

No. 631,407.

Patented Aug. 22, 1899.

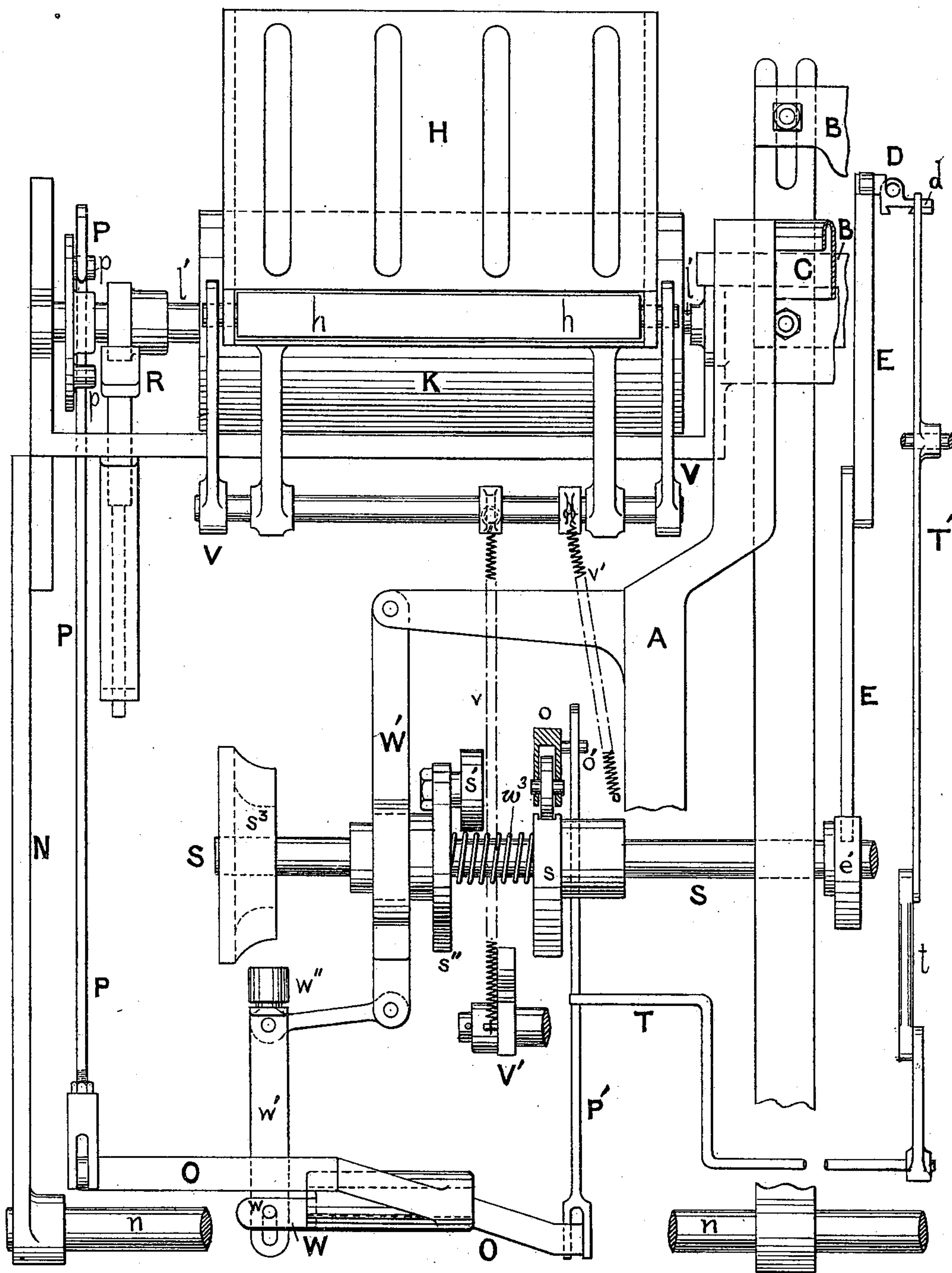
H. R. ROSS.

LOOM.

(Application filed May 2, 1898.)

(No Model.)

4 Sheets—Sheet 1.



WITNESSES.
Joseph Bates.
E. Howard

FIG. 1.

