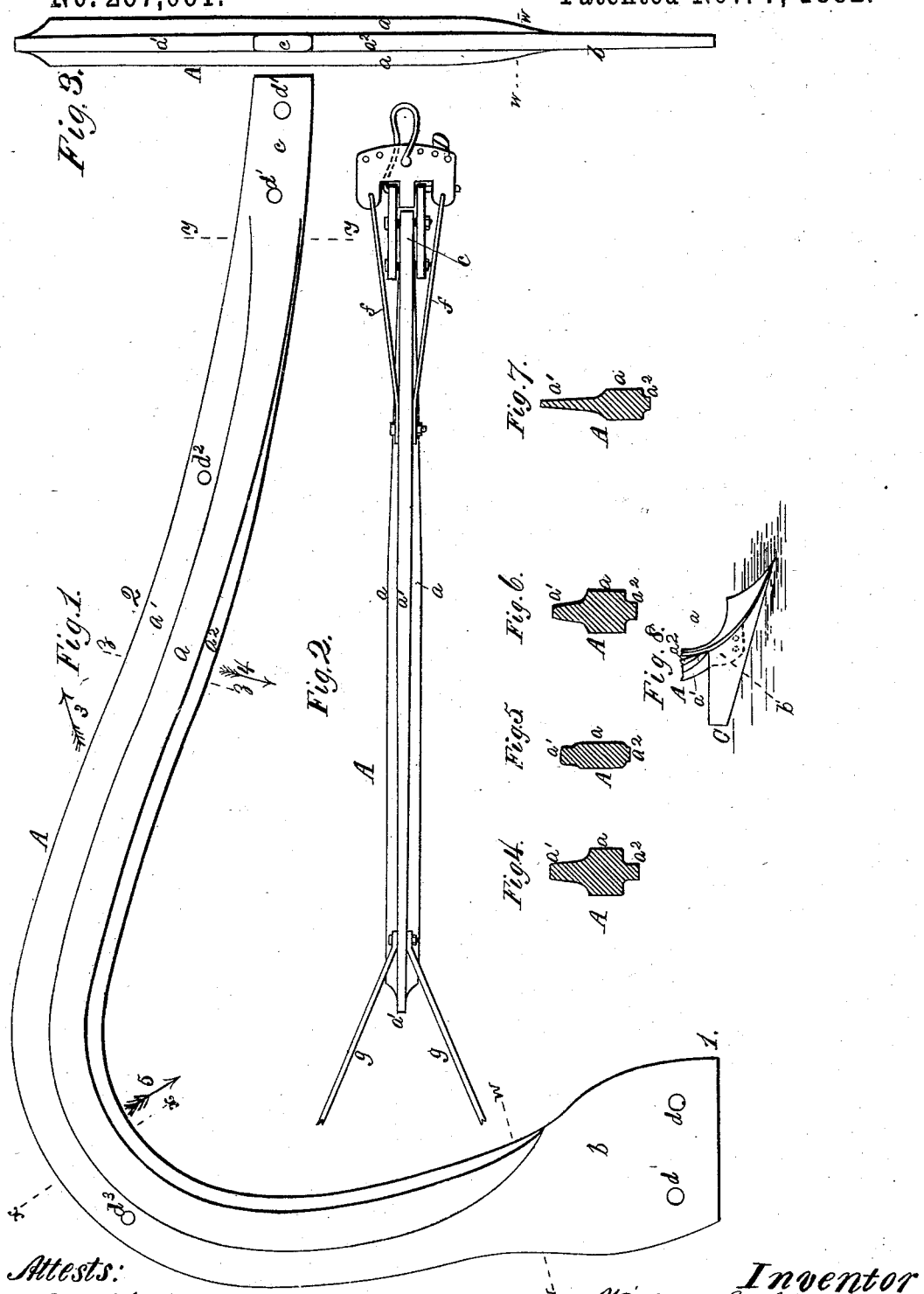
(No Model.)

