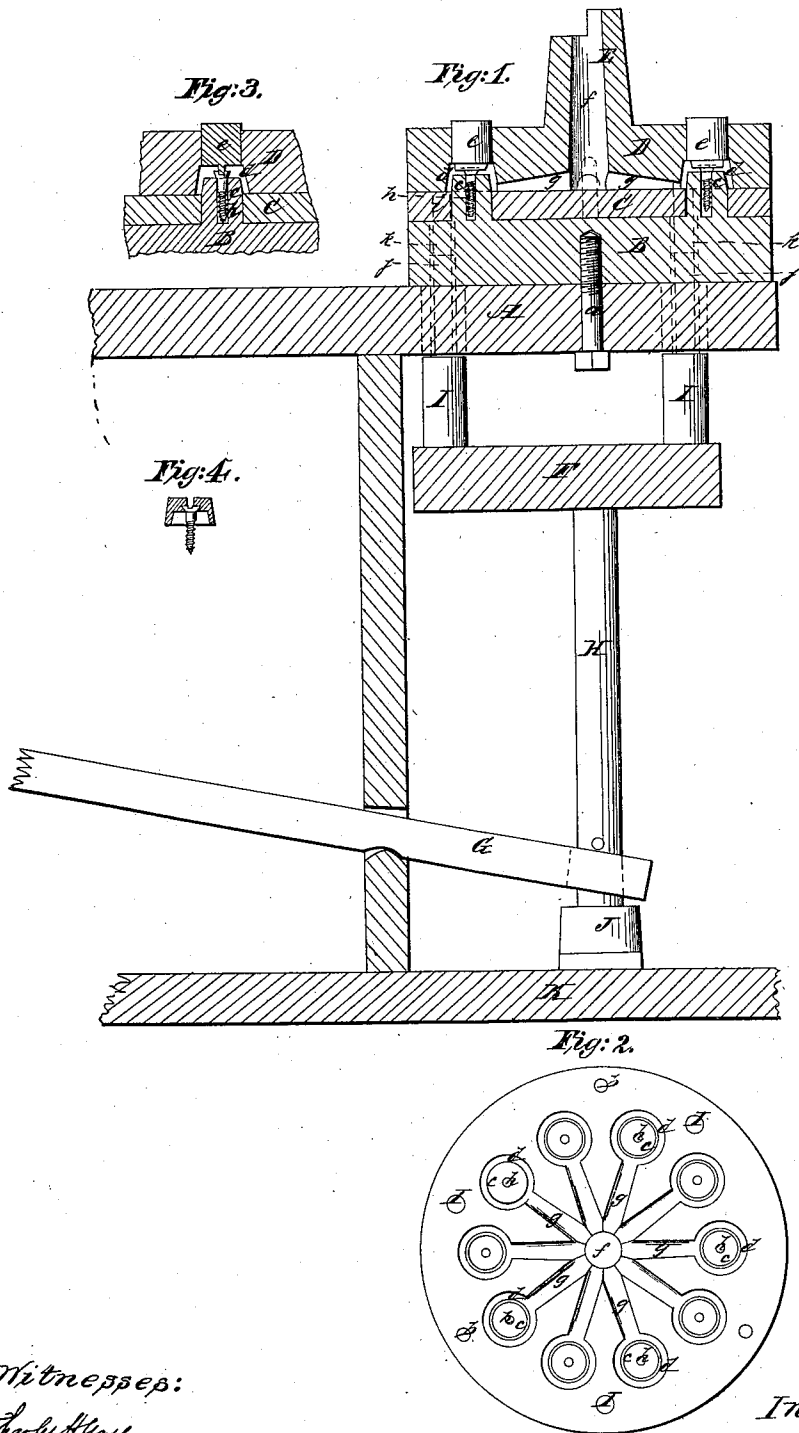


*N. S. Williams,*  
*Casting Screw-Heads,*

*No 42,894,*

*Patented May 24, 1864.*



*Witnesses:*  
*Charles H. Smith*  
*Geo. W. Reed*

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*Norton S. Williams*

# UNITED STATES PATENT OFFICE.

NEWTON S. WILLIAMS, OF EAST HAMPTON, CONNECTICUT.

## IMPROVED MOLD FOR CASTING SCREW-HEADS.

Specification forming part of Letters Patent No. 42,594, dated May 21, 1864.

*To all whom it may concern:*

Be it known that I, NEWTON S. WILLIAMS, of East Hampton, in the county of Middlesex and State of Connecticut, have invented a new and useful Improvement in Molds for Casting Heads on Screws and Tacks and for Casting other Articles; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to make and use the same, reference being had to the accompanying drawings, forming a part of this specification, in which—

Figure 1 is a central vertical section of a mold for casting composition metal heads on screws. Fig. 2 is a vertical section of part of the mold at right angles to Fig. 1. Fig. 3 is a horizontal section in the plane indicated by the line *x x* in Fig. 1. Fig. 4 is a central vertical section of one of the screws.

Similar letters of reference indicate the same parts.

This invention relates to molds of cast-iron or other metal for casting several articles at a time.

