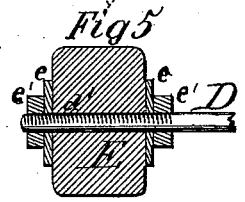
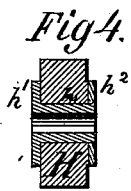
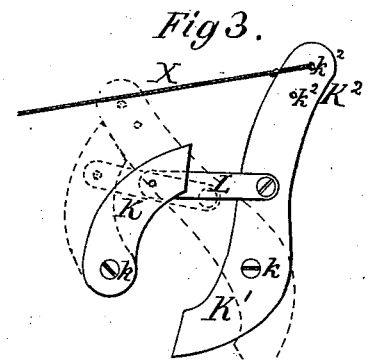
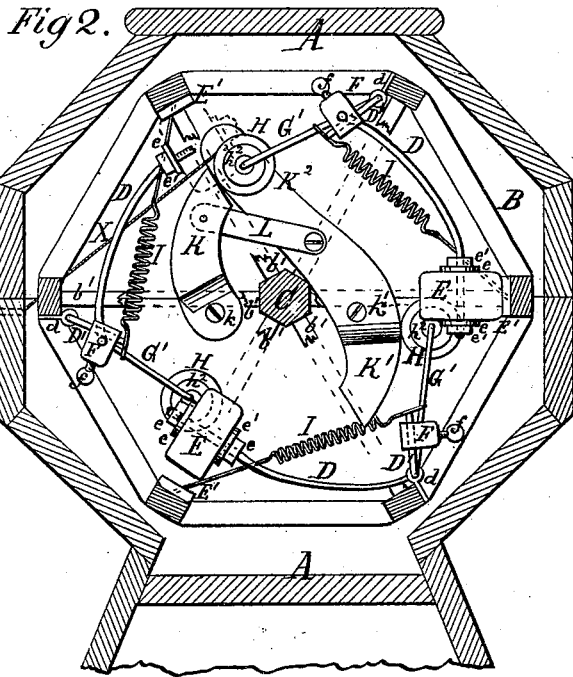
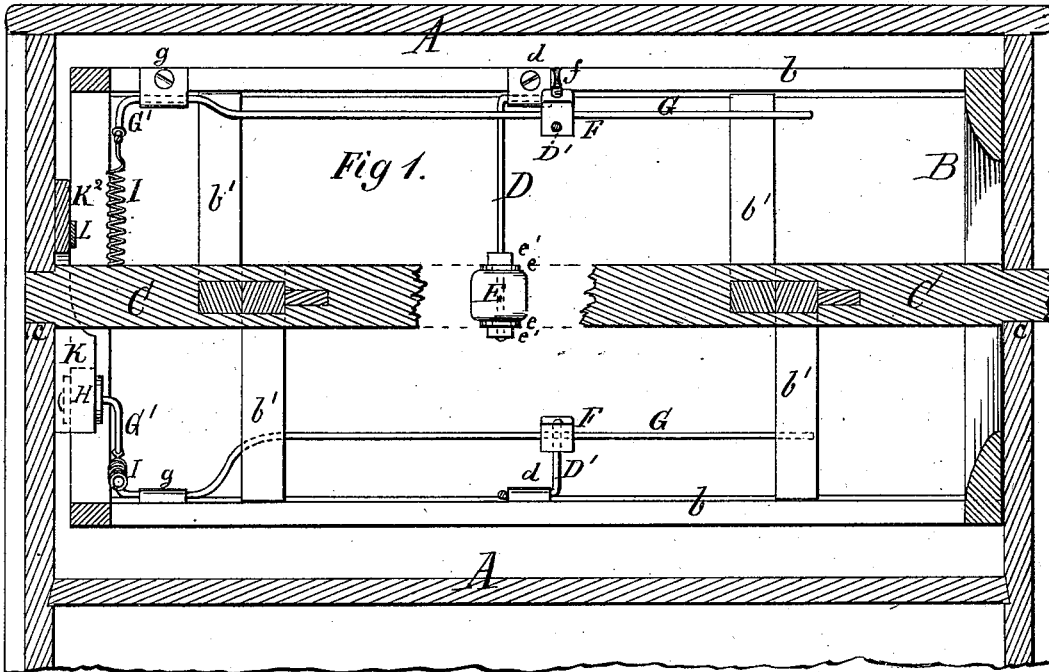


F. B. LEWIS.  
BOLTING-REEL.

No. 184,878.

