

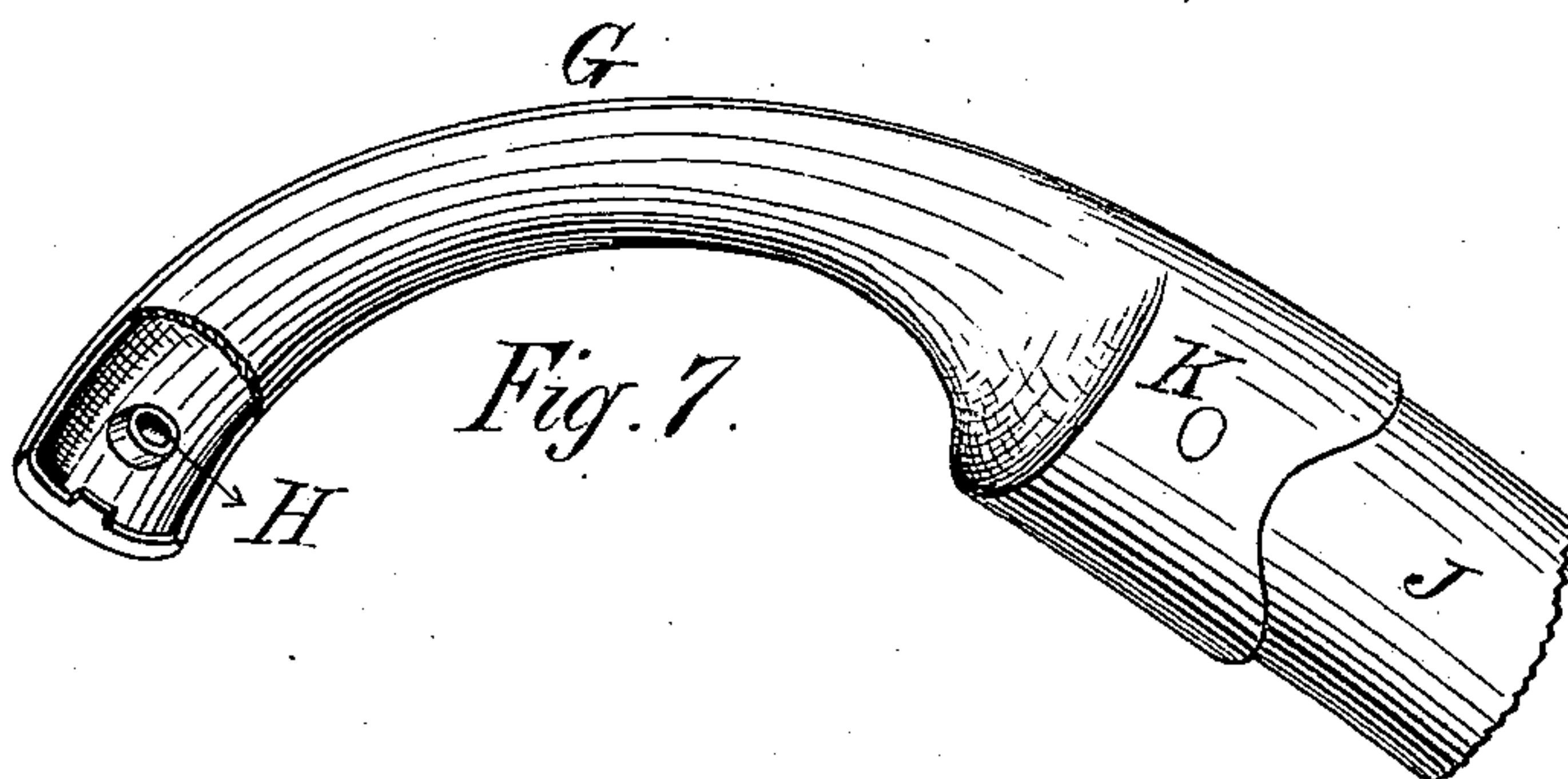
