

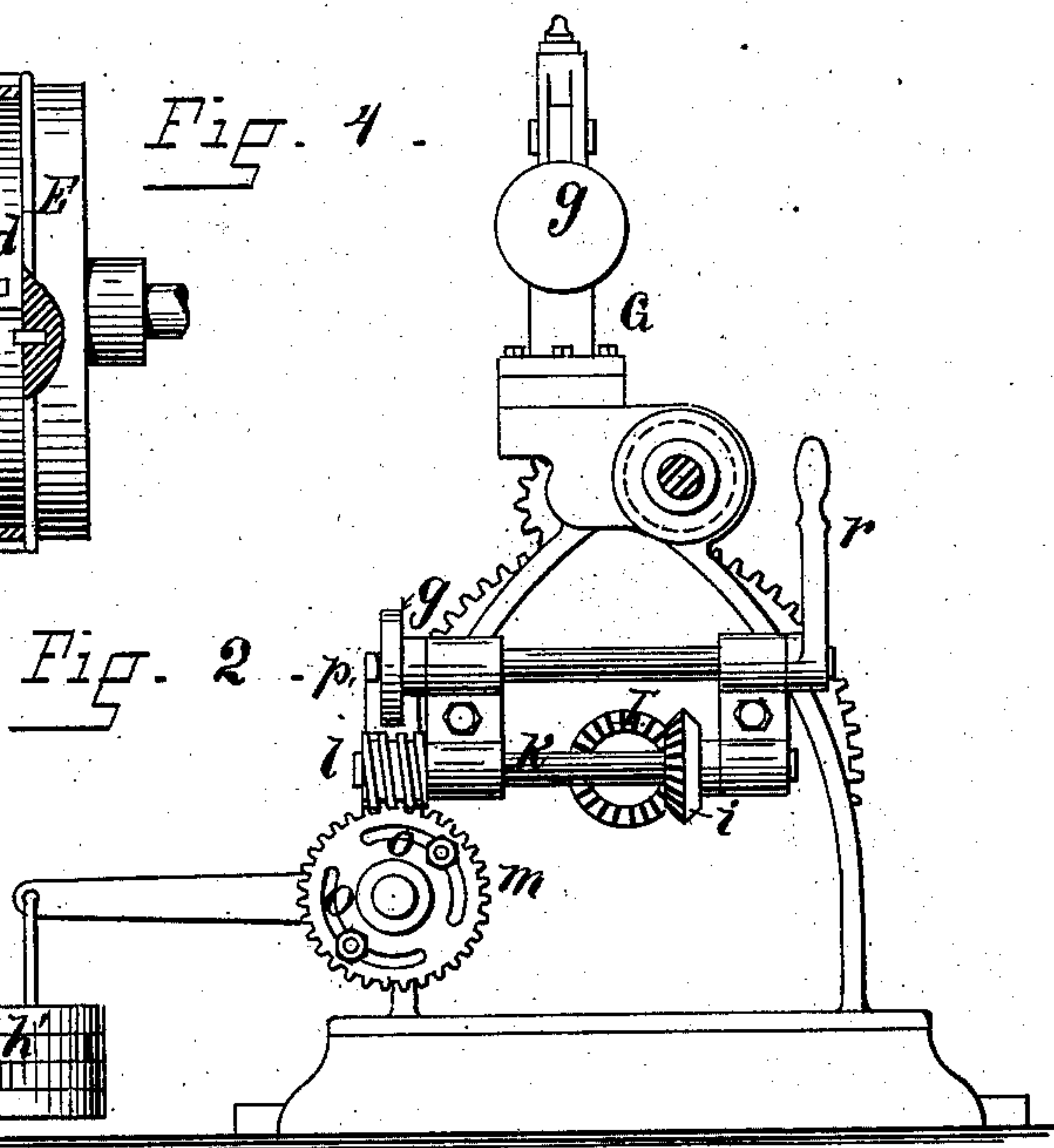
