2 Sheets—Sheet 1.

M. OSBORN.

TIRE TIGHTENER.

No. 187,552. Patented Feb. 20, 1877.

Fig. 1.

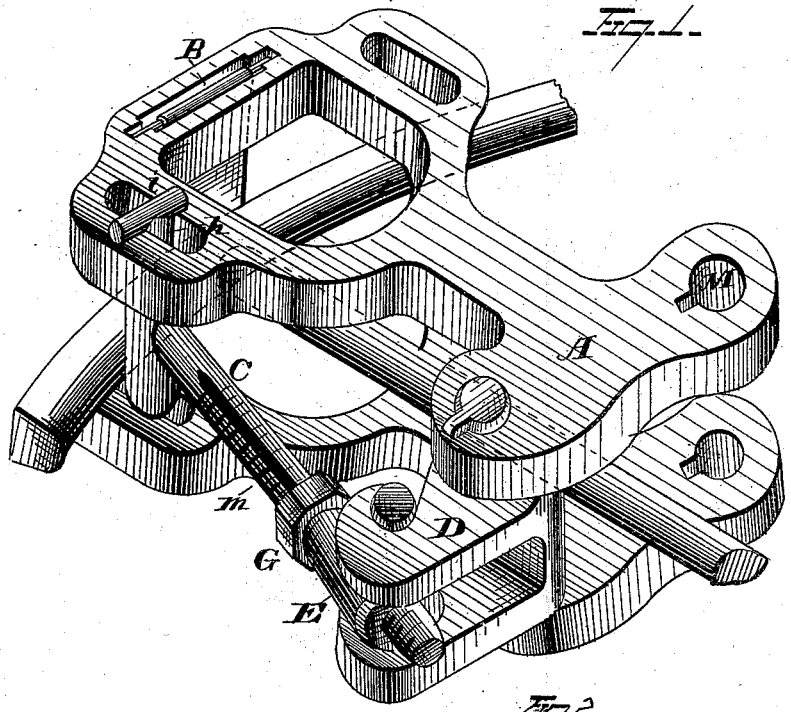
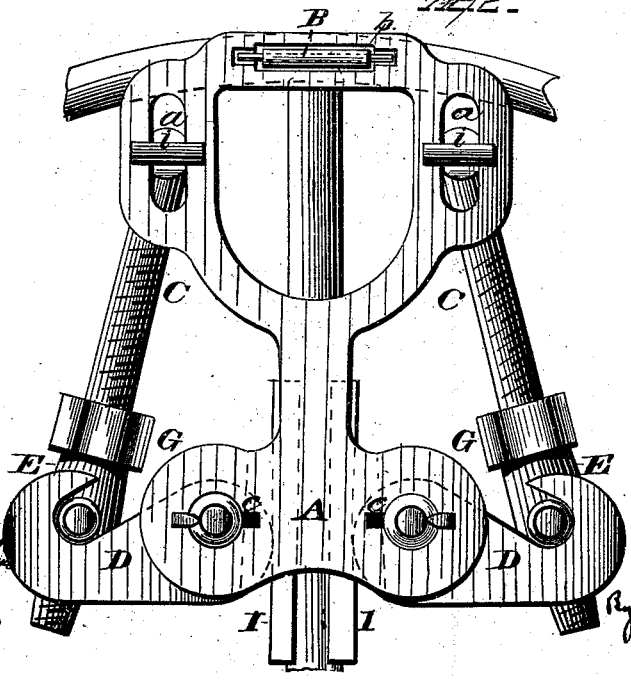


Fig. 2.



WITNESSES

E. A. Hopkinson

A. M. Bright

INVENTOR

M. Osborn,

By Seggett & Seggett

ATTORNEYS

2 Sheets—Sheet 2.

M. OSBORN.

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Fig. 3.

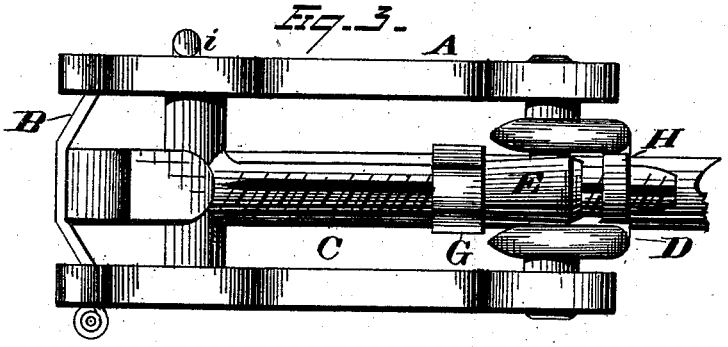


Fig. 4.