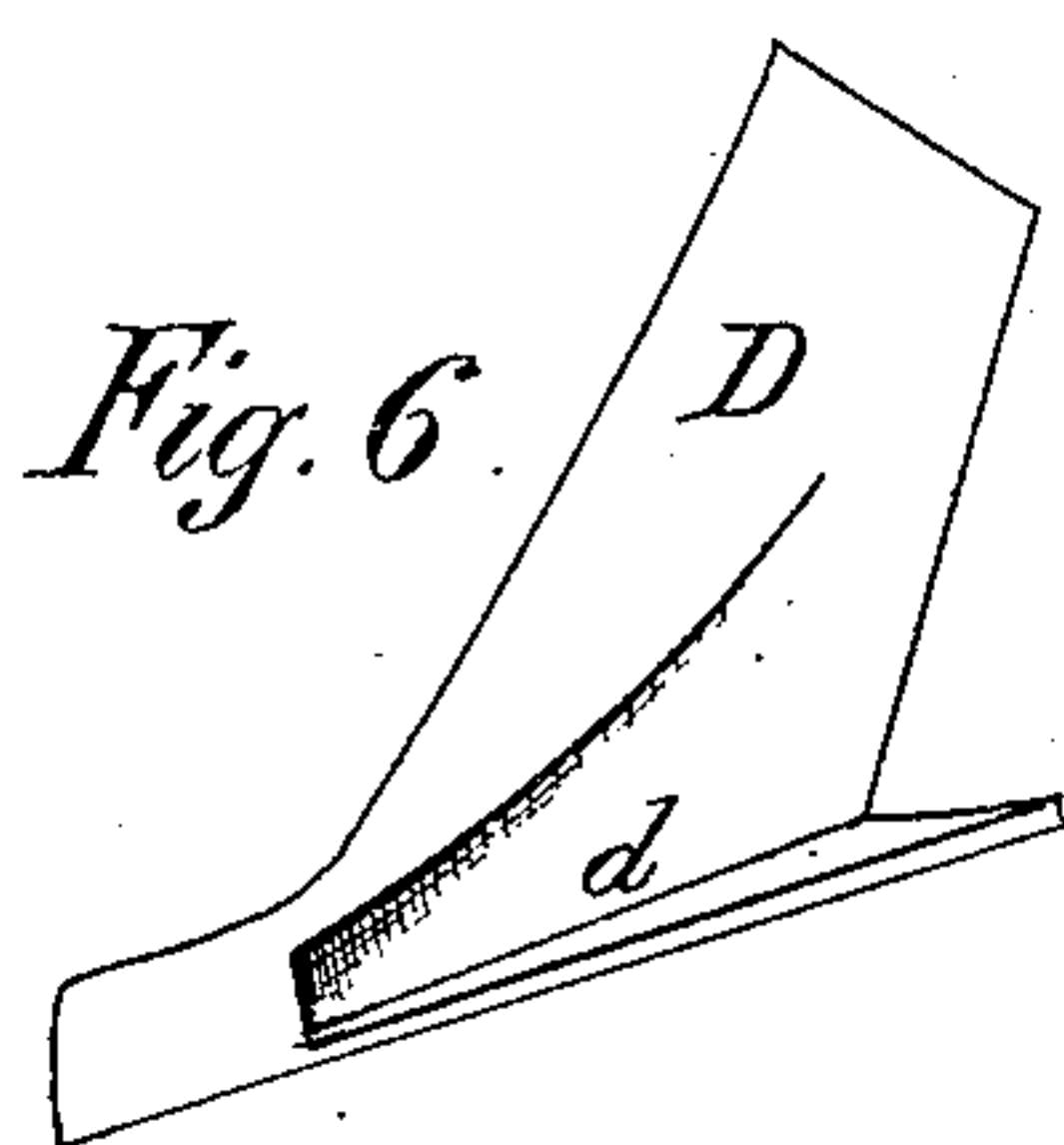
