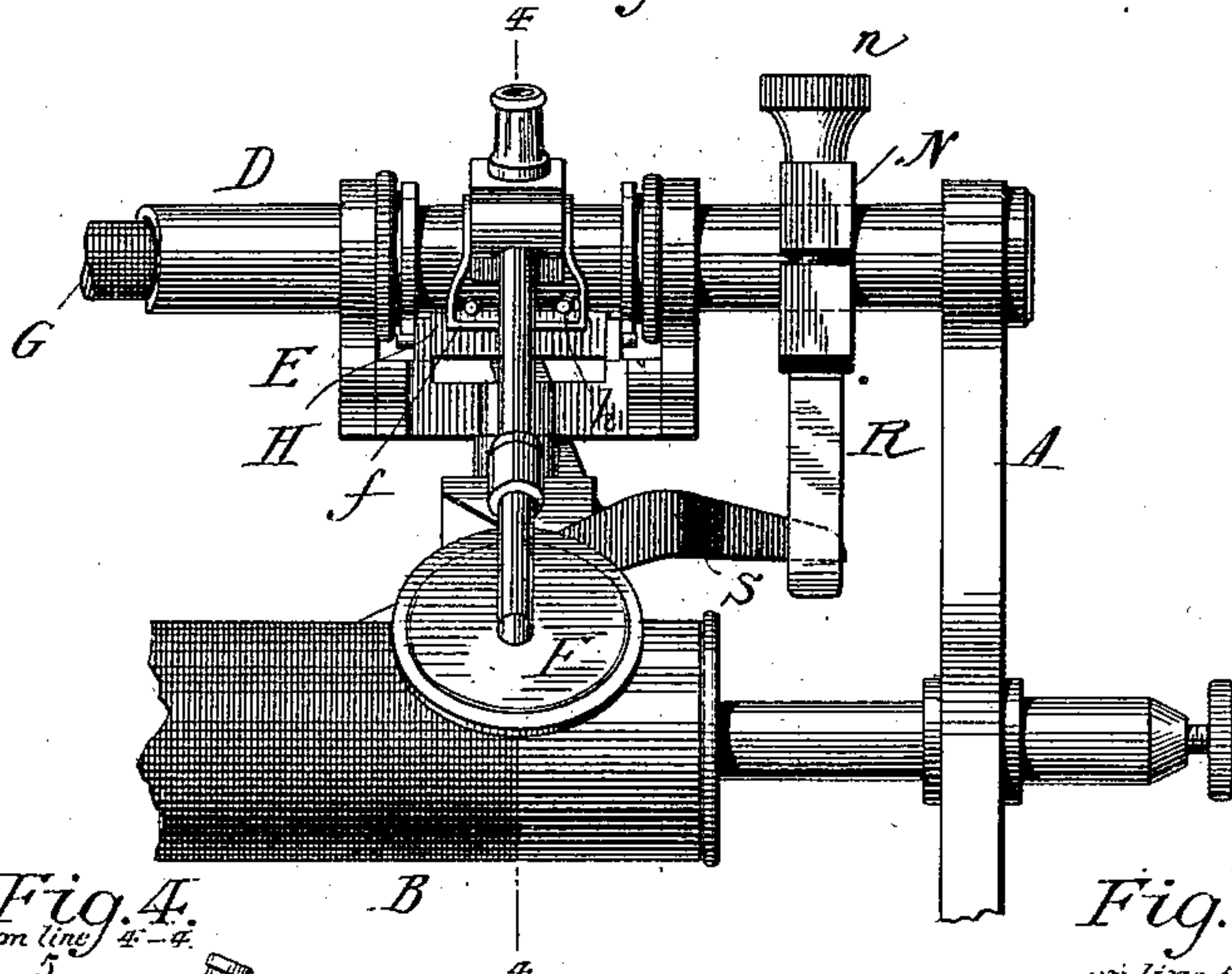


Fig. 4.
on line 4-4.

