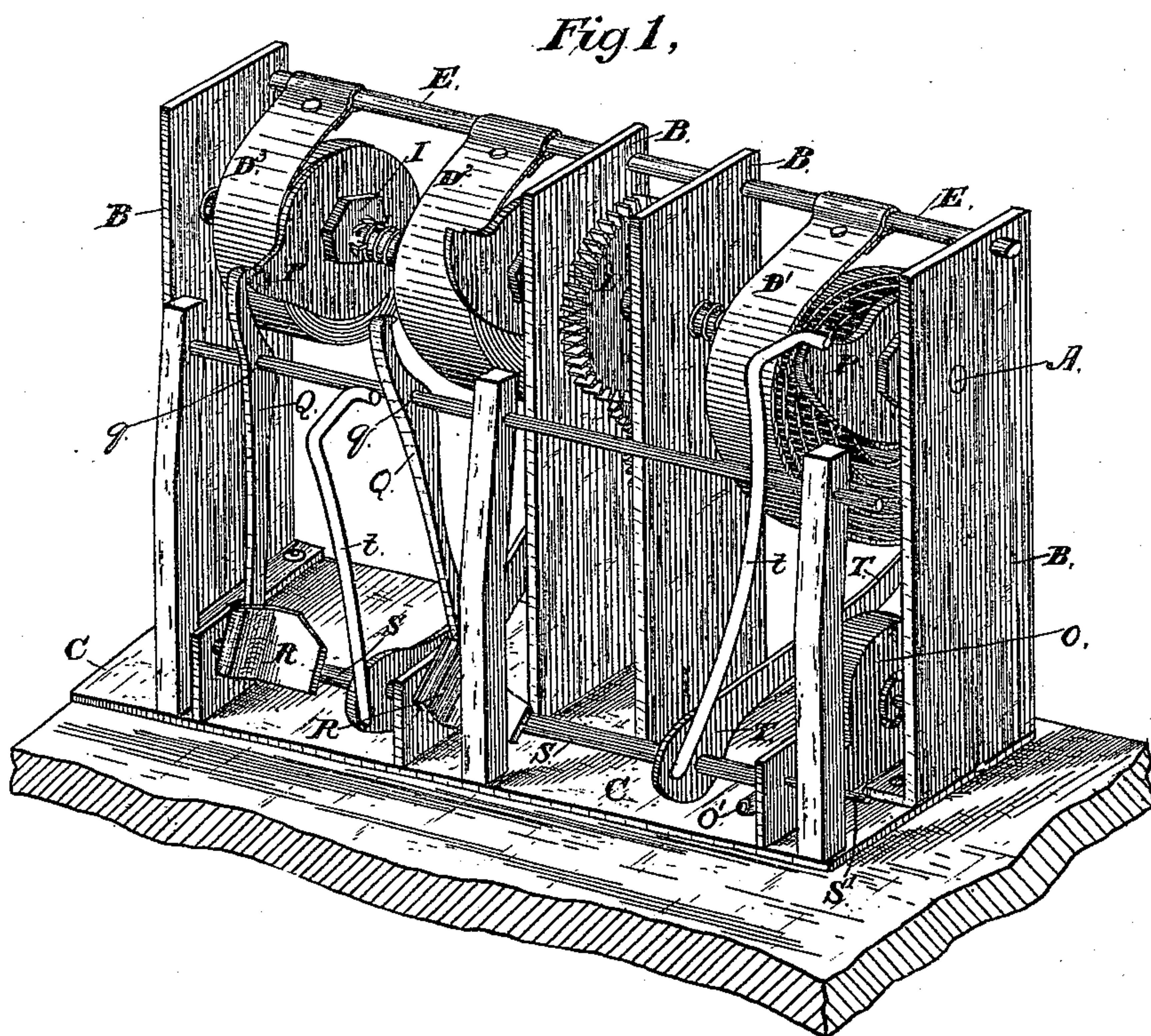


N. N. HORTON.
Spring Motor.

No. 229,887.

Patented July 13, 1880.



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Geo J Mallwood Jr.
Chas J Gooch.