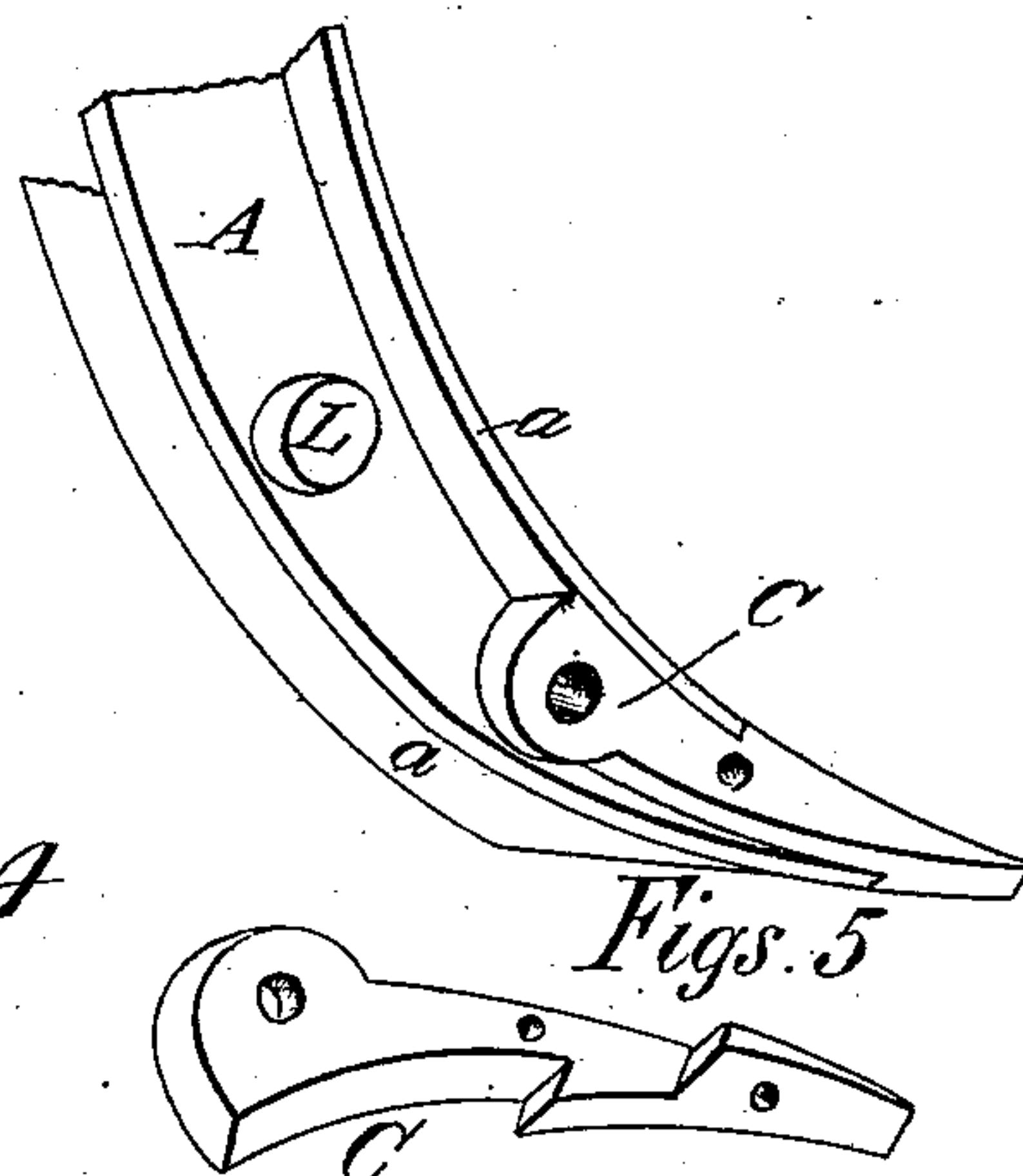
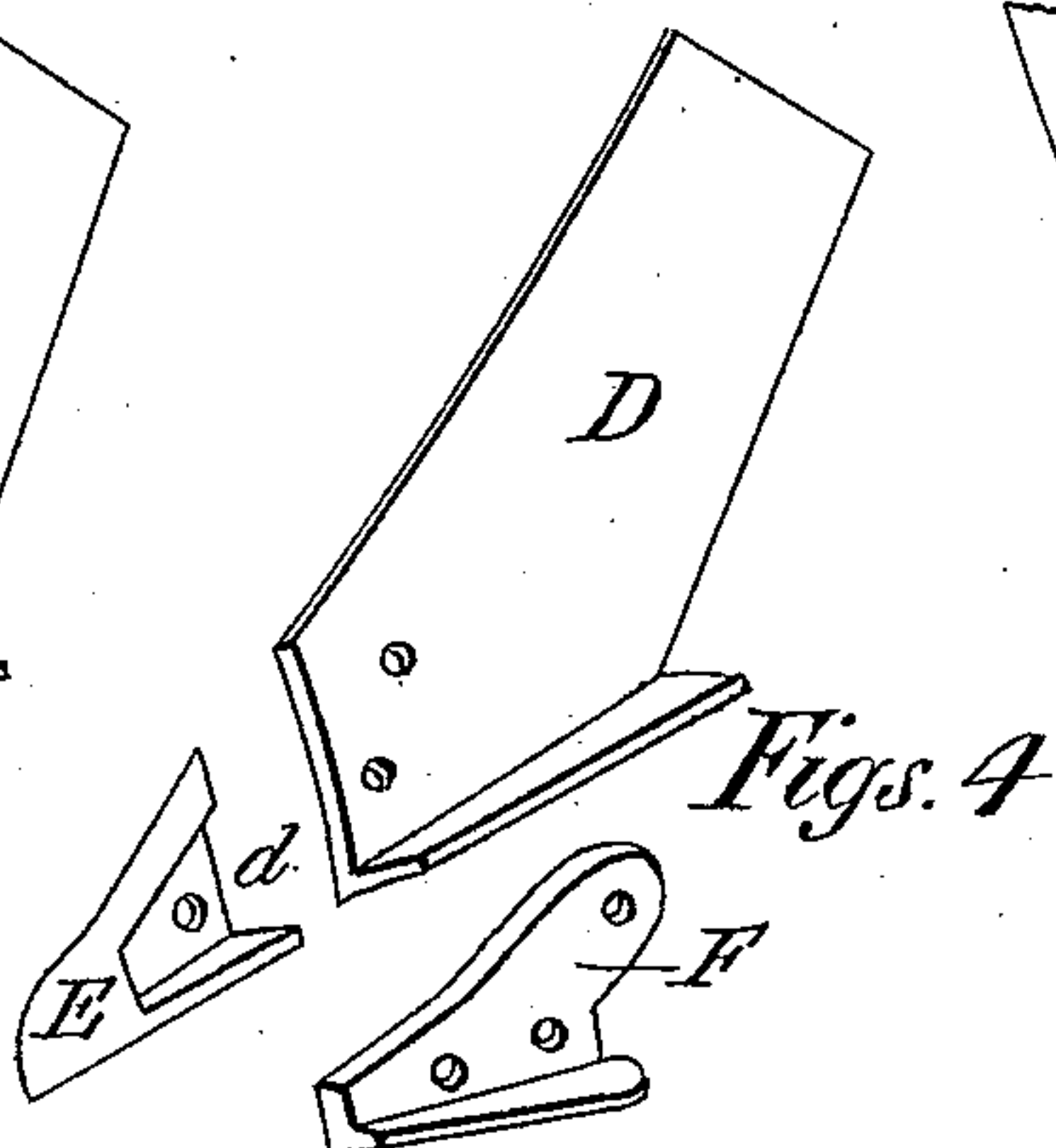