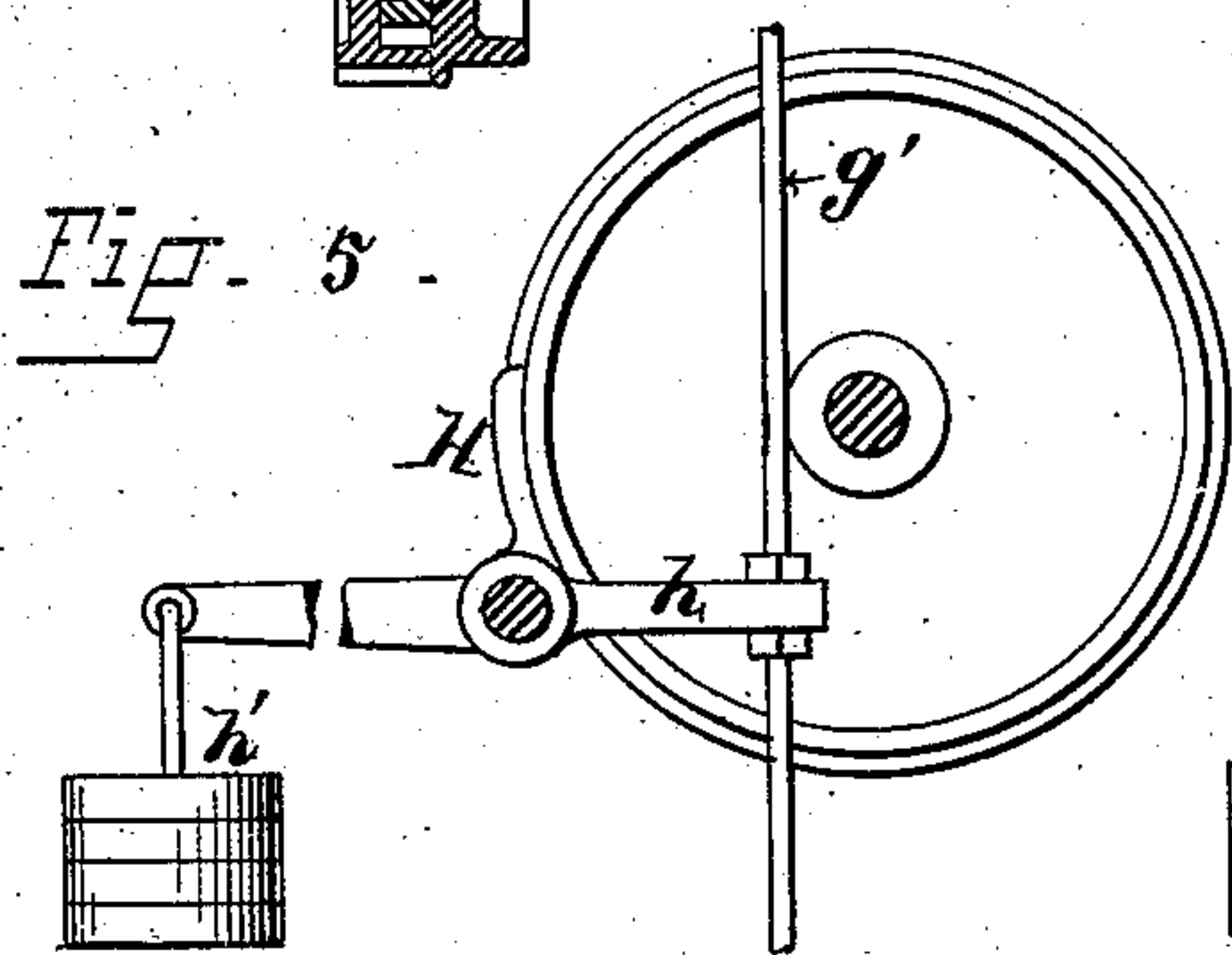
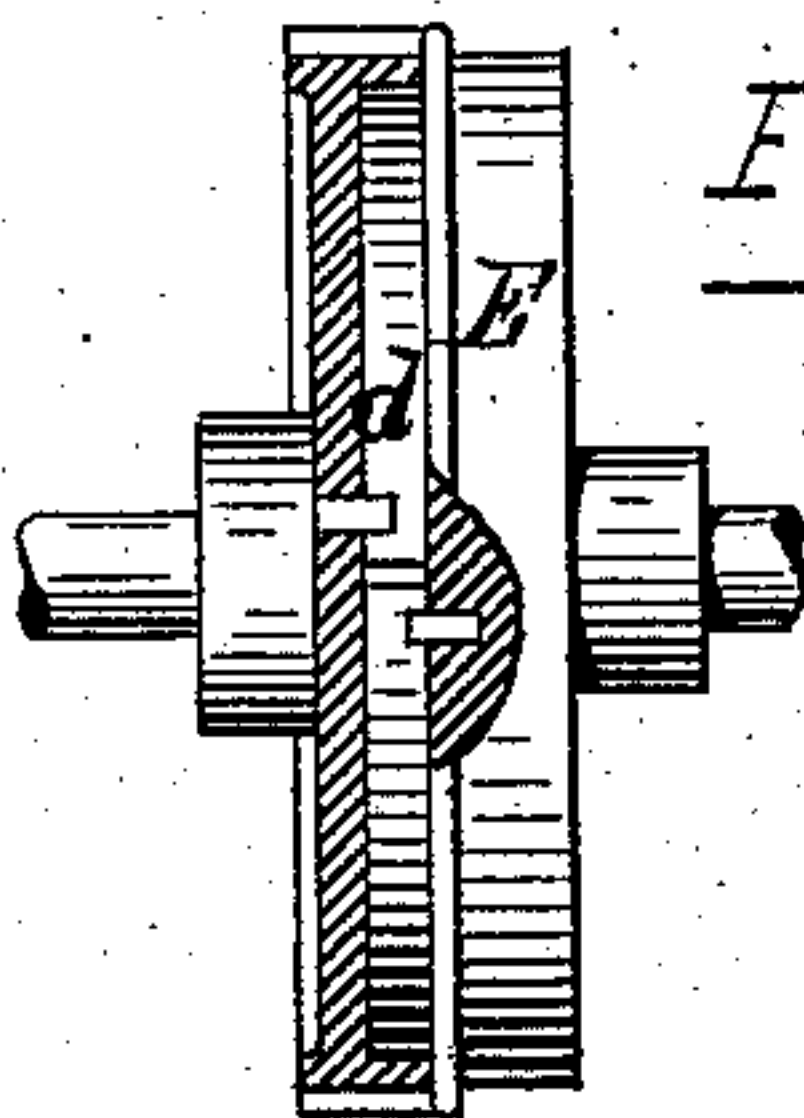
