(No Model.) 2 Sheets—Sheet 1.

W. G. SEELY.

DEVICE FOR OPERATING FRICTION CLUTCHES.

No. 459,175. Patented Sept. 8, 1891.

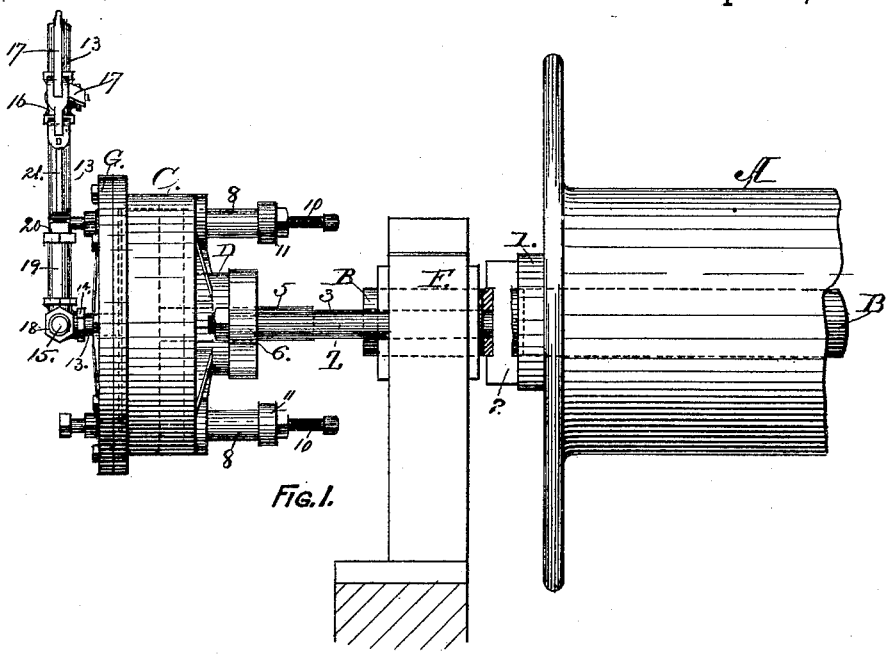

Fig. 1.

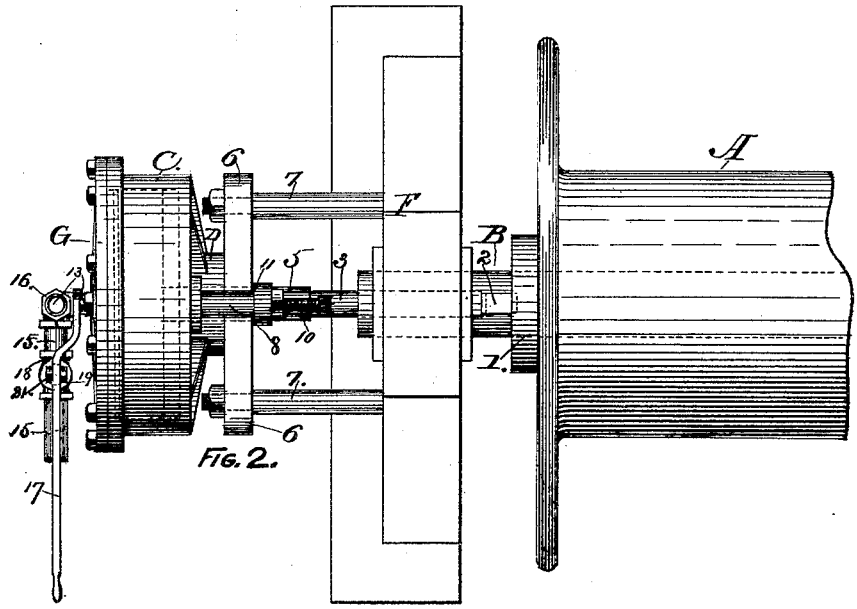

Fig. 2.

Witnesses:
S. B. Brewer
F. G. Michel.

Inventor:
Willis G. Seely,
by William N. Lord,
Attorney.