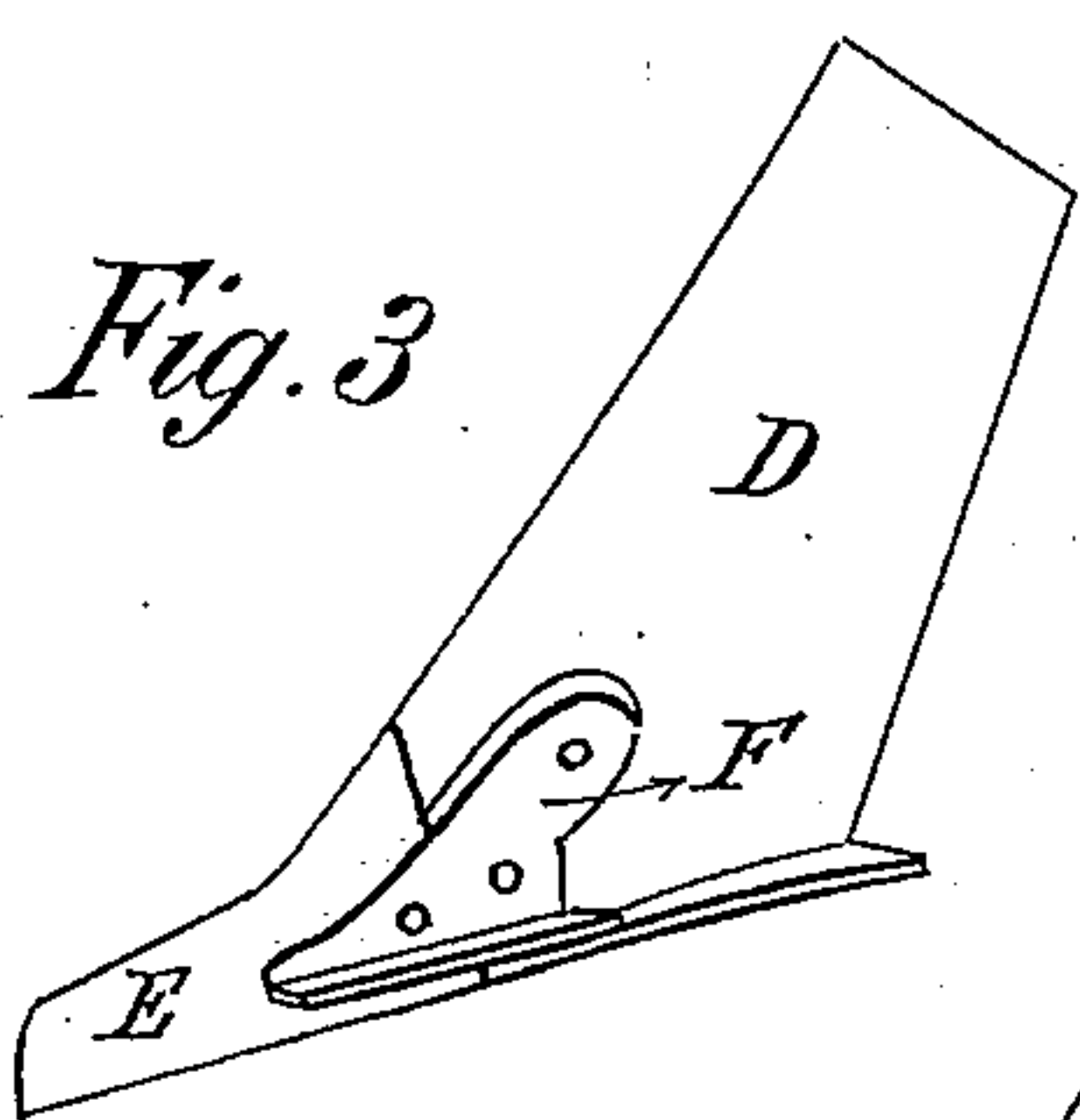
