(No Model.)

J. T. MITCHELL.

MANUFACTURE OF PULLEYS.

No. 422,606. Patented Mar. 4, 1890.

FIG. 1.

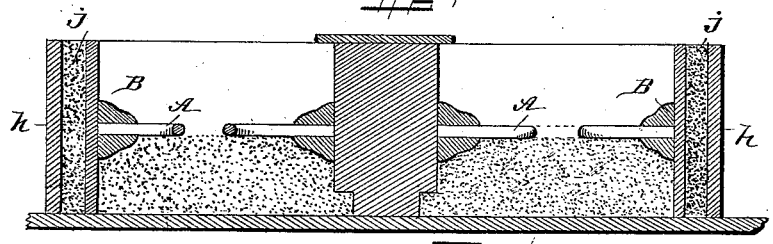


FIG. 2.

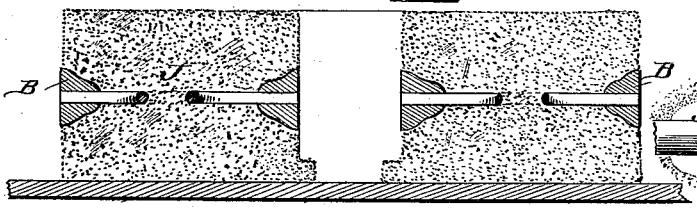


FIG. 3.

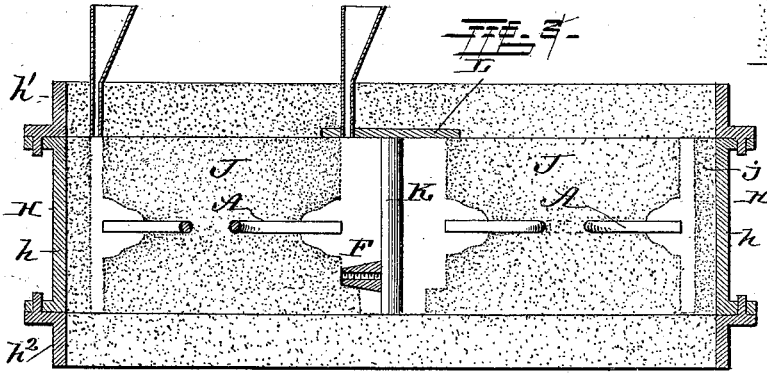


FIG. 4.

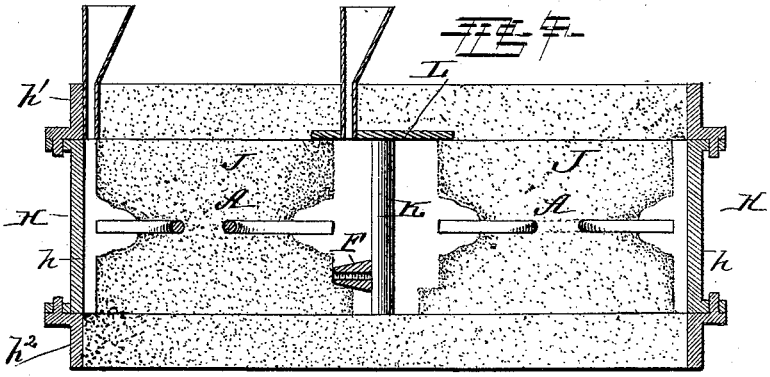


FIG. 5.

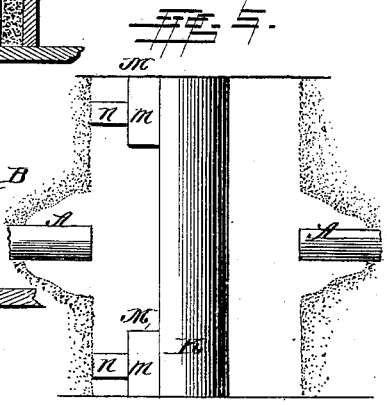


FIG. 6.

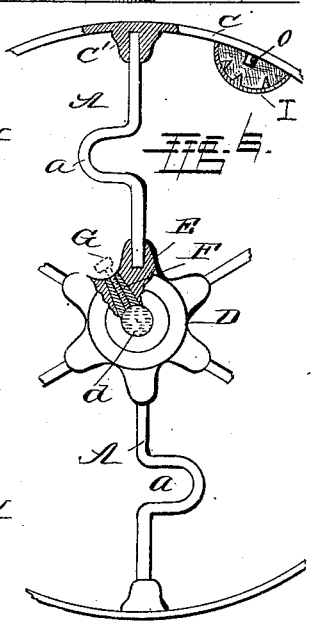
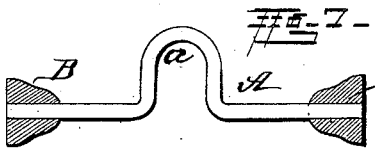


FIG. 7.



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JOSEPH T. MITCHELL, OF SHELBYVILLE, ASSIGNOR OF ONE-HALF TO JAMES S. BAIRD, OF MURFREESBOROUGH, TENNESSEE.

MANUFACTURE OF PULLEYS.

SPECIFICATION forming part of Letters Patent No. 422,606, dated March 4, 1890.

Application filed November 17, 1886. Renewed February 3, 1890. Serial No. 338,974. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH T. MITCHELL, of Shelbyville, in the county of Bedford and State of Tennessee, have invented a new and useful Improvement in the Manufacture of Pulleys, of which the following is a specification.

This invention is an improvement in the method of making pulleys; and it consists in the improvements which will be hereinafter first fully described, and then pointed out in the claims.

