

No. 624,432.

Patented May 2, 1899.

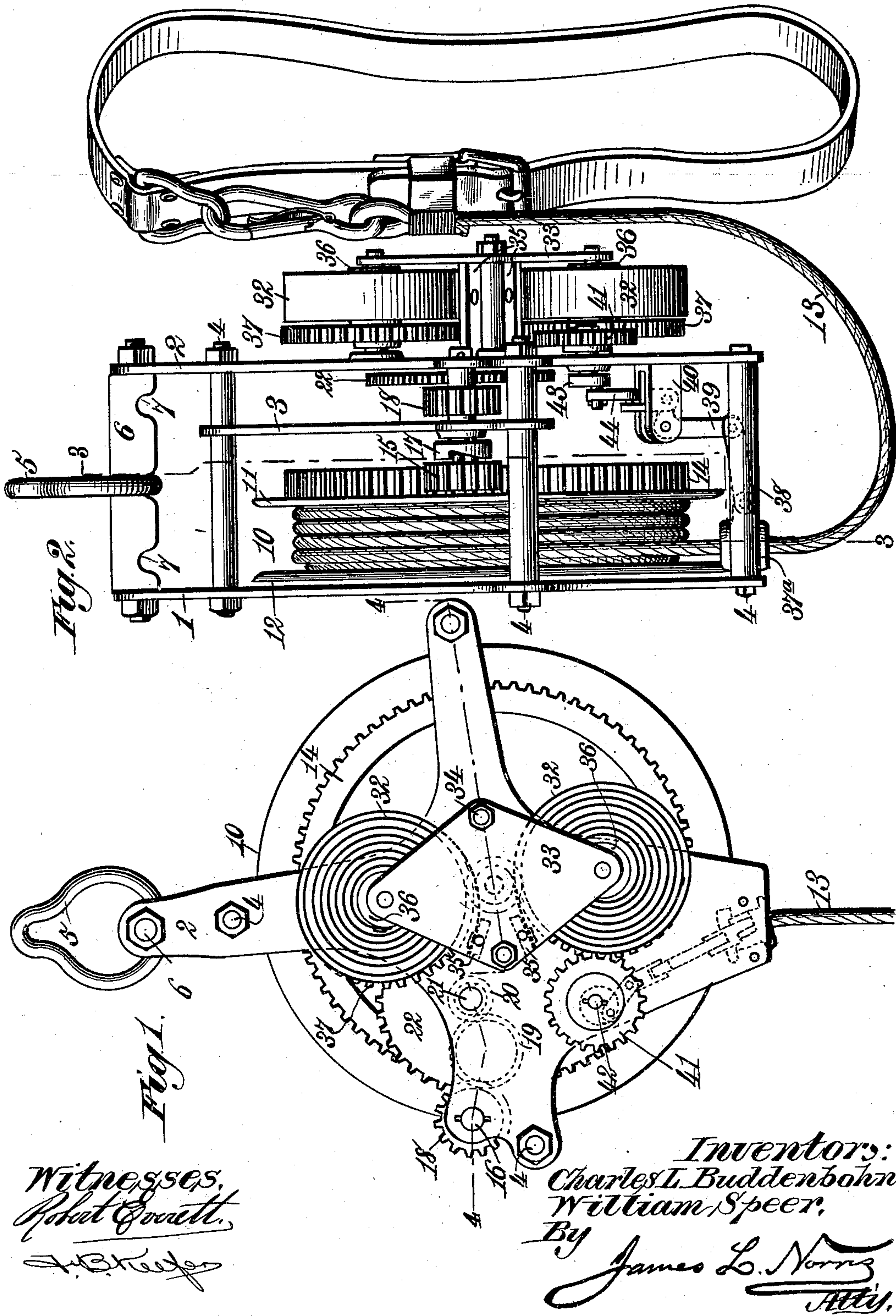
C. L. BUDDENBOHN & W. SPEER.

FIRE ESCAPE.

(Application filed Dec. 22, 1898.)

2 Sheets—Sheet 1.

(No Model.)