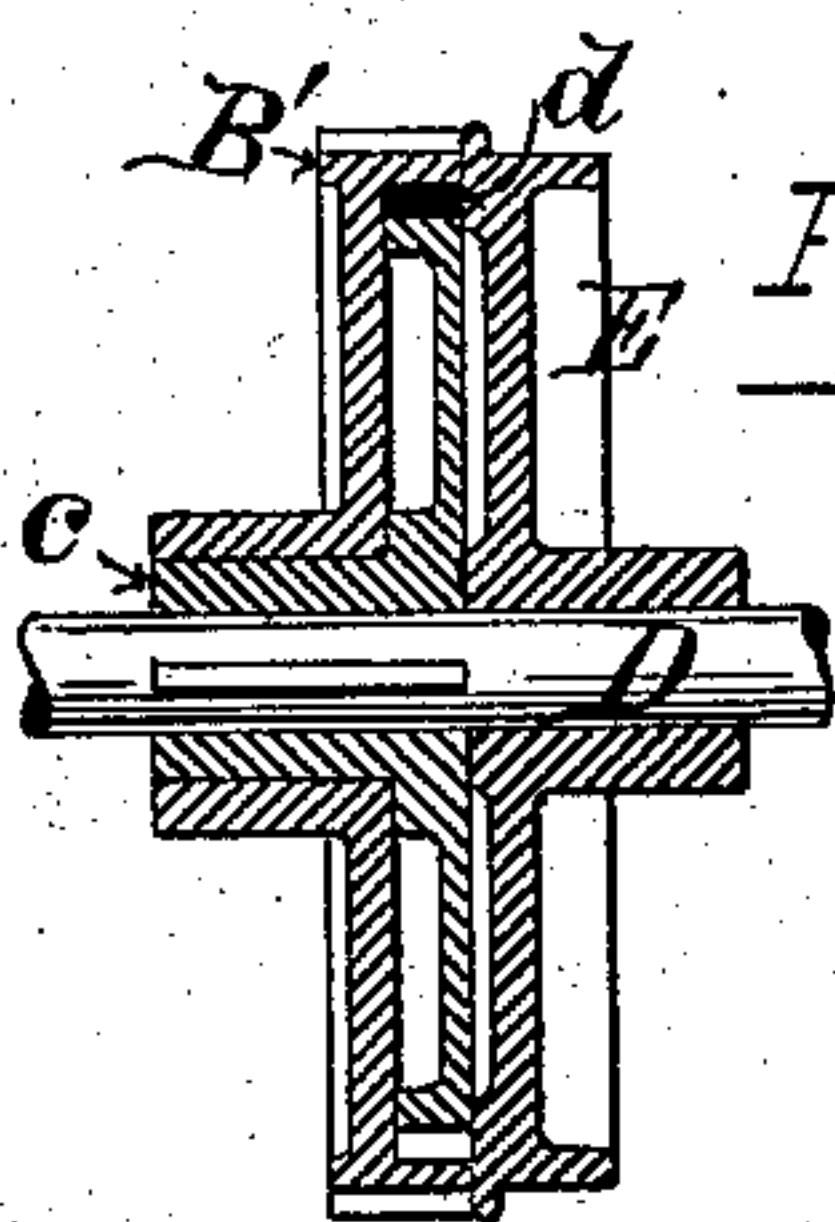
