(No Model.)

# W. R. FEE.

## WOOD PULLEY.

No. 420,267. Patented Jan. 28, 1890.

FIG. 1.

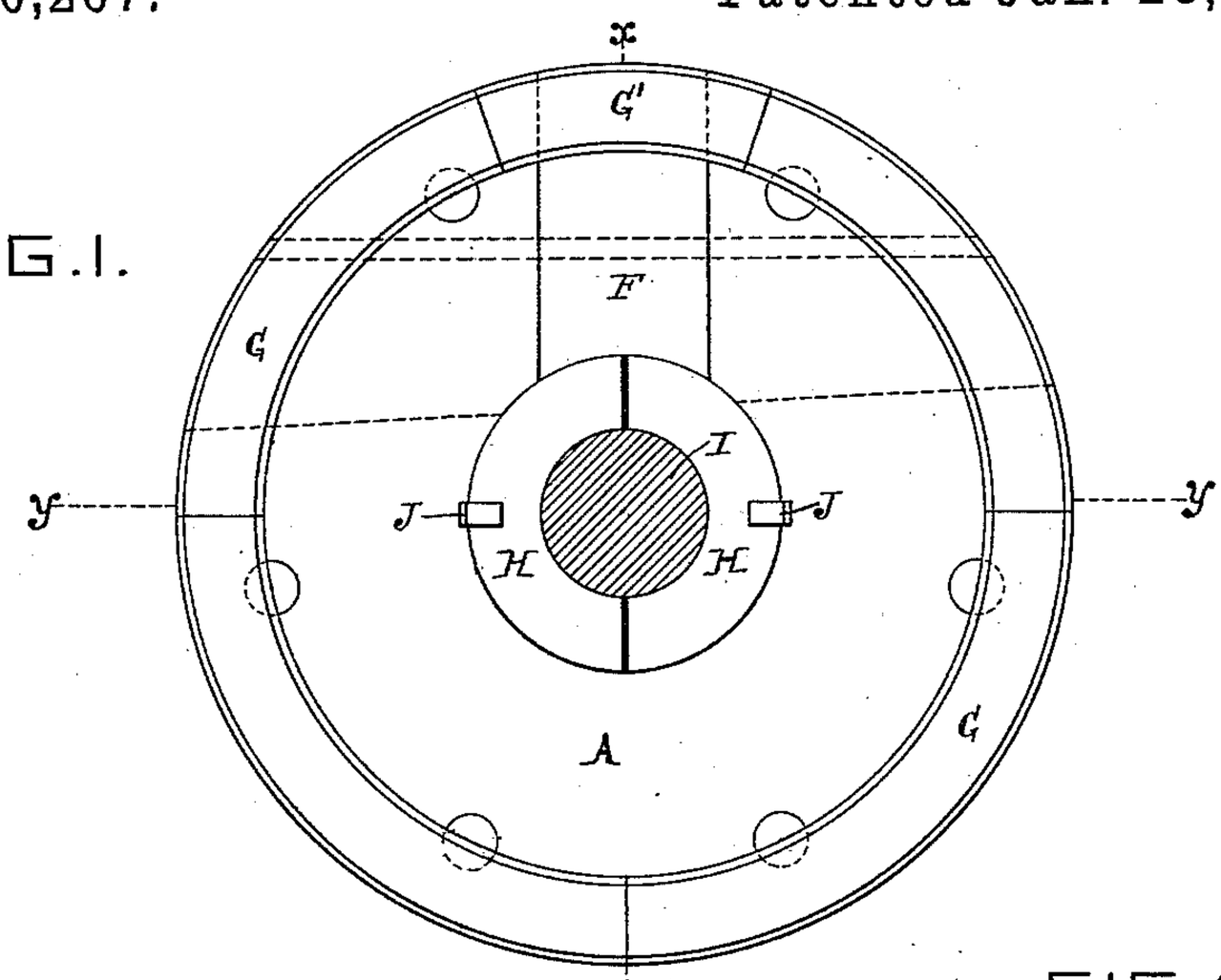



FIG. 2.