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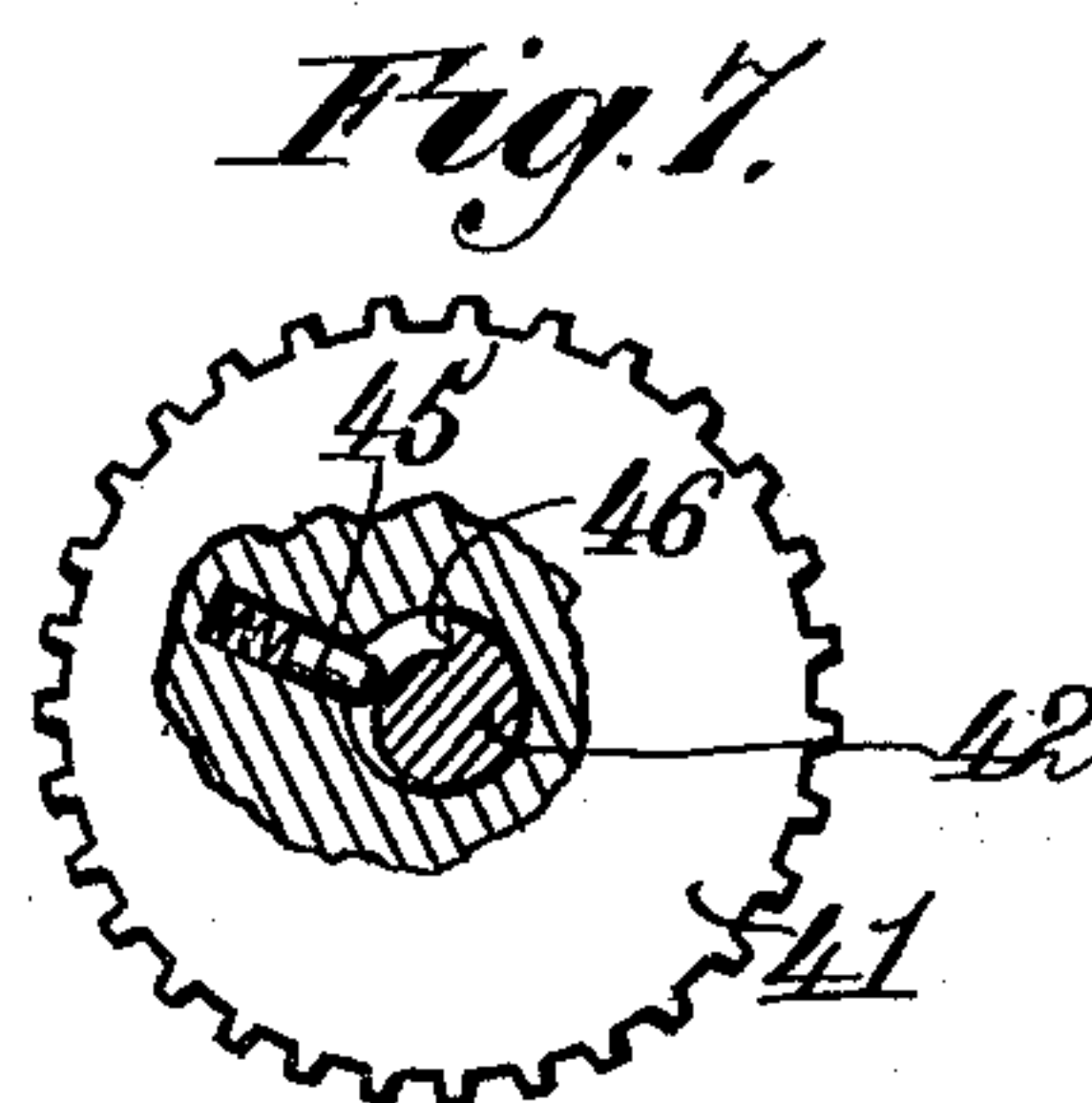
