

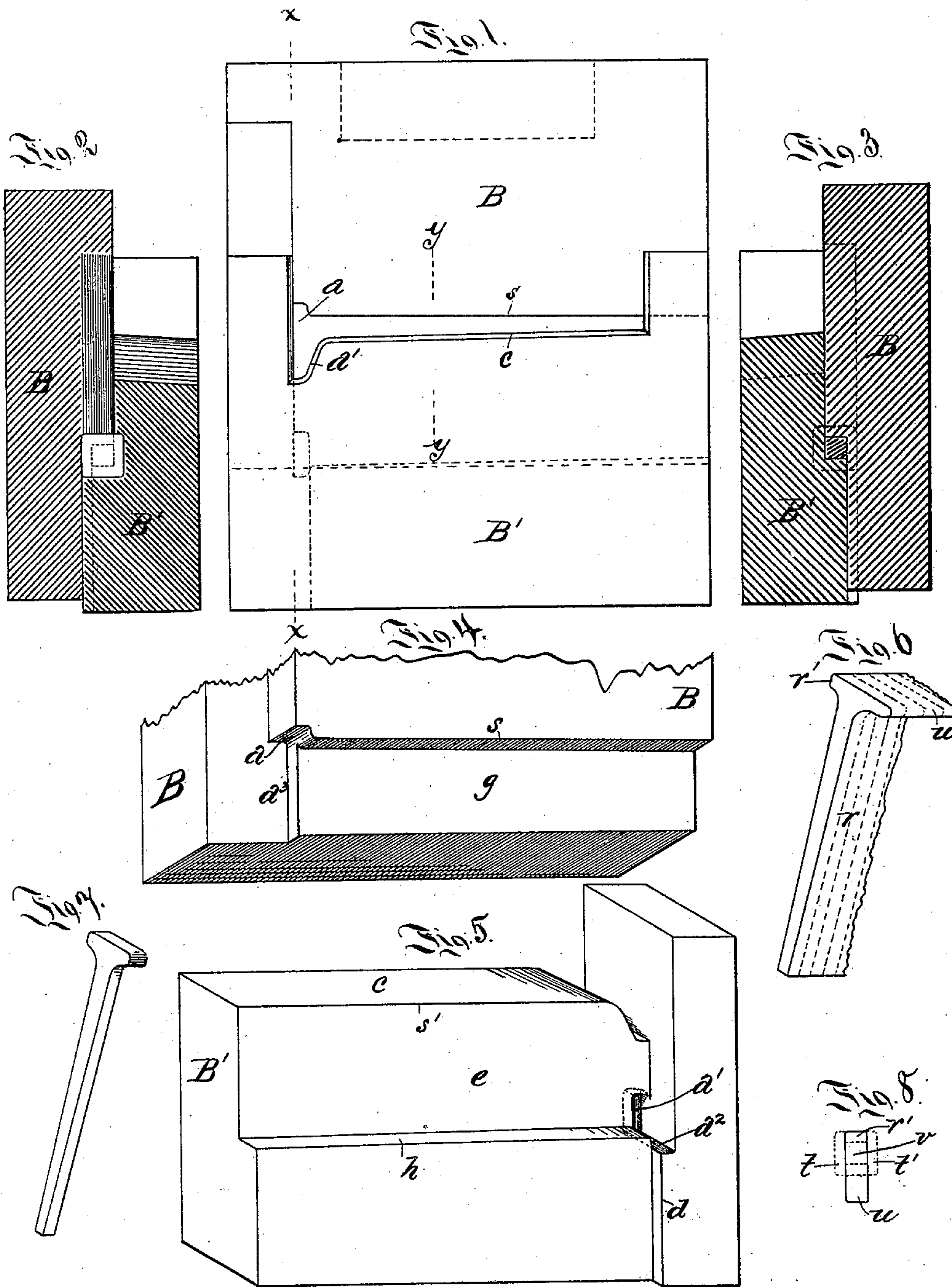
(No Model.)

H. GREER.

PROCESS OF MAKING NAILS AND SPIKES.

No. 308,253.

Patented Nov. 18, 1884.



WITNESSES:

C. M. Clark
R. A. Whittlesy

Howard Greer INVENTOR

By George H. Christy
Att'y.

UNITED STATES PATENT OFFICE.

HOWARD GREER, OF CHICAGO, ILLINOIS.

