

(No Model.)

3 Sheets—Sheet 1.

J. YOUNGSON.

AUTOMATIC FIRE ESCAPE AND ELEVATOR.

No. 533,404.

Patented Jan. 29, 1895.

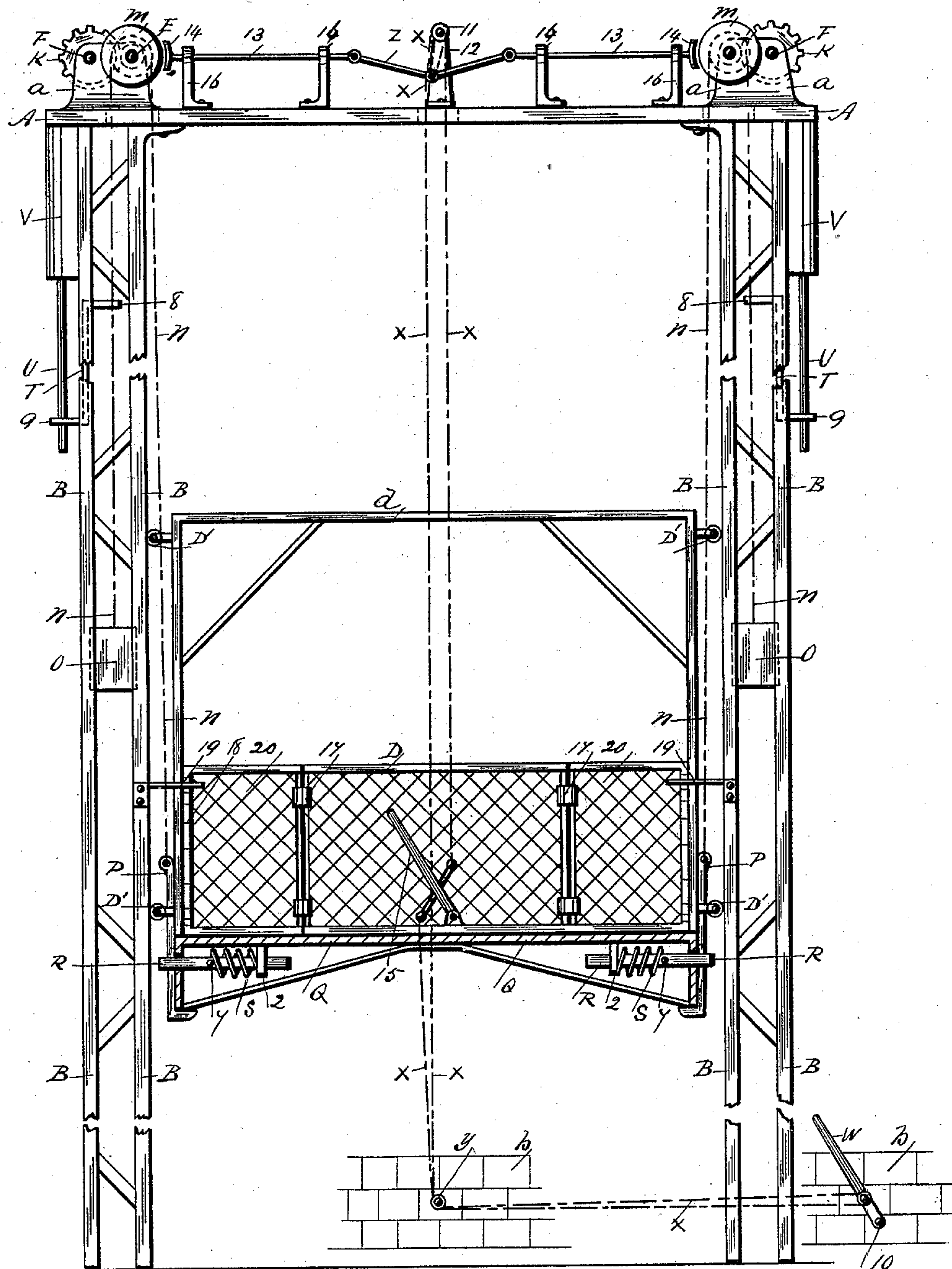


Fig. 1.

Witnesses.
N. M. Pherson
A. Cameron

Inventor.
John Youngson.
By his Atty. John H. Hendry.

J. YOUNGSON.

AUTOMATIC FIRE ESCAPE AND ELEVATOR.

No. 533,404.

Patented Jan. 29, 1895.

