2 Sheets—Sheet 1.

W. W. HUBBARD.

BELT-SHIFTER.

No. 187,532. Patented Feb. 20, 1877.

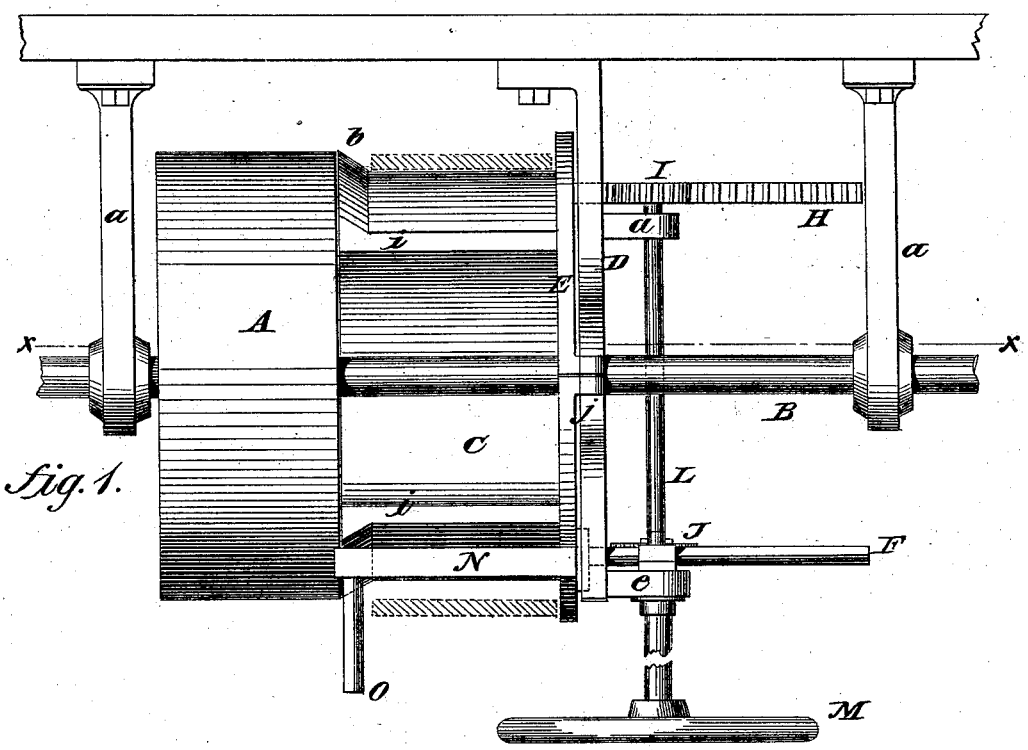
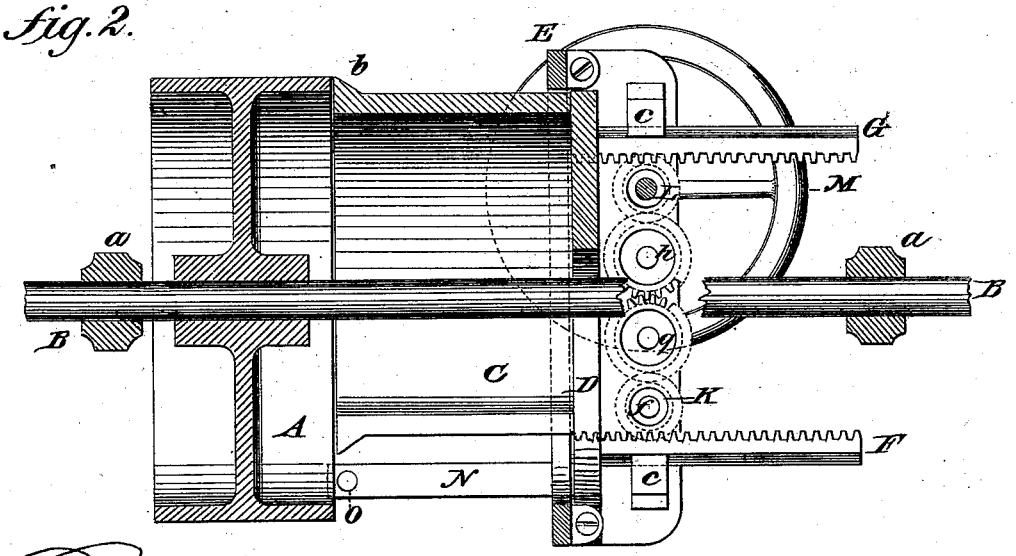


Fig. 1.

Fig. 2.



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2 Sheets—Sheet 2.

W. W. HUBBARD.

BELT-SHIFTER.

No. 187,532. Patented Feb. 20, 1877.

Fig. 3.

