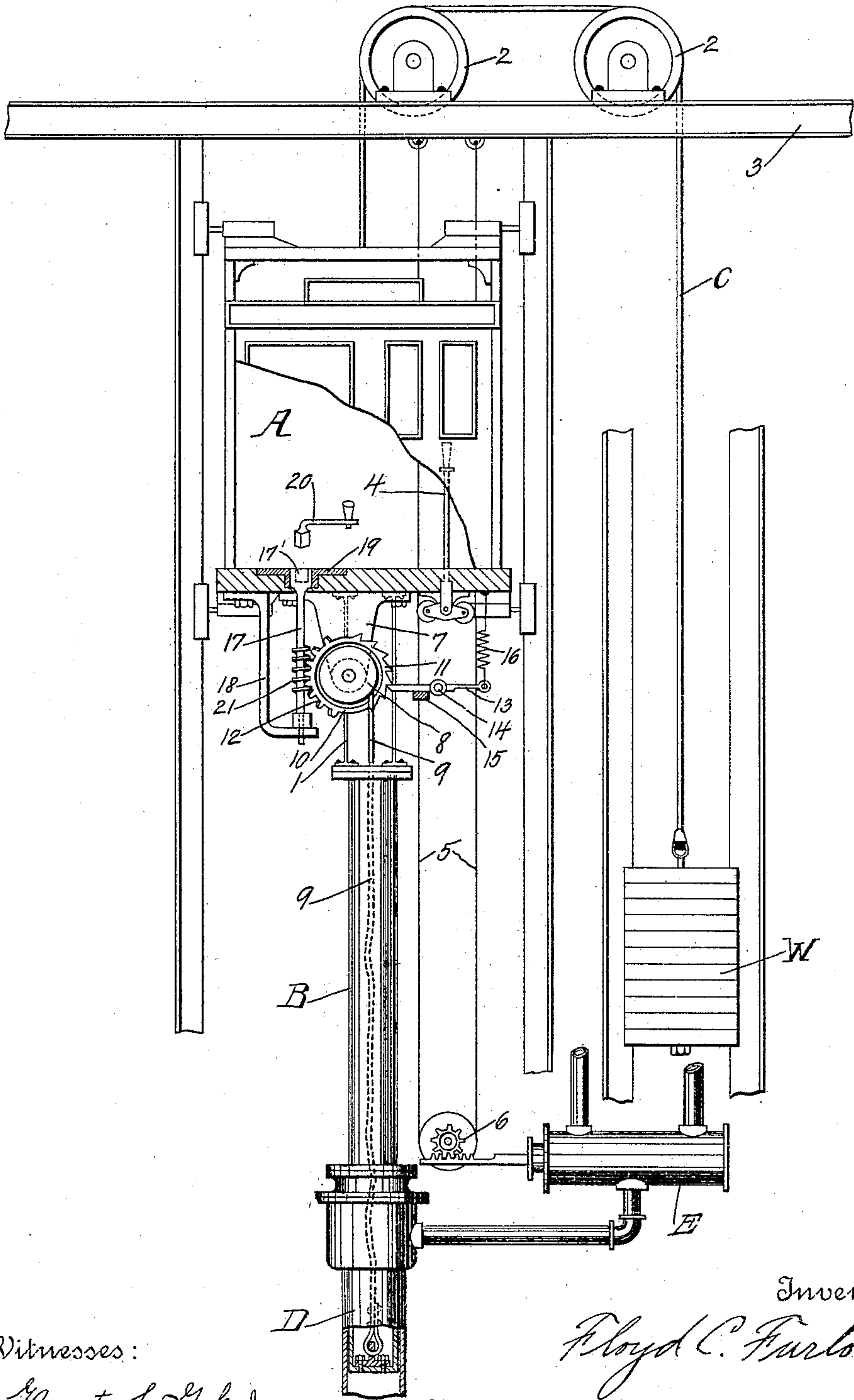


F. C. FURLOW.
 MEANS FOR TIGHTENING PLUNGER CABLES.
 APPLICATION FILED NOV. 4, 1907.

954,027.

Patented Apr. 5, 1910.



Witnesses:

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By

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UNITED STATES PATENT OFFICE.

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MEANS FOR TIGHTENING PLUNGER-CABLES.

954,027.

Specification of Letters Patent.

Patented Apr. 5, 1910.

Application filed November 4, 1907. Serial No. 400,468.

To all whom it may concern:

Be it known that I, FLOYD C. FURLOW, a citizen of the United States, residing at Montclair, in the county of Essex and State of New Jersey, have invented a new and useful Improvement in Means for Tightening Plunger-Cables, of which the following is a specification.

My invention relates to safety devices used in connection with plunger elevators, and more particularly to means for tightening a cable or other safety device used within the plunger of a plunger elevator.

