

A.A. Needham,
Casting Car Wheels.

Nº 18,924.

Patented Dec. 22, 1857.

Fig: 2

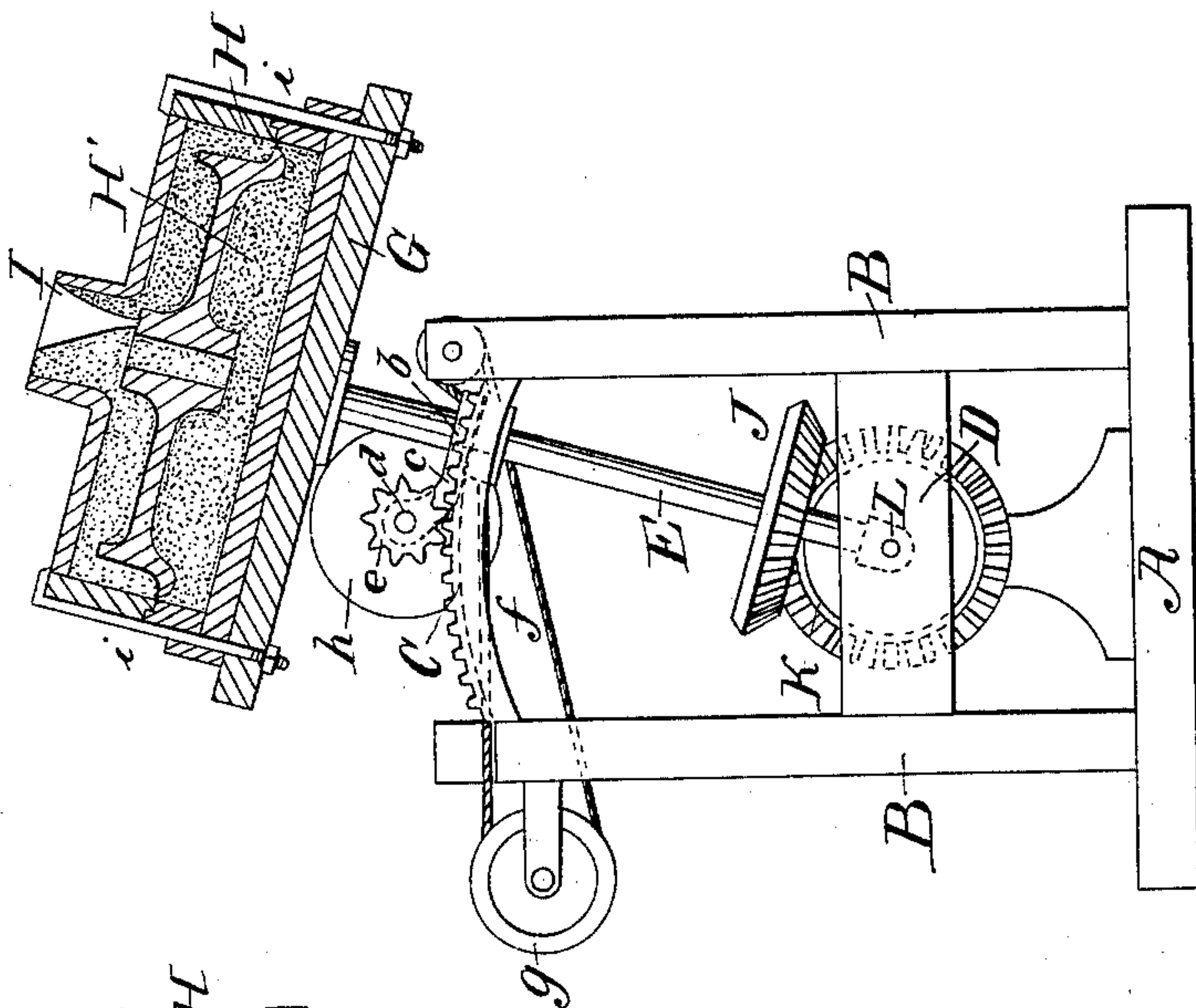
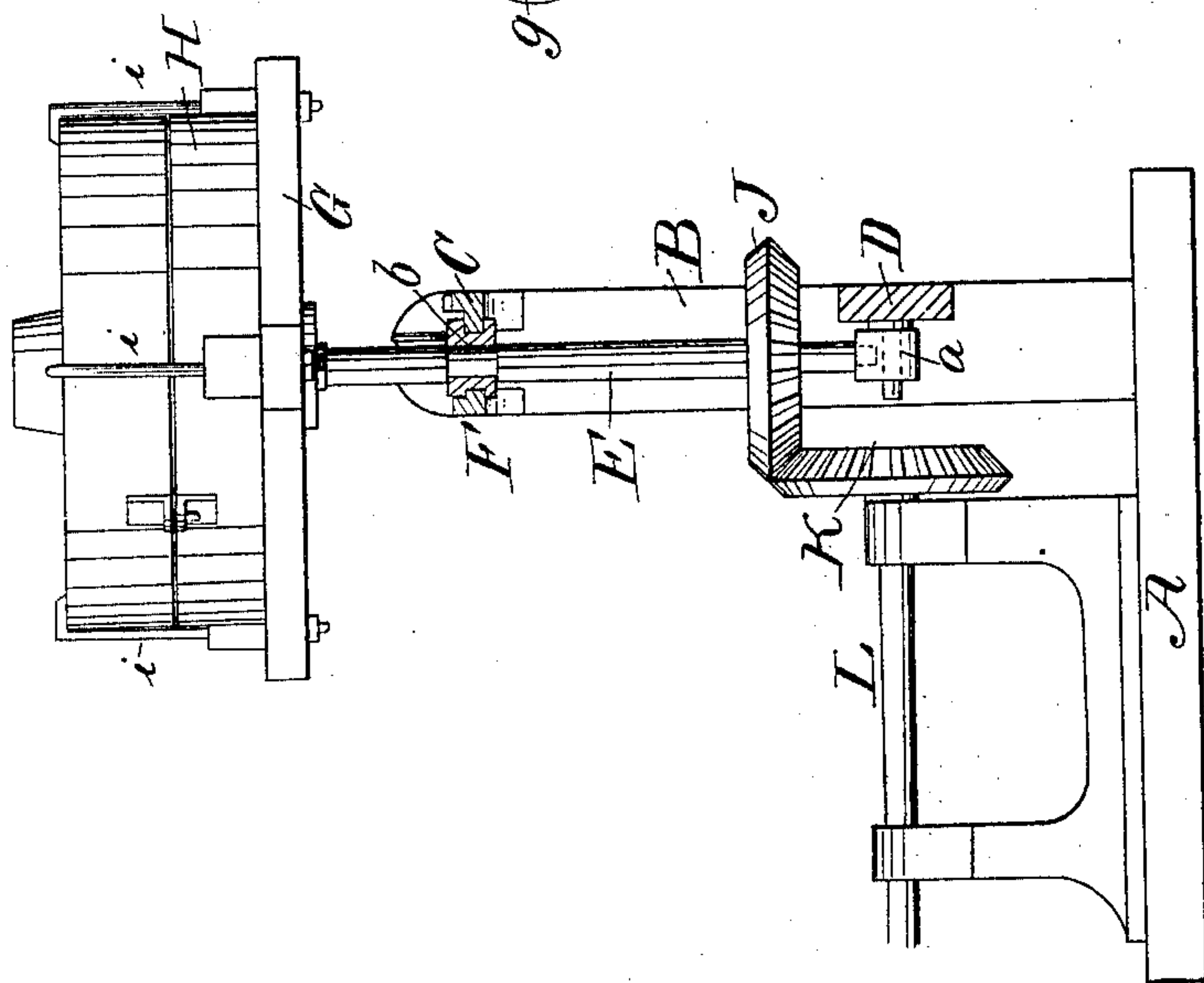