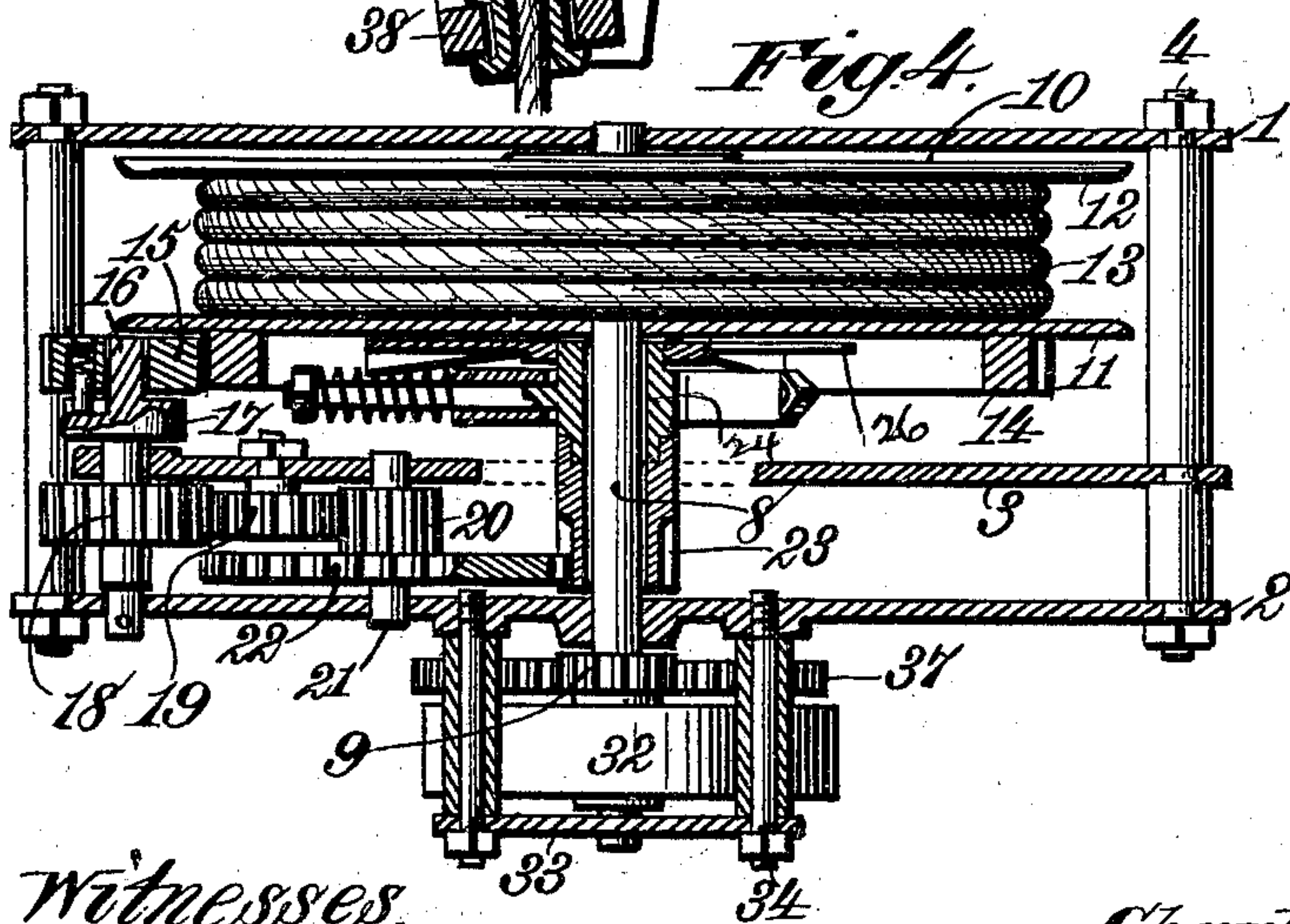
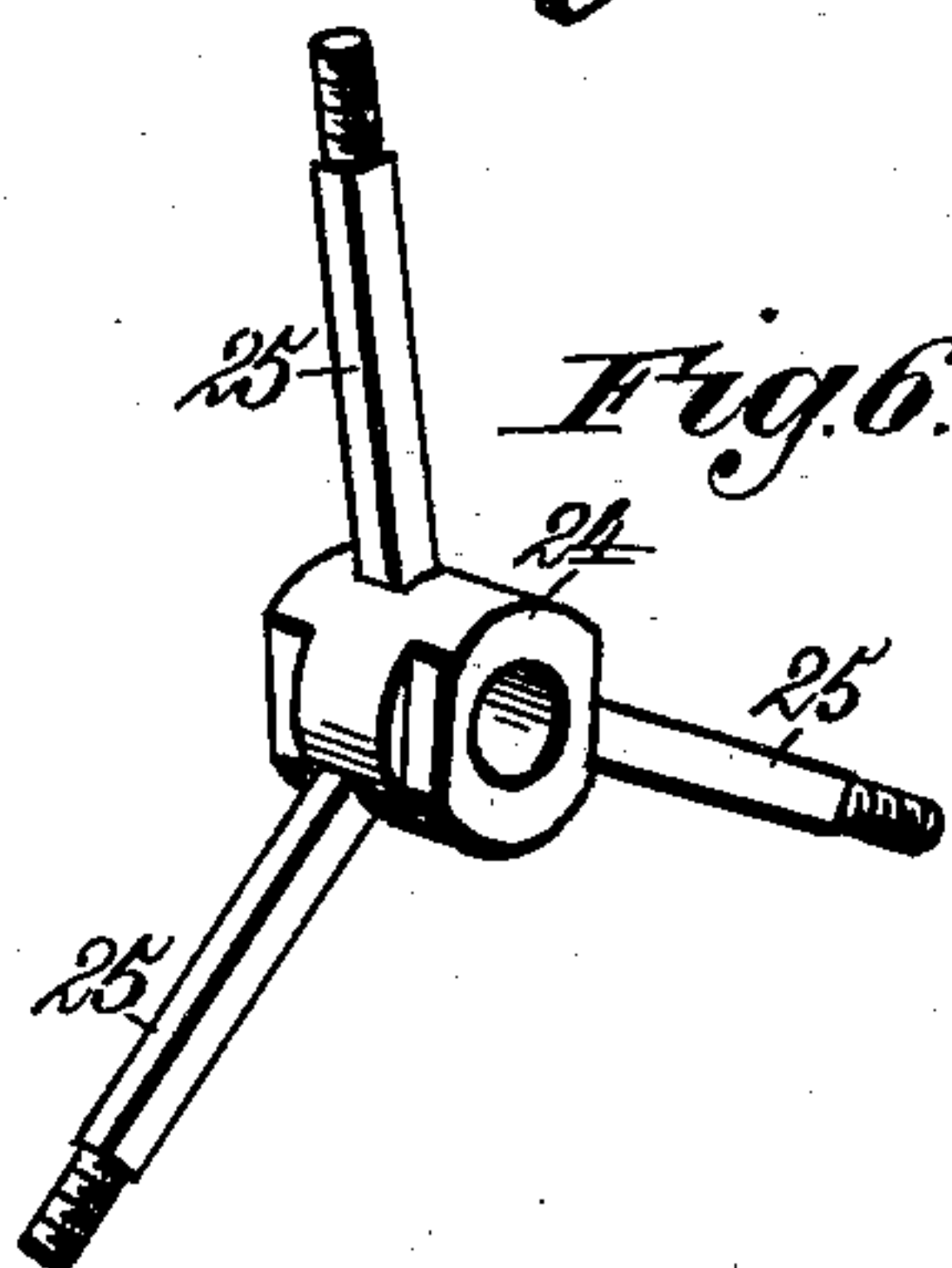
