May 17, 1960 C. L. OLVEY 2,937,046

SHOVEL

Filed Feb. 4, 1957

FIG-1

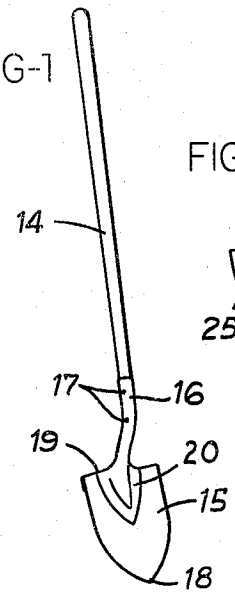


FIG-5

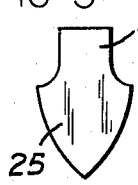


FIG-6

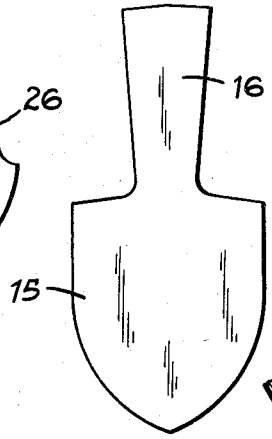


FIG-7

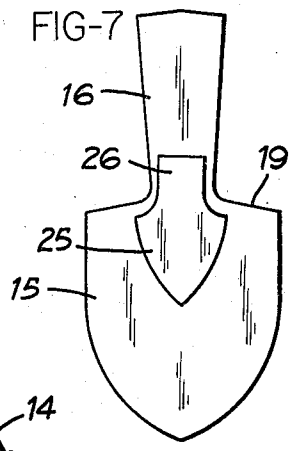


FIG-2

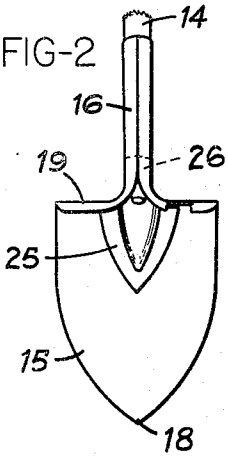


FIG-3

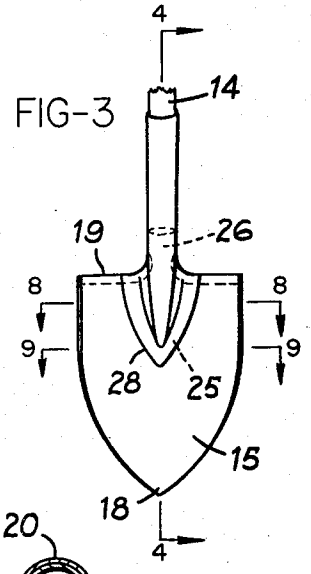


FIG-4

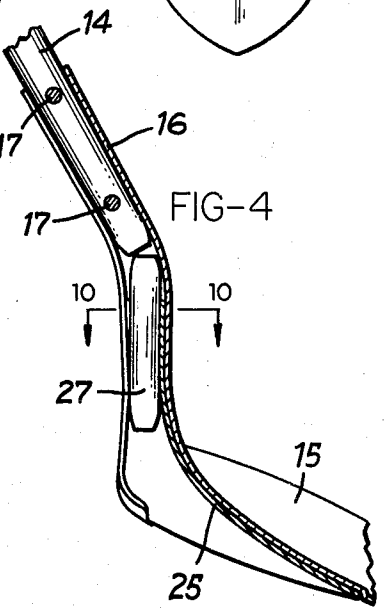


FIG-8

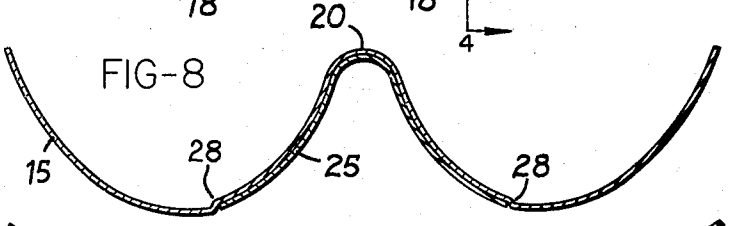


FIG-10

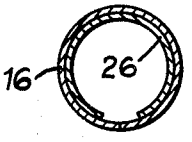
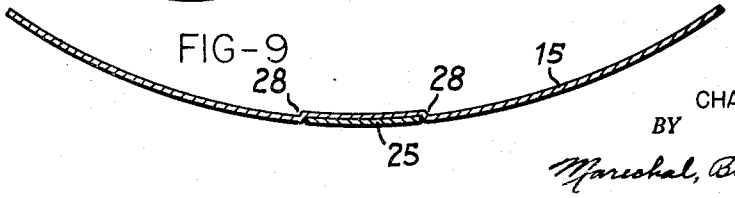


FIG-9



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SHOVEL

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5 Claims. (Cl. 294—49)

This invention relates to shovels and, more particularly, to a unitary blade for a shovel having a reinforcing member embedded therein.