INVENTOR
Hugh R. Ross
by O. W. O'Brien.
att'y

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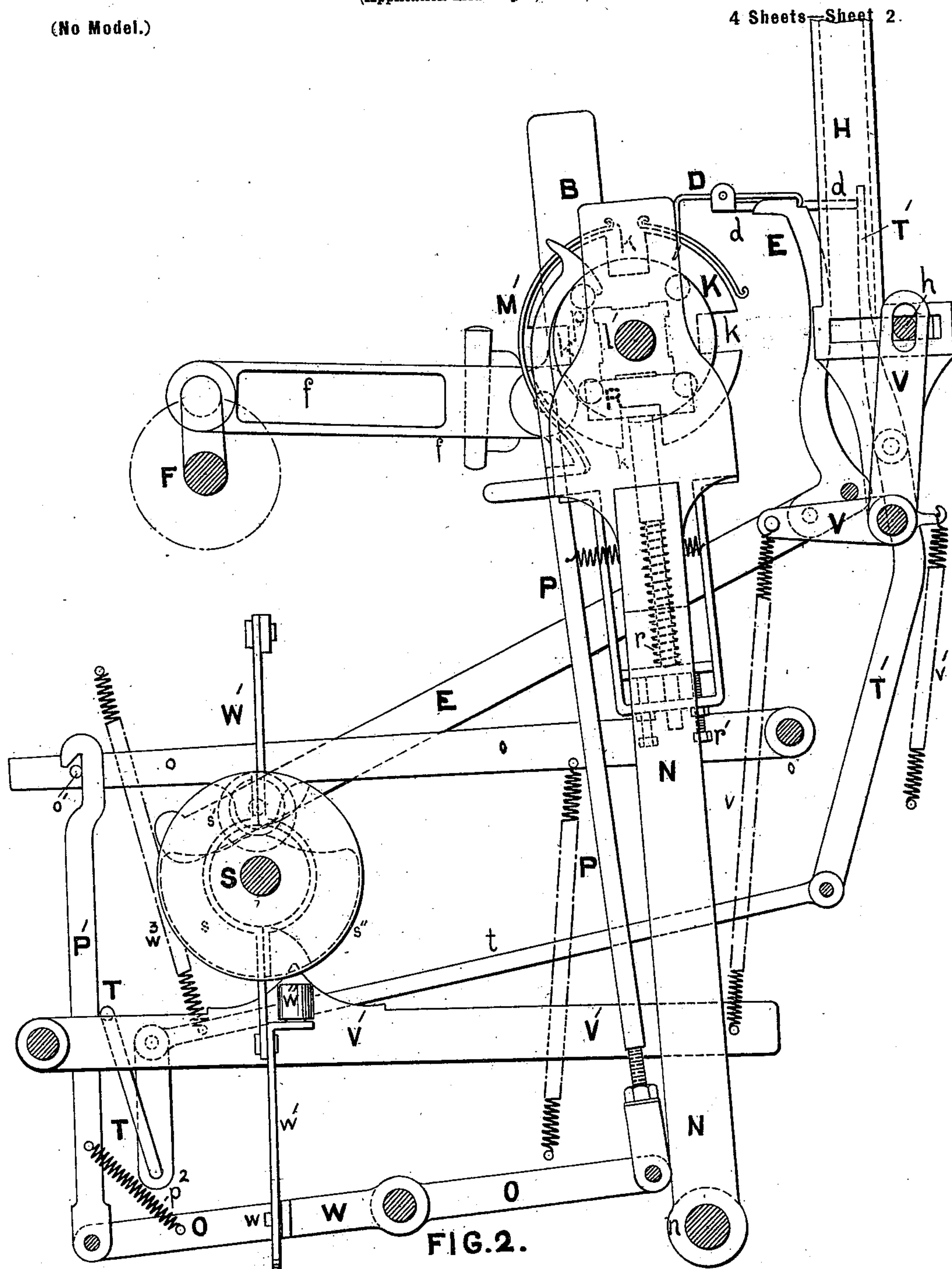
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WITNESSES.

Joseph Bates
E. Howard

INVENTOR

Hugh R Ross
by J. Owen O'Brien
att'y.

