

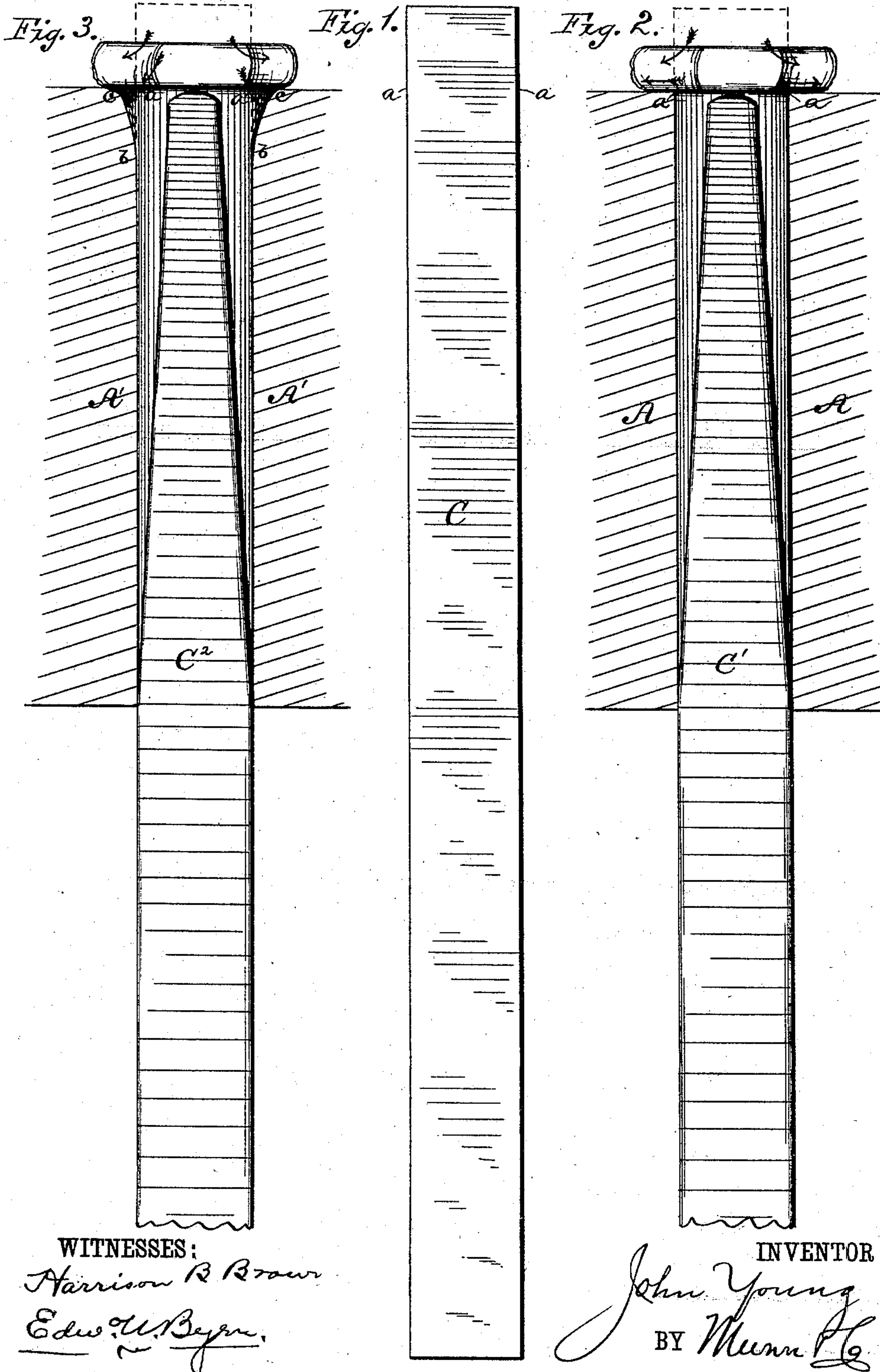
(No Model.)

J. YOUNG.

NAIL.

No. 316,717.

Patented Apr. 28, 1885.



WITNESSES:

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UNITED STATES PATENT OFFICE.

JOHN YOUNG, OF WHEELING, WEST VIRGINIA.

NAIL.

SPECIFICATION forming part of Letters Patent No. 316,717, dated April 28, 1885.

Application filed October 15, 1884. (No model.)