It consists, first, in the combination, with several molds arranged in a circle, of a single central runner which tapers in an upward direction to the mouth, and branch runners radiating from the said main runner to supply the several molds at the same time therefrom, whereby the metal is enabled to run in a uniformly fluid state to the several molds and the necessary facility for parting the several molds is afforded.

It consists, secondly, in certain novel means whereby the parting of the several molds for the removal of the castings is effected more easily and expeditiously.

B, C, and D are three horizontal cast-iron or other metal plates of which the molds are composed, arranged one above another and fitting closely together. The bottom plate, B, is firmly secured by one or more screw-bolts, *a*, to a horizontal platform or bench, A. The center plate, C, and the top plate, D, are kept in central positions upon the bottom plate, B, by means of upright steady-pins *b b*, secured in the bottom plate and passing through holes in the first and second plates, in which they fit easily to permit those plates to be easily lifted.

On the bottom plate, B, there are several raised cores, *c c*, one for each mold, arranged at equal distances apart in a circle. These cores fit easily to corresponding holes in the center plate, C, and are of a height to project the requisite distance above the upper surface of the plate C, which is perfectly even. The portions *d d* of the molds which form the tops and sides of the screw or nail heads or other articles to be cast are formed in the under part of the top plate, D, in positions corresponding with the cores *c c*, and when any impressions or partial depressions are intended to be produced in the tops of said articles—as, for instance, the notches in screw-heads—the plate may be drilled through from the said portions *d d* of the mold and have cores *e e* of the necessary form inserted firmly into them. The top plate is also made with a central stem or socket, E, which is bored out with an upward taper to produce the central or main runner, *f*, and in the under surface of the said plate there are formed grooves *g g*, radiating from the said main runner to form branch runners leading to the several molds.

For casting heads on screws or nails there are central holes, *h h*, provided in the cores *c c* for the reception of the screws or nails, as shown in Figs. 1, 2, and 3. Screws are shown in red outline in Fig. 1, and in black outline in Fig. 3 inserted into these holes.

F is a horizontal cross-head arranged below the platform or bench A, and having attached to it three or more upright pins, I I, which pass freely through holes in the said platform or bench, and through holes in the bottom plate, B, and center plate, C. The holes in the bottom plate are larger than those in the center plate, and the upper portions, *i i*, of the pins I I are of a size to fit the holes in the center plate, and the portions *j j* below of a size to fit the bottom plate; but the smaller portions *i i* are of a length considerably greater than the thickness of the center plate. Square shoulders *k k* are left between the portions *i i* and *j j* of the said pins. This cross-head is supported by a central stem, H, which is secured firmly into it, and which works in a guide, J, secured upon the base K, upon which the platform or bench A is rigidly secured, and this rod H has a treadle, G, so applied to

it that it may be raised by the pressure of the foot upon the said treadle. The weight of the said stem, cross-head, and pins is sufficient to bring them down again when the pressure of the foot is removed from the treadle.

The operation of casting the heads on the screws is as follows: The operator first takes off the plate D, then places the screws in the holes *h h*, and afterward replaces the plate. He next pours the molten metal into the main or central runner, *f*, whence it runs equally and at the same time through all the branch runners *g g* into the molds, continuing to pour until the main runner is nearly full. As the metal contracts in the several molds in cooling more metal is supplied by the weight of the head contained in the main runner. When the metal is set in the molds, which he will know by experience, the operator by one pressure of the foot upon the treadle so raises the post H, cross-head F, and pins I as first to lift up the top plate, D, from the work ready to be removed, which is rendered easy by the upward-tapering form of the runner *f*, which is the reverse of the usual form of the runner, and afterward by the same operation of the treadle to lift up the center plate, C, high enough to free the work from the cores *c c*. This part of the operation is rendered necessary by the close adhesion of the metal to the cores *c c*, caused by contraction in cooling. After the work is removed and the foot taken from the treadle the center plate, C, falls back by its own weight to its proper place. New screws are next placed in the holes *h h*, and the plates C and D replaced, and the casting may be repeated. Other articles made of a sufficiently fusible metal or alloy may be cast in the same way.

The old method of casting tack and screw heads and that which is now in general use, is

by arranging the tack or screw molds in a row to be supplied with metal from a leader running parallel with it. The long narrow mold is inclined to an angle of about forty-five degrees and the metal poured in at the end. The screw and tack heads thus cast prove, on being turned in a lathe to finish them, to be unlike and imperfect in their texture arising from the different head or pressure of metal above each mold or the position of the mold. Moreover, the heads thus cast are taken from the mold with much difficulty.

The great advantage of this invention in casting screw and tack heads is that all the molds being in the same horizontal planes and equidistant from the main runner, the castings are uniform and have the solidity, the want of which caused much difficulty and bad work in the old way, and has induced some manufacturers to adopt the more expensive process of pressing or stamping the heads after they are cast. Another advantage is that the process of casting is much more quickly and easily performed.

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

1. The central main runner, *f*, tapering in an upward direction, in combination with the radiating branch runners *g g*, and the concentric circularly-arranged series of molds, substantially as herein specified.

2. The post H, cross-head F, and attached pins I I, or their equivalents, in combination with the three plates B C D, for the purpose of raising the plates D and C one after the other, substantially as herein specified.

NEWTON S. WILLIAMS.

Witnesses:

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