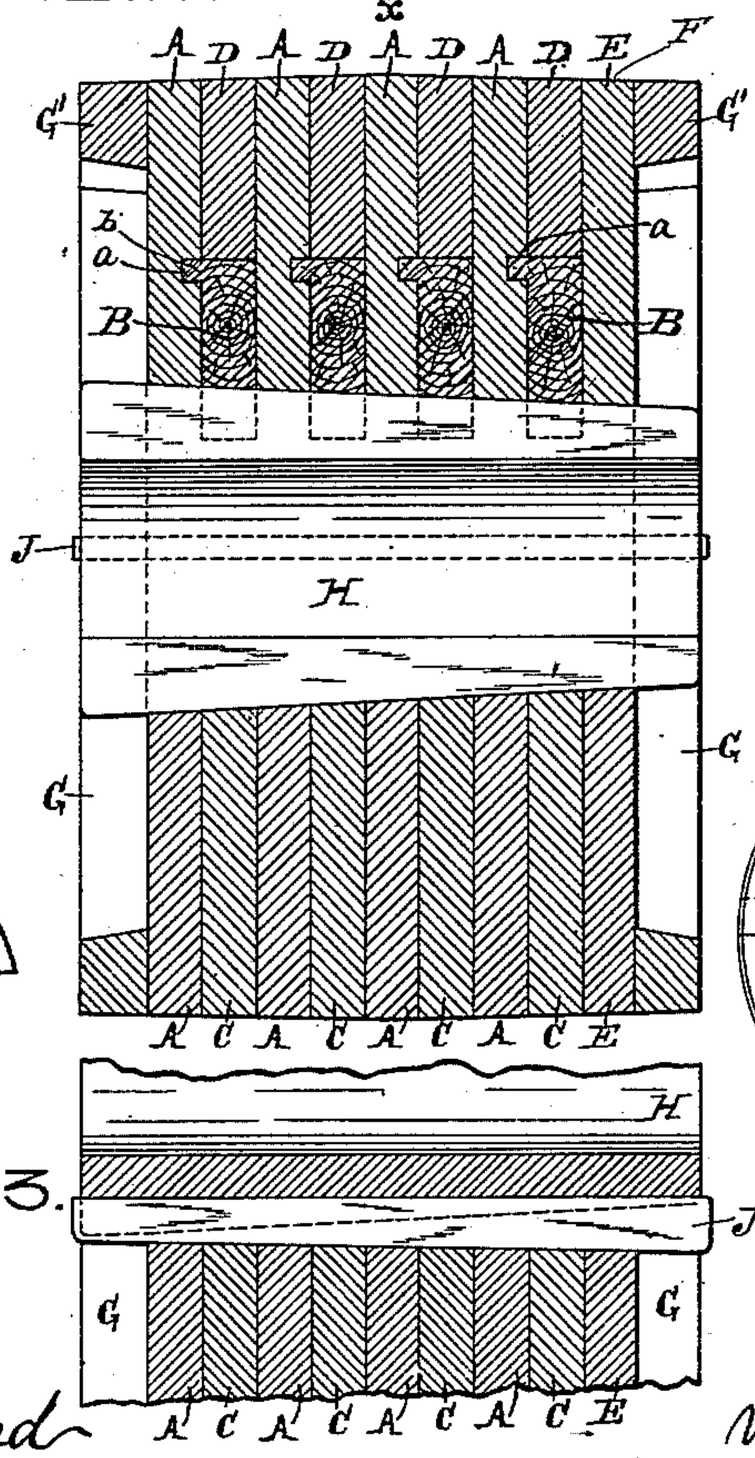



FIG. 6.

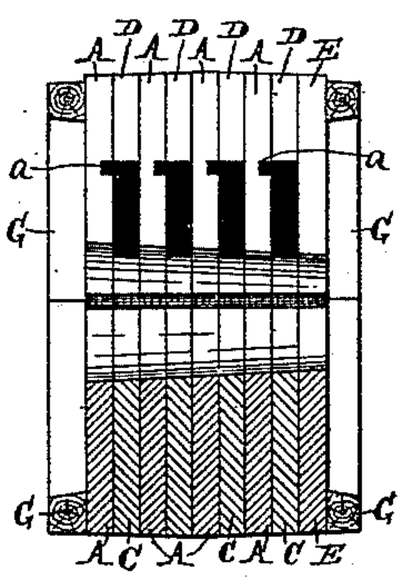



FIG. 7.

FIG. 4.

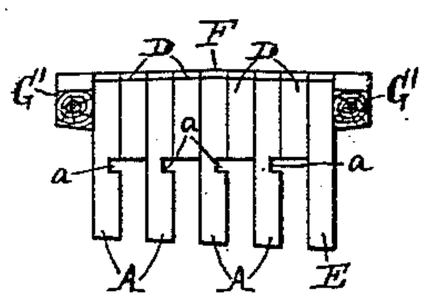



FIG. 5.