In the drawings, Figures 1 and 2 are sectional views of parts of a mold, illustrating steps in my improved method. Fig. 3 is a sectional view of the mold ready for casting. Fig. 4 is a sectional view similar to Fig. 3, except that it shows a metal cheek whereby to chill the face of the pulley. Fig. 5 is a detail view illustrating a slightly-different manner of forming the nut-cavity. Fig. 6 is a face view of a part of the pulley, parts being broken away to show the ends of the spoke and the nut in the hub; and Fig. 7 is a detail view of one of the spokes with the pattern-bosses thereon.

In order to a full understanding of the method, I shall describe in connection therewith the construction of the pulley.

The arms or spokes A are usually bent at *a*, as shown, to relieve the cast rim and hub of strain, and such spokes are preferably formed of wrought-iron with their ends fitted to receive the apertured patterns B, which form the cavities in the mold for the bosses C′ E on the cast rim C and cast hub D. The hub D is cast with a central or axial bore *d* and with bosses E. One end of the hub is usually formed with a portion of smaller diameter than the body of the hub, as will be understood from Figs. 1, 2, 3, and 4. Within this hub is embedded or cast the apertured nut F, the threaded bore of which forms a bearing for the set-screw G, which secures the pulley to its shaft. By casting the nut in the hub I avoid the drilling and tapping of the hub ordinarily required.

The mold is preferably formed in a three-part flask H, which may be of ordinary construction, comprising the middle section *h*, the upper section *h′*, and the lower section h^2, as shown in Figs. 3 and 4.

In making that part of the mold shown in Fig. 1 the hub and rim patterns should be placed in concentric position within the middle flask-section *h*, and the space between the flask-section and the pattern-rim be rammed full of sand, forming the sand-cheek *j*, and the space between the rim and hub patterns should then be filled to one-half its depth with sand. The spokes with the boss-patterns B B thereon should then be placed in the flask, and sand should then be rammed therein until the flask-section is filled, completing the body of sand J. The rim-pattern may now be drawn or removed and the flask-section carrying the cheek *j* may be lifted off, exposing the ends of the arms or spokes and the outer boss-patterns, as shown in Fig. 2, which boss-patterns may then be removed and the flask-section and cheek be replaced. The hub-pattern (not shown) may then be removed, and also the inner boss-patterns, leaving the inner ends of the arms exposed. The nut F, with its core *f* and the center core K, may now be placed in position, and the hub-cavity be covered by a flat plate L, and the upper section having proper sprues or inlets for the molten metal, as shown in Fig. 3, and the lower section may be applied. The mold is then ready for the molten metal.

Sometimes as many as four set-screws are used in one pulley-hub, in which case the number of nuts cast therein would be increased, or a single nut might be employed, such nut being increased in length in line with the axis of the pulley, and having a number of threaded openings.

In the construction before described the nut serves as a core for forming the cavity in which it rests. Now, it will be understood that instead of casting the nut within the hub, as is preferred, I may carry out this feature of my invention in the manner illustrated in Fig. 5, and which I will now explain. In this modification I employ cores M, having heads *m* corresponding to the shape of and adapted to form cavities fitted to receive nuts. A shank or stem *n* extends from this head to

the body of sand in the flask. After casting, the removal of the core M, which may be picked out, leaves a cavity fitted to receive the nut, and the stem of core M forms an opening through which the set-screw may be passed into the bore of the nut.

In practice the face of the pulley is preferably chilled by using a metal surface, as shown at *h* in Fig. 4, against which to cast said face, as the shape of the spokes or arms prevents breakage and leaves no strain in the rim or face of the pulley.

To balance the pulley, I employ an iron cup I, cast hollow and thin, with projections or prickers to hold lead or Babbitt metal sufficient to bring such cup to the desired weight. This cup is secured on a wrought-iron peg O, cast into the rim of the pulley. It is usual to provide one of these pegs between each arm of the pulley and to cut off all except the one to which the cup is secured.

By chilling the surface of the pulley in the manner before described the said surface may be formed perfectly true and the necessity of turning such face be obviated. The chill-cheek is preferably formed with handles for convenience in manipulating the same.

In successfully casting the pulley with a chilled surface the bent spokes or arms perform an important office in that they are able to stand the strain of shrinkage, and the rim is relieved of the warping and distortion which would be incident to the exertion of such strain thereon.

The construction of the pulley herein shown and described is not claimed in this application, but forms the subject-matter of a separate application for patent filed by me September 4, 1888, Serial No. 284,534.

Having thus described my invention, what I claim as new is—

1. The herein-described method of constructing a section of a mold for pulleys, comprising placing the rim and hub patterns within the flask, partially filling the space between said patterns with sand, placing the removable boss-patterns on the ends of previously-prepared spokes, and inserting said spokes and boss-patterns in the flask with the boss-patterns abutting the hub and rim patterns, filling the flask above said spokes and boss-patterns with sand, and removing the said hub, rim, and boss patterns, substantially as and for the purposes specified.

2. The improved method of constructing molds for pulleys, which consists in placing the rim and hub patterns in the middle flask-section, partially filling the space between the rim and hub patterns with sand, placing the removable boss-patterns on the ends of the previously-prepared spokes, inserting said spokes with the applied boss-patterns in the flask-section, filling said flask-section above the spokes with sand, removing the hub, rim, and boss patterns, and placing the upper and lower flask sections above and below the middle flask-section, substantially as and for the purposes specified.

JOSEPH T. MITCHELL.

Witnesses:
JNO. R. WALLACE,
JNO. T. LANDIS.