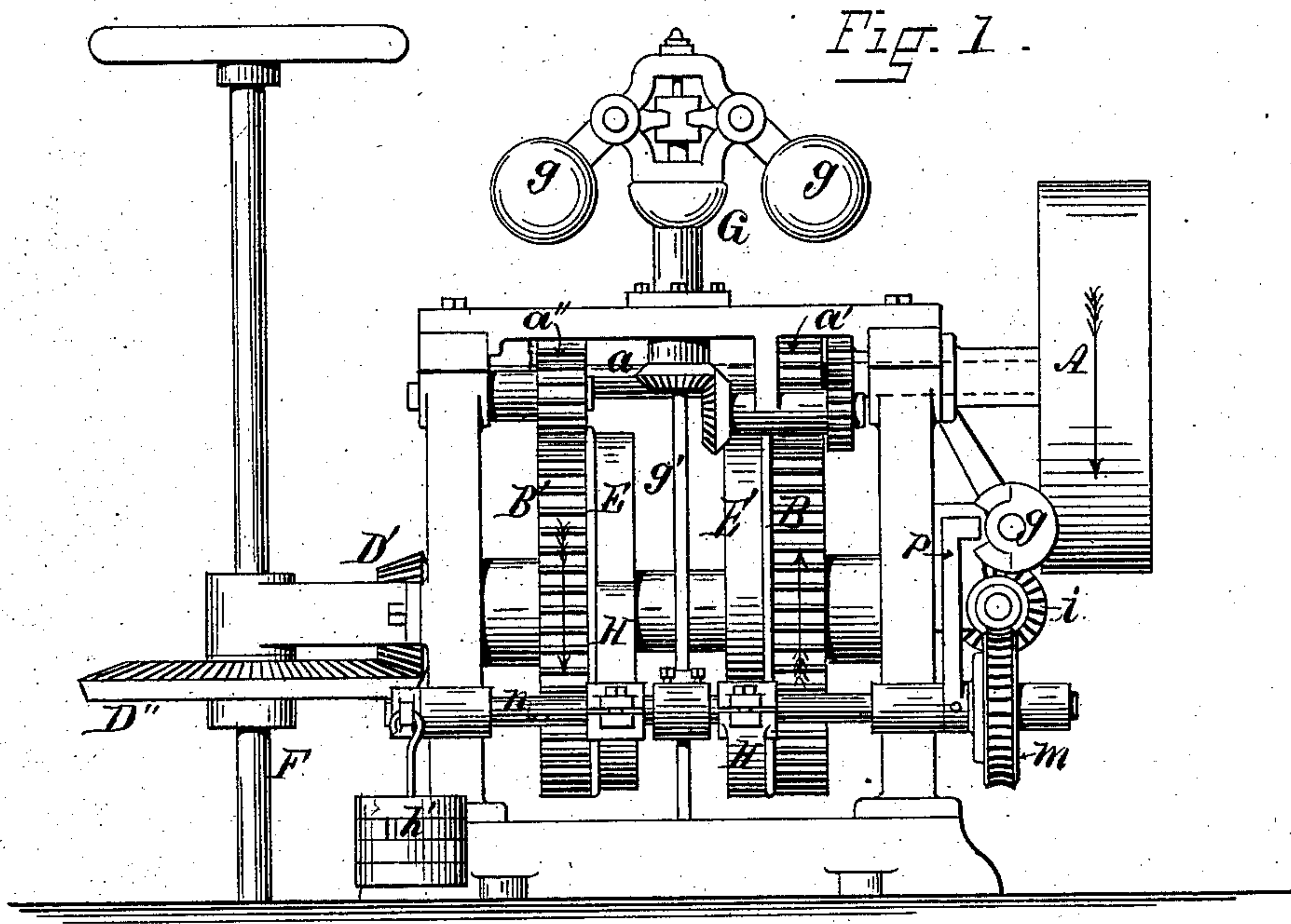
(No Model.)

