

No. 774,767.

PATENTED NOV. 15, 1904.

F. W. LYON.

SAFETY ATTACHMENT FOR HOISTING ENGINES.

APPLICATION FILED APR. 4, 1904.

NO MODEL.

2 SHEETS—SHEET 1.

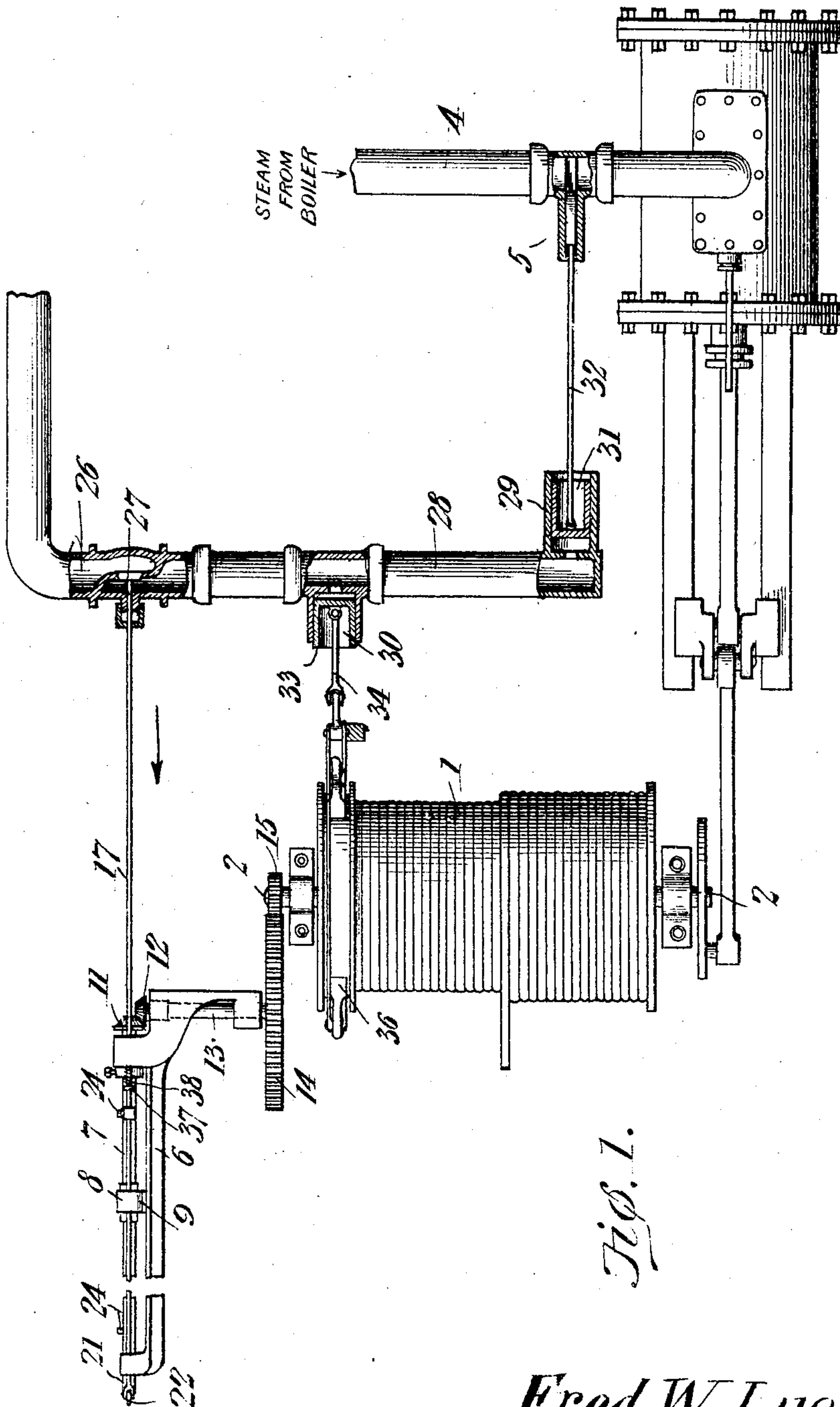


Fig. 1.

