

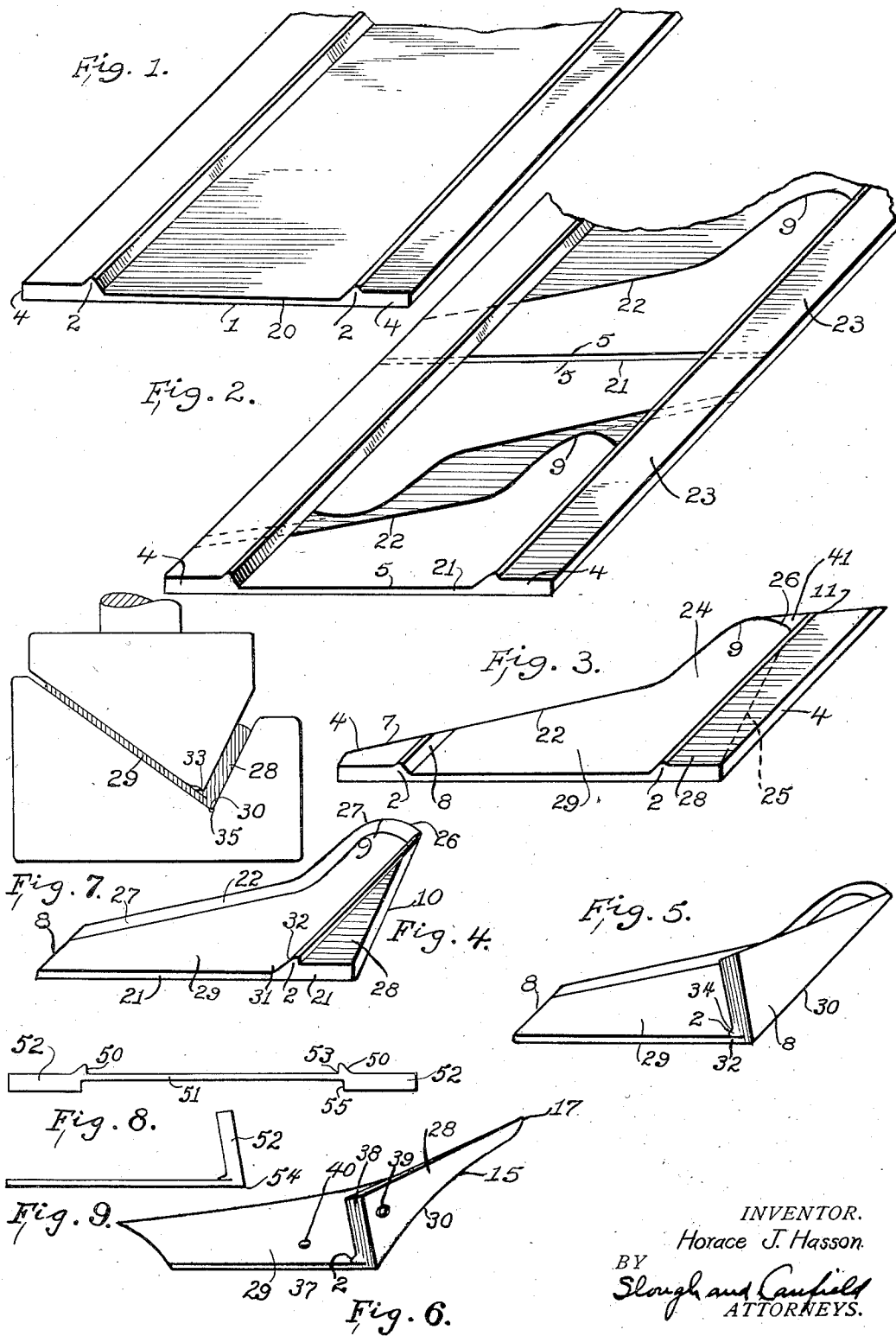
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METHOD OF MAKING PLOWSHARES

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METHOD OF MAKING PLOWSHARES

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This invention relates to plow shares and the methods and means for making the same.

Heretofore plow shares have been made by various processes such as by casting the share in one piece, forming it from a number of pieces cut from steel bars or sheets and welded together, etc.

Various attempts have been made to produce a share from a single piece of steel by cutting and bending and pressing operations but such processes and the shares resulting therefrom have not been successful. One of the reasons has been that it is desirable, in a plow share, to have a relatively sharp edge at the juncture of the wing and the landside of the share and this has been difficult if not impossible to obtain in a share made from a single blank of sheet metal without unduly weakening the share at this edge.