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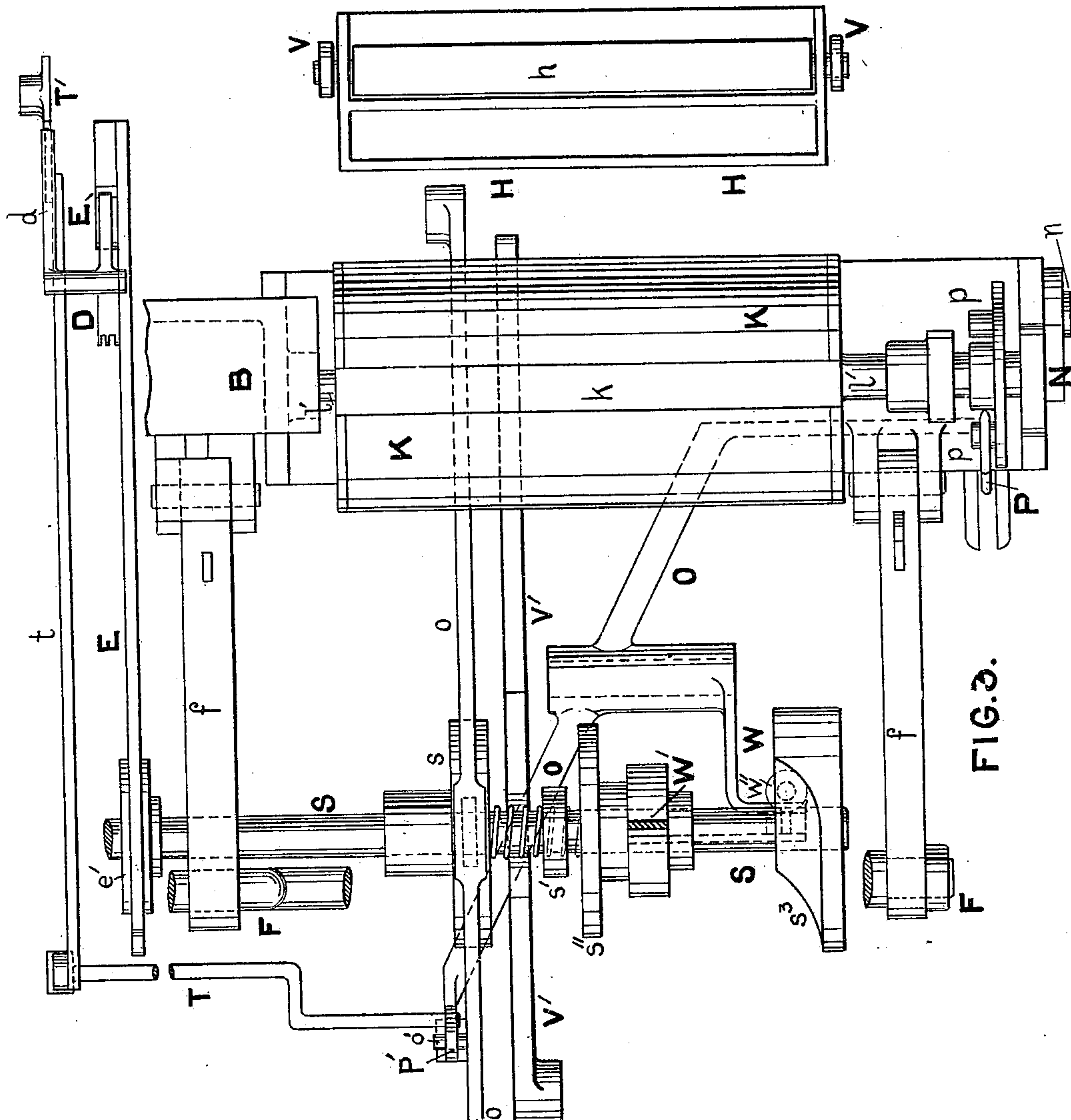
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WITNESSES.

Joseph Bates
E. Howard

INVENTOR.

Hugh R. Ross
By C. O. O'Brien
att'y.