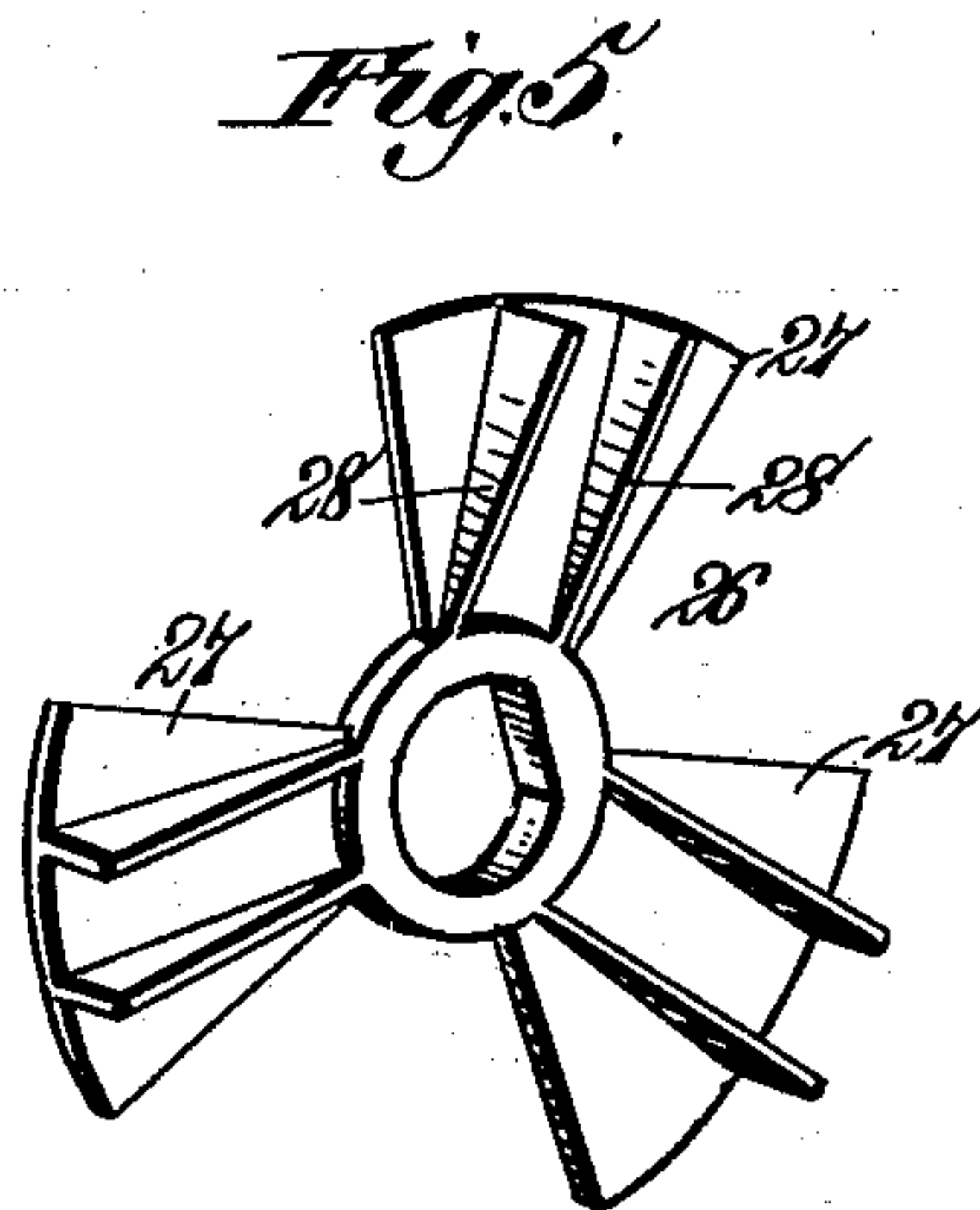
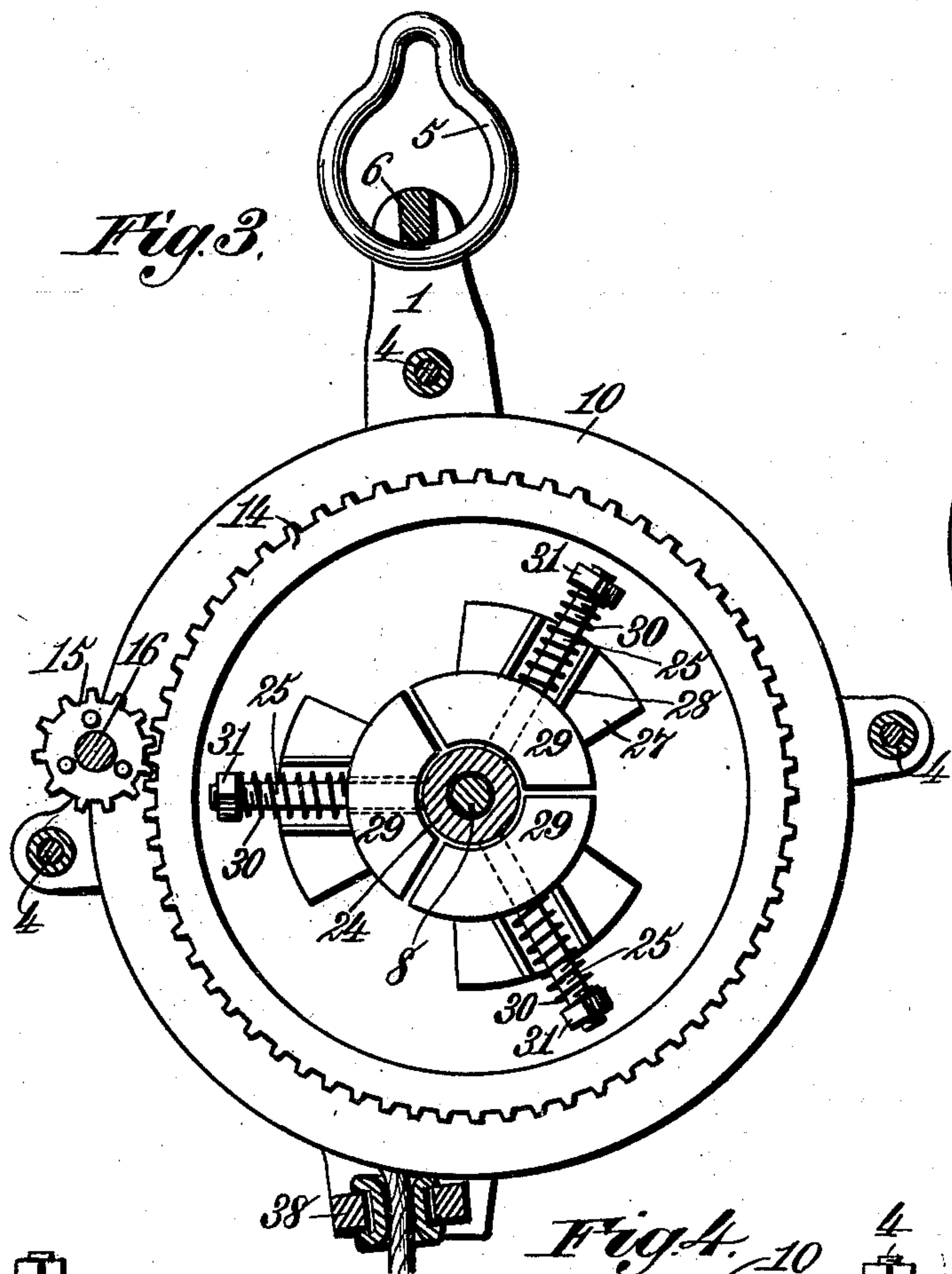
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FIRE ESCAPE.