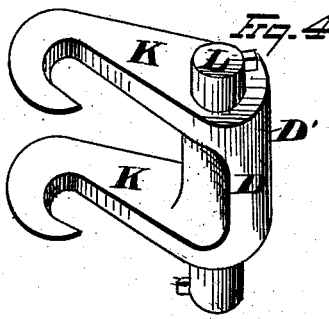


Fig. 5.

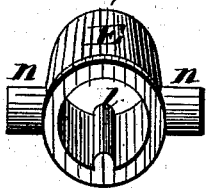
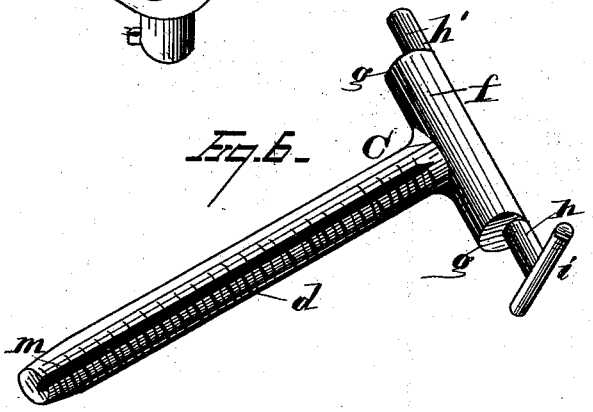


Fig. 6.



WITNESSES

Edw. L. Appleingham

A. M. Bright.

INVENTOR

Milo Osborn.

By Legget and Legget.

ATTORNEYS

UNITED STATES PATENT OFFICE.

MILO OSBORN, OF CLEVELAND, OHIO.

IMPROVEMENT IN TIRE-TIGHTENERS.

Specification forming part of Letters Patent No. **187,552**, dated February 20, 1877; application filed January 26, 1877.

To all whom it may concern:

Be it known that I, MILO OSBORN, of Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new and useful Improvements in Tire-Tighteners; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it pertains, to make and use it, reference being had to the accompanying drawings, which form part of this specification.

My invention relates to improvements in tire-tighteners; and consists, principally, in a combination of devices, as hereinafter fully described and claimed, whereby the grasping of the spoke and the expanding or pushing out of the felly are performed simultaneously by one and the same operation.

In the drawing, Figure 1 represents a perspective view of a tire-tightener embodying my invention. Fig. 2 is a side view thereof. Fig. 3 is an end view. Fig. 4 is a detached view of the eccentric clamp. Fig. 5 is a similar view of the clamp-tightener. Fig. 6 shows a separate view of the expanding-bar.

A represents the retaining-frame, which embraces two pieces, each like the other. It serves to retain the several parts in position, as will be seen by reference to the drawing. Each part of said frame A is provided with slots *a a b* and elongated eyes *c c*. B is an adjusting strap or band, which passes through slots *b*, and is provided at each end with a suitable stop to prevent it from being withdrawn. It is so arranged that it can be lengthened or shortened by being wound or unwound on a reel or bar, to accommodate varying sizes or breadths of wheels. This lengthening or shortening may, however, be accomplished in any other suitable manner. This band or strap acts also in the nature of a hinge when the device is unloosened or put together. C C are the expanding-bars, which consist of the screw-threaded shank *d* and cross-piece *f*. Said cross-piece is provided with offsets at *g*, thus forming the studs or projections *h h'*, one of which carries the retaining or locking-piece *i*. The latter is constructed of such a size as will permit it to pass freely through the slots *a*, but will be prevented from returning when the expanding-bar C is moved to either side from its position when the locking-piece *i* is inserted. The stud or projection *h'* fits into the corresponding slot of the opposite frame-piece from that through which locking-piece *i* is inserted. D D are the eccentric clamps, each provided with two claws, *k k*, and lock projections L L, which latter have also the function of pivots, and are placed eccentrically to the curved line of the surface D'. The tongue or locking projection proper of one of said pivots and projections L extends in an opposite direction from that of the other or opposite locking projection, so as to prevent the unlocking of said clamp from both plates of the retaining-frame at the same time, since the elongation of the eyes *c* is in the same direction in both plates. The same result can, of course, be secured by changing the direction of the elongation of the eyes in the one plate, and constructing the locking pojections of the eccentric clamp to project both in the same direction.