Witnesses

E. H. Stewart
Jno E. Corne

Fred W. Lyon

Inventor

by

C. A. Snow & Co

Attorneys

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2 SHEETS—SHEET 2.

Fig. 2.

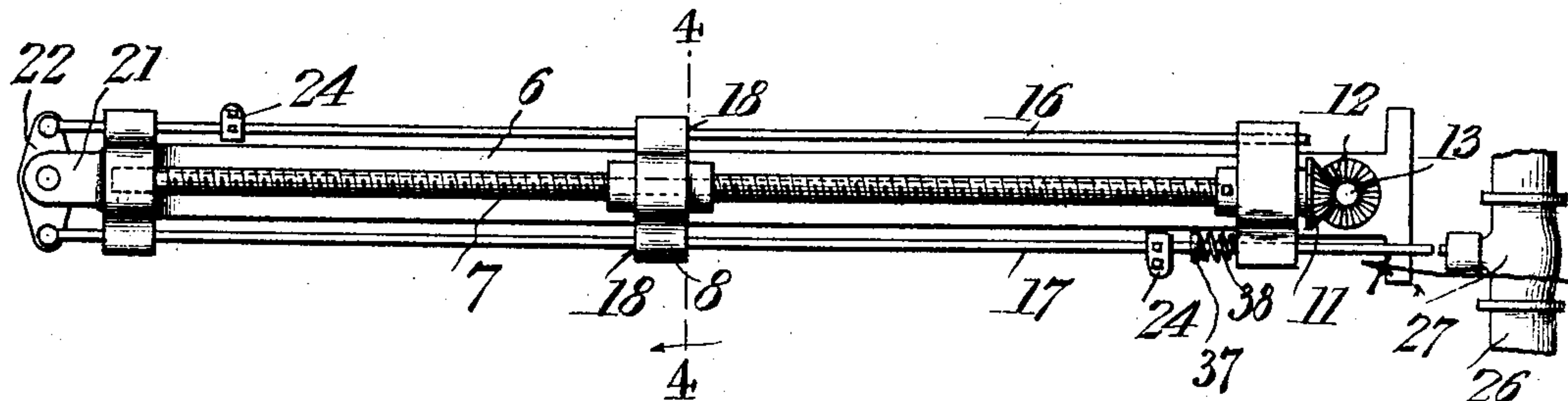


Fig. 3.