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2 Sheets—Sheet 2.



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UNITED STATES PATENT OFFICE.

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FIRE-ESCAPE.

SPECIFICATION forming part of Letters Patent No. 624,432, dated May 2, 1899.

Application filed December 22, 1898. Serial No. 700,043. (No model.)

To all whom it may concern:

Be it known that we, CHARLES L. BUDDENBOHN and WILLIAM SPEER, citizens of the United States, residing at Baltimore city, State of Maryland, have invented new and useful Improvements in Fire-Escapes, of which the following is a specification.

Our invention relates to that class of fire-escapes in which are employed a rotating drum, a lowering-rope thereon, and springs for resisting the downward movement of the rope, the object of the same being to provide an automatic governor or brake for controlling the downward movement of the rope when a passenger is supported thereby, the same being so constructed and arranged that it will act with greater or less force, according to the weight of the passenger.

A further object of the invention is to provide means for automatically laying the rope evenly and smoothly upon the drum and preventing the slipping of the same from the drum.

Other objects and advantages of the invention will hereinafter appear, and the novel features thereof will be set forth in the appended claims.

In the drawings forming part of this specification, Figure 1 represents a front elevation of our improved fire-escape. Fig. 2 is a side elevation of the same. Fig. 3 is a vertical section taken on the line 3 3 of Fig. 2. Fig. 4 is a section on the line 4 4 of Fig. 1. Fig. 5 is a detail perspective view of the brake plate or shoe, and Figs. 6 and 7 represent views of other details.

The frame of the device is made up of a base or back plate 1, a top or face plate 2, and an intermediate supporting-plate 3, all secured together in parallel relation and held spaced apart by the rods or bolts 4 4. The said frame and the parts carried thereby are adapted to be suspended from any suitable point by the ring or hook 5, which embraces the bar 6, connecting the plates 1 and 2 at their upper ends. The said bar is provided with a plurality of notches 7 for the reception of said ring, and in this way provision is made for adjusting the position of the device relative to its point of suspension.

Mounted to turn in bearings in the plates

1 and 2 is a central shaft 8, having a pinion 9 secured to the outer end thereof and having mounted thereon adjacent to the plate 1 a winding-drum 10, the side plates 11 and 12 of which project beyond the intermediate portion and form guide-flanges for the lowering-rope 13, which is wound thereon. The outer plate 11 of said drum has secured to it a circular rack 14, which meshes with a pinion 15, loose on the shaft 16 and having a clutch connection with a disk 17, fast on said shaft 16, so that when said pinion is rotated in one direction it will turn said shaft, and when it is rotated in the opposite direction said shaft will remain stationary. The shaft 16 has secured to it a second pinion 18, meshing with an idle pinion 19, which latter in turn meshes with a pinion 20, fast on a shaft 21, carrying a large cog-wheel 22. The said cog-wheel 22 engages and transmits its motion to a toothed sleeve 23, loose upon the shaft 8 and having a clutch connection with a second sleeve 24, provided with a series of radially-extending arms 25. Instead of this clutch connection between these sleeves, however, the same may be made integral or be secured together in any other suitable manner. Surrounding the sleeve 24 and adapted to rotate therewith, but capable of longitudinal movement independent thereof, is a brake plate or shoe 26, designed to frictionally engage the outer plate 11 of the drum 10. The said plate or shoe is formed with wings 27 27, having flanges 28 28 upon their outer surfaces provided with inclined outer edges adapted to be engaged by the segmental brake-actuating blocks 29 on the radial arms 25 of the sleeve 24. The said blocks are thrown outwardly by centrifugal force upon the rapid rotation of the sleeves 23 and 24, and their outward movement is resisted and partially impeded by the coil-springs 30, which surround the arms 25 and engage at one end said blocks and at the opposite end nuts 31, screwed upon the ends of said arm. Said nuts further serve as a means for adjusting the tension of the springs 30.

