

No. 764,931.

PATENTED JULY 12, 1904.

F. W. DRAPER.
WINDING AND REWINDING MECHANISM.

APPLICATION FILED APR. 13, 1903.

NO MODEL.

Fig. 1.

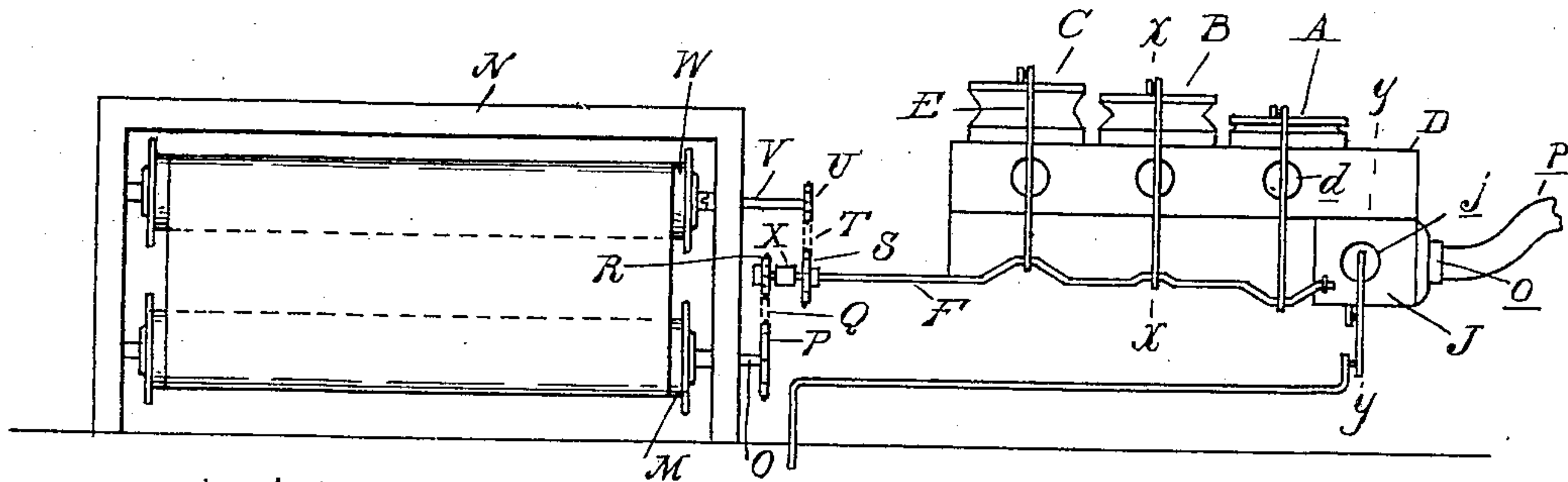


Fig. 2.

