No. 673,899. Patented May 14, 1901.

G. M. CLARK.

CHILL FOR CASTING SOCKETS OR MORTISES.

(Application filed July 18, 1898.)

(No Model.) 2 Sheets—Sheet 1.

Fig. 1.

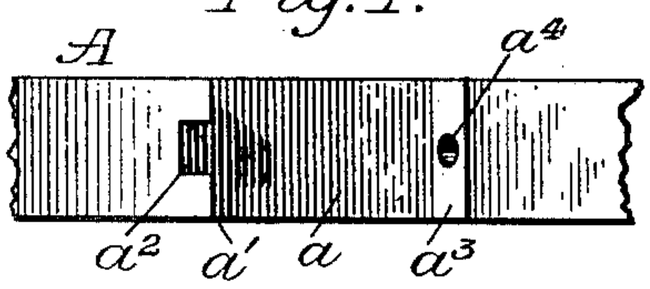


Fig. 2.

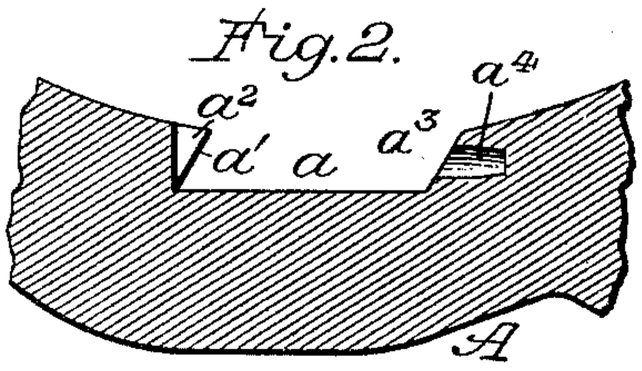


Fig. 3.

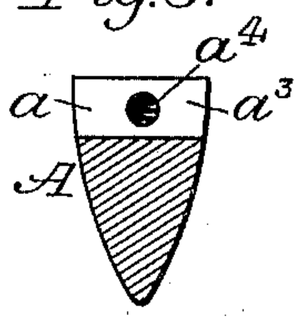


Fig. 4.

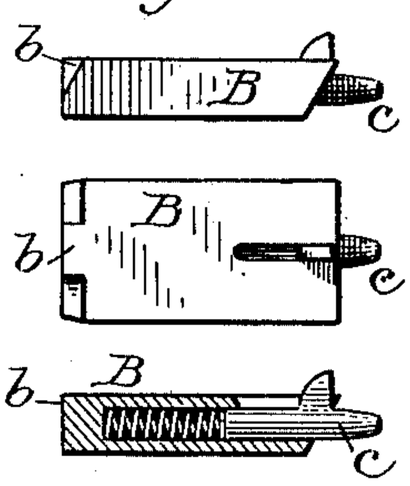


Fig. 6.

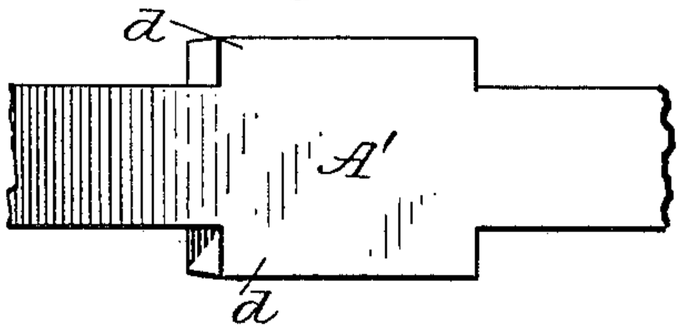


Fig. 5.

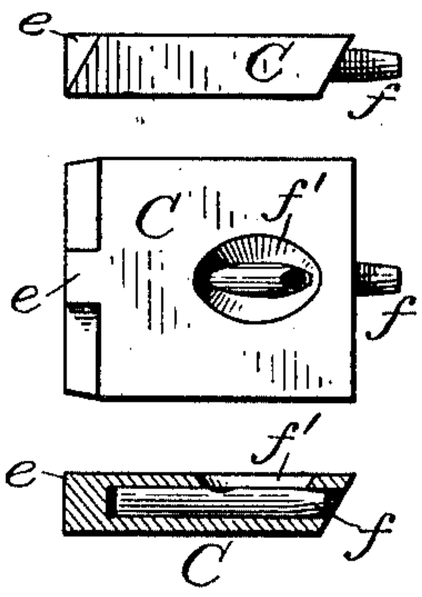


Fig. 8.