In plunger elevators, the weight of the counterweight usually exceeds that of the car alone, and if the plunger should break or become detached from the car, the counterweight would pull the car rapidly to the top of the shaft without any means of control. There is always a possibility that such an accident will happen, because the varying loads and strains on the plunger tend to weaken the joints and fastenings. In order to avoid such accident, a rope, cable, or other connecting device, is sometimes placed in the plunger and connected at its ends to the car and the lower end of the plunger. It is desirable that such connecting device should be under considerable tension, so that it will not only serve to prevent separation of the car and plunger, but will put the plunger under continuous stress in one direction, giving it additional strength and keeping the joints tight. It is of advantage to keep the joints tight, because when water gets into the plunger its buoyancy is lessened and the efficiency of the elevator reduced. My invention may therefore be used to maintain the cable within the plunger taut.

The principal object of the invention, however, is to provide improved means to tighten a cable within the plunger in case of emergency, such as the breaking of the plunger into two parts or the separation thereof from the car, and thus maintain the plunger in rigid connection with the car.

The accompanying drawing is an elevational view partly in section, showing my invention applied to a plunger elevator.

In this instance the elevator car A is connected to the plunger B by means of I-beams or rods 1 which space the car and plunger some distance apart. The counterweight

W is connected to the car by a cable C passing over the pulleys 2 which are mounted on the I-beam 3. The plunger B is adapted to travel in the plunger cylinder D which is supplied with fluid pressure through the main valve E. The movement of the car is controlled in a well known manner by means of the hand lever 4 in the car, which is operatively connected through the standing ropes 5 and gearing 6 to the main valve E.

Bolted to the under surface of the car floor is a bracket 7 in which is journaled a pulley 8. A rope or cable 9 extends through the plunger B and is connected at its lower end to the bottom of the plunger, and its upper end is secured to the pulley or winding drum 8. Connected to the pulley 8 for rotation therewith is a disk 10 formed with ratchet teeth 11 on one portion of its periphery, and worm gear teeth 12 on the opposite portion. A pawl 13 pivoted at 14 engages the ratchet teeth and prevents backward movement of the pulley 8. A spring 16 holds the pawl in operative position, and a stop 15 limits its downward movement. A vertical worm-shaft 17 is journaled at its lower end in an arm 18 bolted to the floor of the car, and at its upper end in a bearing plate 19 set into the floor of the car. The upper end of the shaft 17 is enlarged to form a shaft 17' provided with a squared recess to receive the squared end of a removable crank 20. A worm 21 on the shaft 17 meshes with the teeth 12, and when the shaft is rotated by means of the crank 20 the pulley 8 is rotated to take up any slack there is in the cable 9 and to place a tension on the cable. The worm 21 will ordinarily hold the pulley against backward rotation when the crank 20 is removed, but the pawl and ratchet operate as a safeguard to positively prevent working backward. If desired, the ratchet teeth and worm teeth may be on separate disks and formed on the entire peripheries of the disks, which will allow a greater range of adjustment. The teeth may also be formed on a flange or flanges integral with the pulley if desired.

Various other changes in details of construction and arrangement of parts might obviously be made without departing from the spirit or scope of the invention, and I wish therefore not to be limited to the exact construction disclosed.

What I claim as new and desire to secure by Letters Patent of the United States is:—

1. In a hydraulic elevator, the combination with a car and a plunger beneath the car, of a pulley carried by the car, gear teeth connected to the pulley, a worm-shaft having a worm in mesh with the gear teeth, means for rotating the worm-shaft, and a cable or rope connected at its ends to the plunger and pulley, respectively.

2. In a plunger elevator, the combination with a car and a plunger, of a pulley carried by the car, ratchet teeth connected to the pulley, a pawl cooperating with the ratchet teeth, a cable or rope connected to plunger and pulley, and means for rotating the pulley.

3. In a plunger elevator, the combination with a car and a plunger, of a rotatable member carried by the car, ratchet teeth connected to said member, a pawl engaging the ratchet teeth, worm gear teeth connected to said member, a worm-shaft having a worm in mesh with said gear teeth, means for rotating the worm-shaft, and a flexible member connected to the plunger and to said rotatable member.

4. In a plunger elevator, the combination with a car and a plunger, of a pulley carried by the car beneath the floor thereof, a flexible member connected to the plunger and

pulley, a shaft extending through the car floor, means for rotating the shaft from the interior of the car, and gear connections between the shaft and pulley.

5. In a hydraulic elevator, the combination with a car and a plunger located beneath and secured to the car, of a bracket bolted to the under surface of the car, a pulley journaled in the bracket, a disk secured to the pulley for rotation therewith and formed with ratchet teeth on one portion of its periphery and worm gear teeth on the opposite portion, a vertical worm shaft having a worm in mesh with the gear teeth, a shank on the upper end of shaft journaled in the car floor and formed with a squared recess opening into the interior of the car, a removable crank adapted to rotate the shaft, a pawl in engagement with the ratchet teeth, a fixed stop for the pawl, and a rope or cable connected at one end to the lower end of the plunger, extending upwardly through the plunger and connected at its opposite end to said pulley.

In testimony whereof, I have signed my name to this specification in the presence of two subscribing witnesses.

FLOYD C. FURLOW.

Witnesses:

W. W. LIGHTHIFE,
JAMES G. BETHELL.