H. Davies,

Casting Mold.

No. 98,673. Patented Jan. 11. 1870.

Fig 1

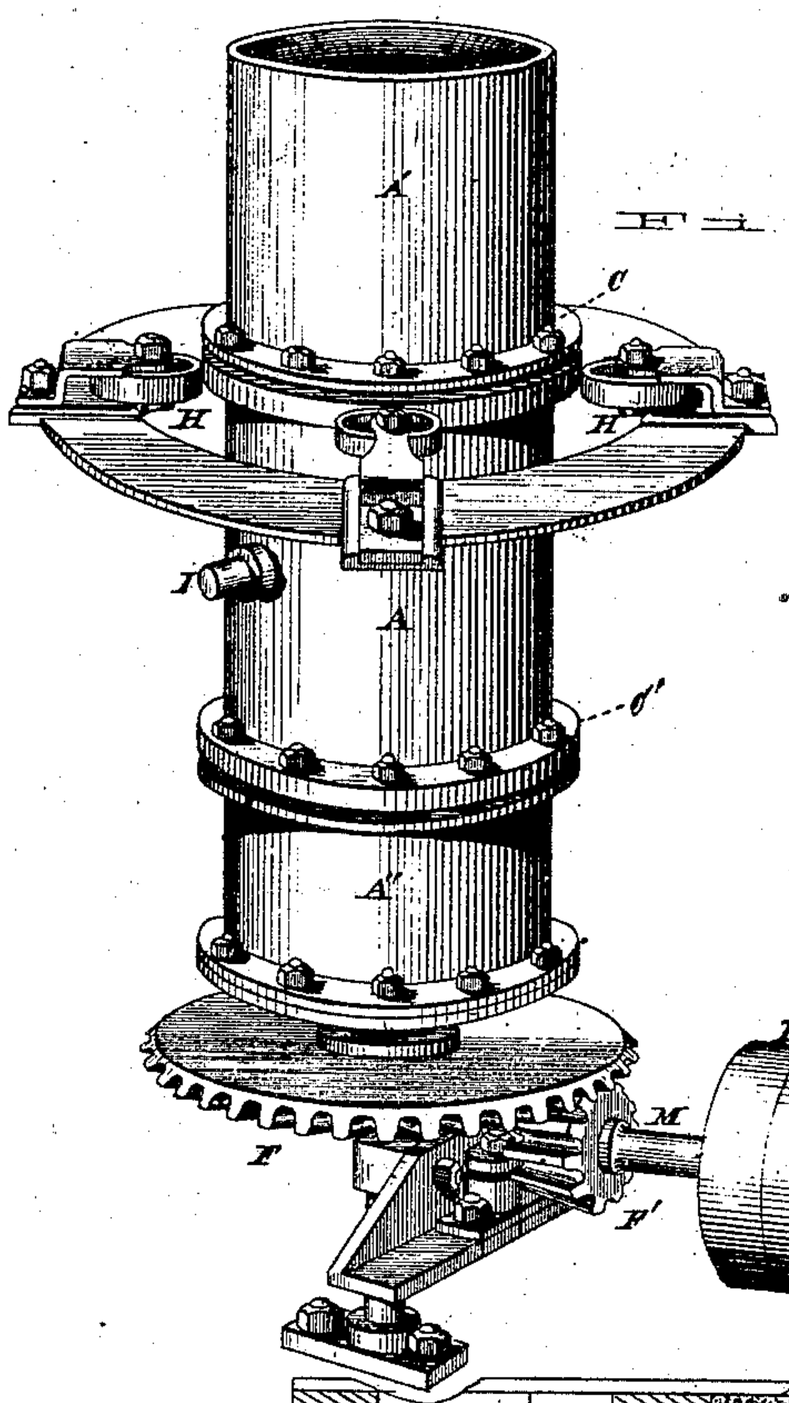


Fig. 3.