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Fig 2,

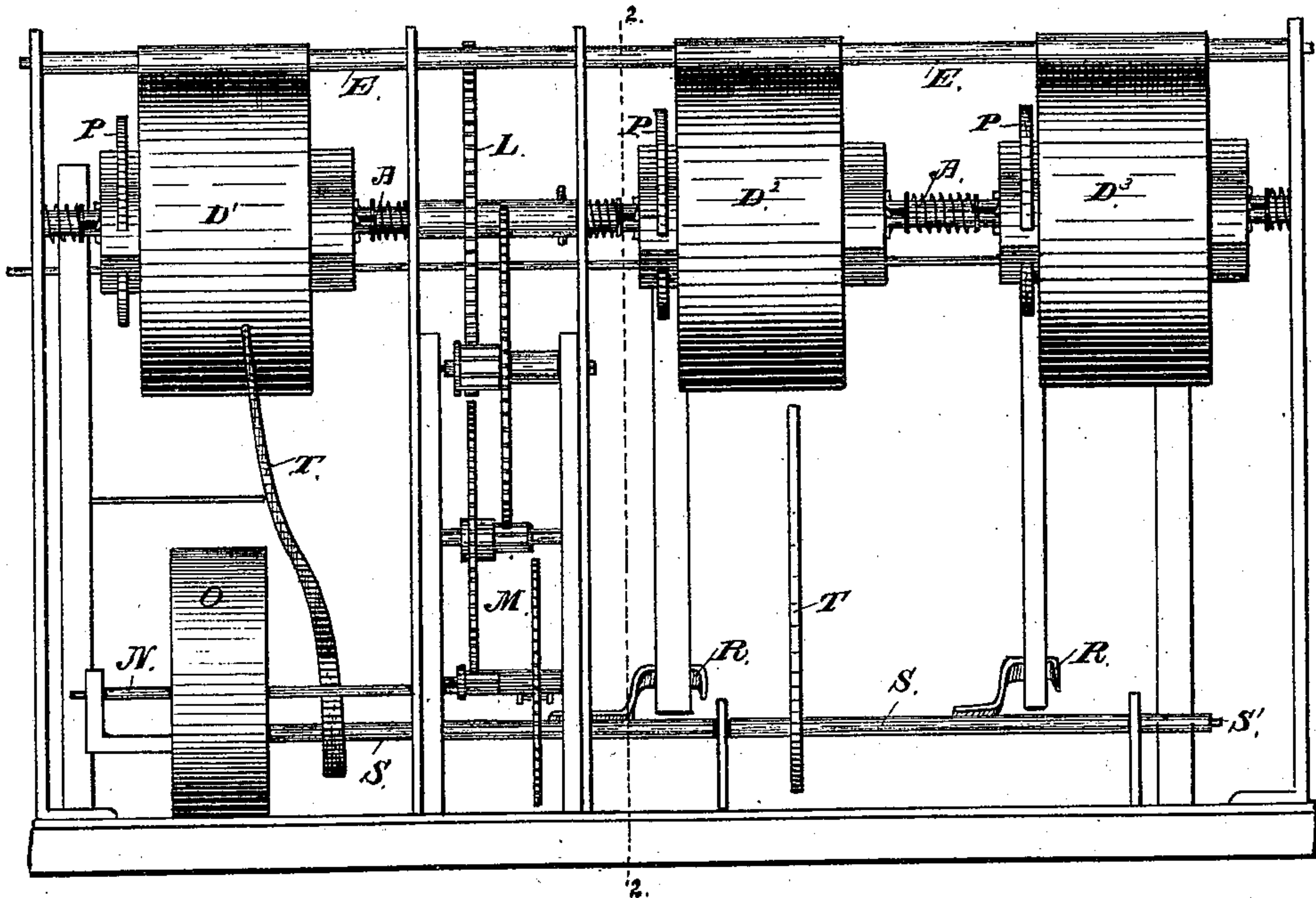


Fig 3,