Furthermore, for various reasons it is desirable that the landside of the share shall be thicker than the wing of the share and this again has been difficult if not impossible to attain from a blank of uniform thickness.

It is an object of this invention to provide an improved plow share.

Another object is to provide an improved one-piece plow share.

Another object is to provide an improved one-piece plow share having a wing of one thickness and a landside of a greater thickness.

Another object is to provide an improved method and means for making plow shares.

Another object is to provide a method and means for making an improved one-piece steel or like plow share.

Another object is to provide an improved method of making a plow share having a landside of greater thickness than the wing.

Another object is to provide an improved metal blank for fabrication into a plow share.

Another object is to provide an improved bar or sheet bar adapted to be produced by a mill rolling operation, and which may conveniently be cut into blanks for fabrication into plow shares.

Other objects will be apparent to those skilled in the art to which my invention appertains.

My invention is fully disclosed in the following description taken in connection with the accompanying drawing, in which:

Fig. 1 illustrates a bar or sheet bar of metal which I may employ in the manufacture of plow shares according to my invention;

Fig. 2 is a view illustrating a method of laying

out upon the bar of Fig. 1, blanks to be used in my improved share-making process;

Figs. 3, 4 and 5 illustrate successive steps of operation in connection with the blanks cut from the bar as indicated in Fig. 2;

Fig. 6 illustrates a completed share made according to my invention;

Fig. 7 is a simplified view illustrating a share-forming die which I may employ;

Fig. 8 is a view illustrating a modified form of bar or sheet bar which I may employ, the view illustrating a modification of the bar shown in Fig. 1;

Fig. 9 is a view illustrating a share made from a blank cut from the bar of Fig. 8.

Referring to the drawing, I have shown at 1 a bar or sheet in a preferred form thereof suitable for use as the material for fabricating plow shares according to my invention. Such a bar may be produced in a steel rolling mill by well known machinery; and inasmuch as bars of almost any shape can be so rolled, it is believed unnecessary herein to illustrate or describe such means. The desired characteristics of the bar described below are believed to be sufficient to enable any mill roll designer skilled in the art to produce the rolls for rolling the bar.

The bar preferably comprises an intermediate portion 20 of a thickness corresponding to the desired thickness of the share wing to be made. Laterally of the thin intermediate portion 20 extending along each of the parallel edges of the sheet bar are relatively thick portions 4—4 of thickness suitable for forming the landside of the share to be made.

Between each thick portion 4 and intermediate portion 1 is an upstanding bead 2—2, the bead joining the intermediate portion with each of the thickened portions. The thickened portions 4—4 are preferably of the same width for a purpose 40 which will become clear hereafter.

Inasmuch as the only processes to be performed upon the bar in making a plow share are cutting and forging operations, no welding being necessary, the material of the bar may be any preferred material particularly adapted to resist the wear of shares in use; and thus the shares of my invention are not limited to weldable or other materials. High carbon steel or manganese steel or other hard wear resisting steel may be employed for the material of the bars.

In Fig. 2 I have illustrated a preferred method of laying out plow share blanks to be cut from the bar 1. In the blank form, the plow share comprises, as shown in Fig. 4, an edge 21 which

is to abut upon the mold board and landside of the plow proper, a wing-tip edge 8, a wing cutting edge 22, a point edge 9 and a landside bottom edge 10. In laying out blanks of this form on the bar (see Fig. 2), diagonal lines 5—5 are drawn across the bar representing the edges 21—21 of the share blanks and diagonal to the length of the bar and parallel to each other. The bar is then cut into diagonal pieces 23 each of sufficient size for two share blanks.

The piece 23 is then split into pieces or blanks 24, one of which is shown in Fig. 3, the split cut being made along a line 22 continued in the direction away from the point edge 9 through the corresponding thickened portion 4 as at 7, Fig. 3, and the split cut in the direction of the point 9 continuing on through the other thickened portion 4 as at 11, Fig. 3. Two such blanks 24 are made from each piece 23 and are identical as will now be understood, the identity arising from the parallelism of the beads 2—2 and the equal width of the thickened portions 4.