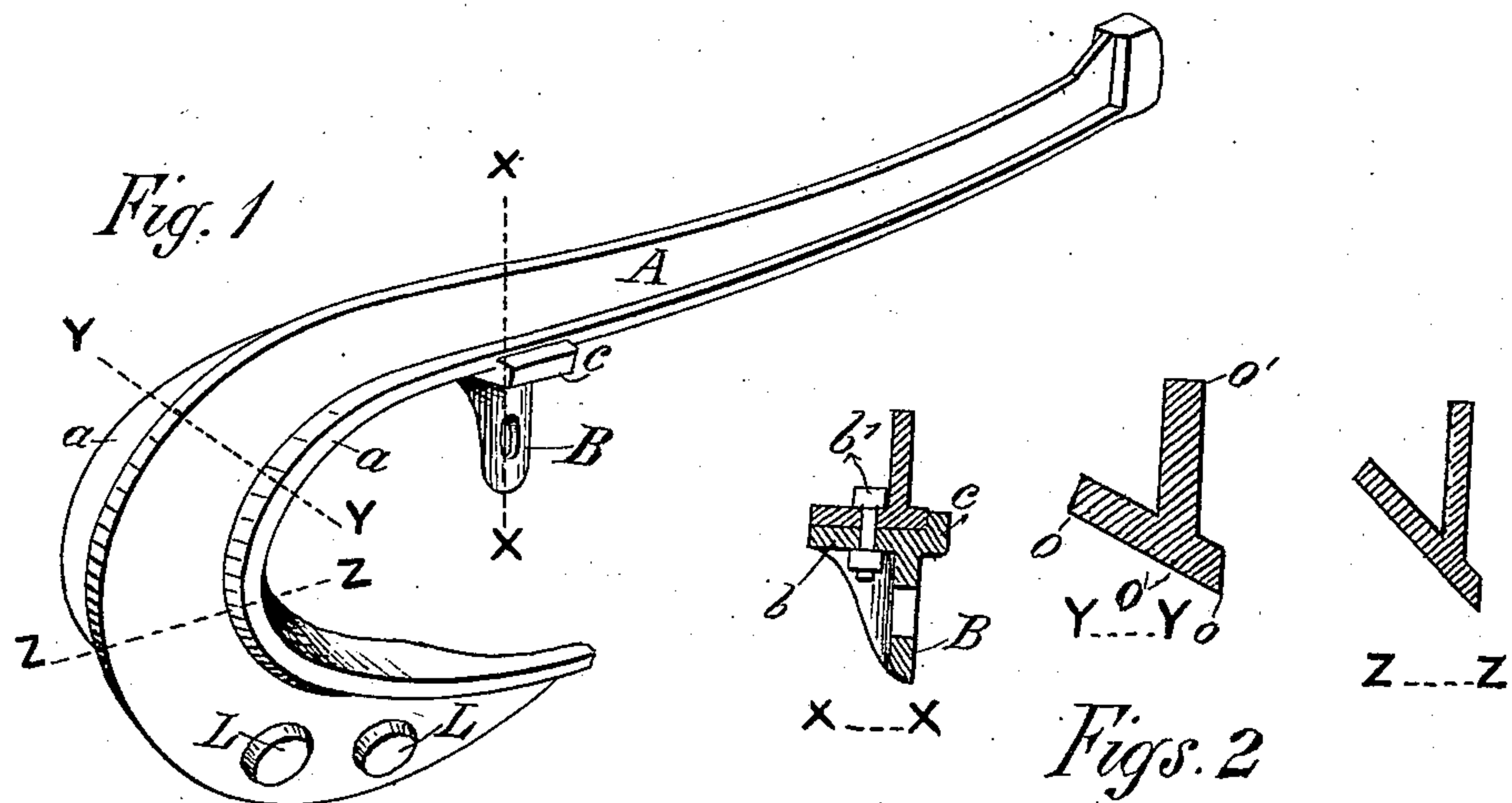
(No Model.)