To all whom it may concern:

Be it known that I, JOHN YOUNG, a citizen of the United States, residing at Wheeling, in the county of Ohio and State of West Virginia, have invented a new and useful Improvement in the Manufacture of Cut Nails, of which the following is a description.

The manufacture of cut nails from Bessemer steel presents an industry of great promise, inasmuch as it does away with the puddling-furnaces, and enables the steel nails to be produced more cheaply than the ordinary iron nails, and for the reason also that the nail can be bent cold back on itself so as to perfectly clinch without breaking. A difficulty has been experienced, however, in making these cut steel nails, which has prevented the economical manufacture and successful introduction of this kind of nail. It has been found that in heading these nails an inherent weakness is left in the nail at its head that allows the heads to be easily broken off in driving, and to such an extent as to interfere seriously with the adoption of this nail, frequently resulting in the return of an entire lot of nails to the factory, and which defect can only be partially remedied at considerable expense, by annealing. The object of my invention is to remedy this difficulty, and to this end it consists in the peculiar form of cut nail, as hereinafter fully described.

Figure 1 represents a side view of a cut-nail blank just after it has been cut from the nail-plate by the knife. Fig. 2 is a side view of the old form of nail just after having been headed, and while still held in the clamping dies, which are shown in section, and Fig. 3 is a similar view illustrating my invention.

Upon investigating the cause of the cracking off of the heads of these cut steel nails, I have made the following discoveries. When a nail-blank, C, as shown in Fig. 1, is clamped in the dies A A, Fig. 2, just after having been cut off of the plate by the knife, the right-angular edges of the dies press tightly up against the nail-blank at *aa*, leaving the blank projecting slightly, as shown in dotted lines in Fig. 2. Then when the header, moving in line with the length of the blank, strikes the end of the same, it swages the head, as shown, and as the metal mashes down the movement

of the metal is in the direction of the arrows, which at the lower side of the head is at right angles to the length of the blank and around the sharp right-angular corner at *a*. The result is that the lay of the fiber of the steel in the head on its under side changes abruptly from the lay of the fiber of the metal in the body of the nail, and this gives an angle of weakness at *a* that renders the breaking off of the head easy.

Another influence operating toward the weakening of the head is as follows: The dies A, having straight edges to *a*, clamp the nail-blank tightly along its body clear to the head, and as the nail-blank is heated, when the dies A A clamp it the metal of the dies chills the steel up to the point *a* and causes here a crystallization of the metal, which prevents it from being homogeneous with the head. The result is, as before stated, that the heads of these cut steel nails crack off, so as to seriously affect their adoption by the public.

To remedy the above difficulties, the only change which I make in the dies is to cut away the metal of the same at their edges, making a curved tapered opening, *b c*, Fig. 3, at the side next to the head, which taper prevents the dies from coming in contact with the nail-blank for a space of about a quarter of an inch from the head. Then when the header swages the end of the blank to form the head, a twofold result is attained. In the first place the movement of the metal in forming the head changes. Instead of moving sharply at right angles to the body of the nail, as in Fig. 2, it crowds down into the tapered opening *b c* between the dies, moving more nearly in a line with the body of the nail, as shown by the arrows in Fig. 3, thereby bracing the angle between the head and body of the nail by the metal *a b c* forming a concave swelled neck whose fiber is more or less longitudinal with the body and merging into homogeneousness with both the head and body, so that no sharp angle of weakness is left. Furthermore, the body of the nail is not grasped by the dies for about a quarter of an inch from the head, and the hot metal blank is not crystallized (before being headed) by the contact of the dies close up to the head.

The nail formed by this construction of die

and mode of working has as much strength at the point between the head and body as at any other point, and even more, and the production of cut steel nails without any defect
5 is rendered at once simple and practicable with the machines already in use.

The advantages of my invention could also be made available with good effect in making iron nails.

10 With reference to the method or process of making the nail as herein described, and the particular construction of the dies for carrying out the same, I do not claim either of these in this case, but reserve the right to cover the
15 same in separate subsequent applications which I propose to make.

Having thus described my invention, what I claim as new is—

A cut steel nail having an overlapping head with a concave swell, *a b c*, of homogeneous metal between the body and the head,
20 substantially as and for the purpose described.

The above specification of my invention signed by me in the presence of two subscribing witnesses.

JOHN YOUNG.

Witnesses:

EDWD. W. BYRN,
SOLON C. KEMON.