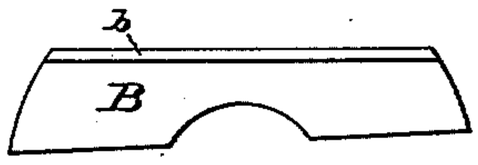
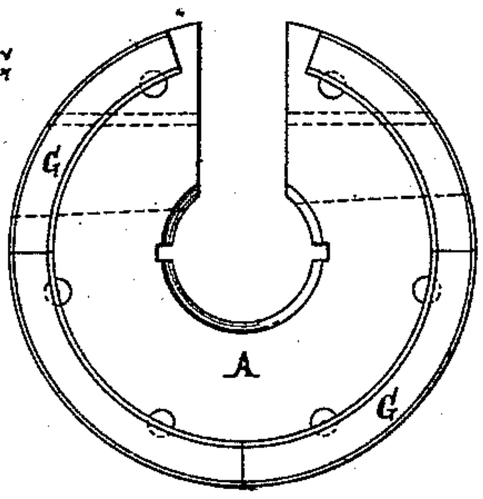



FIG. 3.

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# UNITED STATES PATENT OFFICE.

WILLIAM R. FEE, OF CINCINNATI, OHIO.

## WOOD PULLEY.

SPECIFICATION forming part of Letters Patent No. 420,267, dated January 28, 1890.

Application filed June 29, 1889. Serial No. 316,054. (No model.)

*To all whom it may concern:*

Be it known that I, WILLIAM R. FEE, a citizen of the United States, and a resident of Cincinnati, in the county of Hamilton and State of Ohio, have invented certain new and useful Improvements in Wood Pulleys, of which the following is a specification.

My invention relates to that class of wood pulleys which are so made that they may be readily applied for use without detaching or disturbing the shafting. Its object is to produce a practically-solid wood pulley when in position for use; and it consists in providing the pulley with a removable section of sufficient size to pass the shaft and means to readily lock the removable part in place; and it consists, also, in a cheap reliable means to center the pulley and lock it rigidly to the shaft.

The invention will be first fully described in connection with the accompanying drawings, and will then be particularly referred to and pointed out in the claims.

Referring to the drawings, in which like parts are indicated by similar reference-letters wherever they occur throughout the various views, Figure 1 is a side elevation of my improved pulley secured upon a shaft for use. Fig. 2 is a central vertical section of the same, taken through line *x x* of Fig. 1. Fig. 3 is a view in detail taken through line *y y* of Fig. 1. Fig. 4 is an end elevation of the removable section. Fig. 5 is a side elevation of one of the keys which lock the removable section in place. Fig. 6 is a central vertical sectional view taken in line *x x* of Fig. 1, but with the removable section, Fig. 4, and the bushing and keys for centering and locking the pulley to the shaft removed. Fig. 7 is a side elevation of the view shown in Fig. 6. The views, Figs. 4 to 7, inclusive, are upon a diminished scale.

The body of the pulley is built up of separate pieces glued together, preferably with the grain of alternate pieces arranged in opposite directions for greater strength. The pieces A are first cut to the desired size and then grooved at *a* to receive the flange *b* of the key B, Fig. 5. I place what I call a "keyway-gage," which may be of metal, or of wood saturated with oil, or some substance to which glue will not adhere, upon one of these pieces A, the flange *b* of the key being placed in the groove *a*. I then place the pieces C D, their under sides being first coated with glue, with their edges abutting against the opposite edges of the keyway-gage. Another piece A, properly coated with glue, is placed upon the pieces C D, covering over the keyway-gage, which is slightly thinner than the pieces C D. Another keyway-gage is then placed in position and another set of pieces C and D placed in the same manner, and so on until the desired number are in place to make a pulley of the width of face required. Then the piece E is placed on the last piece A and the parts clamped together. After the blocks are taken out of the clamps the keyway-gages are driven out and the keys B driven tightly in the keyways. The central conical opening is now bored through the pulley, after which the keys are driven out and the separable part F, Fig. 4, is cut out by a thin-bladed saw. The rim-pieces G, of which there may be any number, depending upon the width of the pulley-face, are then secured upon the pulley proper and the same number of pieces G′ are then secured upon the rim of the separable part F, overlapping the joint between the pulley and the separable part F, as shown.