E E are the clamp-tighteners, which slide freely on the shank of the expanding-bars C. Each is provided with a feather, *l*, which fits into the longitudinal groove *m* of the screw-shank of bar C, and prevent the turning or revolving of the same, so that its studs or projections *n* may always be in the proper position relative to the eccentric clamps D. This arrangement of feather and groove is, however, not an essential element of my invention, and may, if desired, be dispensed with. Neither do I confine myself to the particular form of the clamp-tightener shown, since that is not material. H is a retaining washer or movable stop to prevent the clamp-tightener from passing off the shank of the bar C. G G are the tightening and expanding nuts, which fit on the screw-threaded shanks of the expanding-bars C, and to which the power is applied to tighten the hold of the device on the spoke and to expand or push out the felly. I I are the spoke-clamps, preferably constructed of wood, and provided with a groove, corresponding to the curvature or form of the spoke. Said clamps may be lined with any soft material, if desired, as may also, all other parts of the device which necessarily come in direct contact with the wheel operated upon.

The operation of the device is as follows:

One of the plates of the retaining-frame A is loosened and turned back, which leaves the device open for the reception of the spoke of that part of the felly to be operated upon. The tightener is then placed to the spoke, so that the latter is in position, as shown in the drawing, and so that the felly rests on the expanding-bars C. The removed plate is then placed in position, so that the studs or projections h' and the lock-projections L of the expanding-bar and eccentric clamp, respectively, pass through the slots and elongated eyes of the frame-plate. The adjusting strap or band B, connecting the two plates of the retaining-frame, is on the outside of the tire of the wheel, and serves to keep the studs or projections of the expanding-bar in the slots of the frame-piece. The shoulders g on the bars C prevent the frame or rather the two parts of the retaining-frame from coming together, so as to secure a free operation of the several parts. When the lock projections L have been passed through the elongated eyes of the frame-piece the eccentric clamps are turned to lock the same. In this position the radius from the center of the eccentrically-placed pivot and lock projection to the curved surface of the eccentric clamp is shortest. The spoke-clamps I are now applied to the spoke, and being wedge-shaped, are tightly wedged between said eccentric clamps. Power is now applied to the two tightening and expanding-nuts G, and as they move outward they carry with them the clamp-tighteners E, which latter, acting on the claws of the eccentric clamps D, force said claws outward, whereby the pressure on the spoke-clamps is increased, by reason of the greater radius from the center of the eccentrically-placed pivots L to that part of the curved surface of the clamps D now in contact with the spoke-clamps.

In proportion as the said claws move outward, the said radius increases, and, therefore, also the pressure on the spoke-clamps I. At the same time, or as soon as the resistance offered by the clamps to the outward movement of the nuts is greater than the resistance offered by the felly, the expanding-bars C begin to move outward, and to act on the felly to expand the same. Either the eccentric clamp or felly is moved as the resistance offered by the one is greater than that offered by the other; or both are moved at the same time if the resistance is equal.

When the felly has been expanded to the required extent, the space thus formed between the shoulder of the spoke and the felly is filled with a shim or split washer, which keeps the felly expanded against the tire when the tire-tightener is removed, and prevents any friction between the spoke and felly.

To remove the tire-tightener, the nuts G are loosened, and then the spoke-clamps I are removed, which can be done as the pressure on the same has been relieved by the loosening of the nuts, after which the eccentric clamp D is turned to its unlocked position, which permits the frame-plate to be turned back so as to allow the tightener to be removed. It is then applied to any other spoke, if necessary, and the operation repeated.

Instead of constructing the eccentric clamp with claws, said part of the clamp may be made solid, and provided with an opening through which the shank of the expanding-bar C may pass, said opening being made sufficiently large to allow for the movement of clamp on its pivots.

In this case the clamp-tightener E may be dispensed with, as the nuts G will then act directly on the eccentric clamp D.

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

1. In a tire-tightener, the eccentric clamps D, which serve to fasten the tightener to the spoke and to expand the felly, substantially as described.

2. In a tire-tightener, the eccentric clamps D, which serve to fasten the tightener to the spoke and to expand the felly, in combination with the retaining-frame, substantially as described.

3. The eccentric clamps D and retaining-frame, in combination with the expanding-bars C, substantially as and for the purpose described.

4. The eccentric clamps D and retaining-frame, in combination with the expanding-bars C and tightening and expanding nuts G, substantially as and for the purpose described.

5. The eccentric clamps D and retaining-frame, in combination with the expanding-bars C, tightening and expanding nuts G, and spoke-clamps I, substantially as and for the purpose described.

6. The eccentric clamps D and retaining-frame, in combination with the expanding-bars C, tightening and expanding nuts G, and clamp-tightener E, substantially as and for the purpose described.

7. The combination of the retaining-frame A and adjusting-strap B with the expanding-bars C, eccentric clamps D, clamp-tightener E, tightening and expanding nuts G, and spoke-clamps I, substantially as and for the purpose described.

8. In a tire-tightener, the adjusting strap or band B, connecting the plates of the retaining-frame, and allowing the same to be adjusted for wheels of varying breadth, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

MILO OSBORN.

Witnesses:
FRANCIS TOUMEY,
WM. BEHRENS.