W. J. BALL.

PLOW.

No. 306,895.

Patented Oct. 21, 1884.



Witnesses  
John H. Sponseller  
Clemente Meyer.

Warren J. Ball. Inventor  
Per Fred W. Bond Attorney.



# UNITED STATES PATENT OFFICE.

WARREN J. BALL, OF CANTON, OHIO.

## PLOW.

SPECIFICATION forming part of Letters Patent No. 306,895, dated October 21, 1884.

Application filed May 3, 1884. (No model.)

*To all whom it may concern:*

Be it known that I, WARREN J. BALL, of Canton, in the county of Stark and State of Ohio, have invented certain new and useful Improvements in Plows; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the annexed drawings, making a part of this specification, and to the letters and figures of reference marked thereon, in which—

Figure 1 is a perspective view of beam, showing colter or jointer arm attached. Figs. 2 are transverse sections on lines  $x x$ ,  $y y$ , and  $z z$ , Fig. 1. Fig. 3 is an under side view of share, showing its different parts attached. Fig. 4 is a view of share, showing parts detached. Fig. 5 is a view of the lower portion of beam or standard and connecting-bar. Fig. 6 is an underside view of share as formed in one piece. Fig. 7 is a side view of hand-hold for the handles, showing the rear part of one of the pieces cut away.

The present invention has relation to the general construction of plows; and its nature consists in providing a beam substantially of the form shown in the drawings, and in providing a share constructed as shown, and in providing a peculiarly-formed connecting-bar, and in the several parts and combination of parts hereinafter described, and pointed out in the claims.

Similar letters of reference indicate corresponding parts in the drawings.

In the accompanying drawings, A represents the beam, which is provided with the strengthening-flanges  $a a$ , said flanges being of equal thickness and equal distance in cross-section at any point within the limits of said beam. This beam is peculiarly formed in outline and cross-section, the object of which is to obtain the greatest amount of strength with the least possible weight.