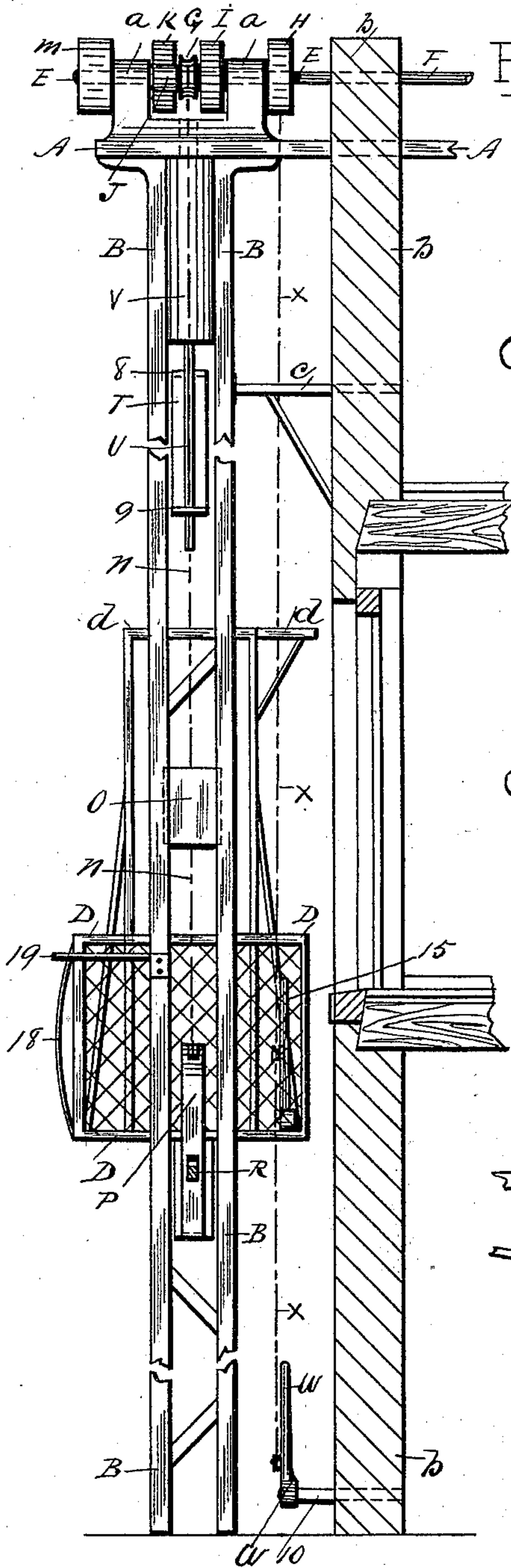


Fig. 2.

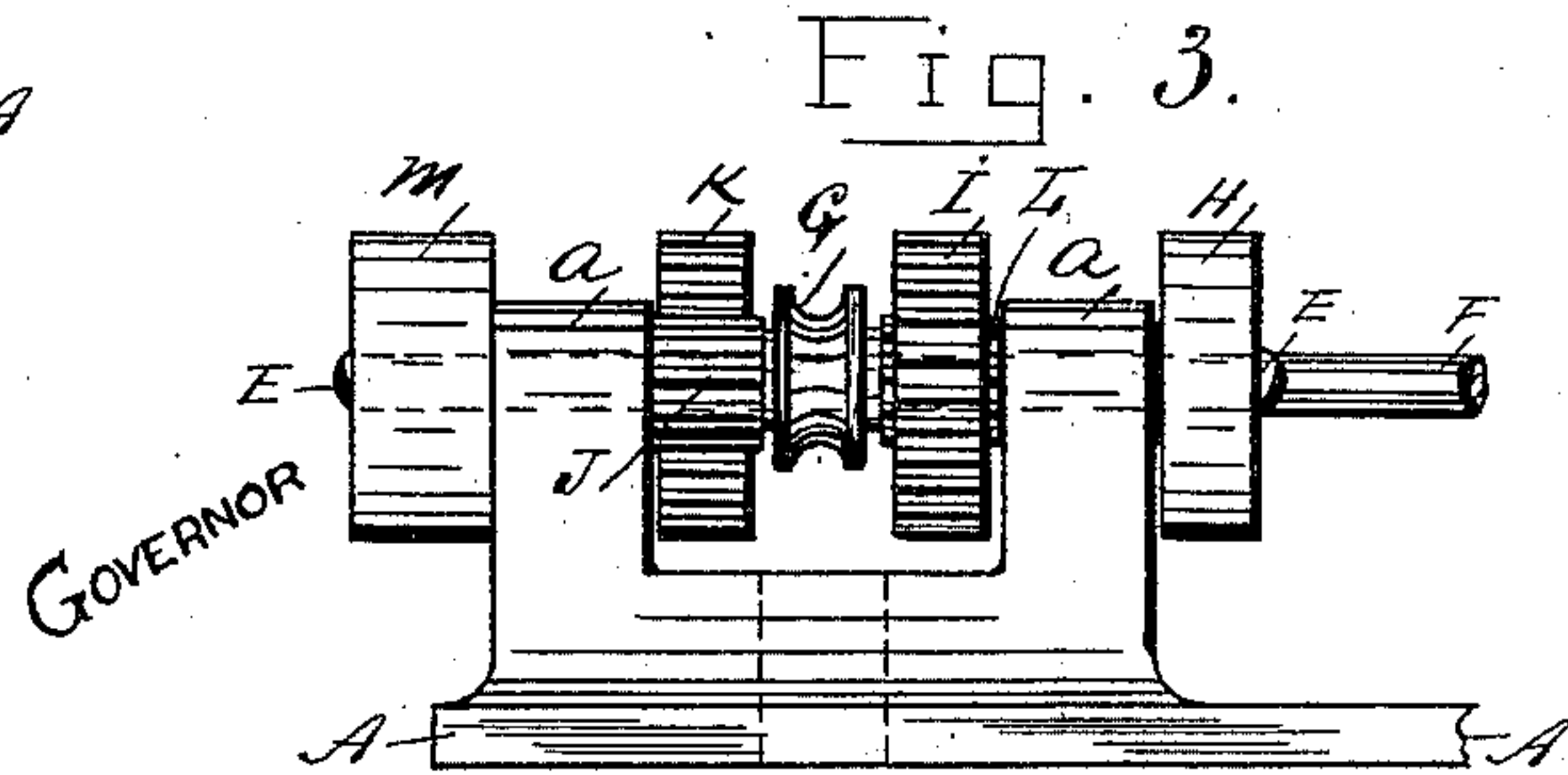


Fig. 3.