From the foregoing description it will be seen that as the rope 13 unwinds, due to the weight of a passenger thereon, the drum 10 will be rotated and its motion will be trans-

mitted through the system of multiplying-gearing described to the sleeves 23 and 24, and the latter will be rotated very rapidly. This causes the brake-actuating blocks 29 to be thrown outwardly by centrifugal force and brought into engagement with the inclined edges of the flanges 28 on the brake-shoe 26, throwing said brake-shoe inwardly into contact with the plate 11 of the winding-drum. This serves to check the movement of said drum and prevents the passenger from descending at a dangerous speed. It will of course be noted in this connection that the heavier the passenger the greater will be the initial movement of the drum 10 and the parts operated thereby and the greater will be the constant tendency of said parts to turn rapidly; but the greater the movement of the drum or its tendency to move the greater will be the pressure exerted by the brake-shoe on the drum. The result is that whatever the weight of the passenger the rapidity of the descent will remain constant.

In connection with the parts above described we employ a pair of tension-springs for the drum, which also serve to rewind the lowering-cord when the weight of the passenger has been removed. These springs 32 32 are located in front of the face-plate 2 and between said face-plate and a supplemental plate 33, held in place upon the frame by rods or standards 34. The said springs are secured at one end to bars 35 35, connecting the plates 2 and 33, and are attached at their other ends to rolls or drums 36, mounted to turn in bearings in the said plates. The rolls 36 have secured to their inner ends the cog-wheels 37, which mesh with the pinion 9 on the end of the shaft 8. The movement of said shaft, caused by the outward movement of the lowering-rope 13, causes, through the gearing described, the rotation of the rolls 36 in a direction to wind up the springs 32. When the weight upon the lowering-rope is relieved, the springs will cause a rotation of the rolls 36 in the reverse direction and a consequent rotation of the drum 10 in a direction to wind up the cord 13 thereon. It will be noted, however, that when the said drum moves in a direction to wind up the cord the pinion 15 slips over the surface of the disk 17, and consequently no movement will be imparted in a reverse direction to the gearing between said pinion and the sleeves 23 and 24, carrying the brake-actuating mechanism. Said mechanism therefore remains at rest and inoperative, except when the lowering-rope is being unwound.

The rope-laying mechanism employed consists of a laterally-movable sleeve, ring, or eye 37^a, located between and guided by the parallel rods or bars 38, connecting the plates 1 and 2 at their lower ends, a bell-crank lever 39, fulcrumed in a bracket 40, depending from an arm on the plate 2, a link connecting one arm of said bell-crank lever with the sleeve 37^a, and means for rocking said bell-crank

lever automatically during the rotation of the drum 10 in one direction. The rope 13 extends through the sleeve 37^a and is provided upon its outer free end with a strap, sling, or other form of harness, by means of which the passenger may secure and retain his hold upon the rope. As the said sleeve is moved in one direction or the other across the drum 10 it carries with it said rope, and the latter is guided first to one side and then to the other of said drum and thereby caused to wind smoothly and evenly thereon. The means for rocking the bell-crank lever 39 to cause the back-and-forth movement of the sleeve 37^a consists of a pinion 41, meshing with one of the cog-wheels 37 and loose upon, but having a clutch connection with, a shaft 42, mounted in a bracket-arm on the main frame, a disk 43, fast on said shaft, and a link 44, eccentrically connected to said disk and pivoted to the outer arm of the bell-crank lever 39. The clutch connection between the pinion 41 and the shaft 42 consists of an inwardly-spring-pressed pin or dog 45 and a shoulder 46 on the shaft, by which construction said pinion will be caused to engage and rotate said shaft when moved in one direction and will slip freely thereon when moved in the other direction. When the lowering-cord is being unwound from the drum 10, the pinion 41 will be moved in the direction of the arrow in Fig. 7. When, however, said cord is relieved from the weight of the passenger thereon, the springs 32 act to rotate the drum in a direction to wind the cord thereon and the pinion 41 is turned in a direction opposite that which it formerly had, the result being that the shaft 42 and the disk 43, carried thereby, is turned with said pinion and through the link 44 the bell-crank lever 39 is rocked. This movement of the bell-crank lever causes a lateral back-and-forth movement to be imparted to the sleeve 37^a and the rope 13, passing therethrough, with the effect of causing the said rope to be laid in even coils upon the drum 10.