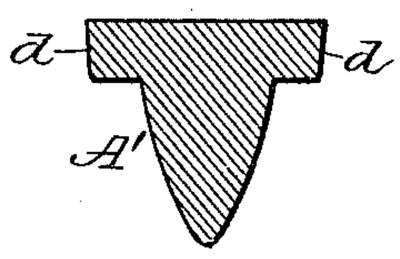
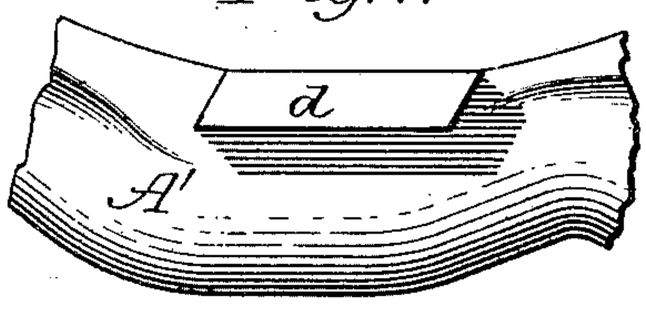


Fig. 7.



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No. 673,899. Patented May 14, 1901.

G. M. CLARK.

CHILL FOR CASTING SOCKETS OR MORTISES.

(Application filed July 18, 1898.)

(No Model.) 2 Sheets—Sheet 2.

Fig. 9.

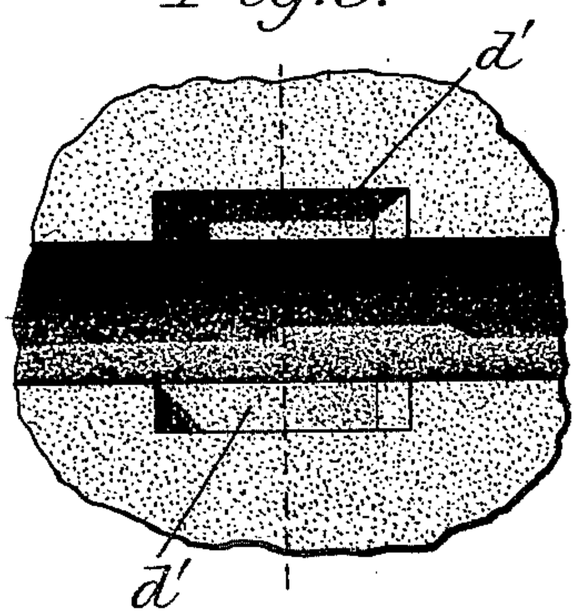


Fig. 10.

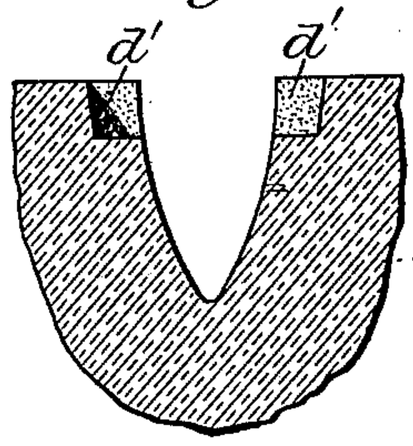


Fig. 11.