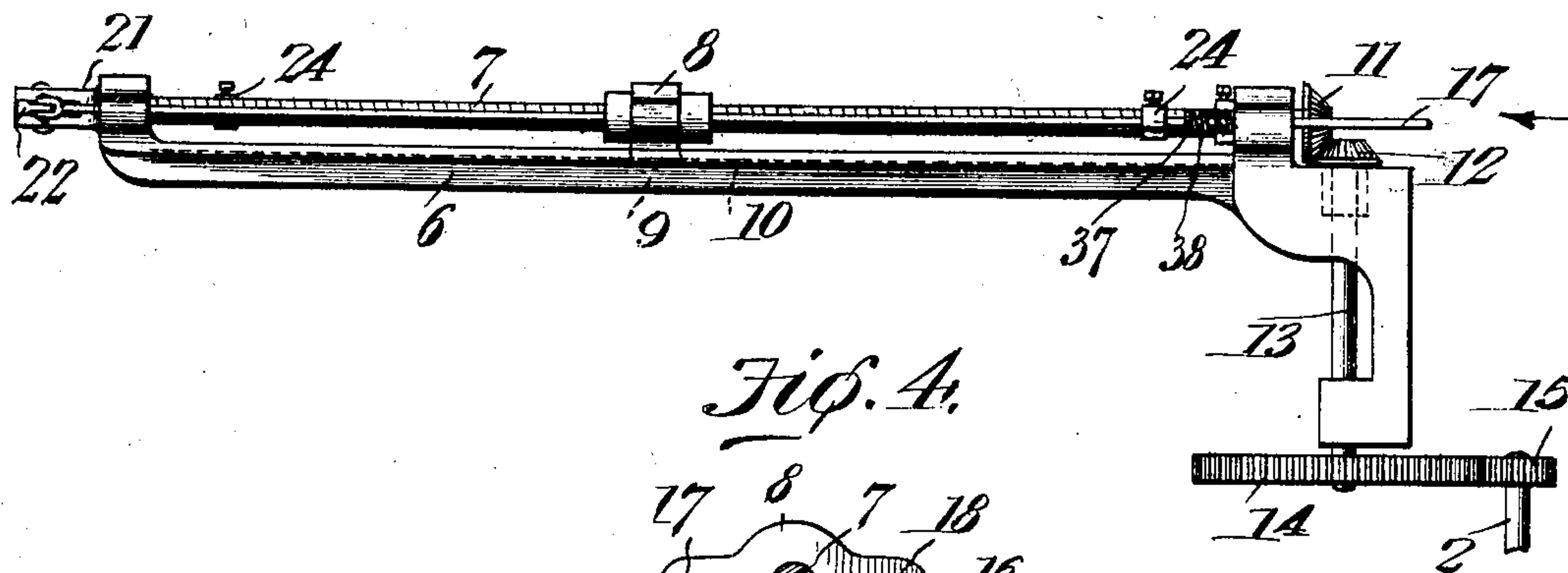


Fig. 4.