Fig: 1.



UNITED STATES PATENT OFFICE.

A. A. NEEDHAM, OF ROCKFORD, ILLINOIS.

IMPROVEMENT IN CASTING CAR-WHEELS.

Specification forming part of Letters Patent No. **18,924**, dated December 22, 1857.

To all whom it may concern:

Be it known that I, A. A. NEEDHAM, of Rockford, in the county of Winnebago and State of Illinois, have invented a new and useful Improvement in Casting Car-Wheels; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the annexed drawings, making a part of this specification, in which—

Figure 1 is a side view of a device by which my improvement is carried out. Fig. 2 is a central section of the principal working parts of the same.

Similar letters of reference indicate corresponding parts in the two figures.

The object of this invention is to remedy the difficulty hitherto attending the casting of perfect wheels in consequence of the rapid and unequal cooling of the same produced by casting with a chill in order to harden their treads or peripheries. Wheels cast with a chill are liable, from the causes above alluded to, to crack and the iron prevented from assuming that crystalline form best adapted for strength.

The invention consists in using two different kinds of iron, hard and soft, and having the mold placed within a revolving flask, the melted hard iron being first poured into the mold, which, in consequence of centrifugal force generated by its rotation, causes the hard iron to be pressed to its edges, which form the tread of the wheel, the softer iron being afterward poured into the mold and forming the center and hub of the wheel, the whole mass of metal within the mold being allowed to cool gradually and slowly, so that the contraction of the wheel will be equal at different parts, and a perfect, strong, and durable wheel obtained.

To enable those skilled in the art to fully understand and practice my invention, I will proceed to describe it.

A represents a base, on which two uprights, B B, are placed, connected at their upper ends by a curved or segment rack, C. The lower parts of the uprights are connected by a cross-tie, D, to which a step, *a*, is pivoted, said step receiving the lower end of a shaft, E. The upper part of shaft E is fitted within a bearing, *b*, which is placed between the rack C

and a cross-tie, F, the bearing being allowed to slide freely between said rack and cross-tie.

To the bearing *b* two arms, *c c*, are attached, said arms having a shaft, *d*, fitted in them, which shaft has a pinion, *e*, on one end, the pinion gearing into the rack C. To the bearing *b* the two ends of a cord or chain, *f*, are attached, said cord or chain passing around a drum, *g*. A crank-wheel, *h*, is attached to one end of shaft *d*.

To the upper end of the shaft E a platform, G, is attached, and to this platform a flask, H, is secured by rods or clamps *i*.

H' is the mold placed within the flask H, and I is the opening through which the melted iron is poured into the mold.

On the lower part of the shaft E there is placed a bevel-wheel, J, which gears into a corresponding wheel, K, on one end of a horizontal shaft, L, the opposite end of which is provided with a crank or pulley.

The operation is as follows: Two cupola-furnaces are used, one for melting the hard and the other for melting the soft iron. The platform G is designed to be near the floor, and the platform, flask, and mold are rotated by means of steam or other power applied to the shaft L beneath the floor. The melted hard iron is first poured into the mold, which is rotated with sufficient speed to force and press it against the edges of the mold, the soft iron being then poured into the mold and forming the central portion and hub of the wheel. By this means a hard and durable tread is given the wheel and a comparatively soft center capable of being bored with facility to receive the ends of the axle. The metal within the mold is allowed to cool gradually, and, as the mold is of equal temperature throughout, the metal will cool and contract equally, so that it will not crack, and the iron will, in consequence of the slow and gradual cooling, assume that crystalline form which insures the greatest strength. By turning the drum *g* or crank-wheel *h*, the flask and mold may be adjusted in an inclined position. This is necessary in many cases, as long hubs are frequently formed on wheels, and in case the melted metal is poured into the mold when perfectly horizontal it would be liable to remain in the lower portion of the mold which

forms the hub, the centrifugal force not being sufficient to overcome the gravity of the metal, or not so much so as to throw it out of said recess. This will be understood by referring to Fig. 2.

I do not claim, broadly, a rotating mold for casting, for this has been previously used for casting pipes; but,

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

Casting the wheel from two different kinds of iron, hard and soft, the hard iron to form the tread and the soft to form the hub and center of the wheel, and properly disposing the two kinds of iron within the mold, as desired, by giving the same a rotating motion, substantially as shown and described.

A. A. NEEDHAM.

Witnesses:

WM. M. BOWDOIN,
M. C. CHURCHILL.