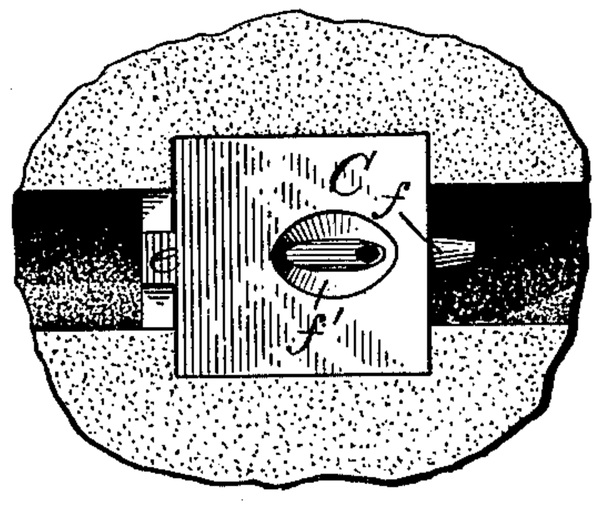


Fig. 12.

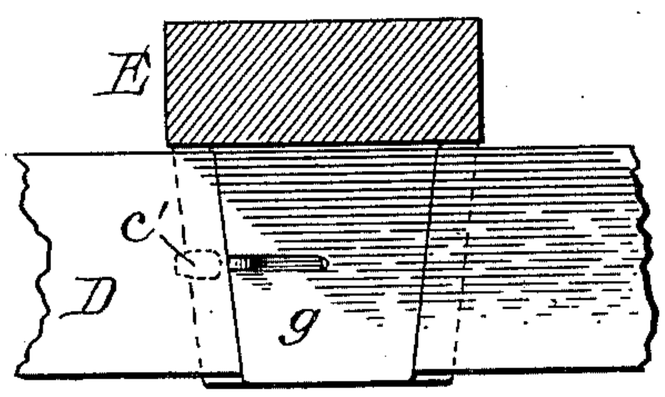


Fig. 13.

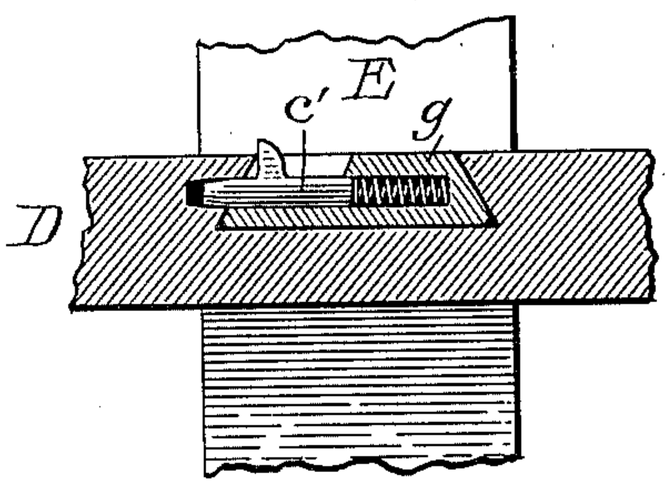
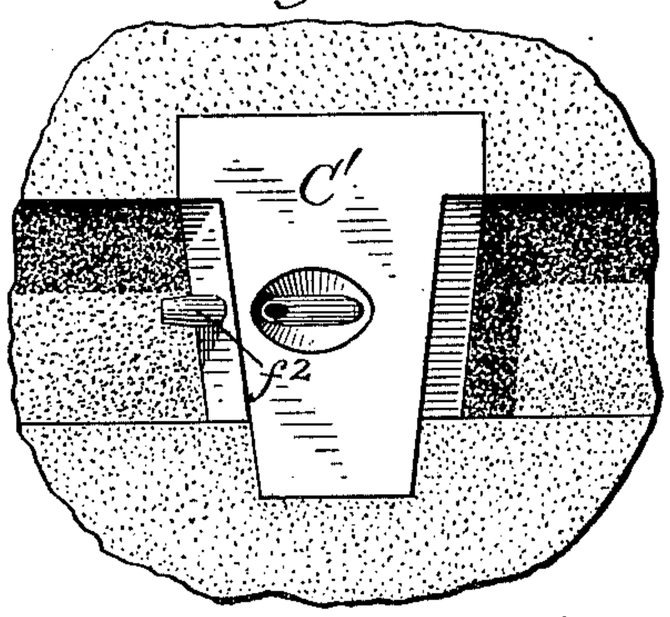


Fig. 14.



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UNITED STATES PATENT OFFICE.