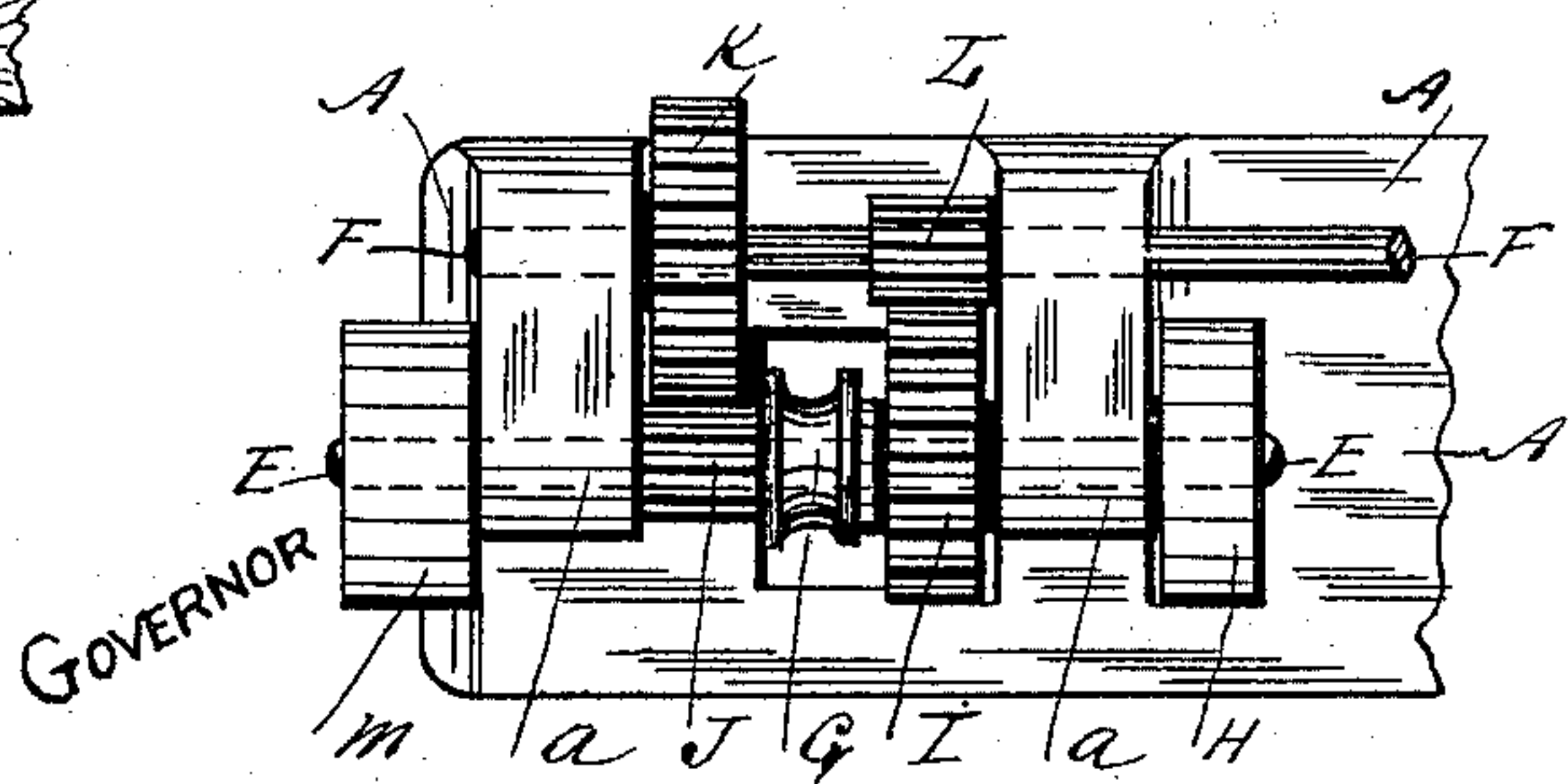


Fig. 4.

