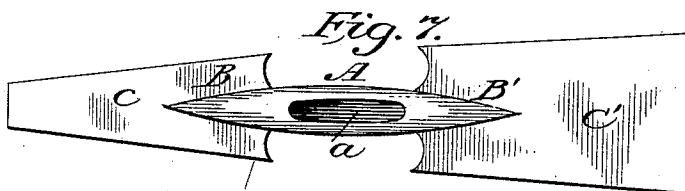
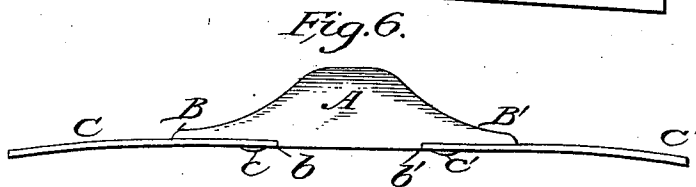
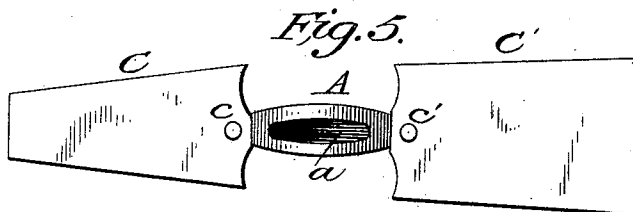
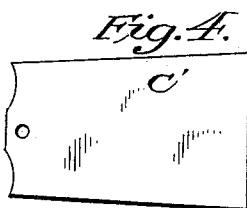
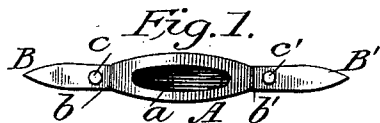


(No Model.)

F. M. BELDEN & M. F. CHRISTENSON.
HOE.

No. 464,489.

Patented Dec. 8, 1891.



Witnesses:

Jas. W. Croham.
Alex. Scott

Inventors.

Frank M. Belden
Martin F. Christenson.
by C. P. Humphrey atty.

UNITED STATES PATENT OFFICE.

FRANK M. BELDEN AND MARTIN F. CHRISTENSON, OF AKRON, OHIO.

HOE.

SPECIFICATION forming part of Letters Patent No. 464,489, dated December 8, 1891.

Application filed April 12, 1890. Renewed October 3, 1891. Serial No. 407,623. (No model.)

To all whom it may concern:

Be it known that we, FRANK M. BELDEN and MARTIN F. CHRISTENSON, citizens of the United States, residing at Akron, in the county of Summit and State of Ohio, have invented a certain new and useful Improved Hoe and Process of Manufacture, of which the following is a specification.

Our invention has relation to improvements in garden-hoes and to improvements in processes for making them; and it has for its objects the construction of an improved form of hoe, which shall combine a forged head welded to blades of rolled plate, and the development of a series of successive steps by which the hoe may be produced.

To the above objects our invention consists in certain novel successive operations and in the peculiar product of those operations, as hereinafter fully described, and then specifically pointed out in the claims, reference being had to the accompanying drawings forming a part of this specification.

In the accompanying drawings, in which similar letters of reference indicate like parts, Figure 1 is an under elevation of the forged head; Fig. 2, a longitudinal central section of the same. Figs. 3 and 4 show severally the rolled-plate blades; Fig. 5, an under elevation of the head with blades riveted thereto; Fig. 6, a side elevation of Fig. 5; Fig. 7, an under elevation of the completed hoe, and Fig. 8 a side elevation of the same.

The first step in our process is the construction of the head A. This head is of malleable metal, preferably steel, and which we produce in one operation by drop-forging. As first produced and as shown in Figs. 1 and 2, the head A has an elongated recess *a*, tapering ends B B' with abrupt shoulders *b b'*, and projecting studs C C' integral with the head. The blades C C', of the form shown in Figs. 3 and 4, are preferably of rolled-steel plate, and each has a perforation to receive

one of the studs *c c'*, and is shaped to rest against one of the shoulders *b b'*.

The second step in our process consists in placing the blades C C' on the head A, so that the studs *c c'* shall enter the orifices therein and their ends rest against the shoulders *b b'*, and riveting or upsetting the studs in said plates, as shown in Figs. 5 and 6.

As a third and final step in our process, the head and riveted plates are brought at their lines of union to a welding heat and placed between dies of a drop-hammer, which simultaneously weld the blades to the head and break through the bottom of the recess *a*, converting it into an eye for the reception of a handle, as shown in Figs. 7 and 8.

As to those skilled in the art, the form of dies used in the different steps of our process will be readily understood. As we make no claim thereon, no form of dies is shown.

We claim as our invention—

1. As an improved process for making garden-hoes, the following steps: drop-forging a head with a cup-shaped recess to form the eye, and studs integral with said head to constitute rivets for the blades, attaching perforated plates to said head by riveting the studs in said plates, reheating the whole, and then simultaneously welding the plates to the head and completing the eye by drop-forging, substantially as shown and described.

2. An improved hoe having a drop-forged head with an eye, tapering extensions having studs integral with said head, and rolled perforated metallic blades riveted by said studs and welded to said extensions by drop-forging, substantially as shown and described.

In testimony that we claim the above we hereunto set our hands.

FRANK M. BELDEN.

MARTIN F. CHRISTENSON.

In presence of—

C. P. HUMPHREY,

C. E. HUMPHREY.