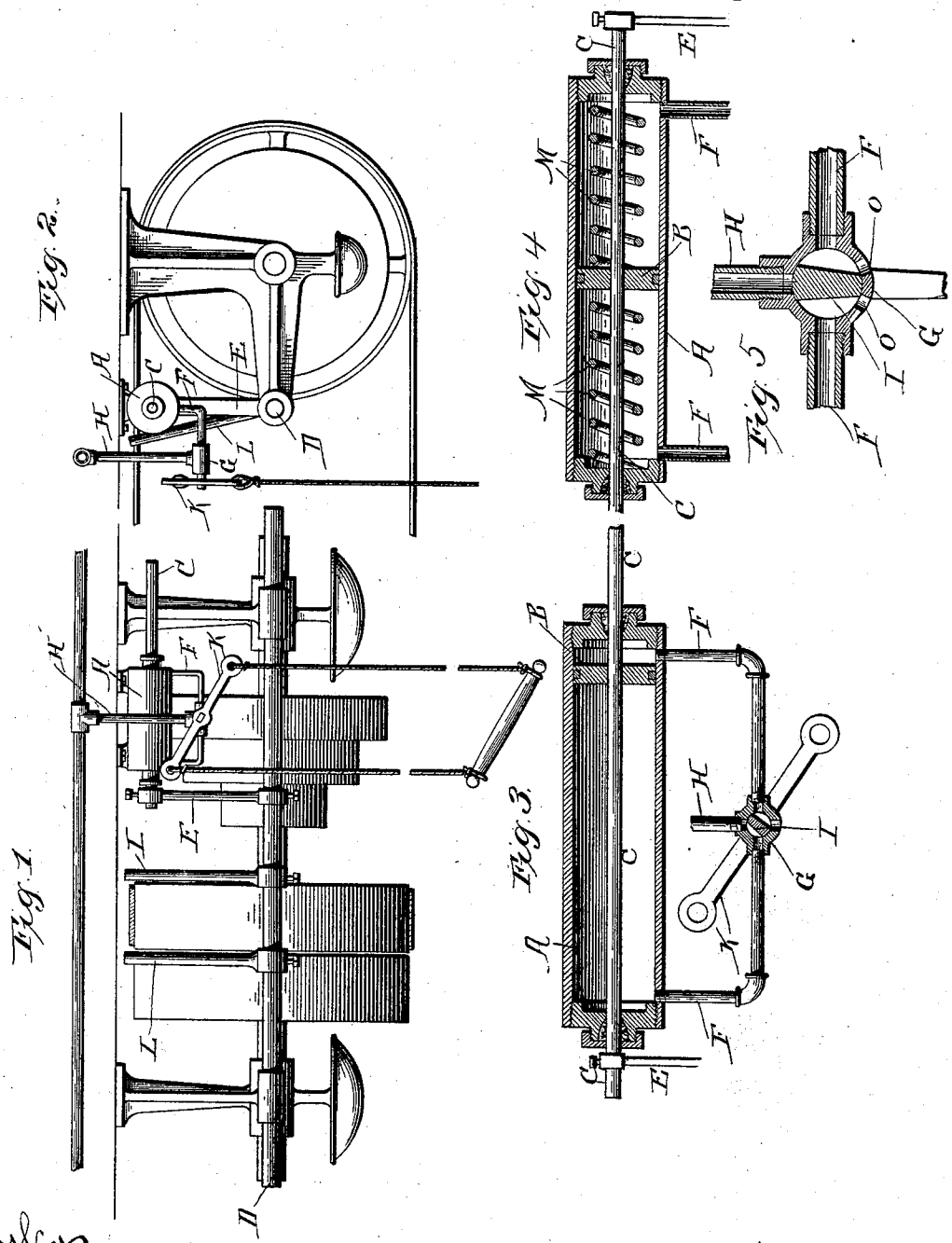
(No Model.)

H. A. FERGUSSON & A. J. KLINE.

BELT SHIFTER.

No. 588,967. Patented Aug. 31, 1897.



Witnesses

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BELT-SHIFTER.

SPECIFICATION forming part of Letters Patent No. 588,967, dated August 31, 1897.

Application filed March 13, 1896. Serial No. 583,023. (No model.)

To all whom it may concern:

Be it known that we, HENRY A. FERGUSSON and ALEXANDER J. KLINE, citizens of the United States, residing at Jersey City, in the county of Hudson and State of New Jersey, have invented certain new and useful Improvements in Belt-Shifters, of which the following is a specification.

Our invention relates to an attachment for belt-shifters; and it consists in the usual shifter-rod, and an arm secured thereto at right angles, combined with a separate operating-cylinder placed to one side of the rod, but in vertical alinement therewith, and which cylinder is provided with a piston, and a piston-rod that is connected to the shifter-rod by the arm, as will be more fully described hereinafter.