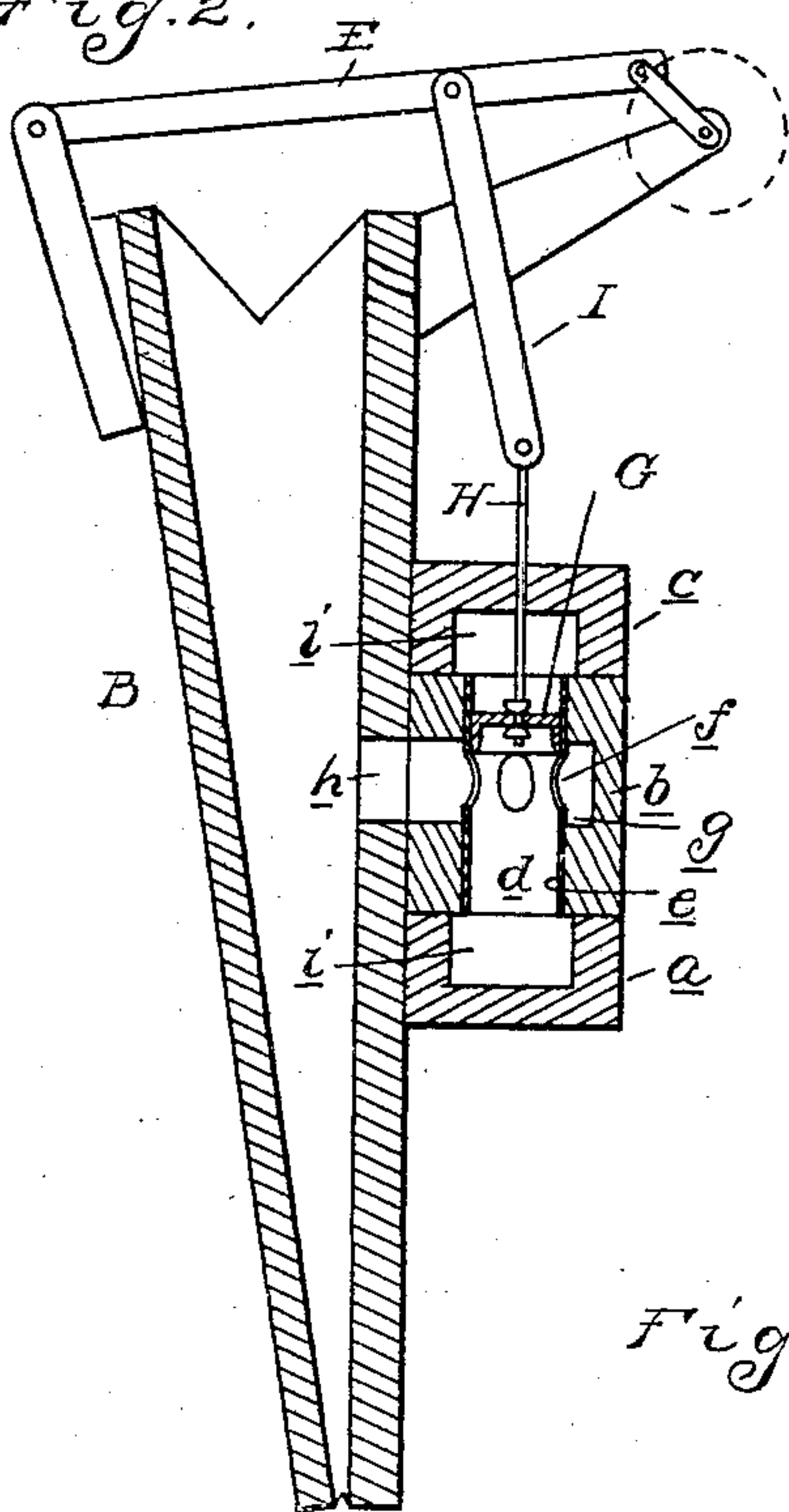


Fig. 3.

