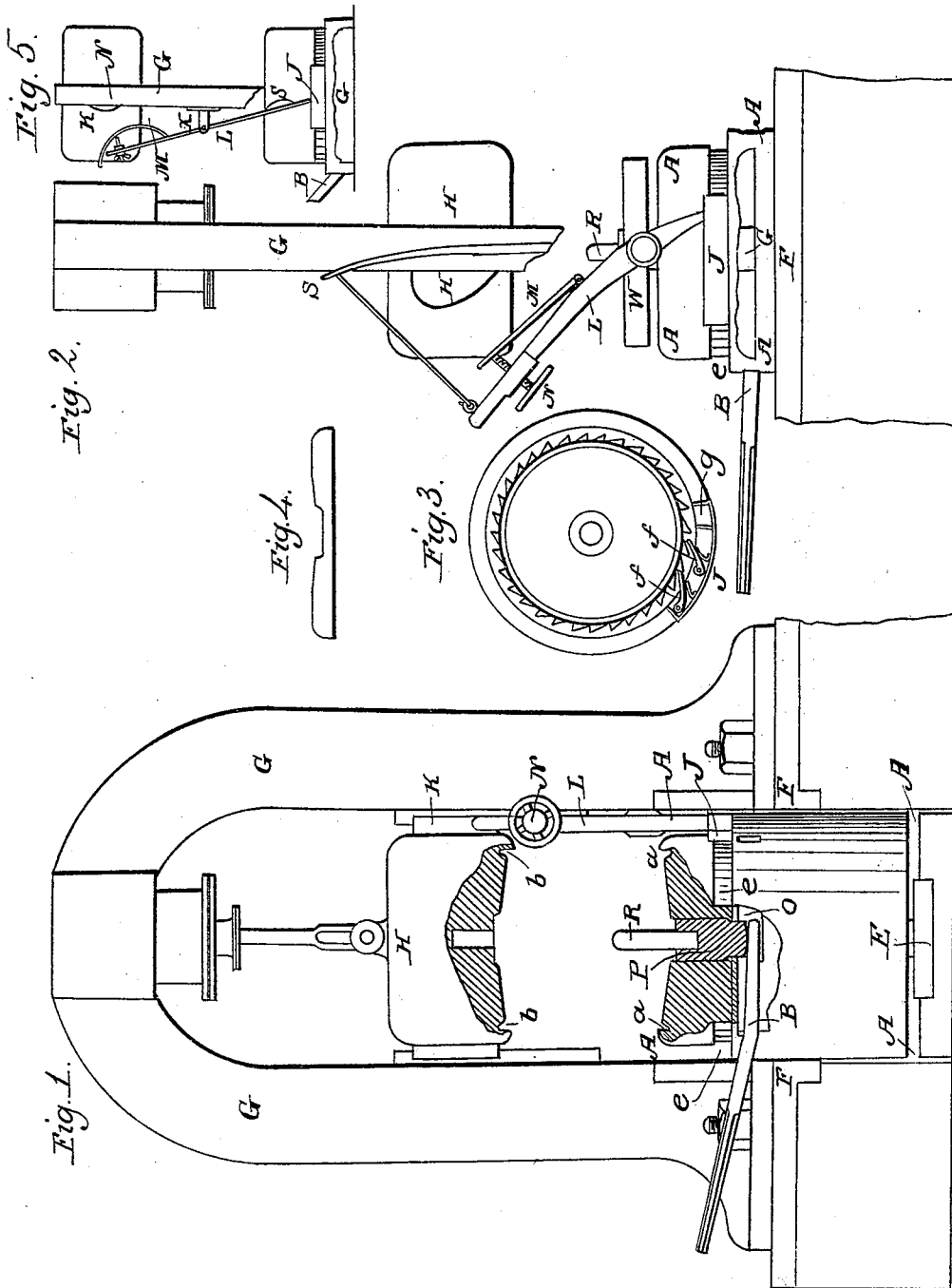


N. STARKS.
Making Railroad Car Wheels.

No. 7,746.

Patented Oct. 29, 1850.



UNITED STATES PATENT OFFICE.

NATHAN STARKS, OF ALBANY, NEW YORK.

MACHINE FOR MAKING WROUGHT-IRON CAR-WHEELS.

Specification of Letters Patent No. 7,746, dated October 29, 1850.

To all whom it may concern:

Be it known that I, NATHAN STARKS, of the city of Albany and State of New York, have invented a new and useful improvement in machinery to be used in the making of wrought-iron wheels for railroad-cars and other purposes, which I call "Starks' wrought-iron wheel swage;" and I declare the following specification with the drawings hereto annexed as part of the same to be a full and complete description of such process and apparatus, similar letters designating the same parts in all the figures.

Figure 1 represents a front view and Fig. 2 a side or profile view of the apparatus. Fig. 3 a plan of the face of the anvil.