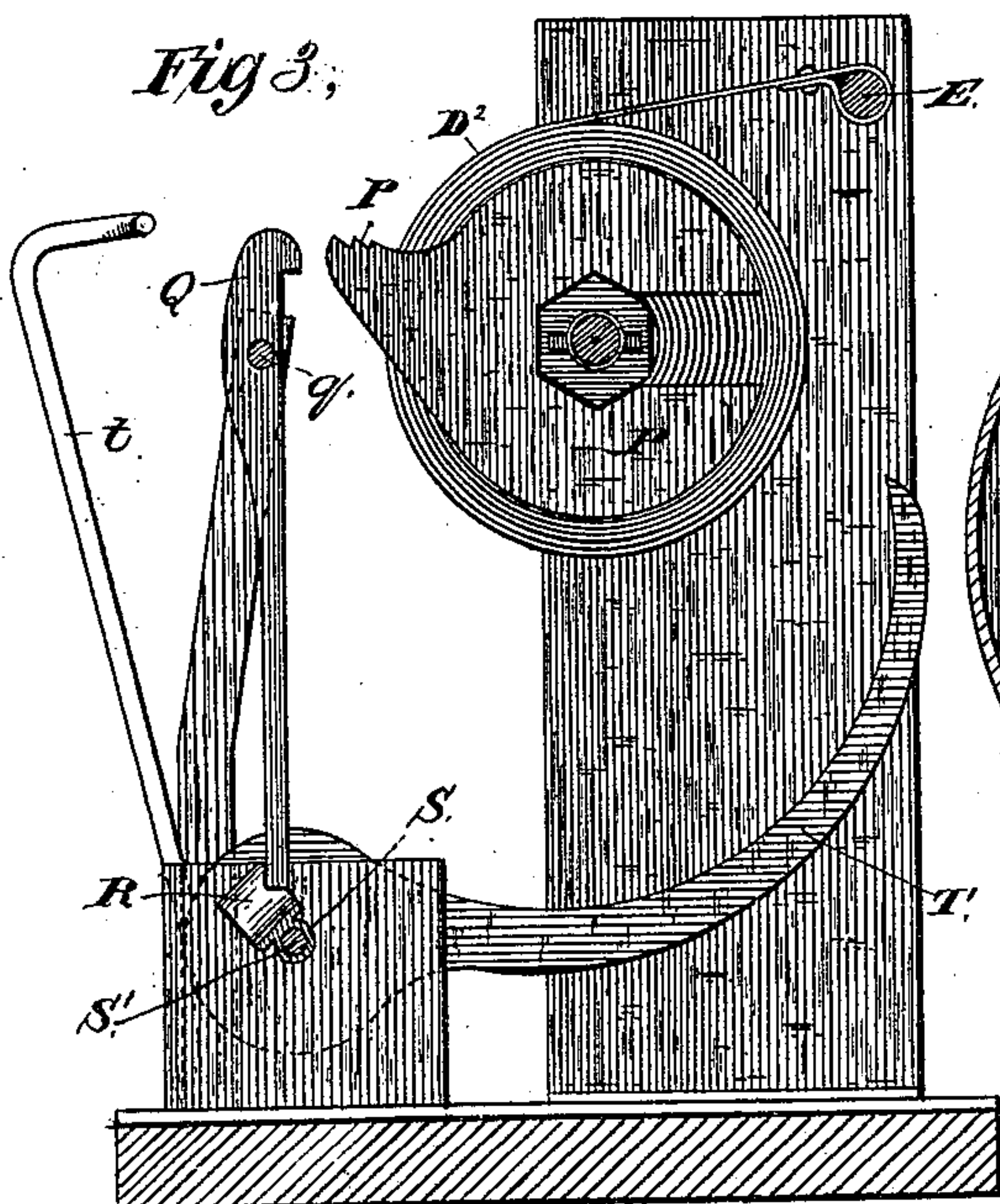
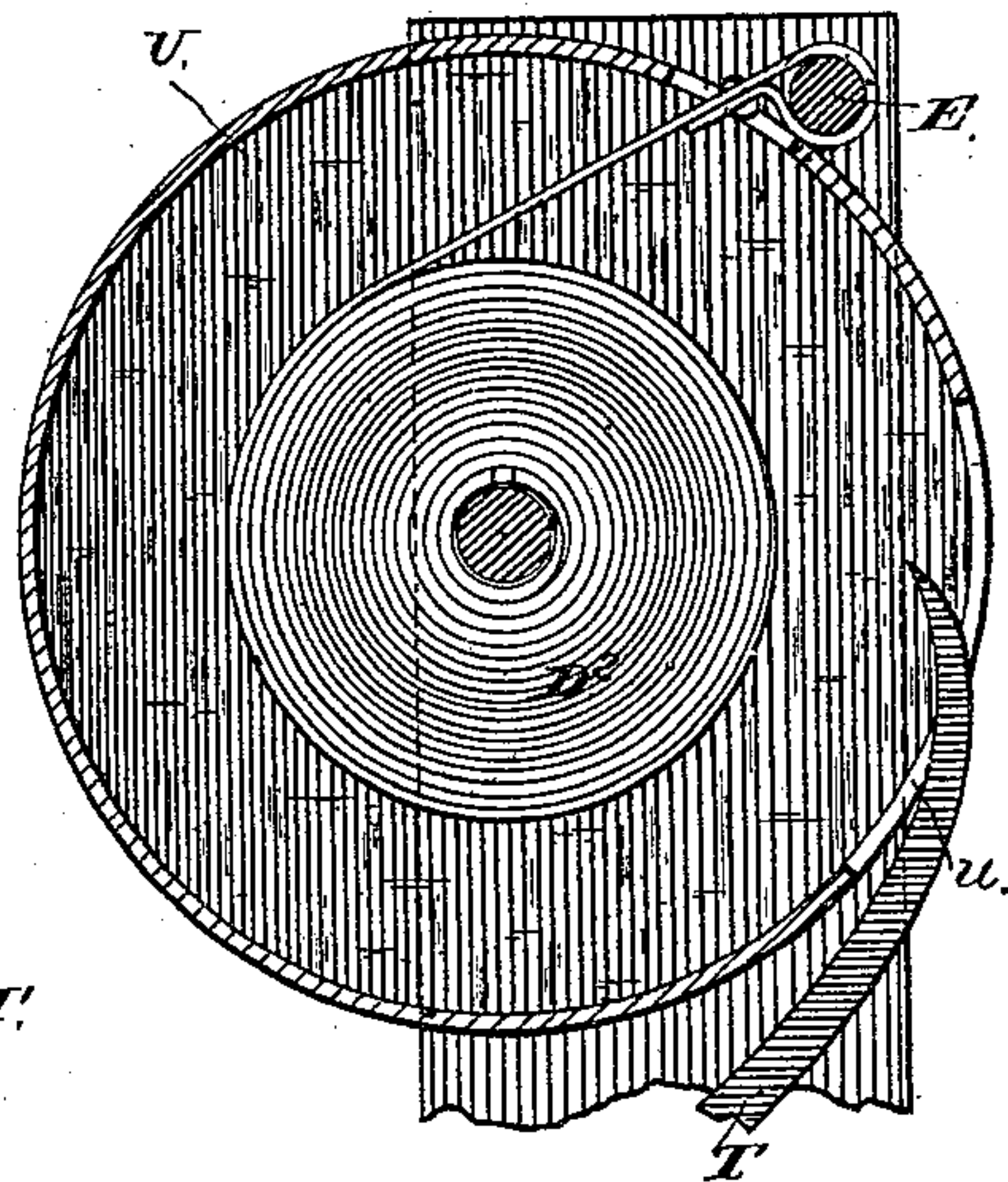