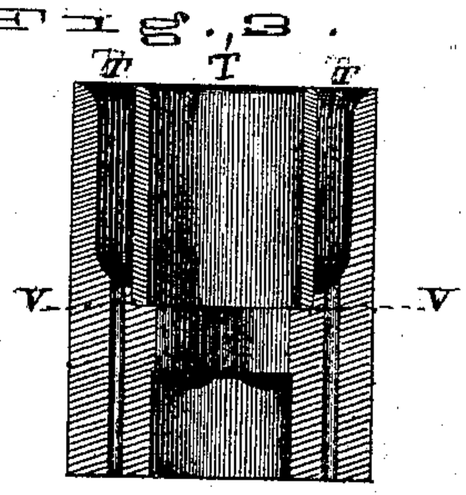
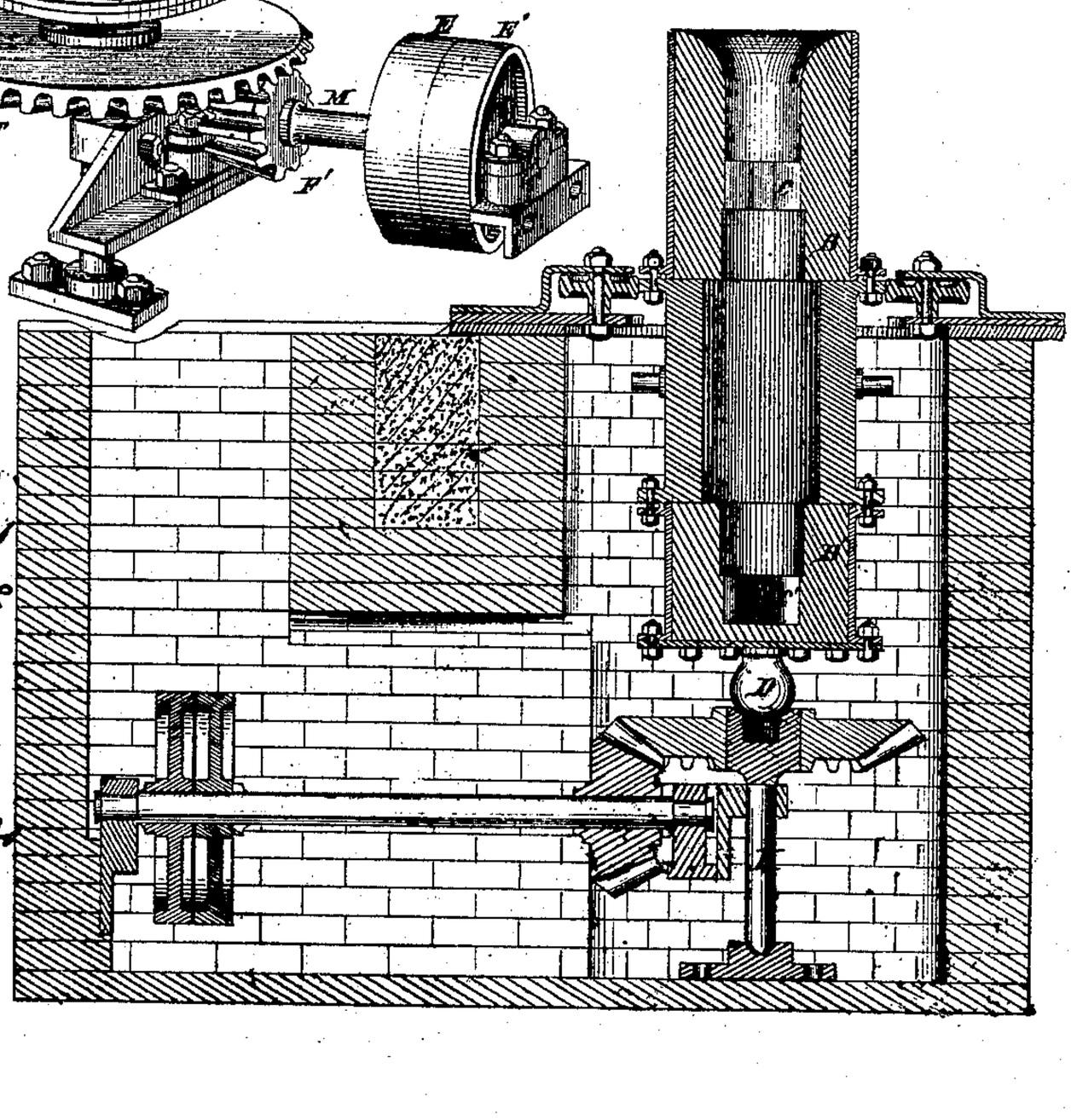


Fig. 2



Attest.
William Davies
James Moore

Inventor,
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United States Patent Office.

HENRY DAVIES, OF COVINGTON, KENTUCKY.

Letters Patent No. 98,673, *dated January* 11, 1870.

IMPROVEMENT IN MOULDS FOR CASTING METALS.

The Schedule referred to in these Letters Patent and making part of the same.

To all whom it may concern:

Be it known that I, HENRY DAVIES, of Covington, in the county of Kenton, and State of Kentucky, have invented a certain new and useful Improvement in the Art of Casting Metals; and I do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the annexed drawings, making part of this specification.

The objects attained by my invention, are—

First, control of the quantity and quality of the chill imparted to chilled rolls, and other cylindrical and circular bodies requiring to be chilled at their outer surfaces.

Second, by it I am enabled to obtain a more clear and solid casting, by driving the slag and dross to the centre, in which condition it will rise to the top, and may be taken off if required.

Third, by it I am enabled to secure a true concentric hole in circular castings in which the core does not pass through the casting, as in casting hollow cannon, which is accomplished by revolving the mould in the same manner, but after the metal is poured in, when the superior centrifugal force of the metal will drive the core to the centre.