GEORGE MARSHALL CLARK, OF HIGGANUM, CONNECTICUT, ASSIGNOR TO ELMER S. HUBBARD, OF MIDDLETOWN, CONNECTICUT.

CHILL FOR CASTING SOCKETS OR MORTISES.

SPECIFICATION forming part of Letters Patent No. 673,899, dated May 14, 1901.

Application filed July 18, 1898. Serial No. 686,274. (No model.)

To all whom it may concern:

Be it known that I, GEORGE MARSHALL CLARK, a citizen of the United States, residing at Higganum, in the county of Middlesex and State of Connecticut, have invented new and useful Improvements in Means for Casting Sockets or Mortises of Various Forms for the Reception of Blocks or Tenons Provided with Locking-Bolts, of which the following is a specification.

The object of my invention is to economically provide mortises or seats in cast-metal structures for the reception of tenons which are locked therein by means of transverse bolts, and especially mortises which are irregular in form—as, for instance, dovetailed—and with or without lateral recesses for occupation by corresponding projections on the tenons with a view to preventing the accidental displacement of the tenon in its mortise or its escape therefrom.

So far as my knowledge extends the class of mortises to which I specially refer have involved in their formation the use of more or less expensive machinery—*i. e.*, milling and boring tools—all of which may be avoided by the employment of my invention.

Although my invention is widely applicable and possesses value in various connections, it will be obviously impracticable to herein indicate more than a few instances, which, with appropriate descriptions, will enable persons skilled in the art of casting metal to readily apply the invention regardless of the form of mortise or socket which may in each instance be desired.

As types of special applications I have selected for purposes of illustration the casting of cotton-gin ribs having socketed seats for the ready reception of wearing blocks or plates and also the casting of tapered dovetailed sockets for the reception of correspondingly-shaped tenons, as is desirable, for instance, in the construction of cast-iron frames for light machinery, the blocks, tenons, or plates in each instance being provided with locking-bolts for firmly confining them in their mortises or sockets and preventing their accidental displacement.

Referring to the drawings, Figures 1, 2, and 3 illustrate a portion of a cotton-gin rib having a wearing-plate socket or mortise respectively in top view, longitudinal section, and lateral section. Fig. 4 illustrates in three views a wearing plate or block having a bolt and adapted to occupy the mortise or socket in the rib. Fig. 5 similarly illustrates a "chill" provided with a sliding bolt, which is used in a mold for forming the mortise or socket in the rib. Figs. 6, 7, and 8 illustrate a portion of the pattern, with its core-print, (used in forming the mold for casting the rib,) respectively in top view, side view, and lateral section. Fig. 9 illustrates in top view a portion of a sand mold as formed by the pattern. Fig. 10 is a lateral section of the mold on the dotted line, Fig. 9. Fig. 11 illustrates the mold with the chill, Fig. 5, in position for casting, its bolt being properly extended and the mold being ready for the top section or "cope." Fig. 12 illustrates in side view a portion of a bar having a tapered dovetail mortise or socket in one side thereof and in section a portion of a second bar having a corresponding tenon provided with a locking-bolt. Fig. 13 illustrates the first bar of Fig. 12 in section on the line of the locking-bolt of the tenon of the second bar, and Fig. 14 is a top view of a portion of a sand mold with a chill in position for forming the mortised bar of Figs. 12 and 13.

The portion of a cotton-gin rib A shown in Figs. 1, 2, and 3 embodies the part specially liable to be worn away at its edges by the action of the saws and fiber, and hence the importance of providing each rib with a hard-metal wearing-plate B, which occupies the mortise or socket *a* in the rib. It is essential that these wearing-plates should be firmly secured in position, because should they become displaced and be engaged by the adjacent saws sparks would fly and the cotton fired, with danger of serious conflagrations. It is also important that said wearing-plates should be capable of ready insertion and removal, so as to obviate dismantling the gin as far as possible should new wearing-plates be needed. For these reasons the wearing-plates are provided at one end with a spline *b* and at the other end with a spring-controlled slidable bolt *c*. The end which has the spline is beveled from the top outwardly, and the end which

has the bolt is beveled inwardly or undercut. For the reception of this wearing-plate the mortise or socket *a* must have one end undercut, as at *a'*, and have a recess a^2 for receiving the spline *b*, while the other end of said socket must be outwardly beveled, as at a^3, and also have a hole or bolt-seat a^4 for receiving the outer end of the locking-bolt *c*. This improvement in cotton-gin ribs was disclosed in United States patent to Lemain, dated December 5, 1893, No. 510,073. Prior to my invention this mortise was formed by cutting away the metal, as by special tools or "mills," and by drilling the bolt-hole, all of which involved considerable expense, which I have now obviated by my invention.