The objects of our invention are to provide an attachment for a shifter-rod which is already in use and in which the operating-cylinder is entirely separate and distinct from the shifter-rod and located at a distance therefrom, but preferably in vertical alinement therewith, in contradistinction to having the shifter-rod to extend directly through an operating-cylinder, as has heretofore been done, avoid the necessity for special designing of hangers, which is necessary in order to secure perfect accuracy of movement in order to prevent binding or cramping, which is liable to occur when the cylinder is applied directly to the shifter-rod, and to produce a cheap and simple mechanism for shifting belts that can be applied to a shifter-rod already in position, and which mechanism will hold the belt after it has been shifted and against all creeping.

Figure 1 is a side elevation of a countershaft carrying a tight and loose pulley and the ordinary shipping rod and fingers and showing our improvement applied thereto; Fig. 2, an end view of the same. Fig. 3 is a longitudinal section of the cylinder and its attachments. Fig. 4 shows a similar sectional view of the cylinder with a spring placed therein upon each side of the piston. Fig. 5 is an enlarged detail view of the valve.

In Figs. 1, 2, and 3 a cylinder A is fitted with a piston B and piston-rod C. This cylinder is fastened securely by means of bolts to the stringer, parallel to and in a vertical line with the usual shipping-rod D, being preferably located above said rod and having the piston-rod connected to the shipping-rod by the arm E, the latter being secured to the piston and shipping rod by suitable set-screws, so that the movements of the shipping-rod will be simultaneous and identical with the piston-rod. The cylinder A is provided with air-tight stuffing-boxes at each end, through which the piston-rod extends, and it is also provided with two admission-pipes F, one at each end, for admitting compressed air to the cylinder. These pipes are connected to the opposite sides of the valve G, which valve also has a connection H, with a suitable supply of compressed air, such as a reservoir, pump, or blower.

I is a plug fitted to a suitable seat within the valve, as shown in Figs. 3 and 5, and is so formed that when turned at an angle of several degrees either side of a horizontal line an air-passage is formed from H to F, at the same time opening the opposite pipe F to the atmosphere through the exhaust-hole O. The arm K is attached to the valve-plug I, and cords depend from each end thereof to a point in convenient reach of the operator, or the valve may be itself placed in a desirable position for manipulation by said operator.

It is often necessary to so shift belts that three positions of the shipper-fingers L, carried by the rod D, are required where the machine being driven must be started, stopped, and reversed. This is accomplished, as shown in Fig. 4, by having two helical springs M, one in each end of the cylinder and making these springs of a resiliency equal to one-half the effective force exerted by the air-pressure on either side of the piston, and when said air-pressure is not exerted the springs shall keep the piston in a central position within the cylinder, as shown. To start the countershaft, the handle K of the valve in Fig. 3 is turned until the pressure-pipe H is in communication with one of the ends of the cylinder through one of the pipes F, which will also leave the opposite pipe F open to the atmosphere through one of the holes D. In this position the compressed air is admitted to the cylinder, as before described, and the

piston is moved to one end of the cylinder, and by means of the arm E the shipper-rod D is operated so as to properly adjust the belt. To return the belt to the center or loose pulley, the valve is turned to the vertical position, as shown in Fig. 5, when the cylinder is relieved of all pressure and the spring returns the piston to the center thereof. To reverse the action, the plug is turned in the opposite direction, thus admitting air to the passage end of the cylinder and bringing about the reverse movement of the piston, and consequently the shipper-fingers.

Heretofore the operating-cylinder has been applied directly to the shifter-rod instead of at a distance, as here shown, but in that case the operating-cylinder cannot be applied to the shifter-rod after it has once been put in place without designing special hangers for it, owing to the accuracy of the fittings that are necessary in order to have the parts moved without cramping or binding.

Where our invention is to be applied to a shifter-rod and secured directly to the sill or one alongside of it and to which the bearings for the shifter-rod are secured, there is no necessity for changing any of the operating parts or remodeling them in a shop filled with shafting. This is a matter of very great consideration, for it enables our invention to be applied at any suitable point and at very little expense.

Having thus fully described our invention, what we claim as new and useful is—

An attachment for a belt-shifter consisting of an arm, extending at right angles to the shifter-rod, but removably secured thereto at one end, combined with an operating-cylinder placed above the shifter-rod and provided with a piston, and a piston-rod, and to which piston-rod the other end of the arm is secured; a suitable valve and pipes leading from the valve to both ends of the cylinder, the whole attachment being separate from and attachable to the shifter-rod after the rod has been placed in position, substantially as shown and described.

In testimony whereof we have hereunto affixed our signatures in the presence of two subscribing witnesses.

HENRY A. FERGUSSON.
ALEXANDER J. KLINE.

Witnesses:
THOMAS A. WALDRON,
JOHN MAHER.