I am aware that metal plow-beams have heretofore been made with double flange and web, and as the greatest strain is on the lower or under side of a beam that flange is made heavier, in consequence of which, in the cooling of the casting, the contraction will be the greatest where the greatest volume of metal is, thus producing a tensile strain on lower flange before being attached to the plow. By

forming the flanges  $a a$  and the other part of the beam of uniform thickness in cross-section, the contraction will be equal throughout, thus leaving the beam full strength of the iron or metal. To obtain tensile and lateral strength, together with base for attaching the colter or jointer arm, the under side of the beam is made wide.

In constructing the beam as above described it will be very rigid, yet at the same time will admit of considerable vibration under an unusual strain, thereby preventing breakage. This result is obtained by equal contraction and equal distance from O to O and O' to O' at any cross-section. It will be seen that the greatest strain will be where the sharpest curve is located; hence the beam should be formed heavier at that point, the cross-section remaining uniform and the distances the same.

The colter or jointer arm B is substantially of the form shown in Fig. 1 and the transverse section  $x x$ , Fig. 2, the top or upper part of which is provided with the shoulder  $b$ , which fits the beam A, as seen in the drawings, said arm being firmly held in proper position by the clamping-bolt  $b'$ . The colter or jointer arm is also provided with the flange  $e$ , which is for the purpose of more easily adjusting said arm to the beam, and at the same time assisting in holding said arm in proper position.

The connecting-bar C is substantially of the form shown in Fig. 5, and is attached to the beam or standard by suitable clamping-bolts, in case the beam or standard is made of cast-iron or steel. If the beam or standard is made of malleable or wrought iron, said bar may be cast or forged to it. This connecting-bar C is used in connecting the small cast-metal point E when the share is made of cast-iron.

The share D, when made of steel, is of the form shown in Figs. 3 and 4, and is provided with the small point E. Said small point E is provided with the dovetail groove or recess  $d$  on its under side, and is for the purpose of fitting over the bar F, as seen in Fig. 3, and also over the point of the connecting-bar C in case the small point is attached to said connecting-bar C.

The bar F is substantially of the form shown in the drawings, and is firmly held to the share



D and the point E by suitable clamping-bolts, and is for the purpose of holding said parts together.

The object of providing the small point E is to furnish at a small expense a point which is easily adjusted, and at the same time well adapted for the purpose designed.

The form of the share shown in Fig. 6 is cast in one piece, and may be used on any plow having a dovetail portion on beam past a standard to correspond with dovetail recess or groove *d* in said share, and will be more rigidly held in all directions than when attached by an ordinary short groove. In case the beam or standard is made of malleable or wrought iron, the share is then attached to said beam or standard, in which case the connecting-bar C is not used separately, but is cast or forged on the beam or standard, and becomes a part thereof.

The lower portion of the beam A is provided with the projections or bosses L, (best seen in Fig. 1,) which are for the purpose of bringing the landside of the plow flush with the landside-flange *a*. In case the connecting-bar C is used, but one of the projections or bosses L is used, as seen in Fig. 5, said connecting-bar taking the place of one of said projections.

The hand-hold G is substantially of the form shown in Fig. 7, and is formed in two pieces or halves, said parts being held together by bolts. The rear portion of the hand-hold G is provided with the hollow projections H, and are formed of such a length as to meet each other when the pieces or halves are placed in proper position, and are for the purpose of preventing breakage in bolting said pieces together. The rear end of the handle J is placed in the hand-hold G, as shown in Fig. 7, and securely held by the bolt K.

It will be seen that by forming the hand-hold of cast-iron or other suitable metal I am enabled to provide a hand-hold for plows that will not become splintered or get out of shape by the weather, and at the same time the handles J can be formed straight, which will save bending, and at the same time can be more easily finished by machinery, the forward ends of the handles being attached to the plow proper in the ordinary manner.

Having now fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The beam composed of the central web, A, and side flanges, *a*, each flange being of a uniform width in proportion to the web throughout its length, and the beam of such dimensions in cross-section that the distance through the flanges from side to side at any point within its limit will be the same as the distance through the web from top to bottom at the same point, so that the dimensions of the beam either way at any such point will be the same in cross-section, substantially as described.

2. The point E, formed with recess *d*, and the share D, connected together by a separate bar fitting in the recess *d*, substantially as described.

3. The connecting-bar C, formed substantially as shown and described, for the purposes set forth.

In testimony that I claim the above I have hereunto subscribed my name in presence of two witnesses.

WARREN J. BALL.

Witnesses:

WILLIAM H. METZGER,  
FRED W. BOND.