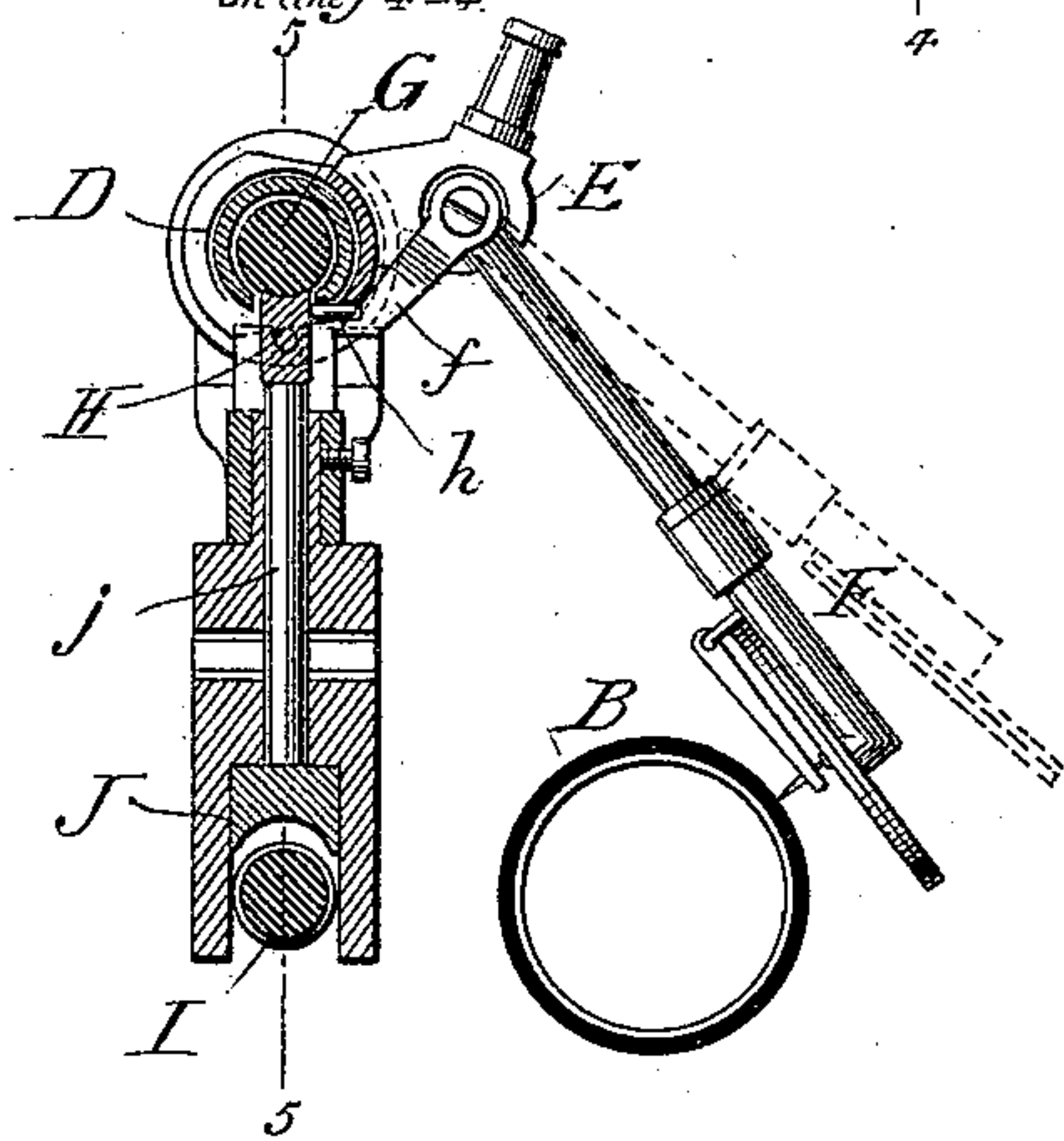


Fig. 5.
on line 5-5.

