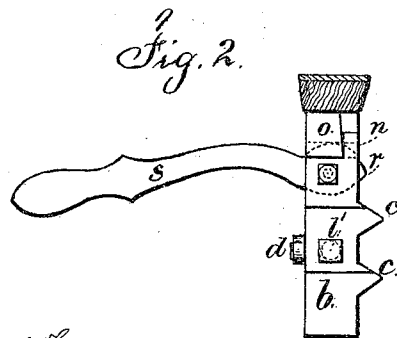
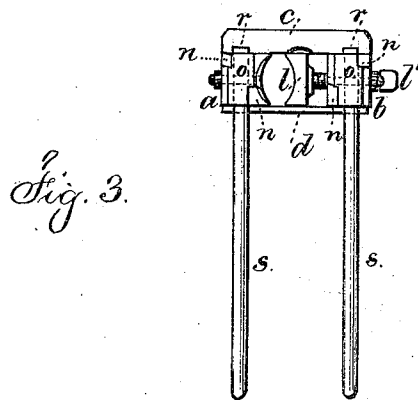
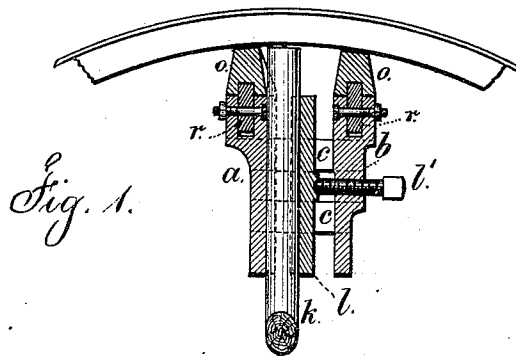


J. W. GRAY.
SPOKE-TIGHTENERS.

No. 181,838.

Patented Sept. 5, 1876.



Witnesses

Chas. H. Smith
Harold Perrell

Inventor

Joshua W. Gray
per L. W. Penell atty.

UNITED STATES PATENT OFFICE.

JOSHUA W. GRAY, OF BROOKLYN, NEW YORK.

IMPROVEMENT IN SPOKE-TIGHTENERS.

Specification forming part of Letters Patent No. 181,838, dated September 5, 1876; application filed July 13, 1876.

To all whom it may concern:

Be it known that I, JOSHUA W. GRAY, of Brooklyn, Kings county, and State of New York, have invented an Improvement in Spoke-Tighteners for Wheels, of which the following is a specification:

Spokes of wheels frequently become loose in the tenons at the hub and felly by the pressure injuring the end fibers of the spokes, or the fiber of the felly or hub adjacent thereto.

The object of the present invention is to furnish a simple and powerful jack, that drives the spoke firmly into the hub, and simultaneously forces the felly away from the shoulders of the spoke, so that a filling-piece or washer, of leather, rawhide, or other suitable material, may be inserted between the felly and the shoulders. By tightening the spoke the felly is strained, and the tie securely held upon the wheel.

In the drawing, Figure 1 is a vertical section of the tightening apparatus as applied to a spoke and felly. Fig. 2 is a side view of the same, and Fig. 3 is a plan view endwise of the apparatus.

I make use of a clamping-stock composed of the side bars *a b*, united together by the plate or plates *c*, and there is a removable tie-bar, *d*, setting over lugs *e e* upon the stocks *a b*. This removable tie-bar *d* allows of the instrument being placed upon the spoke when the tie-bar *d* is out of the way, and when replaced the stock is strengthened sufficiently by said tie-bar to allow the tightener to be firmly clamped upon the spoke *k* by the follower *l* and a screw, *v*, passing through the stock *b*; or a cam may be substituted for the screw. Upon the ends of the stocks *a b* are guide-studs *n n*, between which slide the jack-blocks *o o*, and the stocks *a b* are mortised to receive the cams *r*, each of which has a lever, *s*, by which the cam is partially revolved upon its pivot or shaft.

It will now be understood that the tightener

is to be applied to all the spokes in succession around the wheel, or to such only as require to be tightened. The tightener is clamped to a spoke, with the jack-blocks against the inner surface of the felly, the cams being turned back, so that the jack-blocks are retracted. After the clamp is firmly secured upon the spoke the levers *s* and cams *r* are operated, and the jack-blocks force the felly away from the shoulders of the spoke, and allow for the insertion of the washer of leather or other material, and simultaneously the spoke is forced firmly into the mortise of the hub. If desired, only one jack-block and its cam and lever may be used.

In tire or spoke tighteners heretofore made with a pair of clamping-jaws, the screw acts directly upon one of the jaws that is movable. In my spoke-tightener the jaws or stocks are rigidly connected, and a clamping-follower added between them, so as to keep the stocks at sufficient distance to give room for inserting the washer around the tenon; and the jack-blocks *o* and cams *r* being close up to the felly, there is no undue strain upon the spoke in operating the levers.

I claim as my invention—

1. The jack-blocks *o*, guided between the studs *n* and the cams *r*, in mortises in the stocks *a b*, and acting directly upon the jack-blocks, in combination with the clamping-follower *l*, substantially as and for the purposes set forth.

2. The removable tie-bar *d*, in combination with the stocks *a b*, follower *l*, jack-blocks *o*, and actuating mechanism, substantially as set forth.

Signed by me this 10th day of July, A. D. 1876.

J. W. GRAY.

Witnesses:

GEO. T. PINCKNEY,
CHAS. H. SMITH.