Fig 3^a,



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Fig 4,

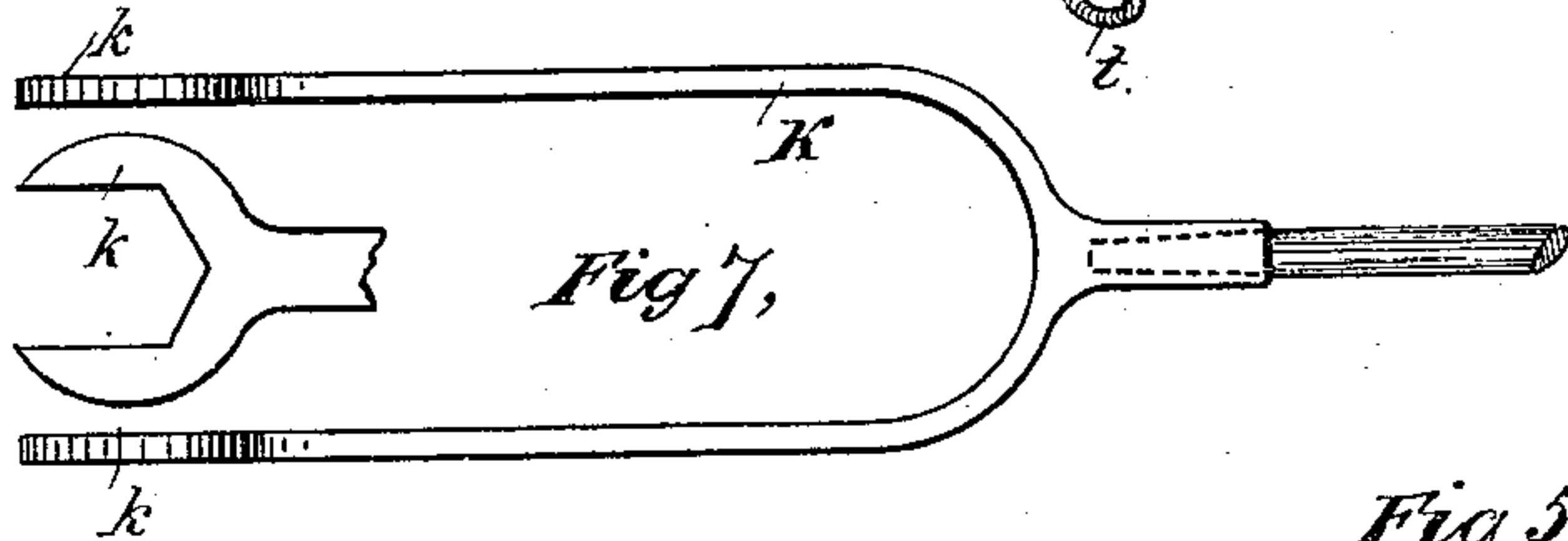
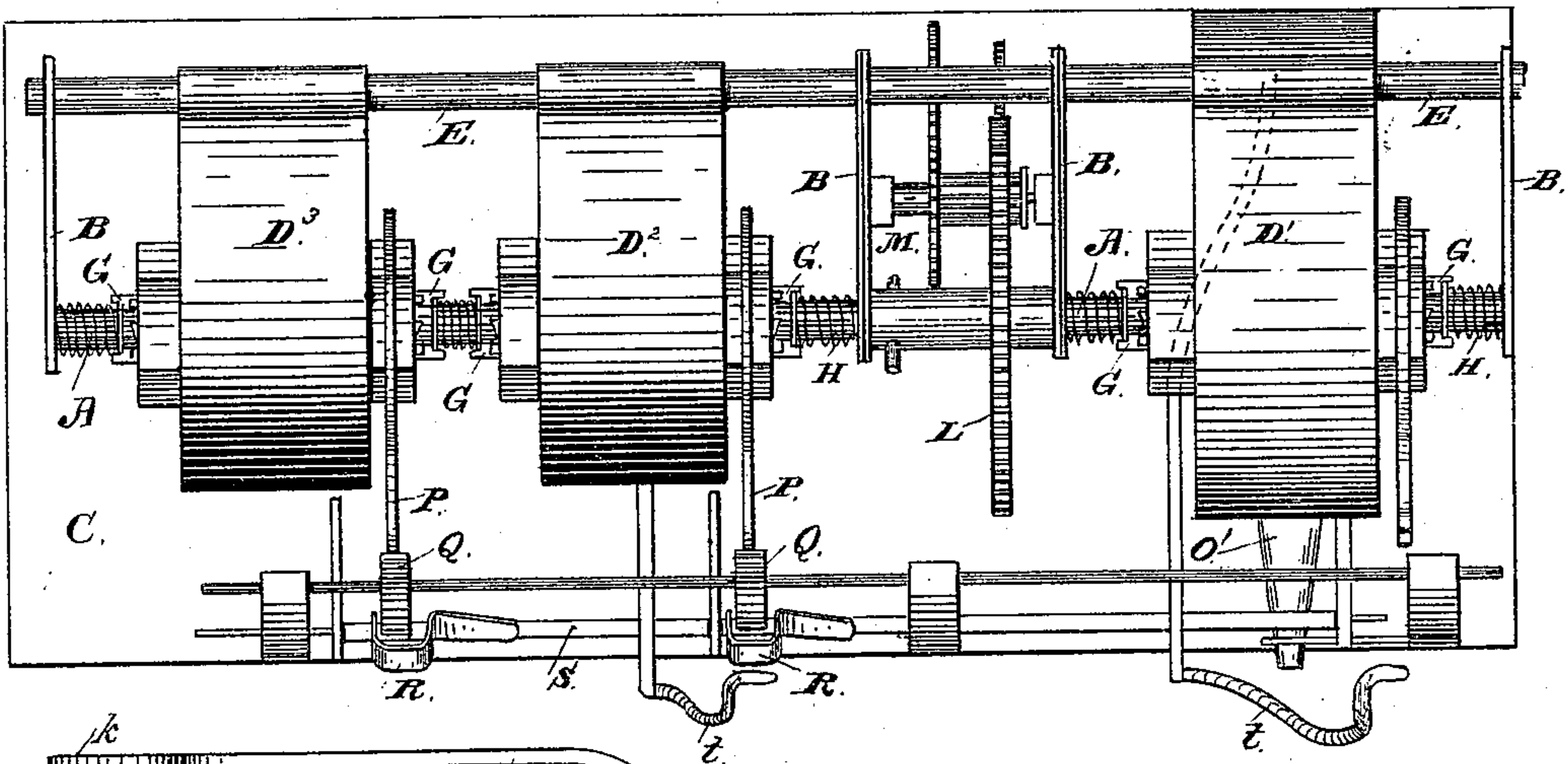