In shovels of the character to which this invention relates, it may be desired that the shovel blade be of varying thicknesses at different points thereon. For example, it may be desired that the point or working edge of the shovel blade be relatively thin while the upper part of the blade adjacent the handle receiving socket be relatively thicker to withstand the extra strains and forces to which it is subjected, and it may be desired that the top edge of the shovel blade be even thicker since it is frequently used as a step or forcing edge by the person using the shovel.

Conventionally such shovel blades have been made by rolling and forming the blade from a metal blank of tapering cross-section, but the formation of such a blank itself and the rolling and forming operations applied thereto are relatively expensive.

According to the invention, however, a shovel blade is formed from starting materials such as ordinary sheet steel, and reinforcing members are affixed to and embedded in the flat blank to provide the desired extra strength and thickness in the various portions noted of the shovel blade.

It is an object of this invention to provide a shovel blade of the character described from a flat blank and having originally separate reinforcing members affixed to and embedded in the shovel blade adjacent to the handle receiving socket in areas where the blade is subjected to concentrated stress.

Another object of this invention is to provide a shovel blade of the character described having a reinforcing member at the back of the blade and extending up into the handle receiving socket thereof for added strength in the areas where the handle socket joins the blade.

Still another object of this invention is to provide a shovel blade construction of the character described in which a socket reinforcing member and a step reinforcing member are provided integral with the finished blade by simple forming operations and without the neceessity of the hot or cold rolling of the steel blank.

Other objects and advantages of this invention will be apparent from the following description, the accompanying drawing, and the append claims.

In the drawing—

Fig. 1 is a perspective view of a shovel embodying this invention;

Fig. 2 is a detailed view of a somewhat larger scale of the rear of a finished shovel blade embodying this invention;

Fig. 3 is a view similar to Fig. 2 of the front of a shovel blade embodying this invention;

Fig. 4 is a fragmentary view on a larger scale of a longitudinal section along the line 4—4 of Fig. 3;

Fig. 5 is a plan view of a reinforcing member according to this invention;

Fig. 6 is a plan view of a shovel blade blank according to this invention prior to a forming operation thereon;

Fig. 7 is a plan view of a shovel blade blank and a reinforcing member in assembled condition according to this invention and prior to being formed into a shovel blade;

Fig. 8 is a transverse section along the line 8—8 of Fig. 3;

Fig. 9 is a transverse section along the line 9—9 of Fig. 3; and

Fig. 10 is a transverse section along the line 10—10 of Fig. 4.

In the drawing, in which like reference characters designate like parts throughout the several views thereof, a completed shovel is shown having a handle **14** and a blade **15**. Handle **14** is received in a socket portion **16** integrally formed with blade **15** as appears hereinafter, and is held in the socket by a plurality of bolts or rivets **17** running transversely through the handle **14** and socket **16**.

Blade **15** has a working edge or point indicated at **18** and a top substantially flat transverse step edge **19** to which the foot of one using the shovel may be applied to force the shovel into the ground. A forwardly raised generally shield-shaped throat area **20** is formed in blade **15** and is that portion of the shovel where the handle receiving socket joins the working area of the blade.

At the rear or bottom-most side of the blade **15**, a generally shield-shaped reinforcing member **25** is affixed to and embedded into the blade **15** during the forming thereof as more particularly appears in Figs. 8 and 9. Reinforcing member **25** carries an extension **26** which reaches a short way up into the handle receiving socket **16** for added reinforcement of the socket beyond blade **15**. Also, in the particular construction shown as illustrative of this invention, a short wooden dowel **27** is shown inserted for added strength into the lower bending portion of socket **16** beyond the end of handle **14** therein.

As illustrative of a method of manufacturing a shovel embodying this invention, a shovel blank of sheet steel is stamped out substantially in the form shown in Fig. 6, and a second blank for the formation of reinforcement **25** is stamped out generally in the form shown in Fig. 5. It should be noted that both of these blank pieces are flat and of uniform thickness and are simply and economically produced from regular sheet steel without the necessity of rolling or forging operations on the steel or otherwise altering or controlling or working the original blank to produce a blank of vraying thickness.

After stamping out the blanks, the reinforcing blank is positioned upon one surface of and attached, as by seam welding, to the shovel blank as indicated in Fig. 7. Thereafter the assembled blanks in the form shown in Fig. 7 are subjected to a simple forming operation as in a metal forming press or the like in which the blade portions **15**, throat portions **25**, and socket portions **16** of the assembled blanks are given the shapes and configurations indicated in, for example, Figs. 2–4 and 8–10. Thus the blade portion is given the transverse and longitudinal shovel shape indicated in Figs. 4, 8, and 9; the edge portions **19** are folded over to make a double-thick reinforced step edge as indicated in Fig. 2; and the socket portion **16** is formed into a socket having a generally circular cross-section as indicated in Fig. 10.