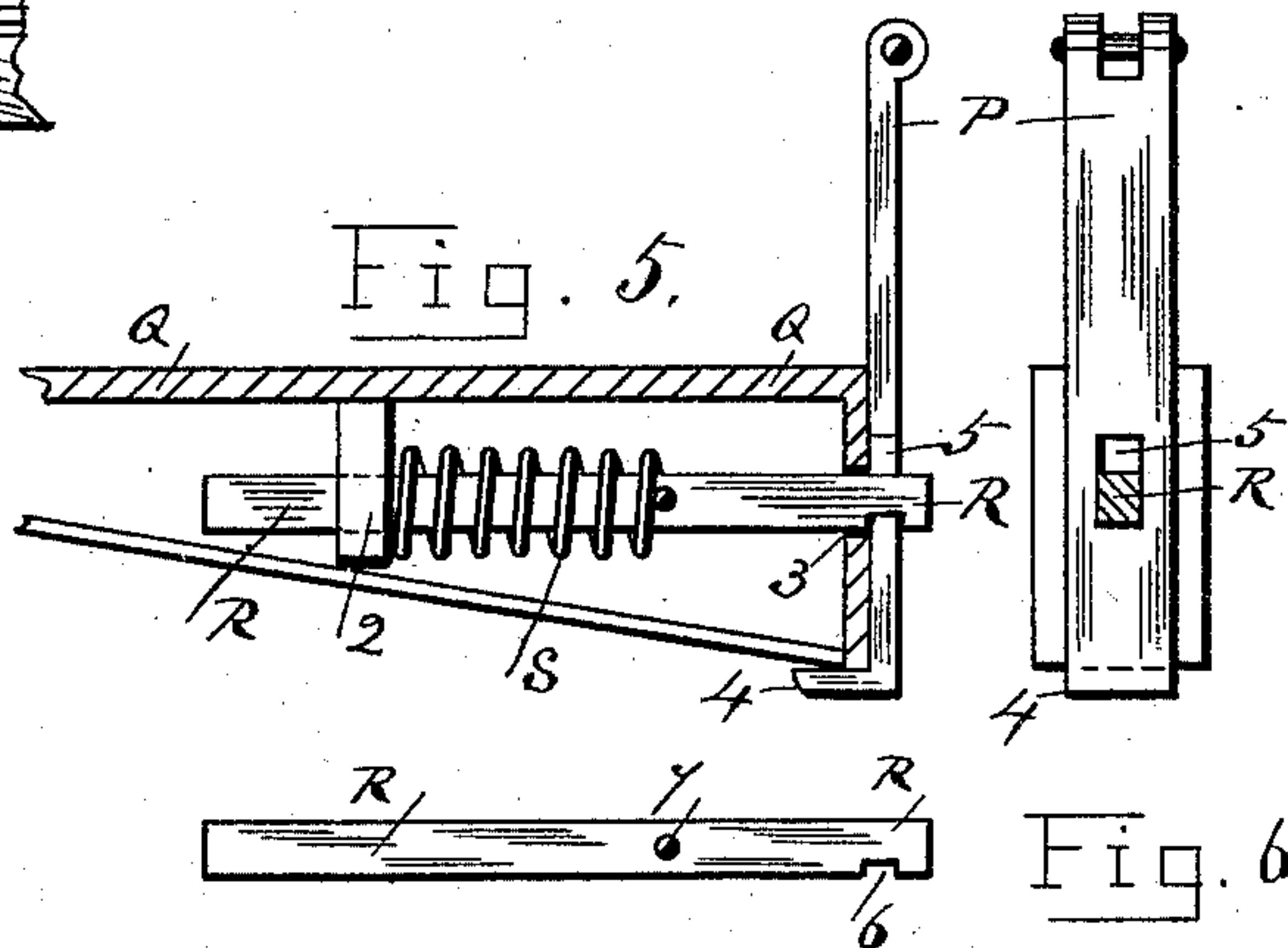


Fig. 5.

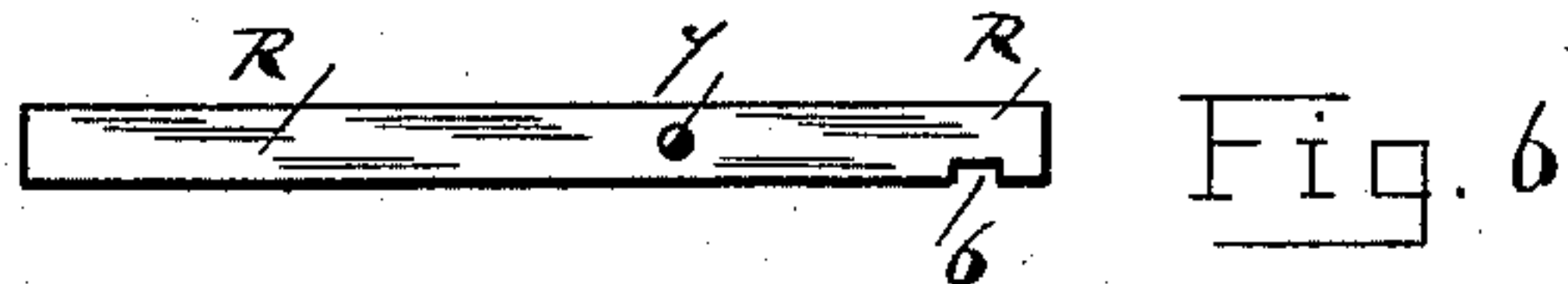


Fig. 6.

Fig. 7.

Witnesses,
A. M. Cameron
A. Cameron

Inventor,
John Youngson
By his Atty. *John B. Hendry.*

(No Model.)