J. MORTON.

GOVERNOR FOR WATER WHEELS.

No. 292,673.

Patented Jan. 29, 1884.



WITNESSES:

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# UNITED STATES PATENT OFFICE.

JAMES MORTON, OF NORWICH, ASSIGNOR TO JAMES BUCKLEY, OF GROSVENOR DALE, CONNECTICUT.

## GOVERNOR FOR WATER-WHEELS.

SPECIFICATION forming part of Letters Patent No. 292,672, dated January 29, 1884.

Application filed July 13, 1883. (No model.)

*To all whom it may concern:*

Be it known that I, JAMES MORTON, of Norwich, in the county of New London and State of Connecticut, have invented a new and useful Improvement in Governors for Water-Wheels; and I hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming part of this specification.

10 This invention has reference to an improvement in the construction of machines for governing the water-supply to water-wheels; and it consists in the peculiar and novel application of a friction band and brake, by means of which the power is applied in one or the opposite direction to operate the gate, as will be more fully set forth hereinafter.

Figure 1 is a view of my improved automatic water-wheel governor. Fig. 2 is an end view of the same. Fig. 3 is a sectional view of one of the driving-gears, the driving-head, and the friction-disk by which the gear is connected with the gate-operating shaft. Fig. 4 is a view partly in section, showing the connection of the friction-band with the gear-wheel and friction-disk. Fig. 5 is a view of the friction-disk, showing the brake-shoe and its connection.

In the drawings, A is the driving-pulley, by which the governor is driven from any constantly-moving shaft, so that as long as the water-wheel is in motion the governor will also be in motion. The driving-pulley A is secured to the horizontal shaft *a*, on which two pinions, *a'*, are fixed, one of which gears into and drives the gear B, and the other, through the intermediate pinion, *a''*, drives the gear B' in the opposite direction. The gears B and B' are driven constantly in opposite directions. They are loosely mounted on the hub of the driving-head C, which is secured to the shaft D.