Fig 5,

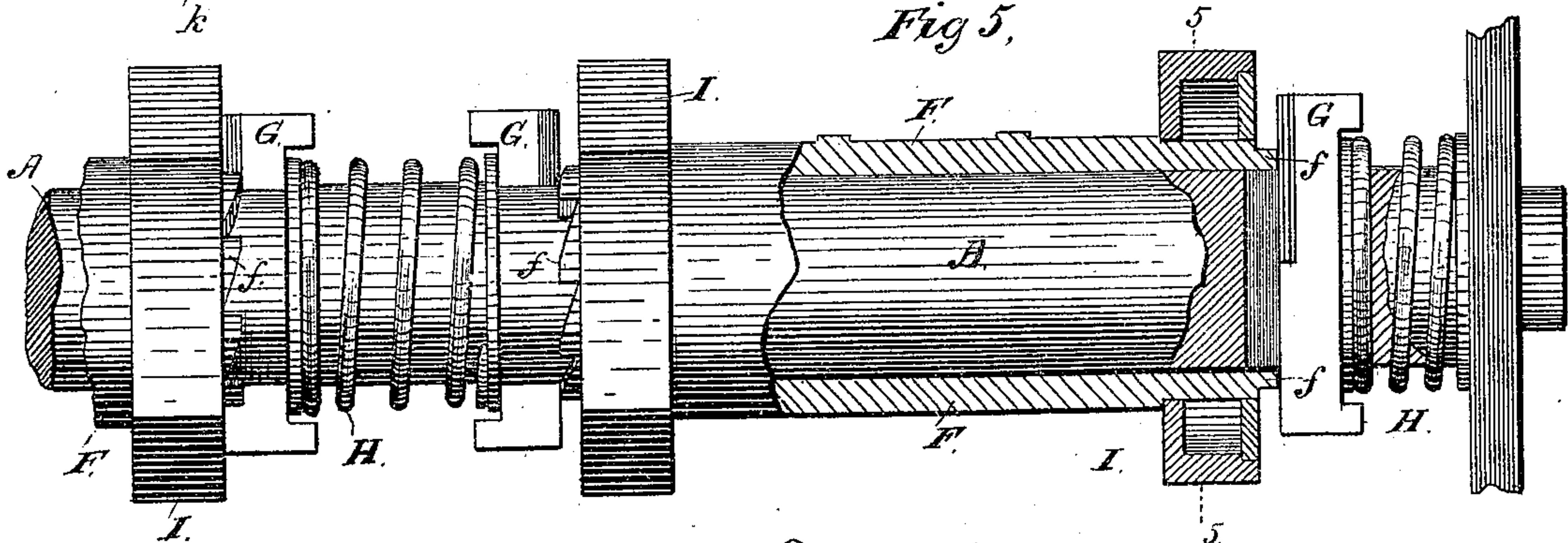
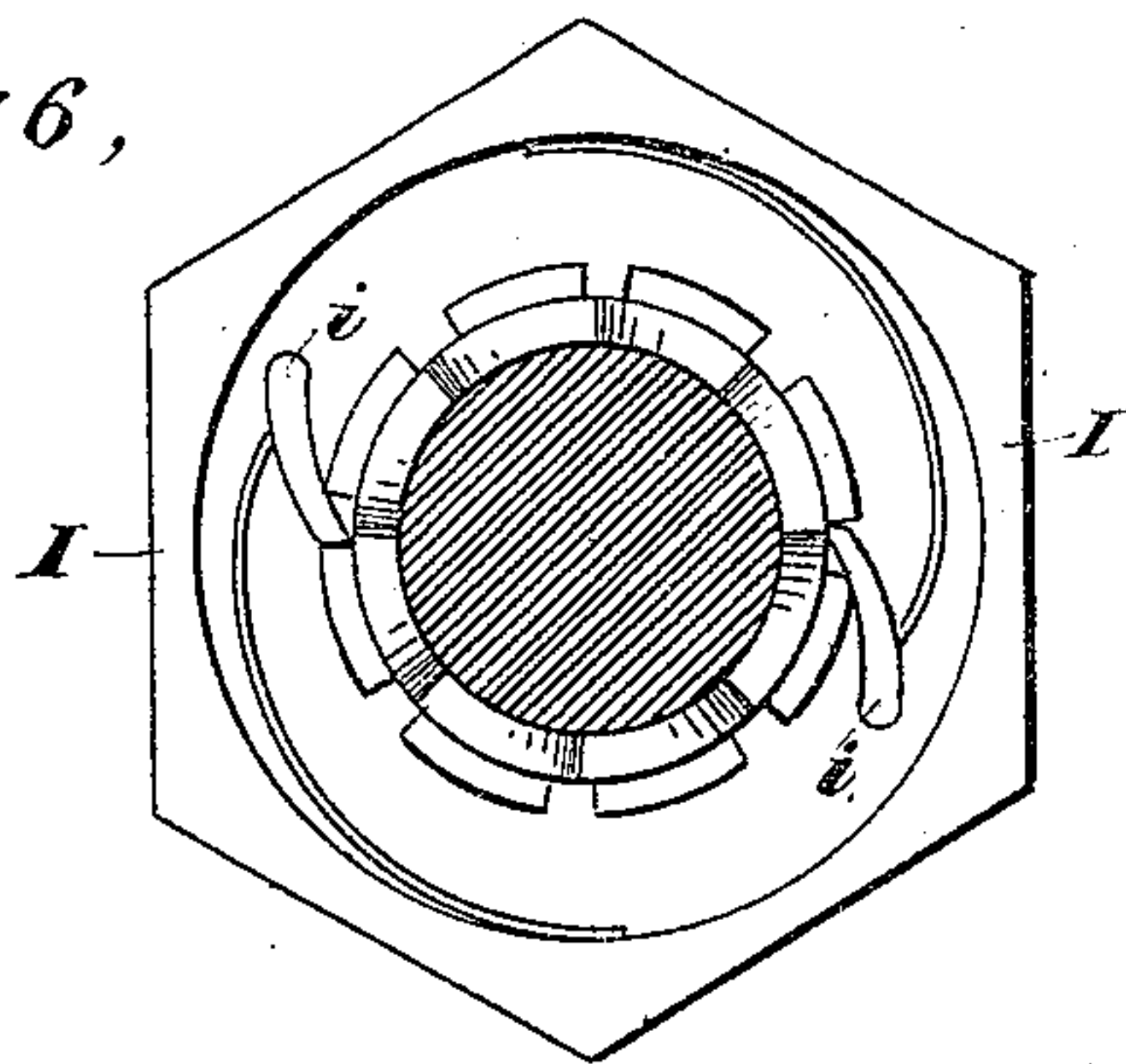