3 Sheets—Sheet 3.

J. YOUNGSON.

AUTOMATIC FIRE ESCAPE AND ELEVATOR.

No. 533,404.

Patented Jan. 29, 1895.

Fig. 8.

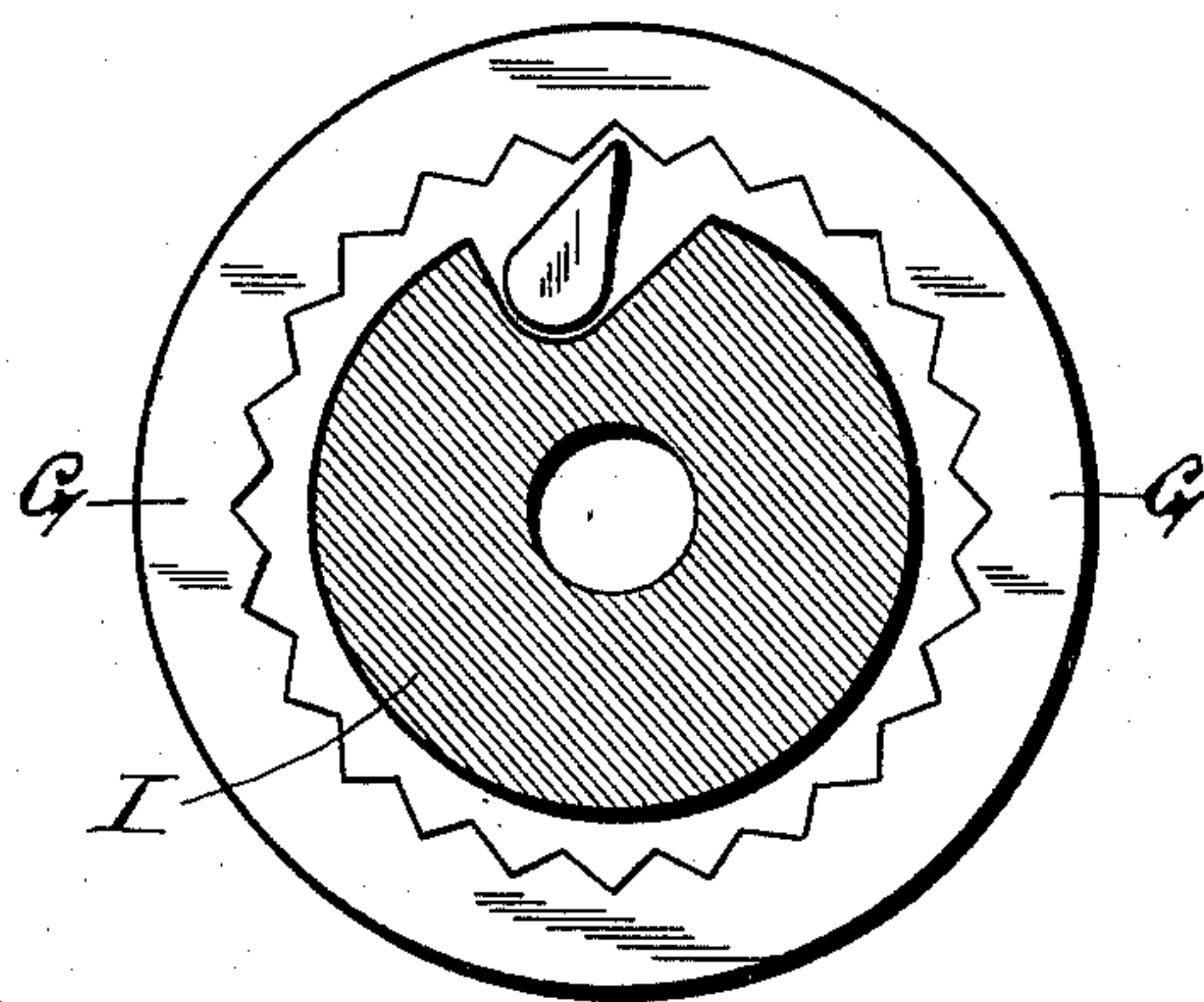
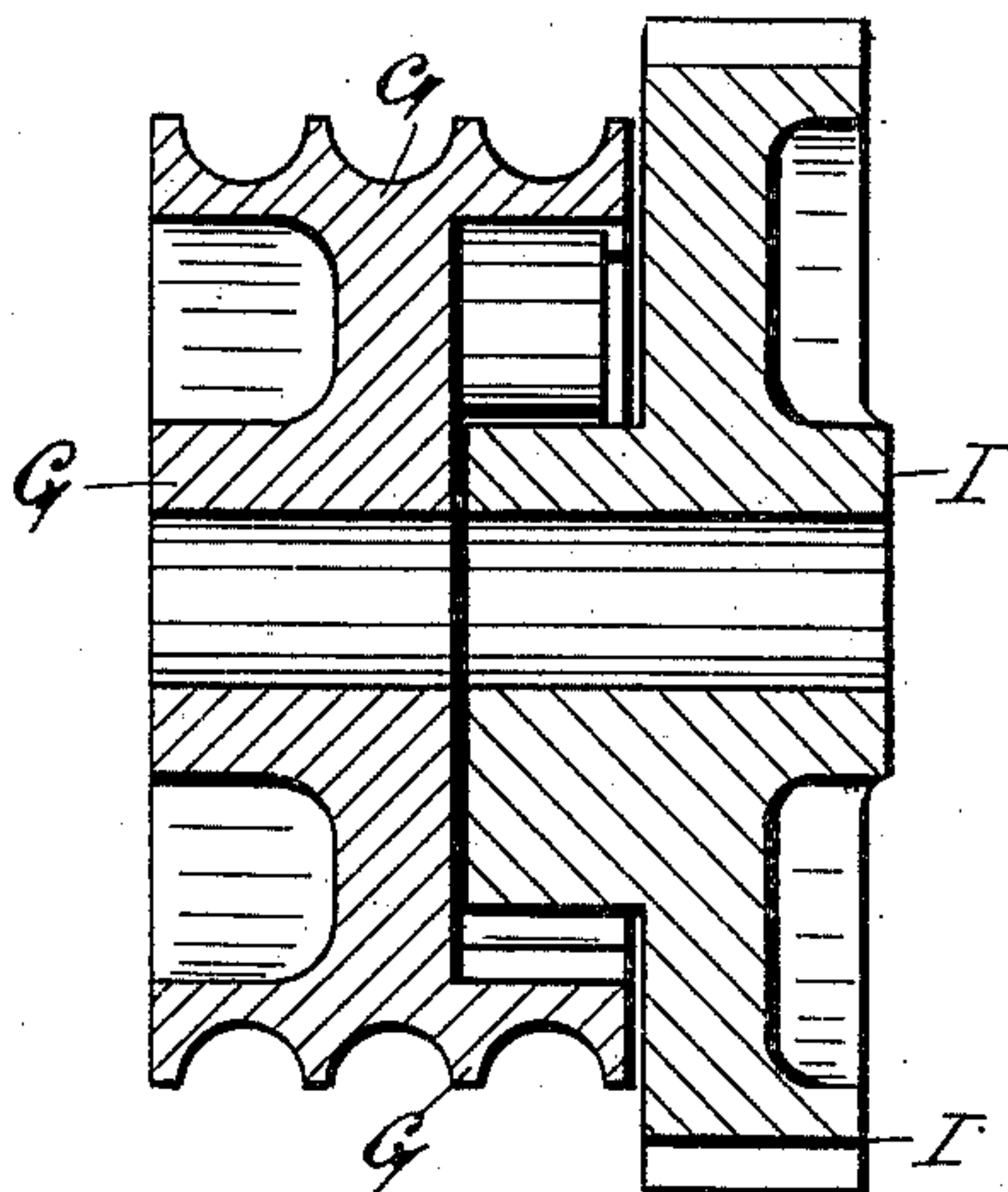