For forming a proper mold the rib-pattern A' is provided with rectangular core-prints *d*, projecting laterally at both sides adjacent to where the mortise or socket is to be formed, as shown in Figs. 6, 7, and 8, so that when properly bedded in the sand of the mold and then removed suitable core-seats *d' d'* are formed, as shown in Figs. 9 and 10, for the reception of the ends of the chill C, as shown in Fig. 11. This chill is composed of suitable metal, and its edges are beveled, as shown in Fig. 5, for forming the beveled ends *a'* and a^3 of the mortise or socket, and it has also a projecting lug *e*, which forms the recess a^2 in said mortise. Opposite said lug this chill is provided with a slidable bolt *f*, accessible through an opening *f'* in the top of the chill, thus enabling it to be readily retired or fully projected, it being thus projected, as shown in Fig. 11, into the body of the mold or casting space to enable it to form the bolt-seat a^4 in the side of the mortise desired. The cope (not shown) having been applied and the casting formed, the chill and the rib will be inseparable until the bolt has been withdrawn, and then the chill can be tilted and readily removed from its matrix in the rib. The sockets thus formed are well surfaced, having absolutely true lines and a perfect bolt-seat. Such chills are capable of being used many times, and should their bolts become wasted away they can be cheaply renewed.

Several ribs are cast simultaneously in one flask, and the chills being counterparts of each other need only be dropped into the several core-seats.

When mortises or sockets are to receive transversely-splined tenons or blocks, as described, the chills can only be removed from the castings by tilting them toward the undercut side of the mortise, and the splines cannot be employed if a true dovetailed socket and tenon are desired. With a tapered dovetailed socket and tenon, however, displacement in one direction is impossible, because of the taper, and by the use of a locking-bolt displacement in the opposite direction is fully prevented, as illustrated in Figs. 12 and 13.

The bar D has a tapered dovetailed mortise occupied by the tapered dovetailed tenon *g* on a transverse bar E, and said tenon *g* has a spring-controlled locking-bolt *c'*, like the bolt *c* in the wearing block or plate already described. For forming this dovetailed socket and its bolt-seat a tapered chill C' is employed in the mold, as shown in Fig. 14, which has a slidable bolt f^2, like that in the chill C. After such a casting has been completed the chill can be detached from the casting only after retracting the bolt, and then it can be driven endwise out of the mortise formed by it.

Having thus described my invention, I claim as new and desired to secure by Letters Patent—

1. A "chill" for forming mortises or sockets in sand-mold castings, having reversely-inclined edges for assuring corresponding inclined sides in a mortise or socket, and provided with a laterally-projecting lug at one side, and a bolt at the opposite side adapted to be projected therefrom or wholly retired within the chill, and an opening in the top of said chill for giving access to said bolt for moving the same, substantially as described.

2. A "chill" for forming mortises or sockets in sand-mold castings, provided with a bolt adapted to be projected therefrom or wholly retired within said chill, and an opening in the top of said chill for giving access to said bolt for moving the same, substantially as described.

3. The combination with a sand mold provided with a suitable molding or casting space, and having appropriate core-prints, of a "chill" which is adapted to form a socket or mortise, and is provided with a slidable bolt adapted to be projected therefrom or housed wholly within said chill, and an opening in the top of said chill for giving access to said bolt for moving the same, whereby a perfect mortise or socket may be assured in the resulting casting, and a bolt hole or seat formed in one side of the mortise by the projecting bolt extending into the molding-space.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

GEORGE MARSHALL CLARK.

Witnesses:
JOHN C. CONLEY,
CLINTON W. DAVIS.