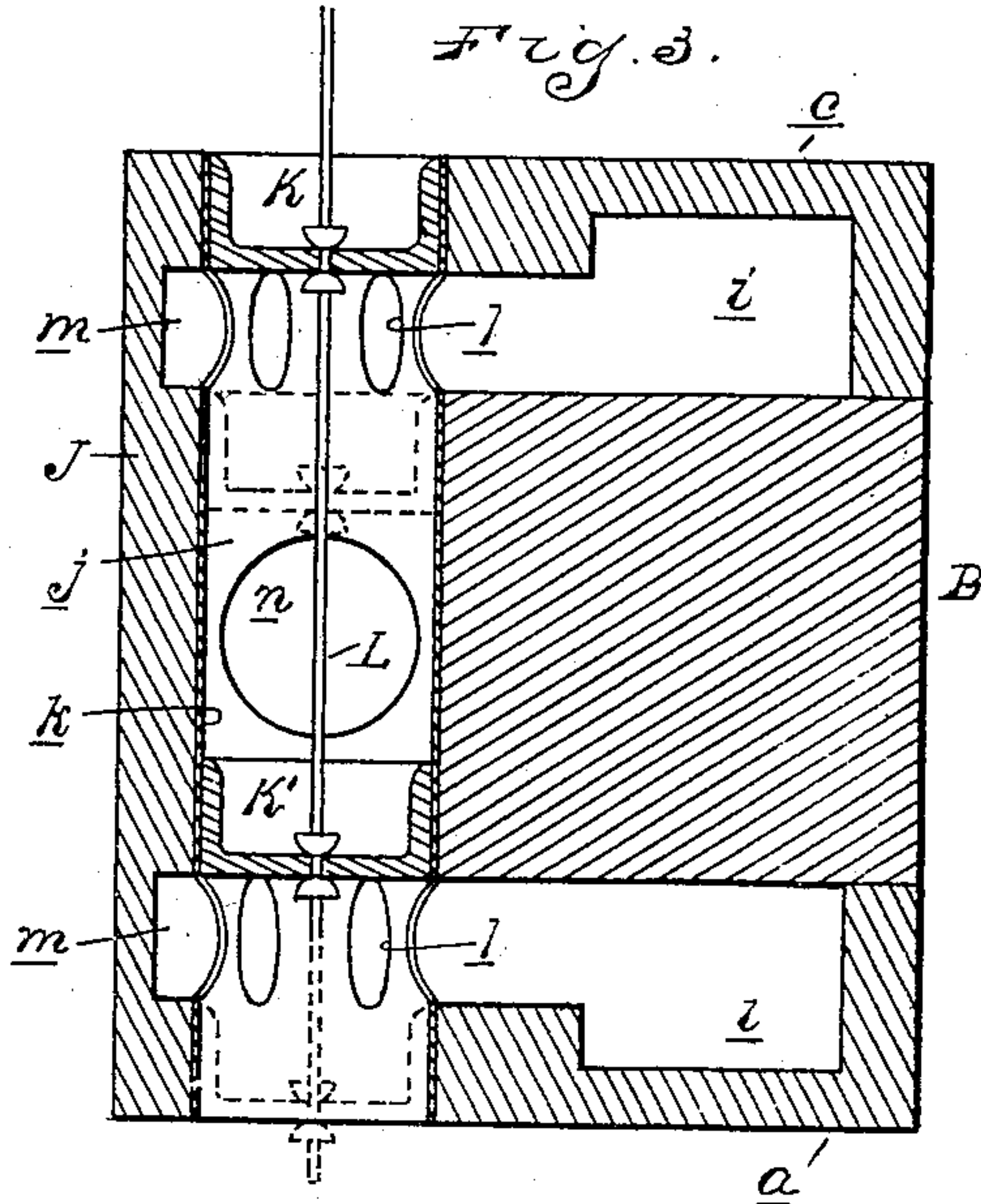
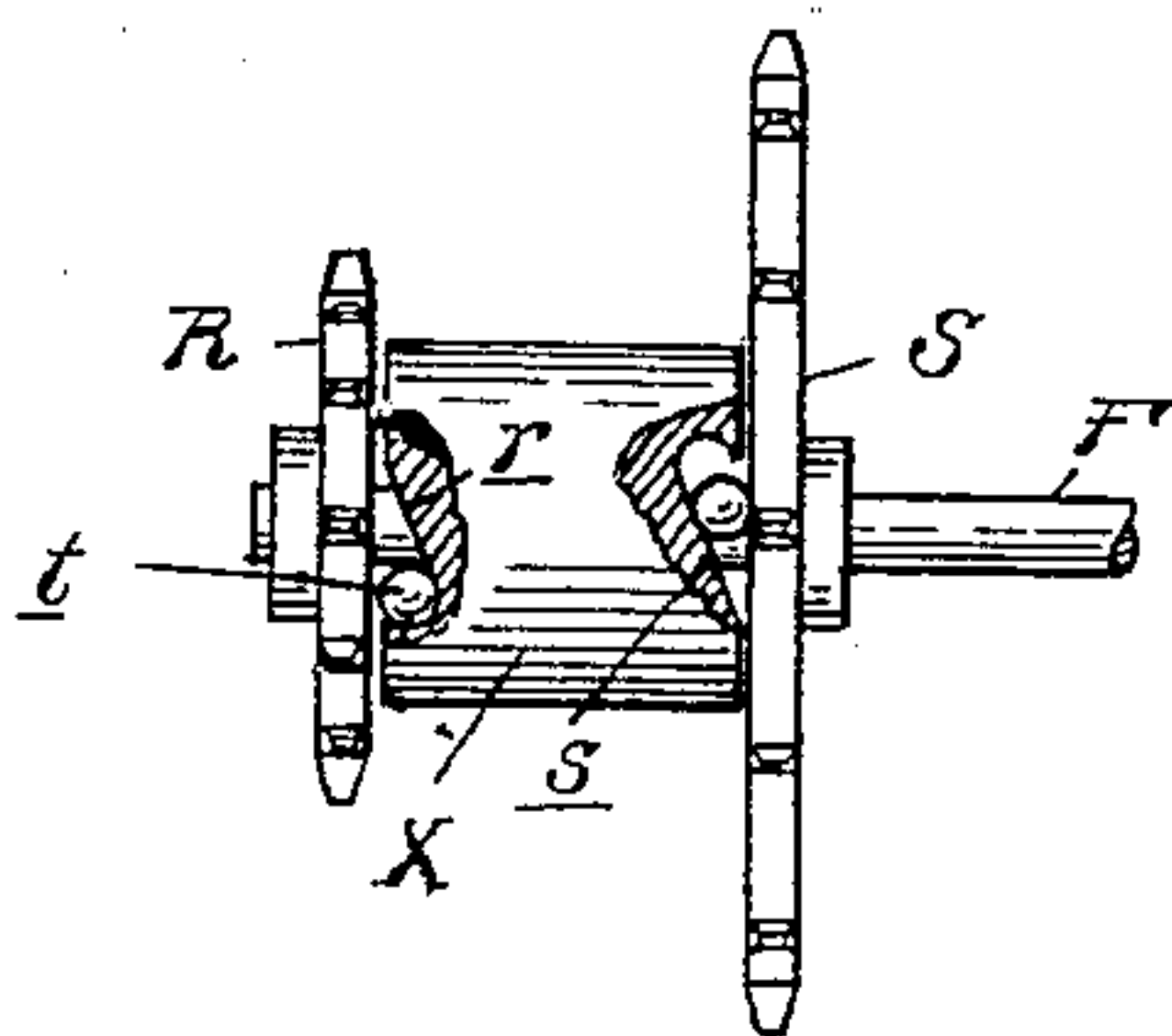