The blank of Fig. 3 is then reduced to the form of Fig. 4. This is done by cutting off the bead 2 and thickened portion 4 in the left-hand portion of Fig. 3 along the line 8 at the base of the bead to form the wing tip; and by cutting the thickened portion at the right of the blank of Fig. 3 along a diagonal line 25 and finishing the point edge 9 by a round cut at 26 indicated in Fig. 3.

The blank of Fig. 4 is then heated in a furnace and by means of suitable hammers or pressing dies, the edges 22 and 9 are sharpened by a beveling operation indicated at 27. The beveled blank is then heated again and placed in a die of a press or hammer and bent to the form of Fig. 5. This operation bends the thick landside portion of the blank indicated at 28 from the plane parallel to the wing portion 29 into a position at an angle thereto as plainly shown in Fig. 5. This angle is usually less than 90°. This operation furthermore is performed with great pressure or with a powerful blow or successive blows in a hammer employing a die such as illustrated in Fig. 7 and thereby the metal at the juncture of the landside portion 28 and the wing portion 29 is pressed outwardly to form a relatively sharp edge 30. The bend of the blank is, by the shape of the die and the disposition of the blank therein, caused to occur substantially at the base of the bead 2, for example as at 31, Fig. 4; so that the inner side 32 of the bead 2 is brought into engagement with the adjacent surface of the wing 29 as shown in Fig. 5.

The bead in its bent-over position as illustrated in Fig. 5 provides a ledge or shoulder 34 upon which the corresponding edge, for example the edge 33 Fig. 7 of the hammer or press, may push or strike to force the material of the landside portion 28 into the sharp recess 35 of the die to form the sharp edge 30.

Without the shoulder 34 and bead 2, it will be apparent that the edge 33 of the die would exert largely a mere wedging action between the two parts 28 and 29 of the share and would tend to spread and weaken the juncture of these parts whereas by means of the bead and its shoulder, the two parts are firmly hammered together and the relatively sharp edge 30 is produced.

After the share has been formed as in Fig. 5, it may be placed in a final forming die of well known pattern commonly employed with shares in which the landside portion is welded upon the wing portion to bend the wing and the edge 30

outwardly concavely to the well known share shape.

The share of Fig. 6 may be finished by fit cuts along the upper edge 37 of the wing and the rear edge 38 of the landside and by providing suitable holes 39 and 40 for attaching bolts, to attach the share to the plow saddle in the usual manner.

In cases where it is desired to apply a lay to the share point, it may be welded thereon in the usual manner; or, if preferred, the small triangular portion 41, Fig. 3, may be retained on the point of the share instead of trimming it off along the line 26, and it may be folded under the point of the share and meshed down into suitable shape and serve as a lay.

In the process of rolling the bar or sheet bar of Fig. 1, a manufacturer's name, trade-mark or other indicia may be rolled in or on the bar in a repeating line so that each complete share will bear at least one of said marks thus avoiding the inconvenience and expense of applying the mark individually to completed shares as has heretofore been necessary.

In Fig. 8 I have illustrated a modification of bar or sheet bar which may be rolled for making plow shares according to my invention. In this form, the relatively thin intermediate portion 51 has beads 50—50 and thickened portions 52—52 at opposite edge portions of the bar but the bead is on one side and the thickened portion is offset on the opposite side. When the share is cut therefrom and bent to dispose the landside at the proper angle to the wing portion, as illustrated in Fig. 9, the bend may occur generally along the line indicated at 53 in Fig. 8 and the parts will be disposed somewhat as illustrated in Fig. 9. The share may then be press-formed or hammered in a suitable die as above described to force the metal of the thickened portion 52 into a sharp edge or corner as indicated at 54 in Fig. 9, the blow in this modification also being applied upon the bead 50.

In this form, by forming the thickened portion 52 with a relatively sharp edge 55, when the thickened portion 52 is bent upward to form the landside as in Fig. 9, the edge 55 is thereby rotated into the general locality of the edge 54 of the share to be and thus the forming of the share edge 54 is greatly facilitated.

It will be observed that in the bars of Figs. 1 and 8, the entire bar is relatively thin and is disposed generally in a plane and thus the splitting operation by which it is cut into two share units, and the cutting of share blanks from these units can be performed with cutting and/or shearing machines of conventional design.

By providing a bar having two thickened portions, one along each edge, the shares can be laid out thereon as indicated in Fig. 2 in alternate arrangement; that is to say, in two adjacent blanks laid out on the bar, the landside portion for one blank is taken from the thickened portion at one edge of the bar and the landside portion from the other blank from the other edge of the bar. Thus an economical use of material is possible, the waste being very small.