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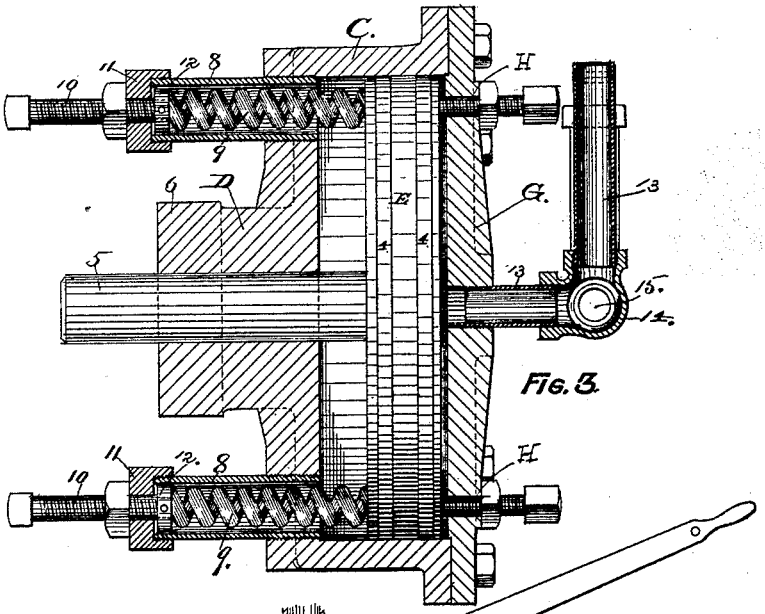

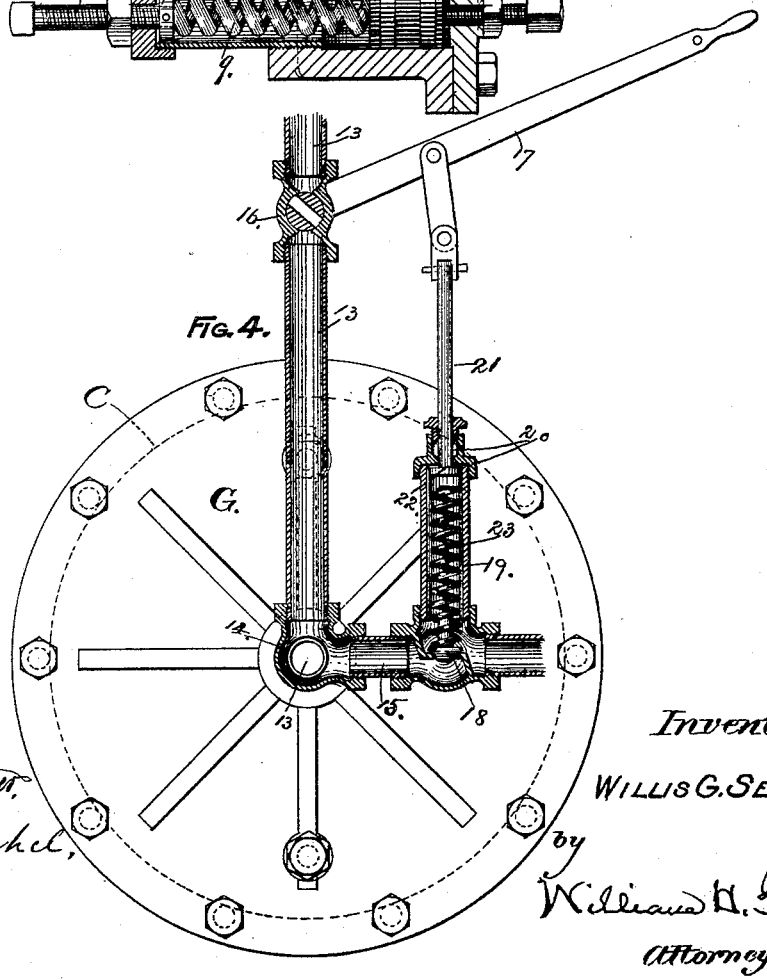

Witnesses:
S. B. Brewer,
F. G. Michel,

Inventor:
Willis G. Seely,
by
William H. Lord
Attorney.

UNITED STATES PATENT OFFICE.

WILLIS G. SEELY, OF ALTAMONT, NEW YORK.

DEVICE FOR OPERATING FRICTION-CLUTCHES.

SPECIFICATION forming part of Letters Patent No. 459,175, dated September 8, 1891.

Application filed October 24, 1889. Serial No. 328,033. (No model.)

To all whom it may concern:

Be it known that I, WILLIS G. SEELY, of Altamont, in the county of Albany and State of New York, have invented new and useful Improvements in Devices for Operating Friction-Clutches of Hoisting-Drums and other Similar Appliances, of which the following is a specification.