E and E' are friction-disks mounted loose on the shaft D. The gear B' is connected with the friction-disk E by the brake-band *d*, one end of which is connected with the gear-wheel B' or B, and the other with the friction-disk E or E', the direction of the motion being such that the brake-band *d* is kept open until resistance is encountered by the friction-disk E, so that one end of the band is held when the

constantly-driven gear-wheel B' draws the brake-band tightly on the periphery of the driving-head, and thus communicates the motion to the shaft D. It will thus be seen that when resistance is applied to the friction-disk E the shaft D will turn in one direction, and when applied to the friction-disk E' it will turn in the opposite direction, and as the shaft D is provided with the beveled pinion D', which gears into the beveled gear D'', secured to the gate-operating shaft, the gate will be moved in one or the opposite direction when the resistance is applied to one or the other of the friction-disks E or E'. This alternate resistance is applied through the speed-governor G, which is the ordinary centrifugal ball-governor driven by intermediate gears from the driving-shaft *a*, so that any acceleration of the speed of the water-wheel and the machinery driven from the same, or any slowing of such speed, is communicated in an increased ratio to the governor, and the weighted arms *g g* are raised or lowered by such change in speed. The short ends of the arms *g g* of the governor enter a block secured to the rod *g'*, and raise the same when the speed diminishes, while they lower the same when the speed is increased.

Referring now to Fig. 5, it will be seen that the rod *g'* is connected with the brake-shoes H H by means of the lever *h*, the weight of the rod and force of the governor being counterbalanced by the weights *h'*, so that the operation of the governor can be adjusted with great nicety.

To make the governor act with precision and prevent the brake-shoes H H from retaining their positions after the gate has been regulated, the beveled gear I is secured to the shaft D, on the end opposite to the beveled pinion D'. The beveled gear I gears into the gear *i* on the shaft *k*, on which the worm *l* is placed, which gears into the worm-gear *m*, secured to the shaft *n*, on which the brake-shoes H H and levers *h h* are secured. The worm-gear *m* is provided with the slots *o o*, in which studs projecting from a plate secured to the shaft *n* pass, so that the worm-gear may be turned nearly one-half of a revolution before the studs bring up against the ends of the slots and operate the shaft *n*, so as to release the



brake-shoe from contact with the friction-disk. As the worm-gear turns very slowly, sufficient time is allowed for the brake-shoes to be released; and it is only when such release does not take place, and to prevent the gate from being moved too far, that this particular safety appliance is used.

$p$  is a stop secured to the shaft  $n$ , and  $q$  is a cam-shaped disk, a portion of which is cut away.

$r$  is a hand-lever for turning the disk so as to allow the stop to bear against the same or pass by the same, and thereby prevent or permit the turning of the shaft  $n$  and the operating of the brake-shoes.

By the use of the brake-band  $d$  and the brake-shoes  $H$  the changes in the direction of the governor are made easy, without sudden stops, so that the strain is brought on the gears and other parts of the governor gradually and without shock, thereby insuring durability and freedom from repairs.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. In a water-wheel governor, the combination, with the main driving-shaft  $a$  and pinions  $a' a''$ , of the gears  $B$  and  $B'$ , mounted loose on the driving-heads  $C$   $C$ , the friction-disks  $E$  and  $E'$ , and the strap-brakes  $d$ , constructed

to be operated through the governor, and the brake-shoes  $H$  to regulate the gate, as described. 30

2. The combination, with the main driving-shaft and its pinions, of the gears  $B$   $B'$ , the driving-heads  $C$ , friction-disks  $E$  and  $E'$ , straps  $d$   $d$ , the governor  $G$ , rod  $g'$ , and shoes  $H$   $H$ , constructed to move the shaft  $D$  and regulate the water-supply, as described. 35

3. In a water-wheel governor, the combination, with the shaft  $D$ , of the driving-heads  $C$   $C$ , the gears loosely mounted on the driving-heads, the disks  $E$   $E'$ , and band-brakes  $d$   $d$ , constructed to connect and disconnect the gears, as described. 40

4. The combination, with the gears  $B$   $B'$ , driving-heads  $C$   $C$ , disks  $E$   $E'$ , and band-brakes  $d$   $d$ , and the brake-shoes  $H$   $H$ , mounted on the shaft  $n$  and controlled by the governor, of the beveled gear  $I$ , pinion  $i$ , worm  $l$ , and worm-gear  $m$ , provided with the slots  $o$   $o$ , constructed to release the brake-shoes, as described. 45

In witness whereof I have hereunto set my hand. 50

JAMES MORTON.

Witnesses:

JOSEPH A. MILLER,

J. A. MILLER, JR.