W. C. CHAMBERLAIN.

PLOW BEAM.

No. 267,061. Patented Nov. 7, 1882.



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WILLIAM C. CHAMBERLAIN, OF DUBUQUE, IOWA.

PLOW-BEAM.

SPECIFICATION forming part of Letters Patent No. 267,061, dated November 7, 1882.

Application filed June 22, 1882. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM C. CHAMBERLAIN, a citizen of the United States, residing in the city and county of Dubuque, and State of Iowa, have invented a new and useful Improvement in Plow-Beams, of which the following is a specification.

My invention relates to wrought-metal beams for plows, especially such as are made of steel; and the object of the same is to produce a beam of such a form and distribution of metal as will afford the maximum strength with the greatest lightness, and at the same time be of symmetrical proportions throughout.

In the accompanying drawings, Figure 1 is a side elevation of my improved plow-beam; Fig. 2, a top view of the same with handle-braces, clevis-braces, and a clevis applied to it. Fig. 3 is a front elevation of the plow-beam shown in Fig. 1. Fig. 4 is a cross-section of the beam in the line *x x* of Fig. 1. Fig. 5 is a similar section in the line *y y* of Fig. 1. Fig. 6 is a similar section in the line *z z* of Fig. 1. Fig. 7 is a similar section in the line *w w* of Fig. 1; and Fig. 8 is a land-side view of a plow and a portion of my improved beam, showing the landside-bar fastened to the foot of the beam.

The beam A, as shown in the drawings, is formed with a thick portion, *a*, and an upper thin portion, *a'*, and a lower thin portion, a^2. The portion *a* is gradually increased in thickness from the point *y y* to about the point *z z*, it being quite thin comparatively at *y y*, as illustrated by the section, Fig. 5, taken on said line *y y*. Then it continues, with about an equal thickness, from the point *z z* to near the point *w w*, when it gradually diminishes in thickness, as illustrated by the section, Fig. 7, taken in the line *w w*. The sections Figs. 4 and 6, taken respectively in the lines *x x* and *z z*, show the thicker and stronger portions of the beam. The upper thin portion, *a'*, of the beam is, in rear of the point *y y*, about twice the width vertically of the lower thin portion, a^2, and where it terminates to form the plow-attaching foot portion *b* it increases beyond this in width, as illustrated by the section, Fig. 7, taken in the line *w w*. It will be observed that the lower thin portion begins at almost nothing near the front end of the beam and gradually increases in width vertically, and begins only to diminish at the point where the plow-attaching foot portion is formed. At this point the two portions *a'* and a^2 unite into one below the thick portion *a* and form the plow-attaching foot portion *b*, which is broader than any other part of the beam. At the front end of the beam the two portions *a'* and a^2 unite into one forward of the thick portion *a* and form a clevis-attaching portion, *c*. In the foot portion *b* and clevis portion *c* holes *d d'*, for receiving rivets or fastening-bolts, are provided, and in the wider thin portion *a'* similar holes, d^2 d^3, for a like purpose, are formed.

In Fig. 8 the manner in which the landside-bar C of the plow is fastened to the foot portion *b* is shown, the foot portion and its fastening-rivets, passed through the holes *d*, being indicated in dotted lines inside of the landside.

In Fig. 2 a clevis, D, is shown fastened to the portion *c*, the bolts being passed through the holes *d'*, and two braces, *f*, are shown, leading from the clevis to the hole d^2, bolted to the upper thin portion, *a'*, of the beam by bolts passed through said hole d^2, and in the same figure of the drawings two braces, *g*, such as are usually employed between the beam and the handles, are shown fastened to the upper thin portion, *a'*, of the beam by a bolt passed through the hole *d*. From the drawings it will be seen that the thin portions *a'* and a^2 are central in a vertical plane of the thick portion *a*—that is, there is an equal amount of metal on each side of the vertical longitudinal center of the beam; also, that these thin portions are of nearly uniform thickness throughout the entire length of the thick portion *a*, there being a slight drawing or thinning down of the metal from near the point *z z* to the lower extremity of the foot *b*, while the thickness is maintained or slightly increased from near the point *z z* to the front extremity of the portion *c*.