A A A A represents a heavy iron anvil whose face is somewhat larger than the intended wheel. In Fig. 1 a partial view is given of a cross-section of the anvil vertically through its axis. The face of the anvil is formed into a matrix or sunk die shaped to form one side or face of the wheel, as is shown by the shadings of Fig. 3, and the profile *a, a*, Fig. 1. The anvil can be turned round upon a center pivot underneath its bottom fitting in a metal socket E which is itself attached to a firm massive block or foundation of wood. It is also steadied by passing through a circular orifice, in an iron slab F, F, which forms the foundation plate to another part of the apparatus. This part consists of the side pieces of a guide frame G, G, of iron, rising parallel with each other, on each side of the anvil and uniting at its top. Between these guides, a very heavy iron hammer or swage H is made to move up and down some distance, by any convenient mechanical power; as by steam, which is the mode suggested by the drawings. The lower face of this hammer, which is of equal size with that of the anvil, has sunk into it a matrix or sunk die, shaped to form the side or face of the wheel, opposite to that formed by the anvil, as is seen by the drawing Fig. 1, which represents a partial cross section through the axis of the hammer, where the profile of the central cross section of the wheel is shown at *b, b*.

In order to turn the anvil round on its pivot during the process of hammering, which is requisite in order to shape the work truly any of the various well known modes of effecting such a movement may be employed. The following is shown as a simple and convenient mode of doing it: Around

the periphery of the anvil a short distance below its face, are placed a set of vertical ratchet teeth, *e, e*. Into these teeth catches or pawls *f, f*, fitted in a box or case operate, the box J moving horizontally and concentric with the teeth. To move this box a curved lever L is pivoted upon one of the upright pieces of the guide frame, its lower end working in a socket *g* Fig. 3, into the box, and its upper end being thrown in one direction by the cam K attached to the hammer, and back again by the spring S. In order to give this lever more or less sweep, and consequently the box and pawls with the anvil a greater or less turn round, the cam operates upon an adjustable arm M attached to the upper side of the lever, and moved up or down by a screw N to advance or withdraw it, so that the cam K shall operate on it, during any desired portion of the stroke of the hammer, or else withdraw it entirely out of reach of the cam.

Another method of effecting the same operation is shown at Fig. 5 where G represents one of the side pieces or guide frames, J the box containing the catches or pawls. The lever L hangs nearly perpendicularly at a small distance in front of the guide frame and is pivoted near its own center upon an arm X projecting therefrom. To the upper part of this lever an adjustable arm M is pivoted at its lower end, and is moved from its upper end, up or down by a screw N to adjust it to the operation of the cam K. In addition to this on the lower part of the lever L, a curved projecting block S is affixed to be operated on by the cam. It will be seen from this description that when the ram or hammer descends the cam K striking S will throw the lower part of the lever L from the frame, carrying the pawls over the ratchet teeth of the anvil. When the ram ascends, striking M it will throw the lower part of lever L toward the frame carrying the pawls against the ratchet teeth and turning the anvil around thereby.

In order to lift the wheel out of the anvil, when completed, or during any part of the process of forging, a circular hole is sunk into the anvil directly under the hub of the wheel, and equal thereto in diameter. At the bottom of this hole, two or more square mortises O intersect each other, cut horizontally through the center of the anvil, and are made large enough to permit the entrance and play of levers B vertically a few

inches. Into the circular hole a plug or pin of metal P, passing freely but snugly into it is placed, its bottom reaching low enough to be operated on by the end of lever B 5 when it is inserted into the anvil. Into the center of this pin P another but smaller one is inserted R. This is intended as the center of revolution of the mass of iron, that is to be worked into a wheel, and is to 10 serve as a mandrel for the formation of the eye of the hub, and is in diameter a little smaller than the intended eye, when finished. This arrangement of a central plug to lift the wheel out of the lower die, 15 or anvil, and of a pin inserted therein as the mandrel for the formation of the eye in the hub of the wheel, is the most ready and economical mode of combining the two objects in one operation.

20 The operation of the machine is thus: A cylindrical mass or draft of metal equal to the thickness of the intended hub of the wheel, and of such a diameter, as will when hammered out fill the dies and complete 25 the wheel, has a hole made through its center fitted for the pin R. The mass of iron having been brought to a proper heat for swaging is placed upon the pin, and the hammer put in operation. Whenever it 30 may become necessary in the judgment of the workman, the anvil is turned round, by the hand, or by permitting the cam on the hammer to operate on the lever M. Whenever it is desired the wheel can be raised

from the anvil by the lever, as seen at W 35 Fig. 2.

It may be advisable to employ sometimes two sets of anvils and swages in making a wheel, in order to complete the process perfectly and without chance of failure in the 40 operation. In that case the first pair of dies are to be made in the form shown by the profile section at Fig. 4, when the wheel is to take the ultimate form made by the dies, shown in the preceding figures, the intention 45 being that the first set of swages shall stamp or hammer the hub and a small part of the wheel external thereto, leaving that portion of metal projecting beyond, to extend with an equal thickness, so as to be ready to take 50 the finishing blows for the rim with its projecting edges to the best advantage from the dies shown in Figs. 1 and 3.

I claim as my invention and desire to secure by Letters Patent— 55

In the forging of solid wrought iron wheels, when made by drop and die, the use of a lower die or anvil, made to revolve, during the process of forging, horizontally on a central vertical axis either by hand or 60 by the machinery which operates to drop the ram, a hammer, substantially as set forth in the above specification.

Signed:

NATHAN STARKS.

Witnesses:

RICHD. VARECK DE WITT,
H. S. McCALL.