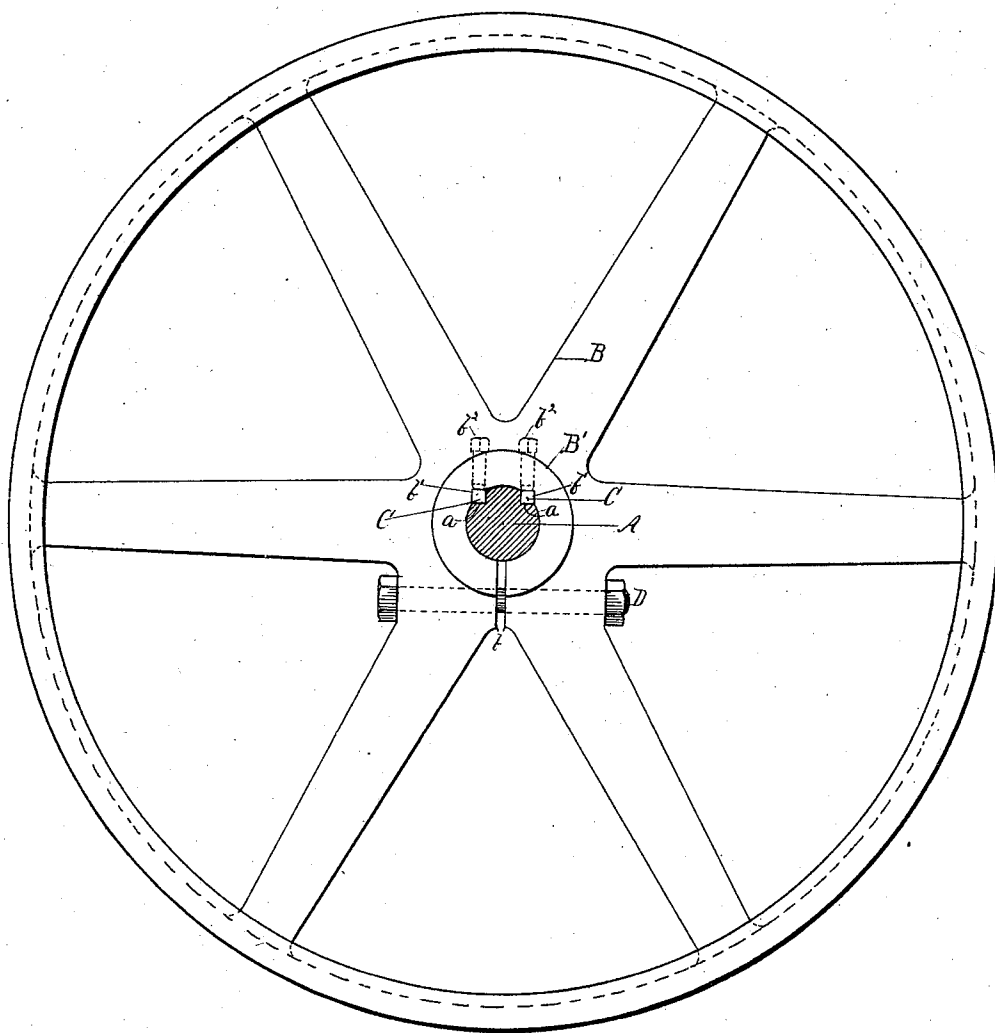


(No Model.)

F. H. BALL.
PULLEY FASTENING.

No. 486,154.

Patented Nov. 15, 1892.



WITNESSES~

Wm. Markes, Jr.

Franklin Moore

INVENTOR~

F. H. Ball

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UNITED STATES PATENT OFFICE.

FRANK H. BALL, OF ELIZABETH, NEW JERSEY, ASSIGNOR TO THE BALL & WOOD COMPANY, OF SAME PLACE.

PULLEY-FASTENING.

SPECIFICATION forming part of Letters Patent No. 486,154, dated November 15, 1892.

Application filed June 18, 1892. Serial No. 437,213. (No model.)

To all whom it may concern.