Fig. 4.



Witnesses
James O. Barry
H. Smith

Inventor
Francis W. Draper
By James Whittier
att'y.

UNITED STATES PATENT OFFICE.

FRANCIS W. DRAPER, OF DETROIT, MICHIGAN, ASSIGNOR TO
FARRAND ORGAN COMPANY, OF DETROIT, MICHIGAN, A COR-
PORATION OF MICHIGAN.

WINDING AND REWINDING MECHANISM.

SPECIFICATION forming part of Letters Patent No. 764,931, dated July 12, 1904.

Application filed April 13, 1903. Serial No. 152,438. (No model.)

To all whom it may concern:

Be it known that I, FRANCIS W. DRAPER, a citizen of the United States, residing at Detroit, in the county of Wayne and State of Michigan, have invented certain new and useful Improvements in Winding and Rewinding Mechanism, of which the following is a specification, reference being had therein to the accompanying drawings.

The invention relates to winding and rewinding mechanism for operating the music-sheets of musical players.

The invention consists, first, in the construction of operating mechanism provided with a reversible motor; further, in the peculiar construction and arrangement of said motor, and, further, in the peculiar construction, arrangement, and combination of parts, as hereinafter set forth.

In the drawings, Figure 1 is a diagrammatic plan view of the winding and rewinding mechanism. Fig. 2 is a vertical section on line *x*. Fig. 3 is a section on line *y y*, and Fig. 4 is a detail of the clutch.

In the operation of mechanical players for musical instruments it is necessary to provide mechanism for winding the music-sheet at governed speed and for subsequently rewinding it at a higher speed. This is usually accomplished by means of a motor always turning in the same direction and suitable intermediate mechanism for driving the music-holding rolls alternately in opposite directions.

In the present invention the intermediate mechanism consists of a reversible motor preferably of the following construction:

A, B, and C are three pneumatics connected to a common support D. The free ends of these pneumatics are connected by pitmen E with the crank-shaft F, the cranks therein being preferably arranged at angles of one hundred and twenty degrees from each other. The member D is channeled to form the air-connecting passages for the motor and also the valve-ports. As shown, the member is formed of the three sections *a*, *b*, and *c*, the central member *b* having formed therein the transverse bores *d*, arranged in the central plane

of each of the pneumatics. Each of these ports *d* is preferably lined with a metallic bushing *e*, and centrally of this bushing is formed an annular series of ports *f*. These ports connect with an annular channel *g*, cut into the member *b* at right angles to the bores *d* therein and connecting, through an aligned port *h*, with its corresponding pneumatic.

G represents pistons slidably engaging the bushing *e* and adapted to close the ports *f* when arranged opposite the same. These pistons are connected by stems H and pivotal rods I with their respective pitmen E.

The members *a* and *c* are formed with longitudinally - extending channels *i* therein, which connect with the opposite ends of each of the bores *d*.