PROCESS OF MAKING NAILS AND SPIKES.

SPECIFICATION forming part of Letters Patent No. 308,253, dated November 18, 1884.

Application filed December 23, 1883. (No model.)

To all whom it may concern:

Be it known that I, HOWARD GREER, a citizen of the United States, residing at Chicago, county of Cook, State of Illinois, have invented or discovered a new and useful Improvement in the Manufacture of Nails and Spikes; and I do hereby declare the following to be a full, clear, concise, and exact description thereof, reference being had to the accompanying drawings, making part of this specification, in which—like letters indicating like parts—

Figure 1 is a front elevation of the dies used in cutting and finishing nails. Fig. 2 is a section of the dies when closed, the section being taken on the line *xx*, Fig. 1. Fig. 3 is a similar section on the line *yy*, Fig. 1. Figs. 4 and 5 are perspective views of the working-faces of the dies. Fig. 6 is a perspective view of the blank from which the nails are cut. Fig. 7 is a perspective view of a finishing-nail having ears on two sides only. Fig. 8 is a diagrammatic view showing the manner of forming the nail-head.

With the development and recent improvements in steel and its manufacture, and with the increasing necessity of utilizing old steel rails and the crop or fag ends of steel rails, there is an increasing demand or necessity for the production in steel of articles of manufacture heretofore made chiefly of iron.

My present invention relates, chiefly, to the manufacture of steel nails and spikes; and it consists in part in an improved method of shaping the blank and forming the head. The upsetting of steel by a header, or even riveting, is exceedingly difficult, and the upsetting process has heretofore been the one chiefly employed in heading operations.

In order to avoid the necessity of heading in the manufacture of steel spikes and nails, I have devised a method in which, where a four-sided projecting head is desired, the larger part of the metal necessary for forming the projecting part of the head is disposed or worked into a rib extending along one edge of a blank or bar, and then, such bar being cut by transverse parallel cuts into a series of separate nail or spike blanks, so much of the metal of the rib as then goes into these nail or spike blanks may by compression be caused to exude or flow back and laterally out so as to form two or more of the projecting sides of

the head; and this process I apply in forming the side ears on spike-heads whereon to engage the claw-bar, as also in making the heads of ordinary nails. Where heads are desired which shall extend out on only two sides of the nail, as in what are sometimes called "finishing-nails," the rib referred to will contain only so much metal as is necessary to form such two projecting sides, and after the nail-blanks are sheared off the projecting metal formed by the rib will, by compression, be caused to exude laterally or to force out the two projecting sides, which will then constitute the nail-head. This method of making nail-heads and spike-heads or parts thereof by means of a projection on one side of the nail or spike blank, and then compressing or forcing back the metal of such projection to form two or more sides of the nail or spike head may be variously applied or embodied in various construction of dies.

In application No. 113,386 I have shown and described a construction of dies suitable for working this metal in making spike-heads, and the method involved in such use of such dies is hereby included within the scope of the present invention; but, for further illustrating the said improved method, I have in the accompanying drawings shown how it may be employed in the manufacture of nails or nail-heads.

In the drawing, B represents the upper and B' the lower die. The lower one of these dies is preferably stationary on any suitable support, and the other, B, has a motion up and down by means of suitable mechanism, so that the corner *s* shall shear across the angular corner *s'* and sever the nail-blanks in succession from the parent bar. This bar is rolled of the form substantially as represented in Fig. 6, in which the parts *r* are exactly or approximately of a width equal to the length of the nail-shank. Along one edge of such bar I make a rib, *r'*, of a height about equal to the distance which one side of the nail-head will project. Along the opposite side of the same edge of the bar I make a rib, *u*, with a sufficient quantity of metal therein, such that when the bar is cut up into nail-blanks by transverse parallel cuts, as indicated by dotted lines in Fig. 6, the metal therein provided in the rib *u* will be sufficient in amount to form