My mode of accomplishing these objects is by revolving the mould upon its axis, and in a vertical position, when the circular motion of the mould will be communicated to the metal, and the centrifugal force thus created will cause the metal to rise higher against the sides, leaving a hollow or basin in the centre, into which the slag or dross will be driven by the greater centrifugal force of the metal, and the height of the edge of the metal or depth of the basin formed on its surface will be regulated by the speed at which the mould is revolved, and will, in this way, give a greater control over the part to be chilled. In other words, the more rapidly the mould is revolved, the higher the metal will be at the periphery, as compared with the centre, and the thinner will be the edge against the chill, and the more quickly cooled, and, consequently, the harder will be the portion chilled, so that the thickness and hardness of the chill will be more completely under the control of the moulder, and may be varied as required by varying the rate of motion of the mould, together with the rapidity with which the metal is poured into it.

The mechanism shown in the annexed drawing, and hereinafter described, is intended to illustrate the application of my invention to the casting of rolls for rolling iron.

Figure 1 is a perspective view of the chill and mould, accompanied with the requisite machinery for sustaining and revolving it.

Figure 2 is a vertical section of the same, in the pit, and in the proper position for operation.

Figure 3 shows a modification of my invention, hereinafter described.

As may be seen from the drawings, fig. 1, the mould is composed of three or more separate parts, A″ A A′, drag, chill, and cope; the drag containing the mould of neck B′ and wabbler C at the lower end of the chill, and the cope A′ containing the neck B and wabbler C at the upper end of the chill, and joined together by screw-bolts and flanges at *c c*, or lugs, or in any of the usual methods used in casting chilled rolls.

Fig. 2 shows a pit in the ground or foundry-floor, on the bottom of which is appropriately placed the mechanism for sustaining and revolving the mould. The said machinery consists of a vertical shaft, K, the lower end of which rests in an appropriate bearing, and its upper end is kept in a vertical position by suitable bearings, as shown.

The top of the shaft K is surmounted by the horizontal bevel-wheel F, face downward, and which is driven by the pinion F′, which receives its power through shaft M, from the pulley E.

E′ is a loose pulley on the same shaft, the functions of which it is not necessary to describe.

A socket, D, fig. 2, is formed in the top of shaft K, in which a ball, formed on the bottom plate of the drag A of the mould rests. Said socket D is chambered out in the centre, as shown, to increase the friction by which the mould is driven, and at the same time to allow the wheels F, shafts K and M, and pulley E to be put into rapid motion before the inertia of the mould is overcome. In this way, any shock to the mould by starting can be avoided.

H H H are friction-pulleys, placed at the top of the pit, or near the surface of the floor, and which, by their contact with the flange of the cope A′, or the upper flange of the chill A, keep the mould in a vertical position.

I I are trunnions cast upon the centre of the chill A, in the usual manner, to raise and lower it into the pit.

Fig. 3 is a vertical section of the cope A, having cylindrical space T, or sinking-head down to the top of the wabbler, or article to be cast, in the usual way, except that it may be smaller, and nearly parallel, in order to admit of a circular channel or space round the outside of smking-head T, as shown.

From the bottom of said space is a series of holes or gates, V V, terminating on the end of the barrel of the roll. This modification of my invention is for the purpose of enabling me, when chilled rolls are to be cast, to pour in hard metal in the circular channel,

and softer metal at the centre, or sinking-head. The former will be delivered near the periphery, while the mould is revolving, and will be kept to the sides of the chill by the centrifugal force, while the centre will be filled with softer metal.

It will be seen, that by varying the quantity and quality of the two metals, the depth and hardness of the chill can be regulated without affecting the quality of the metal in the centre.

Soft rolls, of course, will not require the chill; but two metals may be used in the same manner if necessary.

In casting car-wheels by my improved method, it is only necessary to secure the mould on the back of the wheel F, or on a suitable horizontal face-plate upon shaft K. The centre of the wheel must be concentric with the shaft K, and the gate, into which the metal is poured, must be in or around the centre.

The operation is as follows:

Take enough hard, close metal, to form the flange and tread of the wheel, in a ladle, and enough of any suitable tough, strong iron, that will best stand the concussion of the railroad, in another ladle; put the mould into rapid motion, pour in the hard iron first, when it will be thrown, by the centrifugal force, uniformly against the chill; but before all the hard metal is poured, the softer metal should have been begun to be poured.

In this way a constant stream can be kept up, and a perfect union between the two metals will be secured.

Thus it will be seen that any degree of hardness or thickness of chill on the tread and flange can be obtained, and at the same time have the body of the wheel of the toughest and strongest iron that can be had. It is my intention to apply for separate patents for the casting of cannon and car-wheels at an early day.

Having thus described my invention,

What I claim as new, and desire to secure by Letters Patent, is—

A mould, having a rotary motion given it, as described, when said mould is provided with concentric chambers, T and T', for pouring in two kinds of metal at the same time, as set forth.

HENRY DAVIES.

Witnesses:

JAMES MOORE,

WILLIAM DAVIES.