What we claim as our invention is—

1. The combination with a drum, of a rotatable and longitudinally-movable brake for controlling the movement of said drum, and means actuated by the speed of movement of said drum for automatically throwing said brake into operation.

2. The combination with a drum, of a brake-shoe for controlling the movement of said drum provided with laterally-extending inclined or wedge-shaped engaging surfaces, and brake-actuating devices adapted to be thrown outwardly by centrifugal force to engage and slide upon the inclined surfaces of said shoe, as and for the purpose set forth.

3. The combination with a drum, of a rotatable and longitudinally-movable brake-shoe adapted to engage said drum, and provided with inclined or wedge-shaped projections, and brake-actuating devices adapted to be thrown outwardly by centrifugal force to en-

gage the inclined projections on said shoe, as and for the purpose set forth.

4. In a fire-escape, a drum upon which the lowering-cord is wound, a rotatable and longitudinally-movable brake-shoe adapted to engage said drum, inclined or wedge-shaped flanges on said shoe, a sleeve on the drum-shaft rotated by said drum, radially-extending arms on said sleeve, and brake-actuating blocks carried by said arms and adapted to be thrown outwardly by centrifugal force to engage the flanges on said shoe, as and for the purpose set forth.

5. In a fire-escape, a drum upon which the lowering-cord is wound, a sleeve loosely mounted on the drum-shaft intermediate multiplying-gearing between said drum and sleeve, through which said sleeve is rotated by said drum, a brake-shoe carried by said sleeve but capable of independent longitudinal movement and adapted to engage said drum, inclined projections on said shoe, radially-extending arms on said sleeve, and brake-actuating blocks on said arms adapted to be thrown outwardly by centrifugal force to engage said projections, as and for the purpose set forth.

6. In a fire-escape, a drum upon which the lowering-cord is wound, a rotatable longitudinally-movable brake-shoe adapted to engage said drum, inclined or wedge-shaped projections on said shoe, a sleeve on the drum-shaft rotated by said drum, radially-extending arms on said sleeve, brake-actuating blocks carried by said arms and adapted to be thrown outwardly by centrifugal force to engage said projections, and springs for resisting the outward movement of said blocks, as and for the purpose set forth.

7. In a fire-escape, a drum upon which the lowering-cord is wound, a rotatable and longitudinally-movable brake-shoe adapted to engage said drum, inclined or wedge-shaped projections on said shoe, a sleeve on the drum-shaft rotated by said drum, radially-extending arms on said sleeve, brake-actuating blocks carried by said arms and adapted to be thrown outwardly by centrifugal force to engage said projections, springs for resisting

the outward movement of said blocks, and means for regulating the tension of said springs, as and for the purpose set forth.

8. The combination with a drum and a cord adapted to be wound thereon, of cord-laying mechanism comprising a laterally-movable guide for the cord, a rocking lever connected to said guide, and connections between said drum and said lever, whereby the rotation of the former is adapted to operate the latter.

9. The combination with a drum and a cord adapted to be wound thereon, of cord-laying mechanism comprising a laterally-movable guide sleeve or ring through which the cord passes, a bell-crank lever, a link connecting said sleeve with one arm of said bell-crank lever, a rotary shaft operated through suitable connections with said drum, and a link eccentrically connected to said shaft at one end and to the other arm of said bell-crank lever at the other end.

10. In a fire-escape, a drum, a lowering-cord wound thereon, springs for resisting the movement of said drum in one direction, and for actuating it in the other direction to wind the cord thereon, and cord-laying mechanism comprising a laterally-movable guide sleeve or ring through which the cord passes, a bell-crank lever, a link connecting said sleeve with one arm of said lever, a shaft, a disk fixed thereon, a link eccentrically connected to said disk at one end, and to the other arm of said lever at the other end, and a pinion operated by said drum and having a clutch connection with said shaft, whereby, said rope-laying mechanism will be thrown out of operation, when the lowering-cord is being unwound and into operation when said cord is being wound.

In testimony whereof we have hereunto set our hands in presence of two subscribing witnesses.

CHARLES L. BUDDENBOHN.
WILLIAM SPEER.

Witnesses:

HENRY F. NEW,
CHAS. F. BENDER.