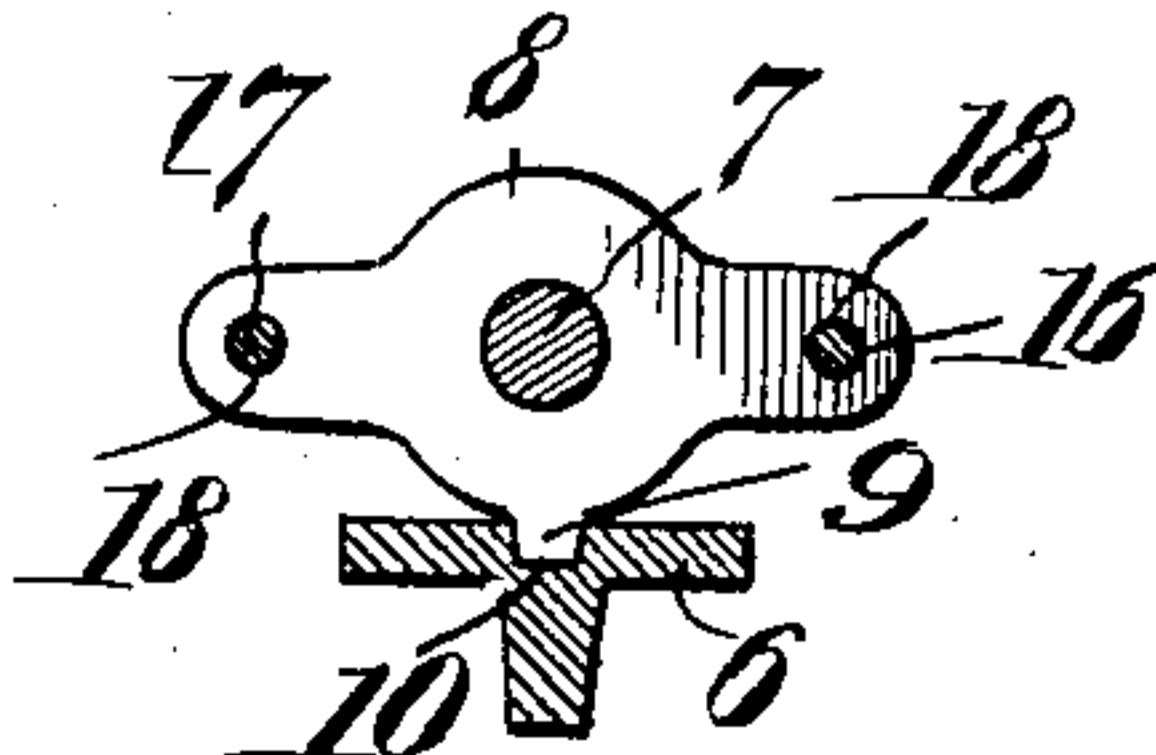
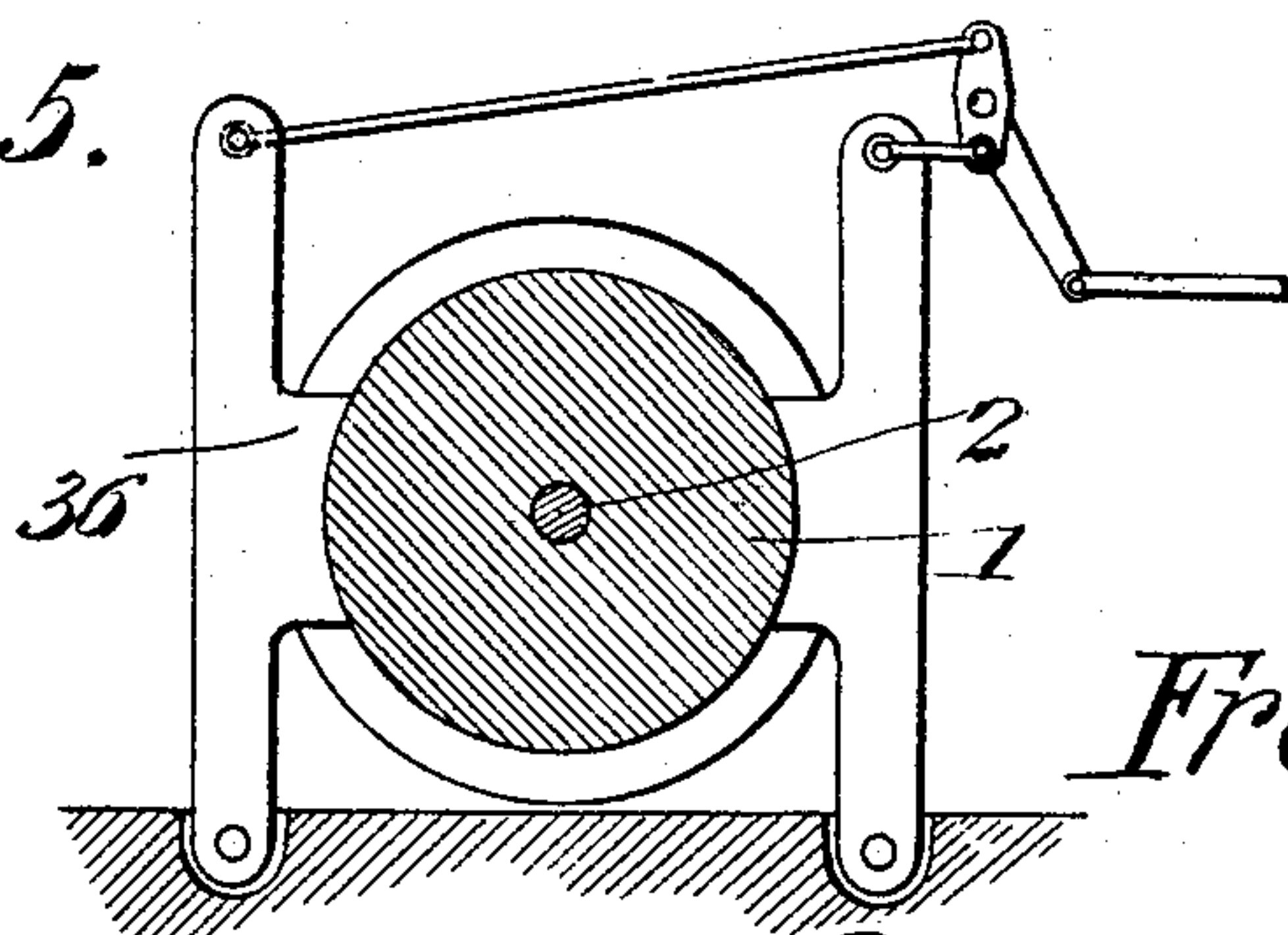


Fig. 5.



Witnesses

E. J. Stewart
Geo. Parker

by

Chas. Snow & Co.

Attorneys

Fred W. Lyon

Inventor

UNITED STATES PATENT OFFICE.

FRED W. LYON, OF GRAND JUNCTION, COLORADO.

SAFETY ATTACHMENT FOR HOISTING-ENGINES.

SPECIFICATION forming part of Letters Patent No. 774,767, dated November 15, 1904.

Application filed April 4, 1904. Serial No. 201,569. (No model.)