J is a block arranged at one end of the member D and having a bore *j* therein, lined with the metallic bushing *k*. This bushing has formed therein two annular series of ports *l*, which respectively connect with annular channels *m* in said block, which latter are connected, respectively, with the channels *i* of the members *a* and *c*. Intermediate the ports *l* the bushing *k* is ported to connect with the channel *n*, leading to the nipple *o*, which is suitably connected, as by the conduit *p*, with the air-exhausting means.

K and K' are pistons slidably engaging the bushing *k* and connected to a common actuating-stem L. These pistons are spaced from each other so that in one position of the stem they will respectively close the annular series of ports *l* and when arranged in position on opposite sides of the central position will connect the passage *n* with one or the other of the channels *i* in the members *a* and *c*.

With the motor constructed as described it will be understood that when the valves K and K' are in the position shown in Fig. 3 the air-exhaust conduit *p* will be connected, through the space intermediate said pistons, with the channels *i* of the member *c* and from the latter to the lower end of each of the bores *d*. The piston-valves G being suitably set, the pneumatics A, B, and C will be successively operated to impart rotary motion to

the crank-shaft F in one direction. In this operation atmospheric air is supplied to the pneumatics through the channel in the opposite member *a*, which, as shown in Fig. 3, communicates with the open end of the bore *j*. By shifting the stem L so that the pistons K K' are in the position indicated in dotted lines in Fig. 3 the channel in the member *c* will be connected with the atmosphere and the channel in the member *a* will be connected by the space intermediate the piston with the air-exhaust conduit. This will cause a reversal of the motor, the operation being similar, but imparting movement to the shaft in the reverse direction.

The motor is connected with the winding and rewinding rolls, preferably by mechanism of the following construction: M is the winding-roll, which is journaled in bearings in the tracker-case N and has a drive-spindle O, which passes through said case. This spindle is connected by suitable means—such as the sprocket P, chain Q, and sprocket R—with the motor-shaft F. The latter is also connected, through the medium of the sprocket S, chain T, and sprocket U, with the rewinding-spindle V.

W is the music-holding roll, which detachably engages the spindle V.

In operation motion from the shaft F is communicated, through the connections described, to the winding-roll M and rewinding-spindle V. It is necessary, however, to provide means for uncoupling one of these during the operation of the other, as otherwise the differential speed of the spindles would prevent proper operation of the music-sheet. This may be automatically accomplished by providing means operating upon the reversal of the motor for alternately disengaging the drive connections with the winding-roll and rewinding-spindle.

As shown, the sprockets R and S are loose upon the motor-shaft F and are alternately connected therewith by friction-clutches, which each drive only in one direction and opposite to each other. These clutches are formed by a head X, secured to the shaft F, between the sprockets and having oppositely-

inclined recesses *r* and *s* in its opposite end, in which balls *t* are placed. The balls will wedge against the adjacent sprocket when the sleeve is driven in one direction, but will run loosely in the other direction, and thus the sprockets will be alternately driven and in opposite directions.

What I claim as my invention is—

1. The combination with a winding-roll and rewinding-spindle, of a reversible motor having a single driving-shaft, arranged intermediate said rolls, sprockets on said shaft operatively associated respectively with said winding and rewinding spindle and means intermediate said sprockets operable upon the reversal of the motor and shaft for alternately imparting motion to said sprockets.

2. The combination with a winding-roll and rewinding-spindle, of a reversible motor and shaft, drive connections between said shaft and said roll and spindle, and means arranged intermediate said drive connections for alternately coupling the same with said shaft upon the reversal of the motor.

3. The combination with a winding-roll and a rewinding-spindle, of a reversible motor and shaft, drive connections between said shaft and said roll and spindle, including sprockets loosely mounted upon the shaft, and means fixed to the shaft intermediate said sprockets for alternately coupling the same to the shaft.

4. The combination with a winding-roll and rewinding-spindle, of a reversible motor having a single driving-shaft arranged intermediate of and common to both of said rolls, means mounted upon the shaft for imparting movement to the rolls and a separate means also mounted upon the shaft and operable by the reversal of the motor and shaft for automatically alternately operating said first-mentioned means to reverse the motions to the rolls.

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

FRANCIS W. DRAPER.

Witnesses:

JAS. P. BARRY,
H. C. SMITH.