While as described hereinbefore I prefer to cut blanks from an elongated bar so formed that the blanks comprise a wing portion and a landside portion, the former relatively wide and thin and the latter relatively narrow and thick, it will be apparent that blanks of identically the same form may be provided, not by cutting them from a bar, but by forming the blanks by drop-forging or

hammering methods. In such instances, a suitable blank of steel may be heated and hammered or pressed in suitable forging dies to give to it the form of the herein-described blank as cut from the bar; and such a forged blank may be then bent to dispose the landside portion at the desired angle to the wing portion and the rest of the method may be that described hereinbefore for blanks cut from a bar.

Thus it will be seen that the gist of my invention resides in the formation of a blank generally flat comprising a thin wing portion and a thick landside portion and then bending the blanks to dispose the landside portion at an angle to the wing portion, and my invention therefore is not limited to the exact means illustrated and described for forming the blanks.

Otherwise my invention is not limited to the exact details of construction shown and described.

Many modifications may be made within the scope and spirit of my invention without sacrificing its advantages.

I claim:

1. The method of making a plow share which includes forming a bar of steel or like hard metal to have a wide thin portion adjacent a narrow thick portion with an elevated bead portion therebetween, cutting a blank from the bar of the general form of an integral share wing and share landside with the wing formed from the thin portion and the landside formed from the thick portion, bending the blank to dispose the landside at an angle to the wing and with the bead portion within the apex of the angle, and die-forming an outer portion of the landside into a relatively sharp longitudinally extending edge by application of pressure upon the bead portion.

2. The method of making a plow share which includes forming a substantially flat bar of steel or like hard metal to have relatively narrow thick portions along opposite edges thereof and an intermediate integral portion relatively thin and wide and an elevated bead portion of greatest thickness between the thin portion and each adjacent thick portion, cutting blanks from the bar each of the general form of an integral share wing and share landside, with the relatively thin portion in the wing and the relatively thick portion in the landside, and with the bead portion between the wing and landside portions, bending the blanks at the juncture of the thick and thin portions to dispose the landside at an angle to the wing with the bead portion within the apex of the angle, placing the bent blank in a die and, die-forming an outer portion of the landside into a relatively sharp longitudinally extending edge, by pressure applied upon the bead portion.

3. The method of making a plow share which includes forming a substantially flat blank of

the general form of an integral share wing and share landside with an elevated bead intermediate thereof, bending the blank to dispose the landside at an angle to the wing with the bead inwardly of the apex of the angle, placing the bent blank in a die and die-forming an outer portion of the landside into a relatively sharp longitudinal edge portion by pressure applied upon the bead, and press-forming the wing and landside into the shape of a finished plow share.

4. A substantially flat bar for use in the fabrication of plow shares comprising relatively thick and relatively narrow generally parallel portions adjacent opposite edges of the bar and an intermediate relatively thin relatively wide portion therebetween, and a parallel elevated bead portion on one face of the bar between each thickened portion and the intermediate portion.

5. A substantially flat bar for use in the fabrication of plow shares comprising a relatively thick relatively narrow longitudinally extending bar portion of the general transverse dimensions of a plow share landside and an adjacent integral relatively thin relatively wide longitudinally extending bar portion of the general transverse dimensions of a plow share wing, and a longitudinally extending upstanding bead providing an intermediately disposed portion of greatest thickness.

6. A substantially flat bar for use in the fabrication of plow shares comprising a relatively thick relatively narrow longitudinally extending bar portion of the general transverse dimensions of a plow share landside and an adjacent integral relatively thin relatively wide longitudinally extending bar portion of the general transverse dimensions of a plow share wing, and a longitudinally extending elevated bead portion between the two said thick and thin portions of the bar.

7. The method of making plow shares which includes providing a substantially flat bar comprising relatively thick and relatively narrow generally parallel portions adjacent opposite edges of the bar, and an intermediate relatively thin wide portion therebetween and an elevated bead portion between the thin portion and each adjacent thick portion, cutting the bar transversely at spaced points to provide blanks therefrom of the general form of an integral share wing and landside portion, bending the blanks at the juncture of the thick and thin portions to dispose the landside at an angle to the wing with the bead portion within the apex of the angle, and die-forming an outer portion of the landside into a relatively sharp longitudinal edge portion, by pressure applied on the bead portion.

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