Be it known that I, FRANK H. BALL, a citizen of the United States, residing at Elizabeth, in the county of Union and State of New Jersey, have invented certain new and useful Improvements in Pulley-Fastenings; 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 appertains to make and use the same.

This invention relates to pulley-fastenings; and it consists in certain improvements therein, as will be hereinafter fully set forth, and pointed out in the claims.

My device is more particularly intended for attaching large driving-wheels to driving-shafts—such as the fly-wheels of steam-engines to the main shafts thereof, for example; but it is applicable to the attachment of almost any form of wheel or pulley to its shaft.

My device is illustrated in the accompanying drawing by a single figure, which shows a shaft A in cross-section and a wheel B in side elevation.

The construction is as follows: The shaft A is provided with two right-angled V-formed key-seats *a a*, which are placed with their apexes ninety degrees apart, thereby bringing their contiguous side walls parallel with each other. The hub B' of the wheel is also provided with two correspondingly-formed and correspondingly-placed key-seats *b' b'*, and when these are brought into juxtaposition with the seats *a a* two perfectly-square keyways are formed, which have two of their opposite angles in the radial lines of the shaft and the two other angles in the circumference of the shaft. C C are keys fitting said keyways. The hub B' has an opening-kerf *b* on the opposite side from the key-seats *b' b'* and preferably equally distant from each. A clamping-bolt D passes through the base of two of the spokes of the wheel just outside of the hub-boss at right angles to the kerf *b*.

The preferred construction is as represented in the drawing; but I do not desire to be limited strictly to it, for the relative position of the kerf *b* to the key-seats *b' b'* may be considerably varied without defeating the desired results; but such a deviation will be

sacrificial of the best results, proportioned to the extent of the deviation.

Heretofore it has been common to use the opening *b* and the clamping-bolt D and a single key placed, preferably, opposite the opening *b*. In such constructions the key has generally been made with considerably more width than depth, and it has generally been driven into place after the wheel has been clamped onto the shaft by the screw-bolt D. It will be observed that the strain upon such a key as just referred to is directly across its breadth, ordinarily midway between its two widest surfaces, while in my construction it will be seen that the strain upon the two square keys is directly in line with its greatest diameter—that is, from angle to angle, oppositely. It will also be seen that the superficial area of my two keys is no greater than would be required for one ordinary flat key, while the total line of resistance to strain is much greater than in a flat key, and that the metal taken from the shaft and the wheel to form the key-seats, while equal in amount to what it would be to receive a flat key of the same area as my two keys, is so disposed as to weaken the parts much less, because the points of resistance are multiplied and distributed.

In attaching a wheel by my device, the parts should be brought into the position shown in the drawing—that is, with the kerf *b* on the lower side of the shaft and the keyways on top. The weight of the wheel then rests on the shaft between the keyways. The keys C C should then be put in place, and this can be done if they are properly fitted without more than lightly tapping them with a hammer. They should be so fitted as not to bind or wedge at all, but merely fit snugly. The binding-bolt D will then be screwed up and grip the wheel firmly to the shaft. In doing this it will be observed that the keys will be gripped as if in a vise between the opposing faces of the keyways. Now it will be noted that when there is but one key and that directly opposite the kerf *b* it will not be gripped in the same manner as when there are two keys of the form and in the position shown by me.

I have shown in dotted lines set-screws *b b*,

which pass through the boss of the hub
against the keys. Such screws are not neces-
sary, but may be used as a matter of precau-
tion to hold the keys in case they should by
5 reason of imperfect fitting fail to be properly
gripped by the action of the bolt D.

What I claim as new is—

The combination, with the shaft A, having
the half-keyways *a a* formed and located
10 therein as described, and the pulley B, hav-
ing half-keyways *b' b'* and the kerf *b* formed

and located therein as described, of clamp-
ing-bolt D in the pulley and the keys C C in
the keyways, as shown, and for the purposes
stated.

In testimony whereof I affix my signature in
presence of two witnesses. 15

FRANK H. BALL.

Witnesses:

JNO. K. HALLOCK,

WM. MARKS, Jr.