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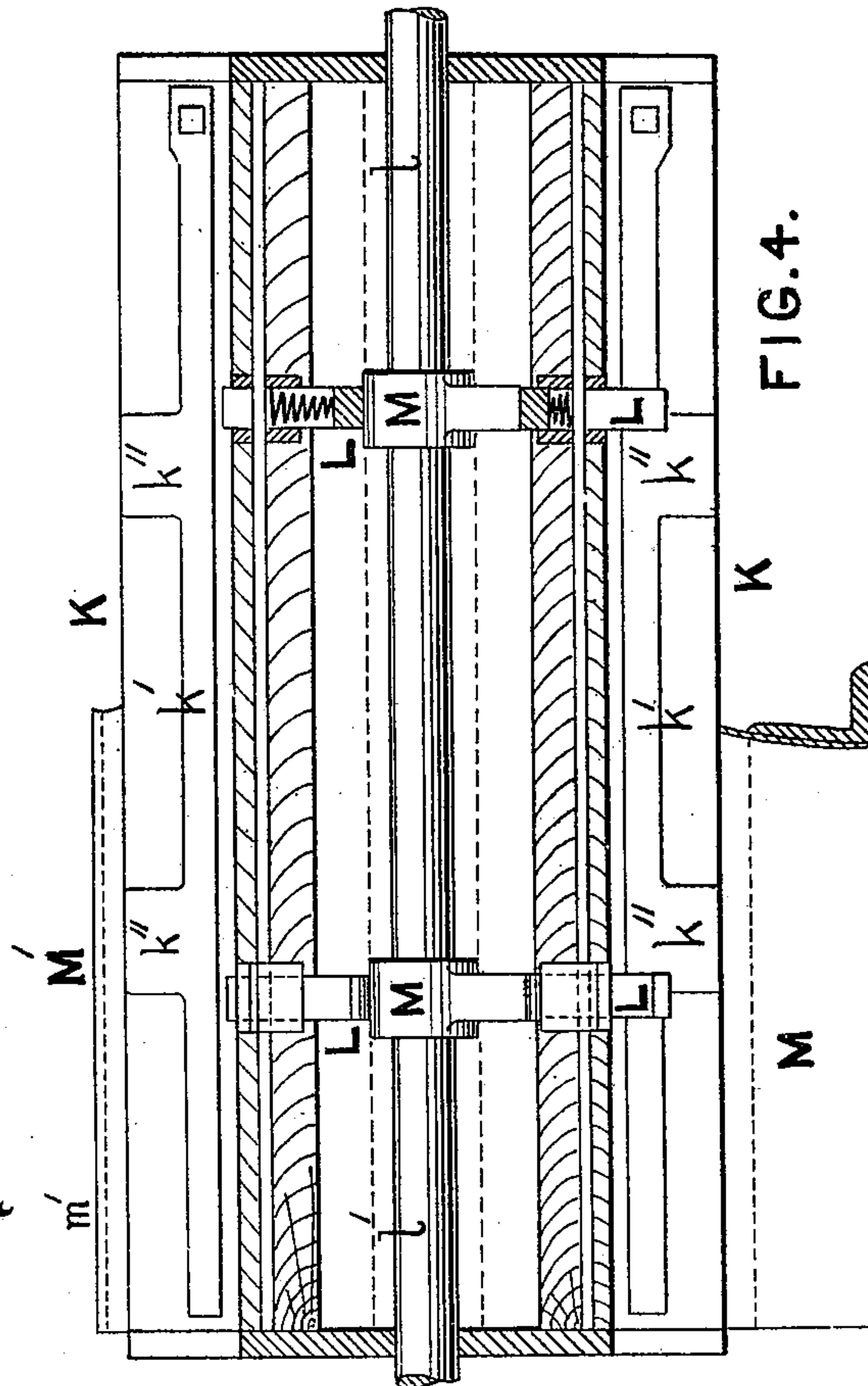
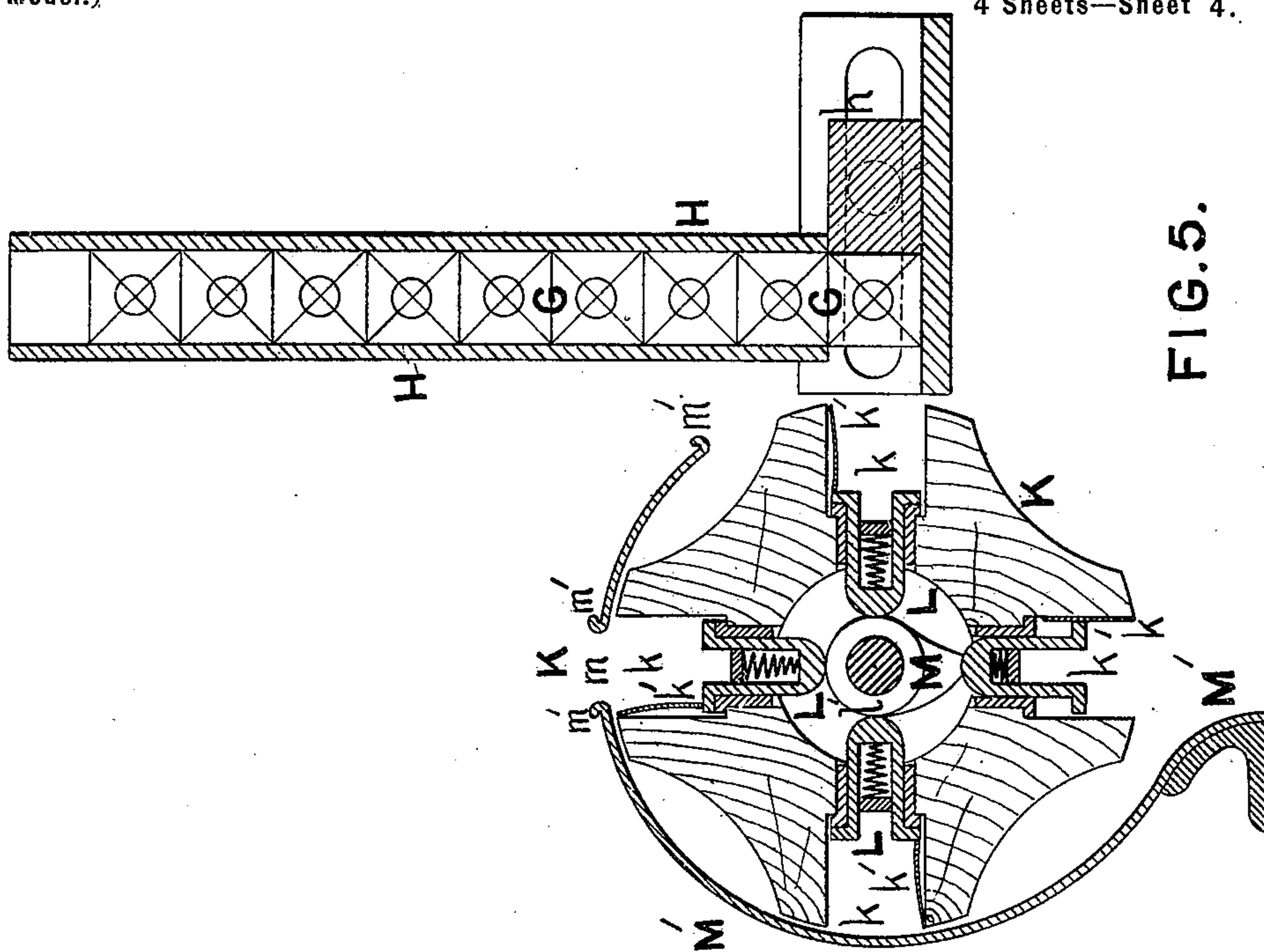
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(No Model.)