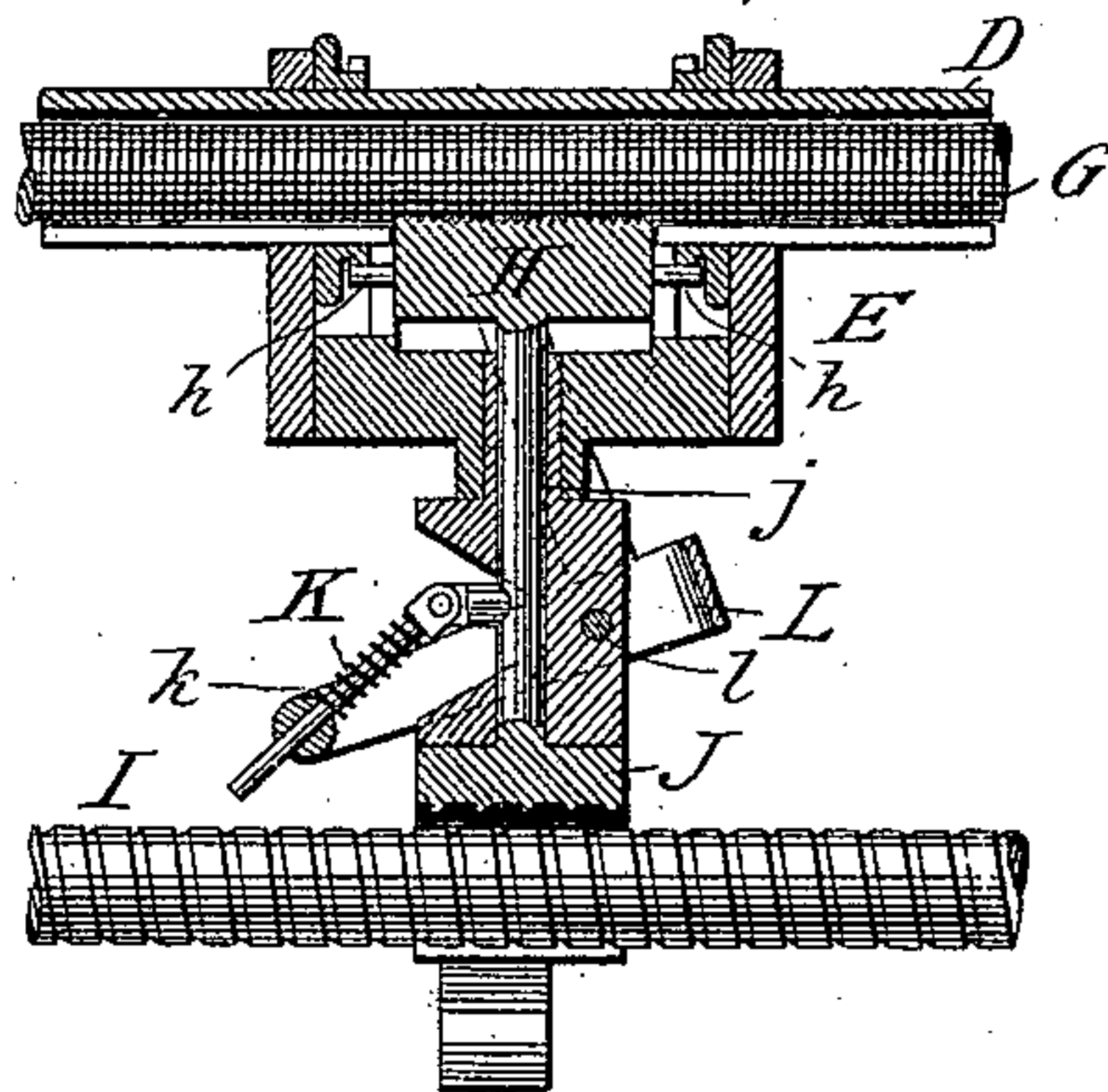
