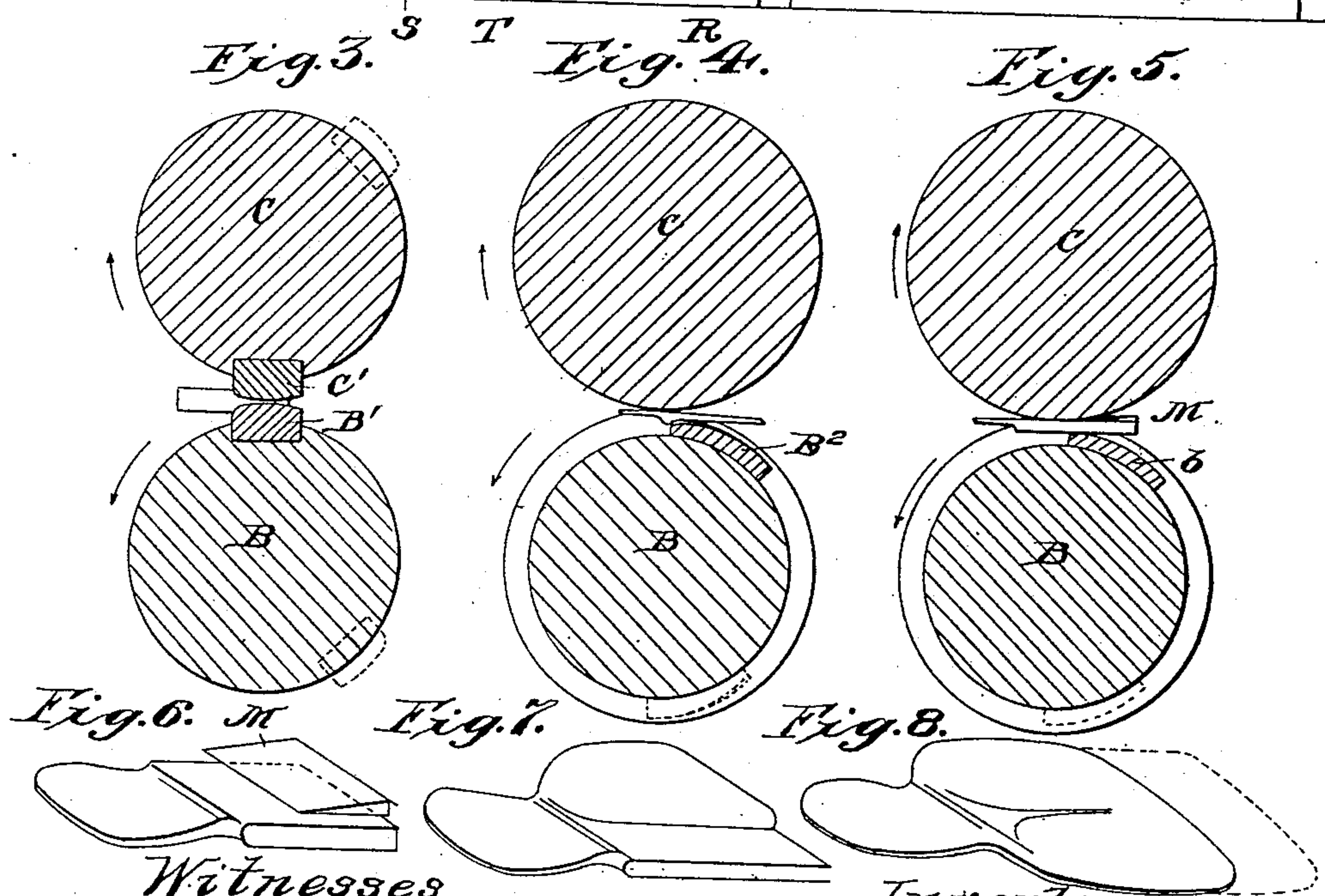