Fig. 9.

Witnesses.

Alexander Hanton
Lamar Wilcox

Inventor.

John Youngson
By his Atty John H. Hendry.

UNITED STATES PATENT OFFICE.

JOHN YOUNGSON, OF HAMILTON, CANADA.

AUTOMATIC FIRE-ESCAPE AND ELEVATOR.

SPECIFICATION forming part of Letters Patent No. 533,404, dated January 29, 1895.

Application filed August 28, 1894. Serial No. 521,551. (No model.)

To all whom it may concern:

Be it known that I, JOHN YOUNGSON, a citizen of Canada, residing at Hamilton, in the county of Wentworth, in the Province of Ontario, Canada, have invented a new and useful Automatic Fire-Escape and Elevator, of which the following is a specification.

My invention relates to improvements in an automatic fire escape and elevator, in which mechanism, stationed at the upper end of vertical and parallel columns which are secured to the wall of a building, is attached to a vertical cage or receptacle, by means of cables, and operated either by hand or by power of any description applied to said mechanism. This vertically sliding cage operates in combination and in conjunction with certain convenient and safety attachments, for instance, certain safety bolts, safety brakes, and air cushions.

The objects of my improvements are, first, to provide a fire escape, the speed of which shall be regulated and governed by means of applied mechanism consisting chiefly of governors and friction wheel brakes; second, to afford facilities for the proper adjustment and placement of the cage at any desired window or opening of a building whether ascending or descending; third, to reduce the friction of several operating parts, by reason of their freedom from engagement at special operations; fourth, to introduce means pertaining to an applied cushion for the cage when heavily laden, and nearing the ground floor; and fifth, to provide an automatic latch for, gate or gates of cage. I attain these objects by the mechanism illustrated in the accompanying drawings in which—