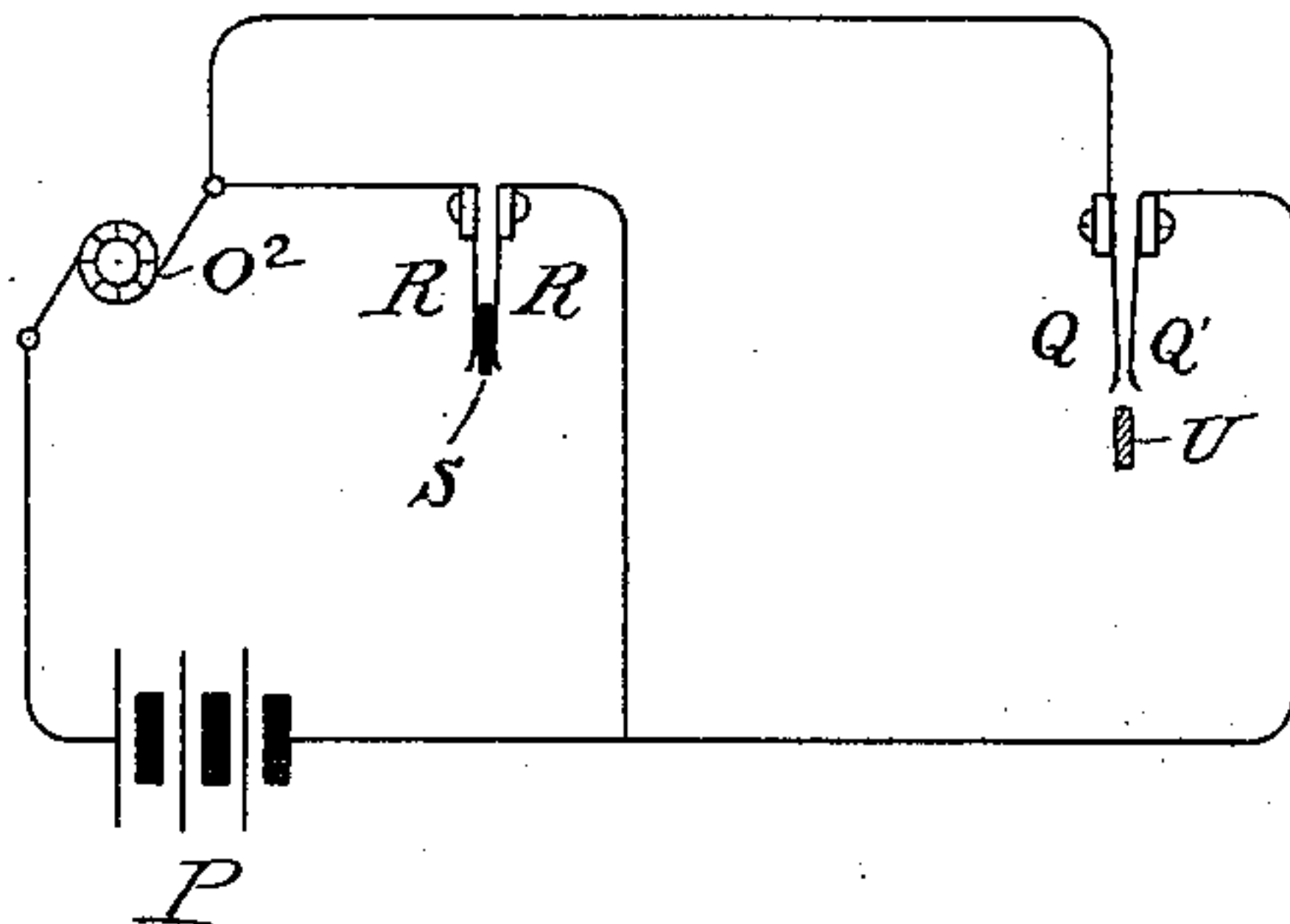


