(No Model.)

W. E. NICKERSON.

FLUID SPEED REGULATOR FOR ELEVATORS.

No. 396,949. Patented Jan. 29, 1889.

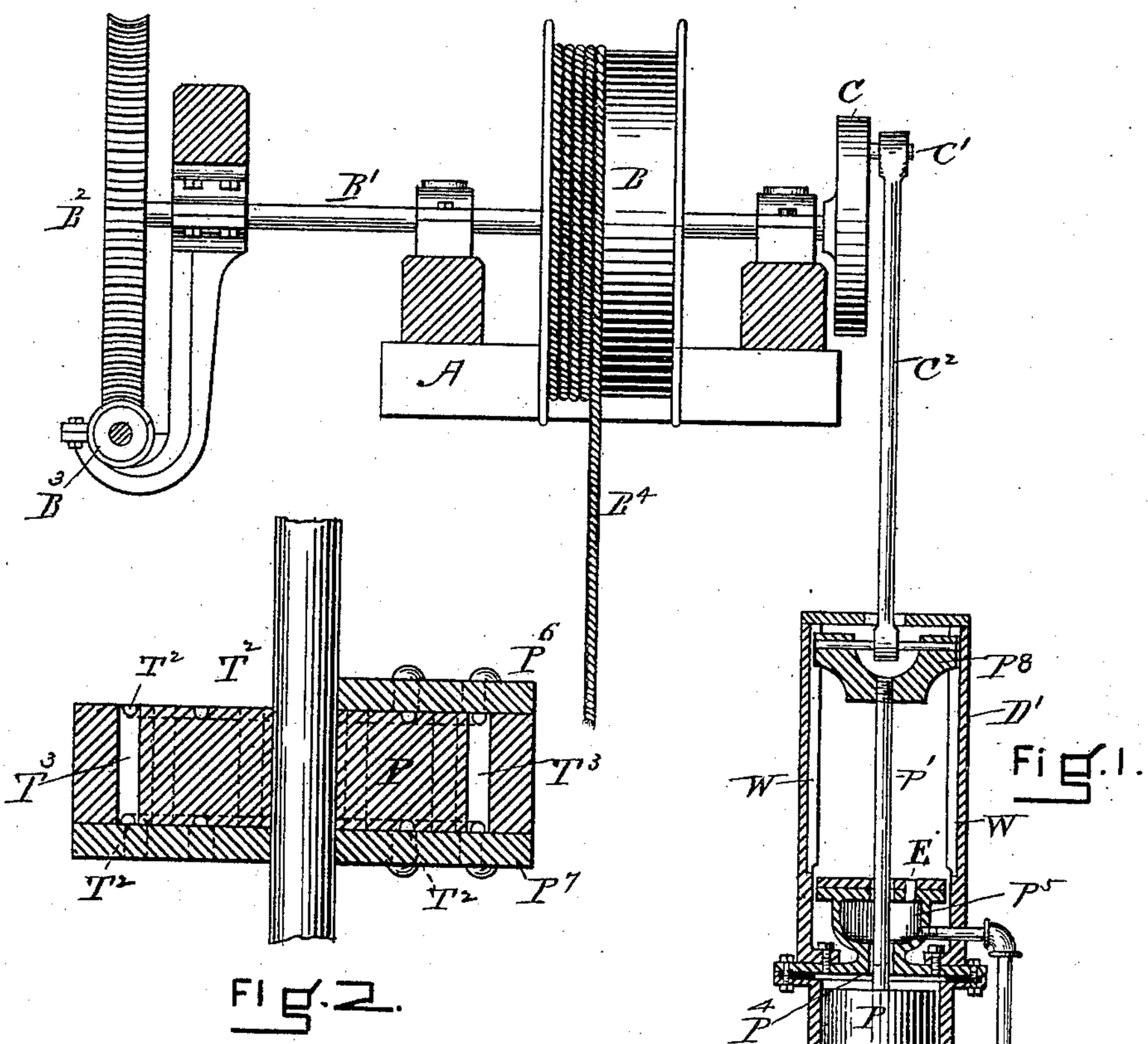

Fig. 1.

Fig. 2.

Fig. 3.

Fig. 4.

WITNESSES.

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FLUID SPEED-REGULATOR FOR ELEVATORS.