Patented Nov. 28, 1876.



Witnesses:  
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# UNITED STATES PATENT OFFICE.

FITCH B. LEWIS, OF TIFFIN, OHIO.

## IMPROVEMENT IN BOLTING-REELS.

Specification forming part of Letters Patent No. 184,878, dated November 28, 1876; application filed October 5, 1876.

*To all whom it may concern:*

Be it known that I, FITCH B. LEWIS, of Tiffin, in the county of Seneca and State of Ohio, have invented a new and useful Improvement in Bolting-Reels, which improvement is fully set forth in the following specification, reference being had to the accompanying drawings, in which—

Figure 1 is a longitudinal vertical central section of my improved bolting-reel. Fig. 2 is a vertical transverse section of the same, with a fuller illustration of the knocking or jarring hammers and their adjuncts. Fig. 3 is a detail view of the coupled adjustable cams, whereby the knocking or jarring hammers are operated. Fig. 4 is a detail sectional view of an india-rubber friction-roller used on the lever-arms of the hammers. Fig. 5 is a detail sectional view of an india-rubber hammer used for jarring or knocking the reel.

The nature of my invention consists, first, in the employment of india-rubber hammers or knockers, instead of metal hammers, in a bolting-reel; it consists, second, in the employment of india-rubber anvils in a bolting-reel, instead of iron anvils; it consists, third, in the employment of india-rubber friction-rollers in a bolting-reel, instead of metal rollers; it consists, fourth, in a pair of coupled adjustable symmetrically-arranged cams, whereby the hammers and rollers of a bolting-reel are operated in a peculiar manner; fifth, in an improved manner of fastening the india-rubber hammers to their lever-arms; sixth, in an improved manner of providing the india-rubber with a metal bearing or box; seventh, in the peculiar construction and arrangement of the said parts, whereby a number of successive blows are given in a horizontal and alternately opposite direction upon the bars of the reel.

The objects of my invention are, mainly, first, to improve the operation of the bolting-reel by avoiding the sharp and insufficient blow of an iron hammer upon an iron anvil, and to give a blow which possesses greater transmitting power, and, at the same time, to avoid the danger of breaking the parts by the concussion upon the rubbers, and by the falling of the hammers and rollers upon the bolting-cloth, and to lessen the noise or rat-

ting of the reel. A second object is to give successive blows in opposite horizontal directions; and a third and last object is to make the machine easier to operate.

In the drawings, A represents the casing of a bolting-reel, and B the bolting-reel, constructed in the ordinary manner, and preferably in the shape of a hexagonal skeleton prism, with six longitudinal bars, *b*, and arms *b'*, fastened to an axle, C, which has journal-bearings *c* in the casing A. Every other one of the said bars *b* is provided with a fulcrum-bearing, *d*, for the lever-arm D of a hammer, E. The said hammer E is made of india-rubber, and fastened between two washers, *e*, by means of two nuts, *e'*, upon the lever-arm D, which, for that purpose, is provided with a continuous screw-thread, *d'*, the back nut being screwed up to the end of said screw-thread, and thus prevented from moving.

At the other side of the bearing *d* the lever-arm D extends in shape of another arm, D', through a coupling-clamp, F, which has a longitudinal rod, G, fastened to it by means of a set-screw, *f*. The rod G is so passed through the clamp F that it touches the lever-arm D', which thereby becomes fastened by fastening the rod G with the screw *f*.

The rod G extends to the discharge end of the reel, and opposite and directly in line with the bearing *d* is secured, by a bearing, *g*, on the same bar that holds said bearing *d*. On the other side of the bearing *g* the rod G extends into a lever-arm, G', with an india-rubber friction-roller, H, at its end. The roller H is mounted on a tube, *h*, with a flange, *h'*, upon which tube another flange or washer, *h''*, is fastened, with the roller H between it and the flange *h'*.

The lever-arm G' is bent at a right angle near its end, and the roller H put on it, whereupon the end is riveted to prevent the roller from slipping off. At a suitable place the arm G is provided with a tension-spring, I, the free end of which is fastened to the reel.