Figure 1, is a front elevation of my improved automatic fire escape and elevator capable of holding a number of people, therefore chiefly adapted to large buildings. The wrought angle or bar iron braced columns which are secured to the wall are broken in two places, in order to show the upper mechanism and also the lower parts of the device. These columns may have any number of these angle braces from top to bottom, and on every side, similar in position and distance apart as those shown at the lower end of column, in Fig. 2 of the drawings. Fig. 2, is a side elevation of the same device showing braced

perpendicular column secured to wall of building by means of one or more bracket braces. Fig. 3, is an enlarged side elevation of the operating and driving mechanism on the upper end of rigid column, this mechanism being composed of two parallel shafts in rigid bearings, provided with rigid casings for centrifugal friction governors, also the brake wheel, double gear wheels and the central triple cable pulley from which the cage, or receptacle, is suspended and vertically operated, the outer ends of said cables being attached to counterbalance weights. Fig. 4, is a plan of Fig. 3. Fig. 5, is front elevation of right hand end of strengthening safety beam underneath the floor of the cage and cable attachment at the end thereof provided with bolt which operates automatically in case of breakage of cable. Fig. 6, is a side elevation of the same, and Fig. 7, is an elevation of said bolt showing recess in same for locking purposes. Fig. 8 is an enlarged sectional elevation of a central triple cable pulley and large gear or spur wheel in position with clutch or dog, and Fig. 9 is a face view of said cable pulley having annular corrugations with which the clutch or dog engages, the butt or large end of said clutch, fitting into a recess which is formed in the hub of gear wheel. One or more of these clutches may be used if necessary, or other modes of driving, but these two views will be sufficient to show the relation or connection existing between said pulley and gear wheel.

Similar letters and figures refer to similar parts throughout the several views.

A, is the upper cross brace of this escape and elevator and is supported by and firmly secured to the top of the vertical and parallel angle or bar iron columns B, their length shown broken which are secured to the wall of a building by one or more braces C, at a convenient distance therefrom, so as to allow sufficient space for the proper working and operation of the vertically sliding cage D, provided with guide rollers D', which engage with the said columns. This upper cross brace A, has bearings, a, forming a part thereof, and into which run the two inner shafts E, and the two outer shafts F, one of each over each column, as seen in Fig. 1. Each said inner shaft E, supports and oper-

ates a central cable pulley G, having one or more grooves for one or more cables. Each cable may be taken one or more times around said pulley, a friction brake wheel H, and a gear wheel I, and gear pinion J, which engage with the gear wheel L, and pinion K, on said shaft F. The said pulley G, and the spur wheel I, which run independent of their shaft E, engage with each other by means of a common catch or clutch in the side of pulley next to wheel. Both said wheel and pulley revolve loose on, or without a sleeve on the shaft. When the cage descends all gears are in motion, and when the cage ascends empty, the cable pulley only, revolves, and when the cage ascends laden, then power is applied to the extended shaft F, to take up the load.

To comprehend the construction and operation of this device more fully I deem it wise to specify more particularly one side only, that the singular number may be employed, both sides of the device being identical, as seen in Fig. 1.

The rigid casing M, forming a part of or secured to the fixed bearing, *a*, contains centrifugal friction governors of approved construction which revolve with the central shaft E.

In respect to operating the escape or elevator, when heavily laden with people or with merchandise, in ascending, the shaft F may be driven by power located in the interior of the building into which the shaft extends. Said shaft may be provided with a clutch for connecting and disconnecting, this being a very important feature in connection with the gear wheels. Also a part of the rear of the upper cross brace A, is intended to be built in, or attached to the wall of building in order to strengthen, and add stability to the upper part of the device in a substantial manner.

The cable proper, N, of the device, which bears the whole weight of the cage, passes over the grooved pulley G, one or more times as before mentioned, one end of said cable being attached to a counterbalance weight O, and the other end of said cable is attached to the upright connection P which forms a part of the cage.

To strengthen the floor of the cage, a safety beam Q, is secured to the under part thereof and is provided with a horizontal safety bolt R, in bearings 2 and 3 of said safety beam. The said upright connection P, to which said cable N, is attached, is provided with a lip 4 at its lower end for support and strength, and a vertically slotted aperture 5 for said bolt, which has a gain 6. In case said supporting cable parts, the upright connection P, drops, thus releasing said bolt which is forced out by spiral spring S, into and between the cross stays and angle sides of column. This spring S, engages with bolt bearing 2 of beam and extension pin 7 of bolt; thus preventing the cage from dropping. When the cage is descending, and the counterbalance weight ascending, at a certain distance up, which said distance

is regulated by the distance of the cage from the ground floor, the upper part of counterbalance engages with the upper projection 8, of piston slide T, having lower projection 9, which is secured to the vertical piston rod U, of vertical air cylinder V, which is attached to the upper outer end of said vertical column. This important element prevents any sudden jar or contact of the lower part of cage with ground floor; and moreover, this action of the air cushion allows a very easy descent at the termination thereof.

In order to prevent a too rapid descent of the cage at any stage of operation, and especially when heavily laden another important element is introduced, namely, the friction brake wheel, seen very fully in Fig. 1, of the drawings. This brake wheel H, before alluded to is secured to shaft E, and revolves with said shaft, and the hand lever W, pivoted at 10 to wall, in close proximity to ground floor is provided with a cable pulley for cable X, each end of said cable being fastened to the ends of rigid cross arm of lever 15 and when the lever W is adjusted to vertical position it draws the double cable X, which is capable of running over pulley 11, and looped over the central connection of the levers Z, and over the cable guide pulley Y down, through the cable guide pulley Y, also pivoted to the wall. Consequently, the central connection of double levers Z, to which the upper loop of double cable X is looped, is drawn up, the loop of said cable X engaging with the grooved pulley 11, in standard 12, the result being, that the horizontal rods 13, which slide in standards 16 engage with the brake wheels H. The ends of these rods 13 are supplied with concaved faced brakes 14, which engage with the face of said brake wheels, thus facilitating the stopping of same, and also the cable pulleys G.