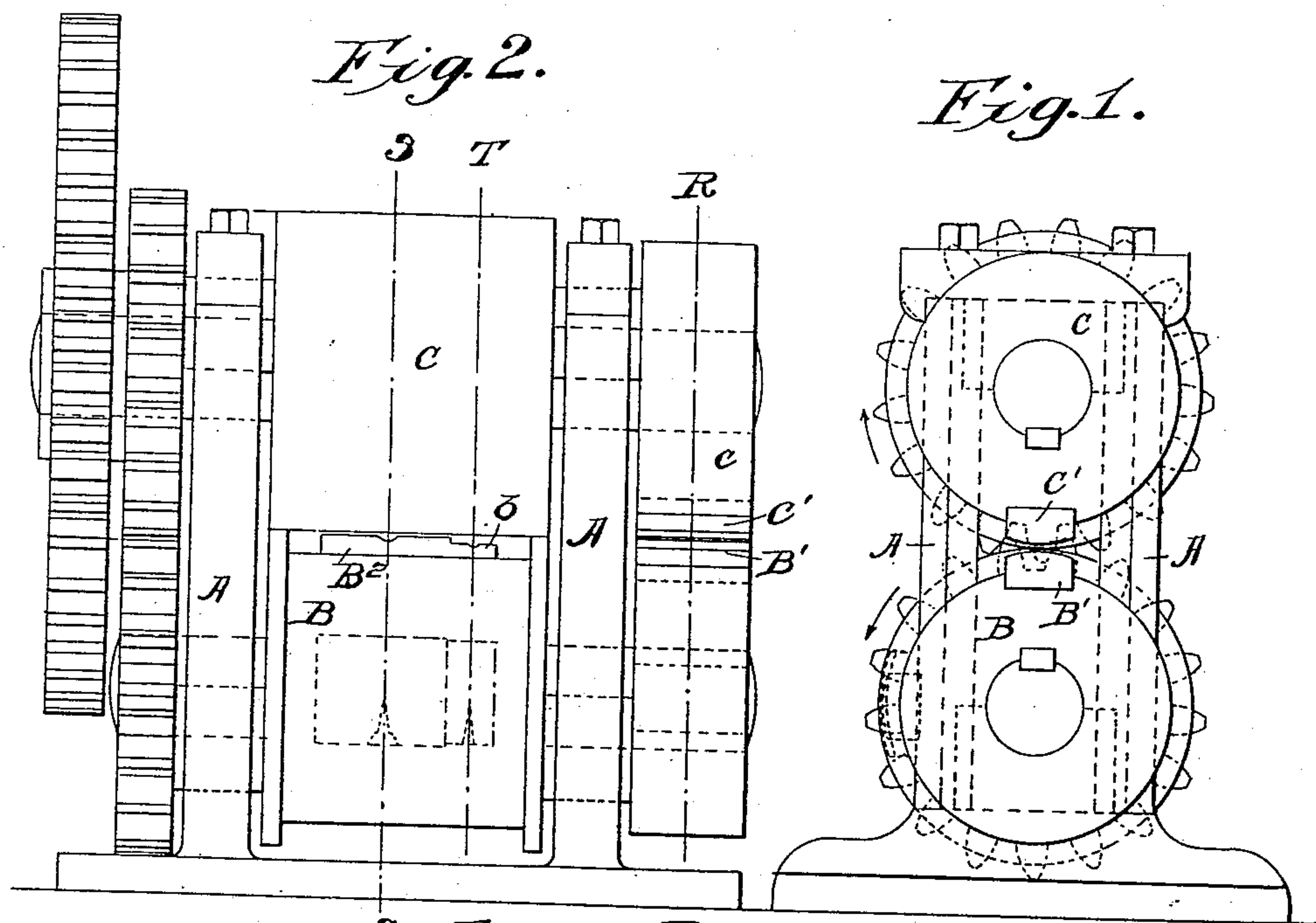