My invention relates to mechanism for forcing together the two parts of a friction-clutch in such manner as to obtain a required degree of frictional adhesion of said parts to accomplish the work in hand; and the object of my invention is to provide a device for said purpose that can be readily applied to an old and well-known form of friction-clutch, said device being of simple construction, easily operated, and effective in its operation. I attain this object by the mechanism illustrated in the accompanying drawings, which are herein referred to and form part of this specification, and in which—

Figure 1 is a side elevation of my device applied to a hoisting-drum, in which only part of the latter is shown. Fig. 2 is a plan view of the same. Fig. 3 is an enlarged longitudinal section of the steam-cylinder of my device detached from the hoisting-drum, the internal parts being shown in elevation; and Fig. 4 is an enlarged transverse section of the steam and exhaust pipes, with the steam-cylinder and the mechanism for operating the steam and exhaust valves shown in elevation.

As represented in the drawings, A designates a hoisting-drum of a common and well-known construction, which is loosely fitted on the shaft B, and is provided with one part of a friction-clutch, (not shown in the drawings,) which is fitted to slide into another part of said friction-clutch, (also omitted from the drawings,) which is secured to said shaft. A loose collar 1 is fitted to slide loosely on said shaft and to bear against the outer end of the hoisting-drum. A transverse key 2 is fitted to slide loosely in a mortise cut diametrically through said shaft, said key being fitted to bear against the outer side of the collar 1. The shaft B is bored centrally in its outer end to receive a pin 3, which is fitted to slide loosely therein. The inner end of said pin bears against the transverse key 2 and the outer end of said pin projects from the outer end of the shaft B.

All of the foregoing parts constitute an old and well-known construction, and, separately considered, said construction forms no part of my invention. The latter will be understood from the following when considered in connection with the accompanying drawings.

C is a steam-cylinder provided with a neck D, which may either be made integrally with said cylinder or of a separate piece, which is attachable to said cylinder. The latter is bored to receive a piston E, provided with packing-rings 4 to form a steam-tight joint with the bore of said cylinder. Said piston is also provided with a piston-rod 5, which projects from the end of the neck D, which is bored to allow said rod to slide loosely therein.

The cylinder C is secured in position so that its center line will range with the center line of the pin 3, and for that purpose I preferably form lugs 6 on opposite sides of the neck D and connect said lugs by means of bolts 7 to the pillow-block F of the shaft B; but said cylinder can be secured by any other means when preferred. The essential points to be observed are that the center line of the cylinder should correspond closely to the center line of the pin 3 and that said cylinder should be secured in such manner that it will remain unyieldingly in position in respect to the end of the shaft B, or so that said cylinder cannot move away from the position in which it is fixed relatively to the end of said shaft. The closed end of said cylinder—the same being that end from which the piston-rod 5 projects—is provided with tubular chambers 8, each of which contains a compressible spring 9, having one end fitted to bear against the piston E in such manner that the force of said spring will be exerted to move said piston backward from the end of the pin 3 when said piston is relieved from the pressure of steam. Each of said springs is provided with an adjusting-bolt 10, which is fitted into a screw-thread in the cap 11, fixed on the outer end of the tubular chamber 8. Said adjusting-bolt has on its inner end a head 12, which is fitted to bear on the corresponding end of the spring to which it is appropriated, and by

means of said adjusting-bolts the tension of said spring can be changed as occasion may require.

G is a detachable head that is fitted to close the open end of the steam-cylinder C. Said head is tapped to receive a steam-pipe 13, which is provided with a three-way fitting 14, having an exhaust-pipe 15, leading therefrom. The steam-pipe 13 is provided with a stop-cock 16, to which a lever 17 is fitted to operate the turn-plug, so as to open and close the passage-way through said stop-cock when occasion requires. The exhaust-pipe 15 is provided with an exhaust-valve 18, made substantially in the form of a globe-check-valve with the cap of the valve-casing omitted therefrom, a tubular chamber 19 being substituted for said cap. The upper end of said chamber is provided with a stuffing-box 20, through which a stem 21 passes into the interior of said chamber. The upper end of said stem is jointed to the lever 17, and the lower end of the same is provided with a head 22, having a smaller diameter than the bore of the chamber 19. Inside of the latter a spring 23 is interposed between the upper side of the exhaust-valve 18 and the lower side of the head 22, said spring not being connected to said head and the latter being left free to be carried from all contact with said spring, so as to relieve the exhaust-valve from the pressure of the spring 23 and leaving said valve only subjected to its own weight and the weight of the spring to resist the pressure of the steam acting against its lower face.