Fig. 6.



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UNITED STATES PATENT OFFICE.

THOMAS H. MACDONALD, OF BRIDGEPORT, CONNECTICUT.

COIN-CONTROLLED PHONOGRAPH.

SPECIFICATION forming part of Letters Patent No. 523,748, dated July 31, 1894.

Application filed December 31, 1891. Serial No. 416,622. (No model.)

To all whom it may concern:

Be it known that I, THOMAS H. MACDONALD, of Bridgeport, county of Fairfield, and State of Connecticut, have invented a new and useful Improvement in Coin-Controlled Phonographs, of which the following is a specification.

This invention has reference to coin-actuated devices for controlling the operation of a graphophone, phonograph or equivalent instrument.

In accordance with my invention the machine is operated in any ordinary or approved manner by an electric motor in a normally open circuit containing a battery or other source of electric energy. When a suitable coin is introduced it momentarily closes the circuit to initiate the operation of the machine. As the machine begins its operation it closes the circuit through a shorter course, at the same time, opening it at the first point. The closure through the second or shorter course is maintained until the machine has reproduced the entire record and the parts have returned to their normal or starting position when the circuit is again automatically opened.

It is the arrangement of mechanism for automatically effecting the above described action that constitutes the essence of my invention. I have also combined with automatic devices means for effecting quick restoration of the parts to their normal or starting position after they have reproduced the entire record.

My improvements are susceptible of embodiment in various forms, and are applicable alike to the instrument known in the art as the "graphophone," to the phonograph, and to other machines or instruments of similar character.

For purposes of illustration I have shown the improvement applied to the graphophone.

In the accompanying drawings,—Figure 1 is a side elevation of a machine containing my improvement. Fig. 2 is a vertical cross-section on the line 2—2 in Fig. 1. Fig. 3 is a side elevation of the carriage and attendant parts. Fig. 4 is a cross-section on the line 4—4 in Fig. 3. Fig. 5 is a vertical longitudinal section on the line 5—5 in Fig. 4. Fig. 6 is a diagram illustrating the circuits.

Referring to the drawings,—A represents the rigid main-frame; B, a horizontal cylinder commonly known as the "record cylinder," having a continuous spiral groove formed in its outer surface. This cylinder is sustained by the usual revolving supports rotated through intermediate gear from a driving pulley C, in the usual manner, represented in numerous patents heretofore granted.

D represents a horizontal tubular guide fixed in the top of the frame, serving to sustain the carriage E, to which the gravitating diaphragm frame F, is hinged as usual, so that as the carriage moves along the guide the style will ride in the record groove and impart to the diaphragm movements such as to reproduce the recorded sounds in a manner well understood in the art. The advance of the carriage slowly along the guide and cylinder is effected by means of a feed screw G, mounted within the guide D, and engaging a vertically-movable segmental nut H, mounted in the top of the carriage and vertically-adjustable. The feed-screw G, is connected at one end with the driving-gear so that the screw receives a slow motion constantly in one direction.

For the purpose of effecting a quick return movement of the carriage I provide a second feed-screw I, mounted longitudinally in the frame and geared at one end to the driving-train. This second screw is provided with a thread of rapid pitch arranged to engage a vertically-movable nut J, connected with the upper nut H, by a vertically-sliding stem or rod j, so that when the upper nut is depressed and disengaged from the upper screw the lower end is engaged with the top of the lower screw, which is so driven as to move the carriage rapidly downward to the starting-point, carrying with it the diaphragm-frame so that it will be in position to commence operations anew.

It is obvious that during the return movement of the carriage the diaphragm-frame must be lifted and upheld to keep the style out of the record groove. This is effected, as shown in Figs. 3 and 4, by providing the hinged arm which carries the diaphragm-frame with a laterally-projecting member f, in the shape of a stirrup and providing the upper nut H, with laterally-projecting studs