4 Sheets—Sheet 4.



WITNESSES.

Joseph Bates.
E. Howard

INVENTOR

Hugh R Ross
by C. Andrew O'Brien
att_y

UNITED STATES PATENT OFFICE.

HUGH R. ROSS, OF BELFAST, IRELAND.

LOOM.

SPECIFICATION forming part of Letters Patent No. 631,407, dated August 22, 1899.

Application filed May 2, 1898. Serial No. 679,534. (No model.)

To all whom it may concern:

Be it known that I, HUGH ROBERT ROSS, of Durham Street Mill, Belfast, in the county of Antrim, Ireland, have invented certain new and useful Improvements in Looms for Weaving, of which the following is a specification.

My invention relates to weaving-loom, and is designed to change or replace the shuttle when the weft breaks or fails, instead of stopping the loom, as hitherto, by an automatic motion actuated by the weft-fork operating a rotary shuttle box or receiver.

It consists, essentially, in constructing the loom with a fixed or stationary cage or receptacle placed at any convenient place at the side of the loom to contain a number of full or threaded shuttles, a revolving shuttle-box on the end of the slay fitted with slides and cams to discharge the empty shuttles, and levers or rods connecting the weft-fork with the actuating mechanism of the rotating box and shuttle cage or receptacle by means of which the box is rotated and a fresh shuttle supplied automatically on the breakage or failure of the weft. It will be fully described with reference to the accompanying drawings, in which sufficient of the ordinary working parts of the loom are shown to illustrate the invention.

Figure 1 is a front elevation; Fig. 2, an end elevation; Fig. 3, a plan; Fig. 4, a longitudinal section of the revolving shuttle-box; Fig. 5, a transverse section of same and shuttle-receptacle.