the remaining three sides of the projecting parts of the nail-head, or will approximate thereto, as may be required. The bar thus made is then fed in between the dies (the moving die B being raised for the purpose) until its forward end shall engage the wall *g*. The upper edge, *c*, of the lower die is provided with a groove, *c'*, for the rib *u*, whereby the blank may be guided between the dies. Then a downstroke of the upper die will cut off one nail-blank and carry it downward onto a ledge, *h*, which projects forward from the lower part of the fixed die. At this point the downward-projecting rib *u* of the nail-blank is compressed in a die or matrix, which is thus formed. The working-face *s* of the upper die, B, is recessed at one end, as shown at *a*, to receive the rib *r'* of the nail-blank, and the wall *g* is cut away at *a'*, below the recess, for a depth equal to the distance which the head of the finished nail is to project for the body thereof. The working-face *h* of the lower die is recessed at one end, as at *a''*, to a depth equal to the depth of the recess *a*, and in the wall is formed a recess, *a'*, connecting at its lower end with the recess *a''*. The recess *a* and cut-away portion *a'* of the upper die and the recesses *a'* and *a''* of the lower die form, when the two dies are together, a cavity of the size and shape of the nail-head to be formed. As the nail-blank is then, by the downstroke of the die B, compressed on the ledge *h*, the metal in the projection *u* entering the recess *a''*, and being larger than can be contained in such recess, the excess of metal thereof will, by the compressive force so exerted, be caused to flow up and fill the lateral parts of the cavity above described, or, being forced into the head, will cause the metal of the head to expand or exude laterally into such cavity, and thereby form a nail-head projecting uniformly on all sides; and in order that the lower side of the matrix or the bottom of the recess *a''* may extend beyond the edge of the ledge *h*, so as to aid in forming the extreme lower right-hand corner of the nail-head, the lower die is at that point provided with a rib, *d*, which enters a correspondingly-shaped recess, *a'''*, in the wall *g* of the movable die. One reason why this method of making nail-heads by compression can be more easily performed than by upsetting results from the fact that as the metal is thus disposed it has less radiating or cooling surface in proportion to its bulk than when an end is left projecting to be upset by a header. Thus the heat is better retained, and consequently the work can be more easily and perfectly done.

Where a two-sided head only is required, the rib *r'* may be omitted and the rib *u* may be made with only sufficient metal therein to form the two sides of the head. In such case the top and bottom parts of the matrix described may be omitted and the metal furnished in each nail-blank by the rib *u* will all of it be caused to flow out laterally or be driven into the head and cause other metal

to exude laterally, and thereby form a two-sided head, as shown in Fig. 7. With this explanation the skilled mechanic will readily understand how to apply this method of operation by rib-rolling, transverse cutting, and lateral compression to the manufacture of any desired kind or shape of nail or spike head, and for the most part it will be sufficient for him to ascertain the amount of metal required to complete or make the head or the projecting parts thereof by lateral exudation, and then roll the bar with that amount of metal in the rib *u*, and from this, when cut into suitable blanks, he can in a properly shaped and proportioned matrix complete the work by compression in the manner set forth.

In Fig. 8 is shown in full lines the head end of a nail-blank. Part of the metal—the rib *u* of this blank—is forced by the dies to either flow outwardly to form the sides *t t'* of the nail-head, or, as I now believe, part of the metal of this rib *u* is forced directly up into the part *v*, the metal of that part being forced outwardly to form the sides *t t'*.

I claim herein as my invention—

1. The method of forming two or more of the laterally-projecting sides of a nail or spike head, which method consists, first, in rolling the material necessary therefor in the form of a rib or ribs along one or both sides of the edge of the bar or blank; second, in cutting such bar or blank into spike or nail blanks by transverse parallel cuts; and, third, in compressing between dies the laterally-projecting portion of each such blank, and so causing the metal to exude on and along the sides of the head not under compression, substantially as set forth.

2. In the manufacture of nails or spikes, the improved method, which consists, first, in cutting a suitable forged or rolled blank into spike or nail blanks by transverse parallel cuts; and, second, in compressing between dies the laterally-projecting portion of each of such blanks, and so causing the metal to exude in and along the side of the head not under compression, substantially as set forth.

3. In the manufacture of nails or spikes from suitably-formed nail or spike blanks, the improved method which consists in compressing between dies the laterally-projecting portions of such blanks, and so causing the metal to exude in and along the sides of the head not under compression, substantially as set forth.

4. The die B, having the wall *g*, recess *a*, and cut-away portion *a'*, in combination with the die B', having the ledge *h* and recesses *a' a''*, substantially as set forth.

In testimony whereof I have hereunto set my hand.

HOWARD GREER.

Witnesses:

R. H. WHITTLESEY,
C. M. CLARKE.