h, so that when the upper nut is depressed and disengaged from the feed-screw, preparatory to the return of the carriage, the nut H, acting on the stirrup f, will throw the diaphragm-frame upward, as indicated in dotted lines, and thus hold the style above and out of contact with the cylinder during its return movement thereover. When the nut is again raised to engage the feed-screw it permits the diaphragm frame to fall to its operative position. The nuts are held in their upper and lower positions alternately by the devices shown in Fig. 5, in which K represents a small stem or spindle pivoted to the stem which connects the nuts and projected through one end of a stirrup L, mounted on a horizontal pivot l, passing through the carriage. A spiral spring k, encircling the spindle K, and bearing within the end of the stirrup acts, when the end of the stirrup is depressed, as shown in full lines in Fig. 5, to hold the nuts upward, or when the end of the stirrup is elevated to press the nuts downward. This action will be readily understood when it is observed that the motion of the stirrup raising and lowering the outer end of the spindle K, changes its inclination so that the spring will press upward or downward upon the nuts. This shifting of the nuts it will be seen, reverses the motion of the carriage without reversing or stopping the action of the screws or driving gear.

The reversing action is rendered automatic by means of stops N and O, fixed on the horizontal guide in position to encounter a roller on the end of an upreaching arm l', of the stirrup L, as plainly indicated in Fig. 1. As the carriage returns to its normal position as shown at the left hand in Fig. 1, the roller encounters the stop N, and as the carriage continues its movement to the left the stirrup L is caused to turn over on its center until the spring finally "passes the center," whereupon the movement is continued by the spring so as to throw the upper nut into action and the lower nut out of action, leaving the machine in position to begin the record. As the machine moves to the right the roller encounters the stop O, by which the position of the stirrup is reversed, and the upper nut disengaged, the diaphragm-frame lifted and the lower nut engaged to effect the automatic return of the carriage. The stops N and O are both divided transversely and provided with contracting or binding screws n and o, whereby they may be fixed in position at any suitable point in the length of the guide N. In this way the distance through which the carriage moves and the points at which its action begins and ceases may be controlled at will according to the length of the record upon the cylinder.

Passing now to the electric connections it is first to be noted that an electric motor of any suitable form may be employed and belted directly to the driving-pulley C, or otherwise connected to the machine.

Referring to Fig. 6, O² represents a motor

contained in a circuit which includes a battery or generator P, and two terminal springs Q and Q', which stand normally out of contact so that the circuit is open at this point. Within the main circuit there is a secondary shunt or short circuit terminating in two spring fingers R R', which tend to close together against each other and keep the circuit closed through the motor. When the carriage is at the starting point an insulated finger S, on the stirrup L, projects between the contact fingers R R', and holds the circuit open so that it stands open normally at two points. Within or adjacent to the main-frame there is fixed a skeleton tube or guide T, adapted to receive and conduct into a receptacle below a coin of predetermined size. Near the bottom of this tube and projecting at one end into the same there is an angular finger U, mounted on a pivot u, and having its outer end formed of conducting material. When a coin is dropped into the tube it acts against and depresses the inner end of finger U, causing its outer end to rise between the fingers Q Q', and thus close the circuit through the motor to start the machine. The fingers Q Q' are mounted on the carriage so that as the latter advances the fingers Q Q' are carried away from the finger U, and the original circuit thus opened. Before this occurs, however, the insulated finger S, moving with the carriage, is drawn from between the fingers R, which are thus allowed to close together so as to establish the new and shorter circuit through the motor. This circuit remains closed until the carriage has moved outward and returned. As the carriage completes its return movement the stirrup L being tilted over to the position shown in Fig. 1, to reverse the feed, at the same time lifts the finger S, upward between the conductors R, thus opening the circuit. During the earlier part of the advance of the carriage and while the fingers Q are still in contact with the lever U, they hold the latter in such position as to prevent the coin from passing below it. The moment, however, that the fingers Q are carried beyond the lever U, the latter is permitted to fall at its inner end and allow the coin to pass onward into the receptacle below.