At certain intervals the rollers H are met by cams K K<sup>1</sup>, over which they travel, and by which they are swung outwardly. The cam K is pivoted at *k* to the head of the case A. The cam K<sup>1</sup> is pivoted at *k'* to the same part, but on the other side of the axle C, and

the eccentric outlines of both cams are symmetrical when in operating condition, so that the cam K points up, and the cam K<sup>1</sup> down. The cam K<sup>1</sup> has an upper lever-arm, K<sup>2</sup>, with holes *h*<sup>2</sup> for the attachment of an operating-cord, X, and a coupling-link, L, connecting it with the upper part of the cam K.

The bars of the reel which are struck by the hammers are provided with india-rubber anvils E', which relieve and protect them from direct wearing action of the hammers. The anvils might, in some cases, be dispensed with.

The axle C may, at one end, be provided with a pulley or with a crank, for the application of either machine or hand power.

Operation: The reel, provided with bolting-cloth, and charged with flour, is set in motion, and the cams K K<sup>1</sup> are moved by the cord X in the positions shown in Figs. 2 and 3 by dotted lines. The rollers H are then forced to mount the said cams at each revolution of the reel. The roller H, by traveling over the cam K or K<sup>1</sup>, is swung back, and the therewith-connected hammer E removed from its anvil E', or from the bar of the reel. Arrived at the end or highest point of the cam the roller H is left without support, and is suddenly drawn back by the spring I, thereby forcing the hammer upon its anvil, or directly upon the reel-bar in case no anvil is provided. The said blow occurs when the hammer is in a horizontal position, so that each revolution of the reel causes two blows of the same hammer in opposite directions, and as there are three hammers, there are six blows to one revolution of the reel, and all these blows are given at equal intervals successively. The reason for having the blows in a horizontal direction is this: that the flour brought down from the cloth by such blow is deposited upon the inclined sides of the cloth, and does not interfere with the flour upon the horizontal part of the cloth, nor strain the cloth by the impetus of its fall, while the inclination of the other parts breaks the force of such fall, and gives the flour at once the necessary motion upon the cloth.

The india-rubber hammer gives a deader blow than a metal hammer, the blow of the latter being sharp and short, and therefore without communicating power, while the blow of the india-rubber hammer shakes the whole reel, without snapping the slats asunder nor loosening their connections, because the yielding nature of the india-rubber prevents the spending of the whole force of the blow at once, and retains a portion thereof as accumulated force, to be expended at the rebound of the parts which were brought in contact.

By using a rubber roller, H, I avoid the an-

noying rattle caused by its meeting with and leaving the cams K K<sup>1</sup>. I also modify the concussion of the said parts in such degree that their connections and bearings are much less affected or disarranged.

In cold weather metal (and especially iron) becomes brittle and breaks easily. In such case a broken hammer will, by its weight and the sharp edges of its fracture, tear up the bolting-cloth. The same is the case if a metal roller breaks or becomes disconnected. An india-rubber hammer or roller is, on account of its lightness, not so easily detached from the operating-lever, either by breakage or gradual giving way of the fastenings from jar, and, if broken, their little weight and yielding consistency involve no danger to the preservation of the bolting-cloth.

The manner of fastening the india-rubber hammer admits adjustment, so that the said hammer may be more or less forcibly clamped between the washers, and thereby give a blow more or less hard or bounding.

The manner of providing the india-rubber roller with a metal bearing is also susceptible of adjustment, inasmuch as the roller, when working loose, can easily be clamped tight by forcing the washer closer toward the flange of the tube, and then and there riveting it upon the tube.

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

1. A bolting-reel having knocking-hammers of india-rubber, substantially as and for the purpose set forth.

2. The combination, with a bolting-reel, of knocking-hammers, arranged to give a succession of blows laterally and alternately in opposite directions, substantially as and for the purpose herein set forth.

3. A bolting-reel having friction-rollers of india-rubber between the tripping mechanism and the hammers, substantially as set forth.

4. The combination of a bolting-reel with jarring or knocking hammers and the coupled cams K K<sup>1</sup>, substantially as and for the purpose set forth.

5. The combination of the india-rubber hammer E, the washers *e*, nuts *e'*, and lever-arms D, substantially as set forth.

6. The combination of the roller H, the flanged tube *h*, and the washer *h*<sup>2</sup>, substantially as set forth.

Witness my hand in the matter of my application for a patent on a bolting-reel this 21st day of September, A. D. 1876.

FITCH B. LEWIS.

Witnesses:

JAMES MARTIN, Jr.,

J. P. THEODORE LANG.