The loom-frame A, most of which is removed, the slay B, the breast-beam C, the weft-fork D, the oscillating hammer-lever E, with which the weft-fork engages, the crank-shaft F, the shuttle G, and other parts of the loom not shown in the drawings are all of ordinary form and construction.

At one end of the loom I place a fixed stationary cage or receptacle H to hold or contain a number of shuttles G, placed one above the other or in other suitable position, from which they can be delivered one at a time by a reciprocating bar or pusher h.

To the end of the slay B, so as to oscillate to and fro with it, I affix or attach a circular revolving shuttle-box K, capable of carrying any desired number of shuttles G and pre-

senting them successively to the shuttle-actuating mechanism as may be required.

In the drawings the revolving shuttle-box K is shown with four chambers k to receive the shuttles, and these chambers are formed so that the shuttles can enter through the sides. Each chamber is provided with a spring or swell k' with outturned ear or lip k'' or of other suitable shape to permit of the shuttle compressing the spring as it enters the chamber from the cage or receptacle H. Each chamber k of the revolving shuttle-box K is also fitted with one or two slides L in the bottom, which operate to expel the shuttles from the chamber. The slides L are operated as the box rotates by a fixed or stationary cam M on the fixed spindle l' , on which the box rotates. The cams M push the slides forward when the chamber is inverted to discharge the shuttle. The slides and cams act direct upon the shuttle to force it out or may act upon the retaining spring or swell alone to withdraw it and allow the shuttle to fall out. A chute may be placed to receive the discharged shuttle and convey it to a receptacle to receive it.

The shuttle-box is inclosed or cased with a circular cylindrical casing M' , which acts as a guide or cover to retain the shuttle in position in the chamber k . It is provided with a slot or slit m in the top, the edges m' extending over the chamber k to hold the shuttle down when the loom is in operation.

The rotary shuttle-box K is supported at its outer end by a radial arm or rod N, which oscillates with the shaft n , upon which the slay B is also pivoted. It is connected to the crank F by the connecting-rod f , by which it is operated to oscillate simultaneously with the slay B. Thus after each shot of the shuttle G the box K swings forward and approaches nearly close to the stationary shuttle cage or receptacle H, from which when the chamber k is empty it receives a fresh shuttle.

The revolving shuttle-box K is caused to rotate as desired to bring each chamber k successively into position from which the shuttle can be put in action by the lever P, which is connected by a series of levers with suitable operating mechanism and with the weft-fork D, whereby when the weft-thread is

broken or absent the lever P is drawn down and the shuttle-box K rotated part of a revolution. The end of the shuttle-box K is provided with pegs p , with which the hook on the upper end of the lever P engages.

The revolving shuttle-box K is held in position by a spring-hammer R, pressed tightly against the square end of the cylinder by the spring r , the tension of which is adjusted by the screws r' .

The lever P for rotating the shuttle-box K is operated by a hooked lever P', attached to the opposite end of a pivoted lever O, to which both are pivoted. The lever o is raised by a cam s on the cam-shaft S at each revolution of the cam-shaft and raises the hooked lever P' with it when the hook is pressed over or in a position to engage with the pin or peg o' in the side of the lever o . Thus the raising of the hooked lever P' depresses the hooked lever P and causes the rotation of the shuttle-box K.

In normal position the hooked lever P' is held by a spring p^2 out of the path of the peg o' in the lever o , and it is pushed or forced into the position shown in Fig. 2 of the drawings by the crank T on the breakage or failure of the weft-thread.

The crank T is connected by the connecting-rod t with the pivoted lever T', the upper end of which engages with the slide or lever d of the weft-fork D. The oscillating hammer-lever E is actuated in the usual way by the cam e' and engages the catch on the end of the weft-fork when the weft breaks, by which the slide or lever d is drawn back, causing a movement of the pivoted lever T', which is transmitted through the crank T to the hooked lever P', which in turn is operated by the peg o' of the lever o .