By connecting the lever 17 with the stem 21 an arrangement is effected whereby a movement of said lever to open the stop-cock 16 to admit steam into the cylinder C will force down the stem 21 to compress the spring 23 to such a degree that the latter will be enabled to resist the pressure of steam against the lower face of the exhaust-valve 18, and the latter will thereby be held down to its valve-seat to prevent the escape of the steam from the cylinder C. On moving the lever 17 so as to close the stop-cock 16 the head 22 will be raised from its contact with the spring 23, whereupon the pressure of steam will force the exhaust-valve from its seat, so as to allow the steam to escape from the cylinder C.

H designates set-bolts, which are inserted in the head G to form checks or stops for the piston E to strike against, so as to prevent the latter from being moved back too far by the action of the springs 9. Said bolts are adjustable, so as to regulate the movement of said piston to a distance just sufficient to clear the two parts of a friction-clutch from contact with each other, and thereby provision is made to avoid all the lost motion incident to the wearing away of the contact-faces of said clutch.

My invention operates in the following manner: When the lever 17 is moved to open the stop-cock 16 to admit steam into the cylinder C, a simultaneous downward movement of the stem 21 is produced to compress the spring 23, and thereby the exhaust-valve 18 will be held down upon its valve-seat in opposition to the pressure of steam which tends to raise said valve to permit the steam to escape from the cylinder. By the pressure of the steam in the latter the piston E will be forced to move in a direction that will carry the end of the piston-rod 5 into contact with the pin 3, and through said pin the pressure acting against the surface of said piston will be transmitted to the end of the drum A, so as to force the movable portion of the friction-clutch, being the part of said clutch that is fixed to said drum, into frictional contact with that part of said clutch that is secured to the shaft B, and thereby said drum and shaft will be connected together to revolve as one piece during the time the frictional contact of the parts of said clutch is maintained. While the piston E is being moved by the pressure of the steam, a compression of the springs 9 is effected by said movement, so that when said piston is relieved from said pressure the resilience of said springs will force the piston back to its normal position.

My invention can also be operated as a means for utilizing the friction-clutch as a brake mechanism, by which a weight attached to the drum-rope can be held suspended at any point when required, or such weight can be lowered thereby as gradually or as rapidly as occasion may require. When it is used for the purpose last-named, the stop-cock 16 must be partially shut until the steam-pressure on the piston E is insufficient to produce a frictional adhesion of the parts of the friction-clutch that will revolve the hoisting-drum to effect a further raising of the suspended weight, and under such circumstances the parts of the friction-clutch will slip sufficiently to have the weight remain in a stationary position. To lower the weight, the stop-cock 16 is entirely closed, thereby the exhaust-valve 18 is entirely relieved from the pressure of the spring 23, and the steam in the cylinder A will escape therefrom and leave the piston E free to be forced back by the springs 9 to its normal position. When preferred, the pin 3 may form an integral part of the piston-rod 5, and when so constructed said pin may be connected to the transverse key 2, so that said key will be positively moved back by the corresponding movement of the piston E.

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

1. The combination of a hoisting-drum loosely fitted on a drum-shaft, a collar loosely fitted on said drum-shaft and bearing against the adjacent end of the hoisting-drum, a drum-shaft provided with a movable transverse key whose ends project beyond the diameter of said drum-shaft and take against the face of said collar, and a steam-cylinder provided with a reciprocating piston whose piston-rod takes

against one edge of said transverse key to effect a pushing movement of said hoisting-drum upon the drum-shaft, said steam-cylinder being provided with springs for effecting the outward stroke of said piston, substantially as herein specified.

2. The combination of a steam-cylinder having a piston fitted to reciprocate therein, a steam-supply pipe provided with a stop-cock which controls the inflow of steam into said cylinder, an exhaust-pipe provided with an exhaust-valve which governs the outflow of steam from said cylinder, said stop-cock and exhaust-valve being intermittently disconnected from each other, a lever permanently connected to said stop-cock, a stem connected to said lever and passing into the spring-chamber of said exhaust-valve, and a spring loosely interposed between the inner end of said stem and the outer face of the exhaust-valve, whereby pressure can be applied to said exhaust-valve before the stop-cock is fully opened, as and for the purpose herein specified.

3. The combination of a steam-supply pipe provided with a stop-cock for controlling the flow of steam through said pipe, a steam-exhaust pipe provided with a valve which controls the escape of steam through said exhaust-pipe, an operating-lever attached to said steam stop-cock and having a stem 21 jointed thereto, and a spring loosely interposed between said stem and the upper side of said exhaust-valve, whereby said exhaust-valve is left free to open when the steam stop-cock is closed and operates as a relief-valve when said stop-cock is open, as and for the purpose herein specified.

WILLIS G. SEELY.

Witnesses:
WM. H. LOW,
S. B. BREWER.