The cone-shaped bushing is composed of the two equal parts H H, each having a keyway cut through it, the bottom of said keyway being parallel with the shaft I. The central cone-shaped opening in the pulley or pulley-hub has also keyways, which are arranged to register with the keyways in the bushing H H, so that the key J, which is slightly tapering when driven in from the small end of the cone-shaped bushing H H, will drive the bushing firmly upon the shaft and prevent the pulley from turning.

The pulley, constructed as above described, is now fitted upon a shaft, as I, and turned up to the form shown in Figs. 1 and 2, after which it is removed from the lathe and is ready for sale.

To apply my pulley for use it is only necessary to place the pulley proper, as shown in Fig. 6, over the shaft, insert the part F, Fig. 4, in place, and drive in the keys B, Fig. 5.

The pulley is now practically a solid pulley secured loosely over the shaft I.

To lock the pulley to the shaft it is only necessary to place the cone-shaped bushing-sections around the shaft, drive them in so as to tightly embrace the shaft, and wedge the cone-bushing in the cone-shaped opening in the pulley. For ordinary work this will hold without any key, but for greater security the key J is driven in from the small end of the cone-bushing H H to firmly lock the shaft and pulley together and prevent the bushing from working out.

The bushing and the keys for locking the parts together are preferably made of hard wood, and each half of the bushing is slightly less than a half-circle, so that when driven in they embrace the shaft firmly.

The pulley shown in the drawings and above described is a small solid pulley; but my invention is equally applicable to small and large pulleys. The device shown is really a pulley-hub. When larger pulleys are to be used, the same construction, so far as the center of the pulley is concerned, is employed, and there may be any number of the pieces A C D employed. The face of the pulley may be made of the proper width by building out upon each side any number of the rim-pieces G G′, and while I have shown in the small pulley four of the locking-keys B it is obvious that a fewer number may be used, even one or two being sufficient to lock the separable part F in position. It is also obvious that the key B *b*, Fig. 5, may be made of metal or very hard wood, in which case it may be wholly seated in one of the sectional pieces. The key being made thinner, the keyway, with its groove *a*, may be wholly cut in one of the pieces A, in which case of course the alternate piece might be entirely plain, instead of the two separable pieces C and D.

I do not limit myself to the exact construction shown, as it is obvious that many mechanical changes may be made in the construction of the pulley without departing from the spirit or scope of my invention, the distinguishing features of which consist in a practically-solid pulley or pulley-hub having the removable section sufficient in size to pass the shaft, keys passing through the pulley and removable section to lock the parts together over the shaft, and a cone-shaped bushing having a central opening to receive the shaft and adapted when driven into place to lock the pulley on the shaft and also lock the keys B in place, in the manner set forth. It is also obvious that instead of making the cone-shaped bushing in two parts it may be made in a single piece longitudinally slotted through one side, so that when driven into place it will bind upon the shaft and also wedge the pulley and center it in position.

What I claim as new is—

1. A wooden pulley-blank composed of separate sections having keyways through them to receive keys B, and the keys B, adapted to fit said keyways, whereby when the keys are in position a cone-shaped opening may be formed through said blank and the keys to receive a cone-shaped bushing, the said keys being adapted to lock a separable portion of the pulley in place, and the bushing adapted to prevent the displacement of the keys, substantially as shown and described.

2. The combination, substantially as specified, in a wood pulley, of the separate sections having keyways through them, the removable part F, and the keys B, for locking the removable part F of the pulley in position, the said pulley, including the removable part and keys, when together having a cone-shaped central opening through them, the two-part cone-shaped bushing to fasten the pulley upon the shaft and lock the keys in position, substantially as shown and described.

3. In a wood pulley, the combination, substantially as specified, of the pulley-hub composed of the parts A C D, the parts A being grooved at *a*, the keys B, having flanges *b* to enter grooves *a* in pieces A, the separable part F, the bushing H H, the said pulley and bushing having keyways, and the key J, to lock the pulley and bushing together and clamp the bushing upon the shaft, substantially as shown and described.

4. The combination of the two-part pulley consisting of the pulley proper, Fig. 6, and the removable part F, Fig. 4, both of said parts having keyways through them registering with each other, the keys B *b*, fitting said keyways and locking the parts together, the said pulley proper, removable part, and keys having the cone-shaped opening through them, the cone-shaped bushing having a center opening to embrace the shaft and adapted to fit the cone-shaped opening in the pulley proper, removable part, and keys, whereby the pulley is locked to the shaft and the parts of the pulley locked together, substantially as shown and described.

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