The reciprocating bar or pusher h in the cage or receptacle H is operated by cranked levers V, by which the lower shuttle is pushed forward when required. The cranked levers V are operated in one direction by the lever V', which is connected thereto by a connecting spring or link v and in the opposite direction by the spring v' . The lever V' is depressed by the cam or disk s' , carried by the disk s'' on the cam-shaft S. The disks s' s'' are moved into position to engage the lever V' each time the hooked levers P P' are operated to rotate the shuttle-box K. The pivoted lever O carries an arm W with a pin or peg w in the end which engages with a link w' and raises it when the lever is raised, bringing a bowl or runner w'' into contact with another cam s^3 on the cam-shaft. The link w' is also connected with another lever W', pivoted to a fixed bracket at its upper end, and the action of the cam s^3 on the runner w'' moves it in a direction away from the cam. The lever W' is in contact with the disk s'' and when moved by the cam s^3 slides the disk s'' along the cam-shaft S until the disk s' is over the lever V' in position to depress it as

the cam rotates. A spring w^3 moves it back again. The levers are so arranged that the forward movement of the pusher h in the receptacle H commences when the crank F is nearly at the end of its outward stroke and the shuttle-box K almost in contact with the shuttle-receptacle H.

In operation the breakage of the weft-thread permits the weft-fork D to engage the oscillating hammer-lever E, the motion of which is transmitted through the slide or bracket D d to the pivoted lever T' and crank T to throw the hooked lever P' into engagement with the oscillating lever o . The movement of the oscillating lever o is then transmitted through the hooked lever P' and pivoted lever O to the hooked lever P, and the shuttle-box is rotated. By the same operation the disk s' is brought into contact with the lever V to operate the pusher h after the partial revolution of the shuttle-box K has taken place. The revolution of the shuttle-box K brings a full shuttle into position to be thrown across the web and so continue the weaving without stopping the loom and at the same time brings an empty shuttle into position to be discharged to be refilled or rethreaded and also brings an empty chamber h of the box H opposite the cage or receptacle H to receive a refilled or rethreaded shuttle.

What I claim as my invention, and desire to protect by Letters Patent, is—

1. In a loom for weaving, the combination with a stationary shuttle-receptacle fixed to the end frame, and a revolving shuttle-box, of mechanism for positively transferring a shuttle from the stationary receptacle to the revolving box and mechanism comprising internal stationary cams placed in the center of the revolving shuttle-box for positively discharging the spent shuttles from the revolving box while a fresh shuttle is simultaneously presented to the next stroke of the picker and an empty box presented before the receptacle to receive a full shuttle substantially as described.

2. In a loom the combination with a rotary shuttle-box provided with a number of chambers open at the periphery to receive shuttles and projecting pegs by which it is rotated of a hooked lever, to engage the pegs a second hooked lever and a bar connecting the two hooked levers a continuously-oscillating lever with a peg to engage the second hooked lever, a crank for throwing the lever into engagement with the peg, and a weft-fork, the said crank being operated by the weft-fork on the breakage of weft, substantially as described.

3. In a loom in which the shuttles are changed when the weft breaks, the combination with a rotary shuttle-box to receive the full shuttles of a fixed internal cam placed in the interior of the rotary box to eject the empty shuttles, a stationary receptacle to contain a supply of shuttles fixed to the frame

of the loom, a reciprocating pusher for transferring the shuttles to the shuttle-box an oscillating lever for actuating the pusher of the shuttle-receptacle, and mechanism connecting with the weft-fork for throwing the operative parts into engagement on the failure of the weft-yarn substantially as described.

4. In a loom, the combination with the weft-fork D and oscillating hammer E, of a pivoted lever T' and crank T which are operated by the weft-fork, the continuously-oscillating lever o provided with peg o', the hooked lever P' which is thrown into engagement with the peg o by the crank T, the connecting-lever O, and the hooked lever P and the rotary shuttle-box K rotated by the lever P, substantially as described.

5. In a loom, the combination with the weft-fork D, and oscillating hammer E, of a pivoted lever T' and crank T which are operated by the weft-fork, the continuously-oscillating le-

ver o provided with peg o', the hooked lever P' which is thrown into engagement with the peg o by the crank T, the connecting-lever O, the hooked lever P the rotary shuttle-box K rotated by the lever P the stationary shuttle-receptacle H and the pusher h by which the shuttles are transferred from the receptacle to the box substantially as described.

6. A shuttle-box for looms constructed with a number of shuttle-chambers k, a swell or spring k' to retain the shuttles, and slides L and stationary cams l to discharge the shuttles as the box is rotated, substantially as described.

In witness whereof I have hereunto signed my name in the presence of two subscribing witnesses.

HUGH R. ROSS.

Witnesses:

JOHN MCQUADE,
IDA ROULSTON.