The beam A may be produced by either rolling, swaging, or drawing, or in any well-known practical way of treating wrought-iron or steel for like purposes.

To produce my beam a bar of metal of uniform thickness, and of proper width and thickness to form a given-sized beam which shall have, when finished, the thick portion *a* and thin portions *a'* and a^2, is rolled, swaged, or drawn, so as to increase its original width and reduce its thickness, either throughout or, as shown at *a'* and a^2, outside of the portion *a*,

the upper thin portion, a', being about twice the width of the lower thin portion, a^2. The thick portion a is also rolled, swaged, or drawn down toward the part c on a gradual taper from near the point $z\,z$ to the point $y\,y$. This operation upon the bar makes it in the form of an inverted cross—that is, the transverse branches of the cross at all points being nearer the bottom than the top vertical portion, as shown more clearly in Figs. 4, 5, 6, and 7.

In any construction of my beam it is essential that both of the thin portions a' a^2 be retained, and that the upper thin portion be about twice as wide as the lower thin portion, and while this essential feature is retained the thin portions might be of uniform thickness from near $y\,y$ to near $w\,w$, and the thick portion a might be of nearly a uniform thickness from $w\,w$ to $y\,y$. I, however, believe that the beam, with its portions $a\,a'\,a^2$, formed as shown and described, will answer a better purpose than any other which may be adopted, because this construction and form gives a very symmetrical proportion and the best distribution of metal, as regards strength and lightness, from a small amount of material.

My improved beam is the result of observation and experience in the use of beams. The desideratum in metal plows is to have a beam of the greatest possible lightness and cheapness of construction with the necessary strength. The distribution of metal in the beam as shown by me meets very nearly, if not quite, the object sought. The principal strength required in a beam is from the points 1 to 2, and the greatest strain is undoubtedly in the direction of the arrow 3, while a very great strain is also in the direction of the arrows 4 and 5, and there is also considerable strain in lateral directions, all of which strains, it will be seen by those familiar with the forms adopted in metal for giving strength with lightness, are well provided for in my beam by the peculiar distribution and form of the metal, while at the same time it affords great strength as a whole beam, especially when made of steel, which is used in all metal beams now constructed by me.

As a modification of my invention the thick portion a of the beam might be divided, so as to form two or more strong ribs; but in such construction the thin portion a' must be about double the width of the thin portion a^2.

In some constructions of plows a single brace, g, and a single brace, f, may be adopted in place of pairs of such braces, as shown, without departing from my invention.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. A wrought-metal beam, A, constructed with the thick portion a and thin portions a' a^2, substantially as described.

2. In a metal beam, A, the combination of the thin portion a', thick portion a, thin portion a^2, and widened foot b, substantially as and for the purpose described.

3. A metal beam comprising the thick portion a, thin portions a' and a^2, which latter are terminated in the clevis-attaching portion c and the plow-attaching portion b, and the metal forming the entire beam formed and proportioned substantially as and for the purpose described.

4. The combination, with the beam having the thick portion a, thin portions a' a^2, and the portions b c, of the plow-handle braces g, substantially as and for the purpose described.

5. The combination, with the beam having the thick portion a, thin portions a' a^2, and the portions b c, of the clevis D and clevis-brace f, which latter is attached at d^2 to the thin portion a', at a point above the thick portion a, while the clevis is attached at d' to the thin portion c, substantially as and for the purpose described.

6. A wrought-metal beam in its cross-section having the form of an inverted cross, or with its short lateral arms or branches nearer the bottom than the top of the beam, substantially as and for the purpose described.

WILLIAM C. CHAMBERLAIN.

Witnesses:
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