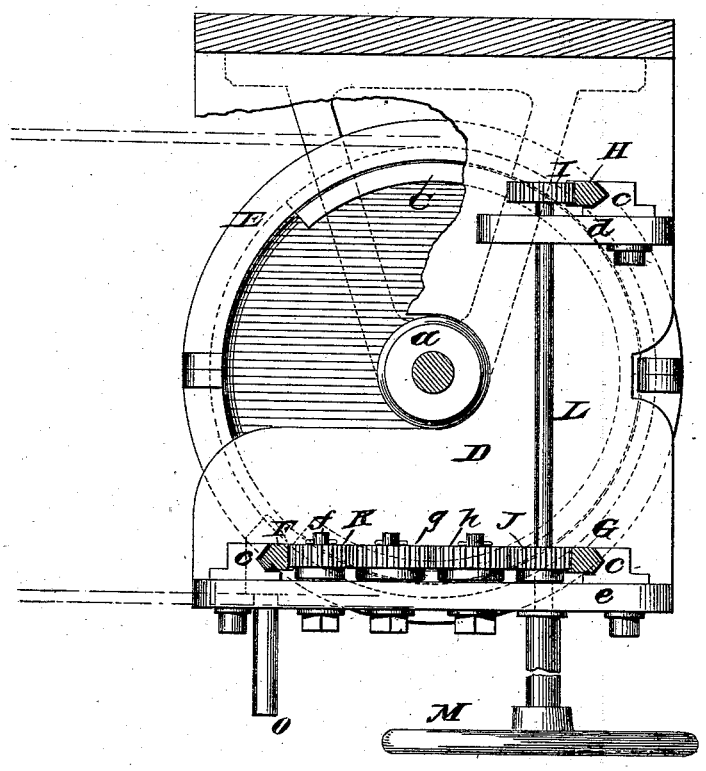
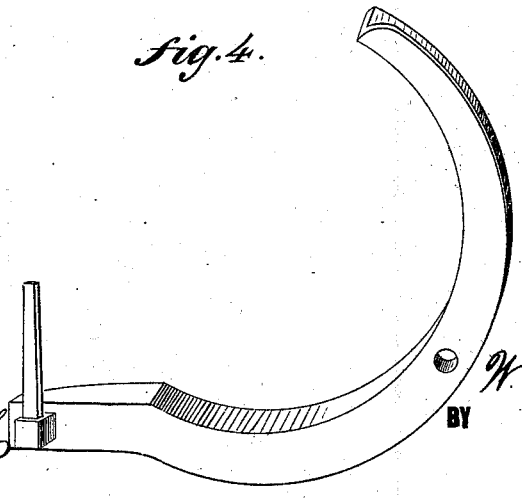


Fig. 4.



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UNITED STATES PATENT OFFICE.

WILLIAM W. HUBBARD, OF MANCHESTER, NEW HAMPSHIRE.

IMPROVEMENT IN BELT-SHIFTERS.

Specification forming part of Letters Patent No. **187,532**, dated February 20, 1877; application filed February 3, 1877.

To all whom it may concern:

Be it known that I, WILLIAM W. HUBBARD, of Manchester, in the county of Hillsborough and State of New Hampshire, have invented a new and Improved Belt-Shifter, of which the following is a specification:

Figure 1 is a side elevation of my improved belt-shifter. Fig. 2 is a transverse section on line *x x* in Fig. 1. Fig. 3 is an end elevation. Fig. 4 is a perspective view of a modified form of a part of my improvement.

Similar letters of reference indicate corresponding parts.

My invention consists in the combination of a stationary drum, for receiving the belt from the driving-pulley, and a follower moved over the said drum by levers or suitable gearing, for forcing the belt from the drum onto the pulley, and also for removing it from the pulley.

The object of the invention is to provide a means for shifting belts which shall obviate the difficulties hitherto experienced in using loose pulleys or idlers with the ordinary means for shifting.

Referring to the drawing, A is a driving-pulley, secured to the shaft B, that is supported by hangers *a*. C is a section of a drum that is smaller in diameter than the pulley A, and is provided with the beveled flange or collar *b*, the outside diameter of which is the same as the pulley A. The drum C is attached to the support D, by which it is firmly held in a position concentric with the shaft B, and with its beveled flange in proximity to the pulley A. An annular follower, E, consisting of two semicircles bolted together, is placed on the drum C. Racks F G H project from the follower E through the support D, and are provided with guides *c*, that are supported by brackets *d e*, attached to the support D.

The racks F G H are engaged by pinions I J K. The pinions I J are secured to the shaft L, which is journaled in the brackets *d e*, and the pinion K turns on the stud *f*, that projects from the bracket *e*, taking its motion from the pinion J through the intermediate wheels *g h*, which revolve on studs projecting from the bracket *e*. A single wheel may be used in place of the pinion K and wheels *g h*, if desired. A hand-wheel, M, is secured to the lower end of the shaft L. An arm, N, having the shifting-pin O, projects from the follower E over the drum C. The side of the drum C is cut away at *i i*, and the support D is notched at *j*, for convenience in applying the shifter.

The operation is as follows: The belt being at rest on the drum C, between the follower E and the shifter-pin O, the wheel M is turned, moving the follower toward the pulley A by means of the pinions and the racks. The belt is thus forced up the inclined side of the beveled collar *b*, and over the edge of the rotating pulley A. As soon as the belt begins to take motion from the pulley, it requires little or no force to carry it to its proper place on the pulley. When it is desired to shift the belt from the pulley to the drum, the wheel M is turned in the reverse direction, and the pin O draws the belt from the pulley to the drum.

When narrow belts are used, a follower that partly encircles the drum may be used, and a simple lever may be attached for moving it in place of the hand-wheel, the pinions, and the racks. A follower of this description is shown in Fig. 4.

The advantages claimed for my invention are, that loose pulleys are dispensed with, and the belt, when not doing work, is at rest and relieved from strain. The shafts that support the belt are also relieved from pressure.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. A fixed drum, C, provided with a beveled collar, *b*, the sliding follower E, carrying the arm N and pin O, and the pulley A, in combination, substantially as herein shown and described.

2. The follower E, having racks F G H, in combination with the pinions I J K, intermediate wheels *g h*, shaft L, and hand-wheel M, substantially as herein shown and described.

3. The drum C, cut away at *i i*, and provided with the beveled collar *b*, substantially as herein shown and described.

WILLIAM W. HUBBARD.

Witnesses:

C. L. RICHARDSON,

C. H. BARTLETT.