Fig 6,



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UNITED STATES PATENT OFFICE.

NUMON N. HORTON, OF KANSAS CITY, MISSOURI.

SPRING-MOTOR.

SPECIFICATION forming part of Letters Patent No. 229,887, dated July 13, 1880.

Application filed October 27, 1879.

To all whom it may concern:

Be it known that I, NUMON N. HORTON, doctor of medicine, of Kansas City, in the county of Jackson and State of Missouri, have
5 invented a new and useful Improvement in Spring-Motors, of which the following is a specification.

The subject of my invention is a motor actuated by a number of springs on one shaft, adapted to be separately wound, and so arranged that all or any number of them may be made to operate in conjunction when the power of more than one is required, or the whole series may be brought into action one at a time, for which purpose they are so connected that
15 when one spring approaches the termination of its movement it will release the next, the entire series of springs being thus automatically brought into successive operation.

The invention further relates to details of devices for connecting the springs and limiting their movement; and, further, to a ratchet mechanism to effect the winding of the successive springs by a reciprocating movement
20 of a key, which is preferably made with two bits to engage on both sides of the spring with the winding sleeve or arbor.

In order that the invention may be fully understood, I will proceed to describe it with reference to the accompanying drawings, in which—

Figure 1 is a perspective view of the machine. Fig. 2 is a front view of the machine. Fig. 3 is a transverse vertical section thereof.
35 Fig. 3^a is a transverse section of a part of the same, showing the spring incased. Fig. 4 is a plan. Fig. 5 is a longitudinal section of a portion of the shaft and winding-sleeve and its accessories on a larger scale. Fig. 6 is a transverse section on line 5 5, Fig. 5. Fig. 7 is a plan of the double-bitted key, and embraces, also, a side view of the bit thereof.
40

A represents a shaft common to all the springs, running in suitable bearings in standards B B on the bed C. D¹ D² D³ are helical springs, attached at their outer ends to a bar, E, and at their inner ends to winding-sleeves F, which are connected with the shaft by dogs G G, extending through slots in the shaft and
45 pressed by springs H H against ratchet-teeth *ff* on the ends of the winding-sleeve F. The

winding-collars I I turn on the sleeve F freely in one direction, and when turned in the other direction impart the winding movement to the said sleeve through the medium of pawls *i i*.
55 I am thus enabled to wind the spring by a reciprocating motion of the key K without removing it from the collars I I.

The key is forked, as shown in Fig. 7, and constructed with two bits, *k*, to fit the collars I I at the respective ends of the sleeve F and turn them simultaneously.
60

L M represent gearing to transmit motion from the shaft to any object to be driven; but the gearing will, of course, be varied as required to suit the purpose for which it is to be used. In Fig. 2 I have shown the train of gearing connected to a shaft, N, which is intended to represent a fan-shaft, O being the casing of the fan, and O', Fig. 4, the nozzle thereof.
65 70

For the purpose of locking the springs individually and permitting them to be brought into action successively and automatically, I mount rigidly on a winding-collar of each spring after the first an arm, P, which is held
75 by a detent, Q, pivoted at *q*, and retracted at the proper moment by a lug, R, fixed to a sleeve, S, actuated by the contact of the preceding spring with a trigger, T, fixed to said sleeve. In the drawings I have also shown a similar
80 arm, P, by which the first spring may be locked and prevented from unwinding. The sleeves S are thus employed for communicating from one spring to the next, said sleeves being independent and being arranged in line on a
85 common shaft, S'.

To each trigger T is connected a stop, *t*, which, as soon as the expansion of the first spring has moved the said trigger so as to retract the detent Q of the second spring, catches the
90 arm P of the first spring, D¹, so as to prevent the further expansion of said spring. This last-described device will in many cases dispense with the necessity for a casing for the spring; but, as it will be preferable to use a
95 casing in many instances, I have shown in Fig. 3^a the spring inclosed in a casing, U, slotted at *u* to receive the trigger T and permit the spring to come in contact therewith.

When it is desired to bring more than one
100 spring into operation at the same time it will simply be necessary to release the arms proper,

P, to such springs, and the release of all these arms at once will, of course, allow of all the springs being put in operation at the same time. The dogs G slip freely over the teeth at the end of the winding-sleeve of any of the springs that are at rest, while the other spring or springs drive the shaft.

The operation is as follows: Upon the revolution of the shaft N the train of gear-wheels L M will be set in motion and the shaft A revolved. When the spring D' has become unwound and distended it will press against trigger T and force it downward, which action will force stop *t* of trigger T into engagement with detent P, and thus hold the spring D' from further expansion. This engagement of stop *t* causes a partial revolution of the sleeve S, which tilts back lug R and allows detent Q to become disengaged from the arm P, and thereby releases spring D², which thereupon begins to uncoil until its expansion acts in a similar manner upon its stop *t*, to release another detent Q, and thereby permit the uncoiling of the next spring, D³.

Having thus described my invention, the following is what I claim as new therein and desire to secure by Letters Patent:

1. A spring-motor provided with a plurality of springs with connections which release one by the movement of another, and thus bring them into successive action automatically.

2. The combination of the series of springs D' D² D³, arms P, detents Q, triggers T, sleeves S, and lugs R, as and for the purpose set forth.

3. The combination of the springs D' D² D³, arms P, detents Q, triggers T, and stops *t*, as and for the purpose set forth.

4. The combination, in a spring-motor, of the winding-sleeve F and winding-collars I, connected by a ratchet movement to permit winding the spring by a reciprocating movement of the key, as explained.

N. N. HORTON, M. D.

Witnesses:

OCTAVIUS KNIGHT,
WALTER ALLEN.