The lever 15 having angle cross arm to which ends of cable T are attached is located and pivoted in the cage and operates the cable X identically as the lever W; it being obvious that the said brakes 14, may be applied to the wheels H, and operated either from the ground floor, or from the interior of the cage.

The cage D has its upper part *d*, extended and forming a framework some distance perpendicularly above the cage proper, to allow the cage to touch the ground floor if desired when the columns are some eight feet from the ground, and also extending inward, at right angles, toward the wall of building. This right angled and braced extension may be used for the purpose of opening different kinds of projecting and sliding screens with which the windows of buildings may be covered, when the cage is ascending, and of closing said screens when the cage is descending. This latter is important so as to keep the people from falling from the windows when the cage is descending. The small guide rollers or pulleys D' are pivoted to the cage at convenient

places to suit the requirements of large or small escapes, and the said rollers are intended to run against either side or partially between the angle or bar irons which form the columns.

The one or more gates 20 of the cage hinged at 17, are latched automatically. Each gate is provided with a convex friction bar 18, which when ascending or descending engages with a projecting bar 19 attached to the column at a convenient place or places, that when the bar 18, engages with the rigid bar 19, the gate is forced to its closed and latched position. In order to secure perfect safety to the people in the cage, this safety device is necessary especially to very high buildings.

To these ends my improvements consist, in its novel construction and adaptation of parts, and in combination especially for heavy work and high buildings such as national and public institutions, factories, warehouses, hotels and large high stores in general.

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

1. In an automatic fire escape and elevator, the combination of the cross brace A, the rear part extending through the wall of building and supported on angle or bar iron columns B, and provided with shaft bearings, a, shaft E, and shaft F, gear wheels I and K engaging with their pinions, the rigid governor casing M, the grooved cable pulley G, with cables N, secured to cage D., substantially as described.

2. The combination of the cross brace A, having bearings a, and supported on columns B, the shafts E and F revolving with their gear wheels and pinions in said bearings the governor casing M, the cable pulley with cables N, attached to upright connection P, of safety beam Q, attached to cage and provided with bolts R, in bearings 2, the spiral springs S, and the counterbalance weights O attached to said cable, substantially as described.

3. The braced columns B, secured to wall of building by braces C, the cross brace A, secured to said columns, and provided with bearing a, having their shafts E and F with gear wheels and pinions, the governor casing M, the grooved pulley G, having one or more cables N, the counterbalance O attached to end of said cable in combination with the cage D, attached to other end of cable by means of slotted connection P, having lower lip 4 engaging with safety beam Q, of said cage, the bolt R, and the spring S, substantially as described.

4. The combination of the columns supporting the upper cross brace having bearings for shafts E, with cable pulley and cable,

the cage with guide rollers and counterbalance attached to ends of said cable, the governor casing M, rigid with said bearing, the brake wheels H, revolving with said shafts, the lever W, near the ground with cable pulley attached and the lever having cross arm, pivoted in the cage, the pulley Y, the double cable X, looped and passed over pulley 11 in bearing 12 and attached to central pin of double levers Z, the horizontal rods 13, in bearings 16, and the concaved brakes 14, substantially as described.

5. The combination of the air cylinders V, secured to upper and outer sides of columns B, and provided with pistons and rods U connected to slides T at 9 having projections 8 in which the counterbalance O engages, the cage D provided with safety beam Q with its connections P, bolts R, and springs S, the cables N, the cross brace having bearings, and secured on said columns, the shafts E, cable pulleys G, governor casings M, the brake wheels H, the horizontal rods 13 having friction brakes 14, in bearings 16, the double levers Z, the cable pulley H, cables X, bearings 12, lever 15, pulley Y and lever W, substantially as described.

6. The combination of the cage D, having braced upper extension d, provided with hinged doors having bowed projections 18, to engage with adaptable projections 19, attached to vertical columns at suitable positions to accomplish the closing of said gates, substantially as described.

7. The combination with the cage D, having hinged doors, of the safety beam Q, secured to said cage, and provided with bearings 2 and 3 for horizontal bolt R, having pin 7, and spring S, and the cable connection P, having vertical slot 5, and under lip 4, substantially as described.

8. The lever W, pivoted to the lower part of wall and provided with cable pulley, the cable pulley Y, pivoted to wall, the cross arm lever 15 pivoted in the cage D, the double cable X, the cable pulley 11 in bearings 12, said cable looped to the connecting pin of double levers Z, the rods 13 in bearings 16, the brakes 14, in combination with the brake wheels H on shafts E of upper cross brace A, substantially as described.

9. The combination of the vertical columns B, and the air cushion cylinders V, having piston rods U with vertical connecting slide T, having upper projections 8 to engage with counterbalance O, attached to cables N, of pulley G, substantially as described.

JOHN YOUNGSON.

Witnesses:

WM. MYERS,

JOHN H. HENDING.