During these forming operations the reinforcing member **25** is embedded or pressed into the rear of blade **15** as indicated in Figs. 8 and 9. Such forming of the blade **15** around and over reinforcement **25**, to produce a raised edge area indicated at **28**, enhances the reinforcing action of member **25** not only by forming it into the back of blade **15** to produce a connection stronger than the original seam welding, but also by what appears to be some

cold welding bonding between adjacent surfaces of reinforcement 25 and blade 15 during the pressing or forming operation. As the socket portions 16 of the blank are formed into the desired circular cross-section, the extension 26 on reinforcing member 25 is also formed circularly within socket 16, as indicated particularly in Figs. 4 and 10, to provide added strength and thickness for reinforcement at the point of greatest concentration of strain where the handle socket 16 meets the blade 15.

Accordingly, it will be seen that this invention provides a shovel construction in which added thickness and reinforcement is supplied to the shovel blade at the points of greatest stress and particularly where the handle receiving socket joins the blade. Also, this reinforcement provides, in the finished shovel, a unitary construction with intimate permanent embedding or joining of the reinforcing member with the shovel blade and socket, not only by welding, but by actually forming or pressing the two together, and additional thickness and reinforcement is provided at the step edges 19 by folding over the corresponding edge of the blank to provide not only a double thick step but also a locking formation completely surrounding the top edge of the shield shaped reinforcement 25. As such, a stronger bond and greater reinforcing action is obtained then if the reinforcement were merely welded or otherwise affixed to the back of the already formed shovel after forming the shovel, or if the reinforcing member were merely an extension of or integral with the backside of the handle socket.

Furthermore, forming a shovel according to this invention is accomplished merely by a simple forming operation and requires neither a blank of varying thickness to be rolled or forged nor a socket of several pieces to be assembled after the shovel is formed. It should also be noted that the application of reinforcing member 25 to the back surface of blade 15 eliminates a sharp edge or juncture on the working front surface of blade 15, and embedding reinforcement 25 in the back of blade 15 not only provides rounded edges 28 on the working face of the shovel but also eliminates a raised juncture or seam protruding from the back face of the shovel.

While the forms of apparatus herein described constitute a preferred embodiment of the invention, it is to be understood that the invention is not limited to these precise methods or forms of apparatus, and that changes may be made therein without departing from the scope of the invention which is defined in the appended claims.

What is claimed is:

1. A reinforced shovel construction of the character described comprising a blade portion of substantially uniform thickness, a handle receiving socket portion integral with said blade portion, a reinforcing member embedded in the back of said blade portion at the juncture of said socket and blade portions and in reinforcing contact with said blade portion substantially throughout the entire area of said reinforcing member, and an extension on said reinforcing member extending into said socket portion for a substantial distance beyond the edge of said blade portion.

2. A reinforced shovel construction of the character described comprising a blade portion of substantially uniform thickness, a handle receiving socket portion integral with said blade portion, a shield-shaped reinforcing member affixed to and embedded in the back of said blade portion adjacent the juncture of said socket and blade portions and in reinforcing contact with the back of said blade portion substantially throughout the entire area of said reinforcing member, an extension on said reinforcing member extending into said socket portion for a substantial distance beyond the edge of said blade portion, and a reinforced top edge on said blade portion on each side of said socket portion.

3. A reinforced shovel construction of the character described comprising a blade portion of substantially uniform thickness, a handle receiving socket portion formed integrally with said blade portion, a reinforcing member embedded in the back of said blade portion adjacent the juncture of said socket and blade portions and in reinforcing contact with the back of said blade portion substantially throughout the entire area of said reinforcing member, and a reinforced top edge on said blade portion on each side of said socket portion.

4. A shovel construction of the character described comprising a blade portion, a handle receiving socket portion integral with said blade portion, said blade and socket portions being formed of a single piece of metal of substantially constant thickness, one edge of said blade portion being turned over on itself forming a double thickness step, and a reinforcing member affixed to and embedded in one surface of said blade portion adjacent said turned over edge and the juncture between said blade and socket portions and in reinforcing contact with the back of said blade portion substantially throughout the entire area of said reinforcing member.

5. A shovel construction of the character described comprising a blade portion, a handle receiving socket portion of generally circular cross-section and integral with said blade portion, said blade and socket portions being formed of a single piece of metal of substantially constant thickness, one edge of said blade portion being turned over on itself forming a double thickness step, a reinforcing member affixed to and embedded in one surface of said blade portion adjacent said turned over edge and the juncture between said blade and socket portions and in reinforcing contact with the back of said blade portion substantially throughout the entire area of said reinforcing member, and a socket reinforcing member integral with said blade reinforcing member and extending into said socket for a substantial distance beyond said turned over edge of said blade portion.

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