W. T. CLEMENT & E. V. FOSTER.
MACHINE FOR ROLLING HOE BLANKS.

No. 93,679.

Patented Aug. 17, 1869.



Witnesses
A. J. R. R. R.
S. J. R. R. R.

Inventor:
W. T. Clement
Edward V. Foster

United States Patent Office.

WILLIAM T. CLEMENT AND EDWARD V. FOSTER, OF NORTHAMPTON, MASSACHUSETTS.

Letters Patent No. 93,679, dated August 17, 1869; antedated August 4, 1869.

IMPROVED MACHINE FOR ROLLING HOE-BLANKS.

The Schedule referred to in these Letters Patent and making part of the same.

To all whom it may concern:

Be it known that we, WILLIAM T. CLEMENT and EDWARD V. FOSTER, both of Northampton, in the county of Hampshire, in the State of Massachusetts, have invented certain new and useful Improvements in Machines for the Manufacture of Hoes; and we do hereby declare that the following is a full and exact description thereof.

The hoes to which our invention relates are of the character generally known in the trade as planters' hoes.

The object of our invention is to facilitate the welding and drawing down, or forging of the several surfaces. Machines have been before employed for doing certain portions of this work, and our machine is intended to perform more of the labor, and to effect that more rapidly and perfectly. Certain portions of the machine are to be used at one period, and other parts at other periods.

We will first describe what we consider the best mode of carrying out our invention, and will afterward indicate specifically the points claimed as new.

The accompanying drawings form a part of this specification.

Figure 1 is an end view, and

Figure 2 is a front view of the machine.

Figure 3 is a transverse vertical section on the line R R.

Figure 4 is a corresponding section on the line S S.

Figure 5 is a corresponding section on the line T T.

Figures 6, 7, and 8, show the hoe-blank in different conditions.

Similar letters of reference indicate like parts in all the figures.

A is a stationary framing of cast-iron, firmly mounted on any suitable support.

B is a roll, supported in bearings in the framing A, geared, or otherwise connected with a steam-engine, or other motive-power, not represented.

C is an upper roll, mounted in the same frame, and connected by stout spur-gears, as represented, with the roll B, so that the two shall turn together.

B¹ is a projection on an overhanging portion of the roll B, and C¹ is a corresponding projection on the corresponding overhanging portion of the roll C.

Within the framing A is a flat projection, b, on the roll B.

By the side of this projection is a grooved projection, B².

These projections are faced with steel, and are accurately shaped, to give the proper form to the metal which is placed between them.

The rolls B and C are accurately adjusted at a

proper distance apart to compress the metal between these projections, B¹ and C¹, to exactly the right thickness for the blade of the hoe.

Assuming our blank to have had the material for the eye previously drawn down, or contracted in thickness by the aid of a trip-hammer, or other means, not necessary to describe, the first operation is to weld on the steel, which is to form the face or working-portion of the edge.

M is a face of steel, previously forged or worked in the form represented, and cut off in proper lengths.

On heating the blank and the steel, and coating the surface of one or both with borax, or other flux, the steel is laid upon the iron, and both are introduced together between the rollers C and B. A period is selected for thus inserting the blank and the steel, when the projection b, on the roller B, is in the position indicated in red outlines in fig. 5. When, by the revolution of the rollers, the projection b is brought into contact with the hoe-blank, as shown in black outline, it commences to compress the steel upon the iron, and, at the same time, to move the iron and steel forward toward the operator, a movement which is not resisted by the operator, and the two metals are soon thrown out, perfectly welded together, and reduced to a uniform thickness. This operation is performed almost instantaneously, and without the loss of much heat.