In order to prevent the fraudulent extraction of the coin after its introduction into the tube to prevent coins of improper sizes from setting the machine in action I make the tube T, as before mentioned, of skeleton form, that is to say, I cut away its front and rear walls longitudinally at the upper end through the middle, so as to leave only the portion necessary to receive and guide the edges of the coin. If the coin be of less than the proper diameter it will escape from the tube before reaching the finger U. Near the top of the tube, which is inclined laterally, I pivot a gravitating plate W, the lower end of which is toothed or serrated and arranged to hang through the opening in the tube. This plate

will yield readily and pass out of the way of descending coin. If, however, an attempt be made to extract the coin by means of a cord the latter will enter between the top of the plate and the coin carried behind the plate so as to prevent its outward passage.

Having thus described my invention, what I claim is—

1. In a coin-actuated phonograph, the combination with the traveling carriage for the reproducer, of two electrodes arranged in proximity to each other on said carriage and constituting the terminals of a circuit for the actuating motor, a relatively stationary coin-actuated lever adapted to make contact with and complete the circuit through said electrodes, said circuit being broken by the movement of the electrodes away from contact with said lever, substantially as described.

2. In a coin-actuated phonograph the combination with the traveling carriage for the reproducer, of two electrodes arranged in close proximity to each other on said carriage and constituting the terminals of a primary circuit for the actuating motor, a relatively stationary coin-actuated lever adapted to make contact with and complete the primary circuit through said electrodes, said circuit being broken by the movement of the electrodes away from contact with said lever, and a secondary circuit for the actuating motor which is completed simultaneously with the breaking of the primary circuit, substantially as described.

3. In combination with a phonograph having a movable carriage, a circuit including the motor spring contact fingers in said circuit, and an insulated arm on the carriage arranged to enter between and separate said contact fingers as the carriage returns to the starting-point.

4. In combination with a phonograph having a movable carriage, the motor circuit terminating in fingers R R', normally in contact with each other the finger S mounted on the carriage in position to enter between said fingers on the return of the carriage to open the circuit and hold the same open.

5. In combination with a phonograph having a movable carriage, a primary motor circuit with terminals on the carriage, the coin-operated lever U to temporarily close said circuit, the secondary motor circuit terminating in stationary fingers R R', and a finger S mounted on the carriage to open the secondary circuit.

6. In a phonograph the combination with the traveling carriage and feed and return screws, of two nuts, one for each of said screws, through which motion is transmitted to the

carriage and an actuating spring for pressing said nuts alternately into engagement with the respective screws, substantially as described.

7. The combination with the feed and return screws, of two nuts, one for each of said screws, carried by a common stem, a spring acting upon said stem to alternately engage said nuts with the screws, respectively, and means for changing the position of and releasing said spring to exert its tension in different directions, substantially as described.

8. The combination with the feed and return screws and the traveling carriage, of two nuts, one for each of said screws, carried by a common stem, through which screws motion is transmitted to the carriage, a spring acting upon said stem, and a tilting stirrup for changing the position of and releasing said spring to alternately snap said nuts into engagement with their respective screws, substantially as described.

9. The combination with feed and return screws and a traveling carriage, of two nuts, one for each screw, adapted to alternately engage with the screws respectively, of a stirrup on the carriage and means for tilting said stirrup to change the position of the nuts, substantially as described.

10. The combination with the carriage, feed and return screws and nuts for engagement with the screws, of a pivoted stirrup, an actuating spring between said nuts and stirrup, and stops for tilting said stirrup to alternately engage said nuts with the screws respectively, substantially as described.

11. The combination with the reproducer having a depending stirrup at the pivoted end thereof, of a pin or projection engaging in said stirrup and lifting the reproducer from the phonogram when the carriage is actuated by the return screw, substantially as described.

12. In a phonograph the combination with the traveling carriage, the feed and return screws, and the connected nuts adapted to be thrown alternately into and out of engagement with the respective screws, of the pivoted stirrup L and the spring between said stirrup and nuts adapted to hold the latter in either position, according to the position of the stirrup.

In testimony whereof I hereunto set my hand, this 23d day of November, 1891, in the presence of two attesting witnesses.

THOMAS H. MACDONALD.

Witnesses:

E. A. FARGO,

CHAS. K. THOMPSON.