To all whom it may concern:

Be it known that I, FRED W. LYON, a citizen of the United States, residing at Grand Junction, in the county of Mesa and State of Colorado, have invented a new and useful Safety Attachment for Hoisting-Engines, of which the following is a specification.

This invention relates to improvements in safety attachments for hoisting-engines, and has for its principal object to provide a means for stopping the movement of a drum or other winding element when the hoisting rope or cable has been wound or unwound to a predetermined extent, the device, while capable of general use, being of especial value in connection with elevators and serving as an automatic means for stopping the car at the upper and lower limits of its travel should the attendant neglect to operate the controlling means.

A further object of the invention is to provide a device of this class which may be adjusted for use in connection with drums of any capacity and applied at comparatively small expense to hoisting mechanisms already in use.

A still further object of the invention is to provide a safety device in which at either limit of winding or unwinding movement the power will be instantly shut off and a brake will be simultaneously applied to the winding-drum in order to stop or check its movement.

With these and other objects in view, as will more fully hereinafter appear, the invention consists in the novel construction and arrangement of parts hereinafter fully described, illustrated in the accompanying drawings, and particularly pointed out in the appended claims, it being understood that various changes in the form, proportions, size, and minor details of the structure may be made without departing from the spirit or sacrificing any of the advantages of the invention.

In the accompanying drawings, Figure 1 is a plan view, partly in the nature of a diagram, illustrating the safety attachment for hoisting-machines constructed in accordance with the invention. Fig. 2 is a plan view of the

valve-actuating device which receives motion from the hoisting-drum. Fig. 3 is a plan view of the same. Fig. 4 is a transverse sectional elevation of a portion of the device on the line 4 4 of Fig. 2. Fig. 5 is a detail view illustrating the form of brake which may be used for the hoisting-drum.

Similar numerals of reference are employed to indicate corresponding parts throughout the several figures of the drawings.

The safety device may be employed in connection with hoisting mechanisms of any class, including those in which a drum is used to receive a cable or rope that is connected to the object to be raised and lowered as well as mechanisms where the hoisting is accomplished by the separation of two or more sets of grooved drums around which the cable or cables are passed, and in the present instance the winding-drum 1 must be considered as typical of a hoisting mechanism of any desired construction. The main shaft 2 of the hoisting-drum may be connected to any suitable operating mechanism—as, for instance, a steam-engine, which is supplied with steam or other actuating fluid by means of a pipe 4, having a gate-valve 5, which is automatically closed in order to cut off the supply of steam at the completion of the winding or unwinding operation.

Journaled in a suitable supporting-frame is a shaft 7, threaded throughout the greater portion of its length and extending through a threaded opening in a nut 8, having a depending tongue 9, adapted to a groove 10, formed in the frame, the tongue serving by engagement with the walls of the groove to prevent turning movement of the nut with the screw. At one end of the screw-shaft 7 is a bevel-gear 11, intermeshing with a small bevel-gear 12 on a shaft 13, that carries a spur-gear 14, intermeshing with a pinion 15 on the shaft 2, or otherwise connected to the shaft in such manner that the rotative movement of the drum will be imparted to the screw-shaft, and the nut 8 will be moved longitudinally thereof. The opposite end members of the frame are provided with guiding-openings for the passage of a pair of parallel

rods 16 and 17, disposed one on each side of the screw-shaft, and the nut is likewise provided with suitable openings 18 for the passage of these rods, the rods serving as an additional means for preventing rotative movement of the nut. At one end of the frame is a lug or bracket 21, to which is pivoted a lever 22, having one of its ends connected to the rod 16 and its opposite end to the rod 17, and both rods are secured to tappet-blocks 24, which may be adjusted to any desired position on the rods, the engagement of the nut with the tappets serving to shift the rods longitudinally.