In operating with the thinning and widening-portion of our machine, indicated by B¹ and C¹, the metal, which is to form the blade of the hoe, is heated to a bright heat, and is held by the attendant, as indicated in fig. 3. It is so applied while the projections B¹ and C¹ are in or near the positions indicated by the red outlines. The revolution of the rollers B and C brings the projections B¹ and C¹ into contact with the iron in the position indicated in black outline, commencing to act near the middle of the bar of iron, and compressing it from thence outward, toward one edge. The single operation now described has the effect to thin and widen one side of the blank.

The blank is now dexterously turned over, and its other edge applied to the machine, and the next revolution of the rolls seizes it again near the middle, and thins and widens the other side of the blank.

Fig. 6 shows the blank in the form in which it is first introduced into the machine;

Fig. 7 shows it after it has been subjected to one operation, and with one side thinned and widened; while

Fig. 8 shows it after it has been subjected to the succeeding operation, and the other side thinned and widened.

It now approximates to the form of the blade of a hoe, being thin generally, but having a ridge along its centre, which is not so much thinned. This ridge must be carefully preserved during all the subsequent stages, for it forms the well-known strengthening-rib or web of the hoe.

The object of the next operation, which is performed in another part of the machine, is to lengthen the blank. In order to do this the blank must be held the other way in the rolls, that is, at right angles to the position in which it was held when it was being drawn in the direction of its width.

B^2 is a projection firmly fixed on the roll B, at the point represented. It projects sufficiently to come nearly in contact with the plain cylindrical surface of the roll C, except along a line in which the ridge, above referred to, is to be received. To accommodate this ridge, a corresponding groove is formed, as indicated, the groove being deep on the front edge of the projection, and diminishing to nothing therefrom.

To operate this portion of our invention, the blank, or partially-formed hoe, is reheated, if necessary, in order to obtain the proper temperature. It is then dexterously thrust in between the rolls B and C, and held as indicated in fig. 4.

The period selected for thus thrusting in the metal is when the projection B^2 is at or near the position indicated in red outline. When the revolution of the rolls has brought the projection into the position indicated in black outline, the blank is powerfully seized between the projection B^2 and the roll C, and is carried forward toward the operator (a movement to which he opposes little resistance,) and the blank is rapidly rolled through its whole length and properly extended. If a single operation should not effect this to the satisfaction of the operator, he again thrusts it in.

The dotted outline in fig. 8 indicates the form of the blank, when it has been subjected to the final operation of this machinery. The subsequent operations are performed by hand, or by other machinery.

It is not absolutely necessary that the widening-

dies B^1 C' be overhung. We can accomplish the work with the bearings and housings outside of the said dies, but they are more in the way in that position.

It must be remarked that it is an important feature of our invention that the dies b B^1 C' B^2 are all so formed as to give a taper to the thickness of the blank, which is worked thereby. It is necessary to leave the edge of the hoe thin, and to taper it gradually backward, so as to give a thickness about twice as great at the back as that near the edge. It is difficult to make this feature properly apparent in small drawings, because the wedge, or volute form of the surface, if represented sufficiently great to be apparent, would be much greater than is actually allowable. We have indicated in red outline the positions of the surfaces so exaggerated.

Having now fully described our invention,

What we claim as new, and desire to secure by Letters Patent, is as follows:

1. We claim, in combination with revolving rolls B C, the construction of the projecting dies B^1 C' , together with their arrangement on the projecting or overhanging portions of the revolving rolls, as described, said dies being adapted for spreading the blanks laterally in the manner described.

2. We claim, in combination with revolving rolls B C, the construction of the projecting dies B^2 b , together with their arrangement on the revolving rolls, as described, said dies being adapted for drawing the blank, and giving form to the central rib on the surface of the hoe, in the manner described.

3. We claim the combination and arrangement of the dies, B^1 , C' , B^2 , and b , on the continuously-revolving rolls B C, to form a machine adapted to perform all the several operations required simultaneously or successively, substantially as herein set forth.

WM. T. CLEMENT.
EDWARD V. FOSTER.

Witnesses:

C. A. MAYNARD,
W. R. HOLLIDAY