SPECIFICATION forming part of Letters Patent No. 396,949, dated January 29, 1889.

Application filed September 21, 1888. Serial No. 285,995. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM E. NICKERSON, of Cambridge, in the county of Middlesex and State of Massachusetts, have invented a certain new and useful Improvement in Fluid Speed-Regulators for Elevators, &c., of which the following, taken in connection with the accompanying drawings, is a specification.

The object of my invention is to so improve that class of speed-regulators in which fluid is used in cylinders that there will be a perfect automatic change of place of the fluid without loss or want of compensation, and also to arrange a novel system of passages in the piston, by which the flow of the fluid in passing through the moving piston from one side to the other is self-regulating in adapting itself to the varying rapidity of motion of the piston, and through it the speed of the machine. These objects I attain by the mechanism shown in the accompanying drawings, in which—

Figure 1 is a view partly in elevation and partly in vertical section, and is intended to illustrate in a general way the application of my invention to regulating the speed of an elevator. Fig. 2 is an enlarged vertical section through the piston, taken on line X X of Fig. 3, a part of the cap-piece being represented as removed. Fig. 3 is a plan of the piston, a part of the cap-piece being represented as removed to show the position of the passages in the interior of the piston; and Fig. 4 is a vertical section of the piston, taken on line *y y* of Fig. 3.

In the drawings, Fig. 1, A represents a frame-work, to which the shaft B′ is connected. Upon one end of the shaft B′, I have a gear-wheel, B^2, which is driven by a worm, B^3, in the usual manner. Upon the shaft B′ is mounted a drum, B, which operates the hoisting-rope B^4.

C, Fig. 1, is a crank-disk attached to the end of the shaft B′. This crank-disk C has upon it a crank-pin, C′, which gives motion, through the pitman C^2, cross-head P^8, and piston-rod P′ P^2, to the piston P in the cylinder D.

D′, Fig. 1, is a frame for supporting the ways W W, upon which the cross-head P^8 slides.

At the upper end of the cylinder D, I have a small reservoir, P^5, which serves to take up any oil that may leak through the box P^4, or that may have become an excess through leakage of the box P^3 in the auxiliary chamber D^2, or from the loss of fluid-space caused by the advance of the piston-rod P^2 into the chamber D^2. This excess is conveyed from the chamber D^2 to the reservoir P^5 by the pipe H.

E, Fig. 1, is a vent-hole made in the top of the reservoir P^5.

I will now describe the construction and arrangement of the piston P shown in Figs. 2, 3, and 4.

P represents the body of the piston, and has on each side circular grooves T^2 T^2, Figs. 2 and 3, the grooves T^2 T^2 on one side of the body P being connected to the corresponding grooves on the other side by holes T^3 T^3, which extend through the piston-body P. The caps P^6 P^7, that are fastened to the piston-body P, are provided with openings T T, which connect with the circular grooves T^2 T^2, made in the body P. The openings T T in the caps P^6 P^6 are not opposite the holes T^3 T^3, made in the body P, so that the fluid in passing from one side of the piston to the other cannot pass straight through, but must form currents that turn a right angle twice in the passage, and also intermingle with each other, and thus greatly lessen the velocity of flowing. The proportional lessening of velocity due to angular turns and intermingling of currents increases rapidly with the increase of velocity of current, so while slowly-moving currents are not much affected by abrupt turns or by the intermingling, rapidly-moving ones are much affected.

If thought desirable, the pipe H may discharge the surplus from the auxiliary chamber D^2 into an independent reservoir instead of into the reservoir P^5, the object of the receiving-reservoir being to hold the surplus from the auxiliary chamber D^2, and to return it through the pipe H during the upward stroke of the piston P.

I claim—

1. In a fluid speed-regulator, the combination of the cylinder D, the piston-rod P′ P^2, and the piston P, having openings whereby

the fluid may pass from one side to the other, with the auxiliary chambers D^2 and P^5 and reservoir-pipe H, substantially as described, and for the purpose set forth.

2. In a fluid speed-regulator, the combination of the cap P^6, having openings T T, with the body P of the piston, having grooves T^2 T^2 and intermediate openings, T^3 T^3, substantially as described, and for the purpose set forth.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, on this 19th day of September, A. D. 1888.

WILLIAM E. NICKERSON.

Witnesses:
FRANK G. PARKER,
WILLIAM EDSON.