At a point adjacent to the end of the rod 17 is a fluid-pressure-supply pipe 26, containing a valve 27, that is connected to the rod 17, and under normal conditions the pressure of the fluid being exerted in the direction of the arrow will serve to maintain the valve in closed position; but when either of the tappets is engaged by the nut the valve will be opened and the fluid allowed to pass to a second pipe 28. The opposite ends of the pipe 28 communicate, respectively, with cylinders 29 and 30. In the cylinder 29 is a plunger 31, connected by a rod 32 to the gate-valve 5, so that when the fluid-pressure is allowed to operate on the plunger 31 the valve will be moved to closed position and the supply of steam or other fluid to the winding-engine will be instantly cut off. In the cylinder 30 is a plunger 33, connected by a rod 34 to a brake mechanism, which serves to press the brake-shoes 36 against a friction wheel or disk carried by and connected to the winding-drum and serving to stop or check the movement of the winding-drum as soon as the plunger is moved outward.

In the operation of the device the tappet-blocks 24 are adjusted to the proper position in accordance with the capacity of the winding-drum and the length of the cable or rope to be wound thereon. During the movement of the elevator or other device and the winding or unwinding of the drum the shaft 7 will be turned in one direction or the other and will move the nut 8 between the tappets. When the nut engages either one of the tappets, the valve 27 will open and allow the fluid-pressure to pass to the cylinders 29 and 30 and result in the cutting off of the supply of operating fluid and the application of the brake hereinbefore described.

In some cases, where the pressure may not be sufficient to close the valve 27, a collar 37 is secured on rod 17, and between this collar and the adjacent portion of the frame is placed a compression-spring 38, which will serve to positively close the valve when the nut moves to release position.

Having thus described the invention, what is claimed is—

1. The combination with a hoisting mechanism, including an operating device, of a screw-

shaft revoluble with the hoisting mechanism, a nut disposed on the shaft and movable longitudinally thereof, means for holding the nut from revoluble movement, a pair of rods serving partly as guides for the nut, tappet-blocks disposed in the path of movement of the nut, and a means connected to the tappet-blocks for cutting off the actuating medium of the operating device.

2. The combination with a hoisting-drum, of an operating device for the drum, a screw-shaft, a nut mounted on the shaft and movable longitudinally thereof, a pair of connected rods arranged parallel with the shaft, tappet-blocks disposed on the rods and in the path of movement of the nut, and means connected to said rod for cutting off the actuating medium of the operating device.

3. The combination with a hoisting-drum, of an operating device, a screw-shaft, gearing connections between the screw-shaft and the hoisting-drum, a nut carried by the shaft, a pair of parallel rods disposed one on each side of the shaft, a pivotally-mounted lever between the rods, tappet-blocks carried by said rods and adjustable thereon, a fluid-pressure-supply pipe leading to the operating device, and a valve controlled by said rods for cutting off the flow of fluid to said pipe.

4. The combination with a hoisting-drum, of an engine, a fluid-pressure-supply pipe connected thereto, a valve in said pipe, a second pipe connected to a source of fluid-pressure, a cylinder connected to said second pipe, a plunger disposed in the cylinder and connected to the valve, a controlling-valve in said second pipe, and means controlled by the extent of movement of the winding-drum for opening said second valve.

5. The combination with a hoisting-drum, of an operating-engine, a steam-pipe connected thereto, a valve for said pipe, a second pipe connected to a source of pressure-supply, a pair of cylinders connected to the second pipe, plungers in said cylinders, one of said cylinders being connected to the valve of the steam-pipe, a hoisting-drum brake operatively connected to the second plunger, and means controlled by the extent of movement of the hoisting-drum for governing the flow of fluid to said pipe.

6. The combination with a hoisting-drum, of a drum-operating engine, a steam-pipe connected thereto, a valve for said steam-pipe, a brake for the drum, a pipe connected to a source of pressure-supply, a controlling-valve in said pipe, a pair of cylinders connected to the second pipe, plungers in said cylinders, means for connecting one of the plungers to the steam-valve, means for connecting the second plunger to the brake, a threaded shaft operatively connected to the hoisting-drum, a frame having bearings for the shaft, a nut carried by the shaft, and provided with a tongue adapted to a groove in said frame, a pair of

rods arranged parallel with the shaft and extending through guide-openings in the frame and in the sides of the nut, a pivotally-mounted lever connecting the rods, tappet-blocks
5 adjustably mounted on the rod, and means for connecting one of said rods to said operating-valve.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

FRED W. LYON.

Witnesses:

G. VAN HOOREBEKE,
J. S. CARNAHAN.