March 16, 1943. E. J. ARMSTRONG 2,313,858

SELF-LOCKING TOOL SHANK

Filed Feb. 13, 1941

FIG. 1.

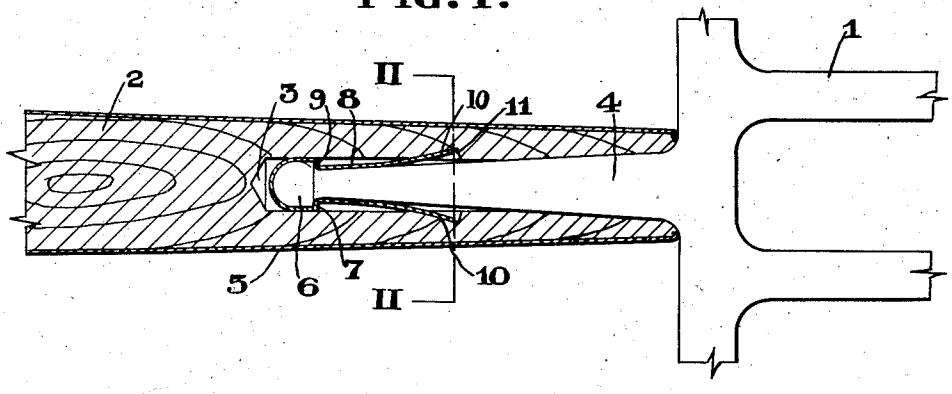


FIG. 2.

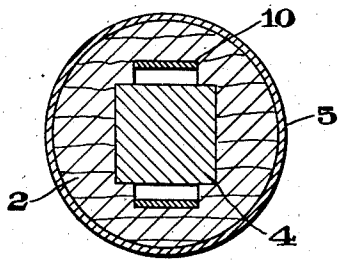


FIG. 3.

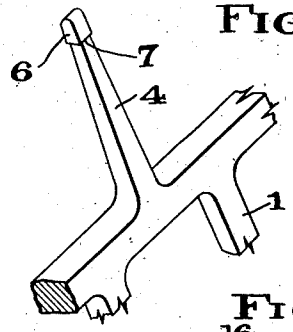


FIG. 6.

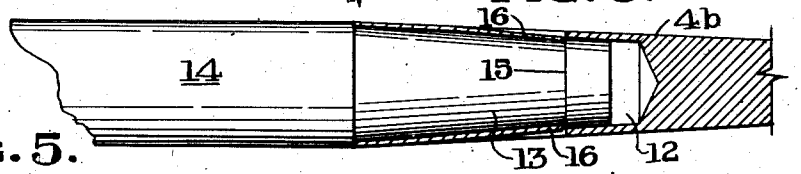


FIG. 5.

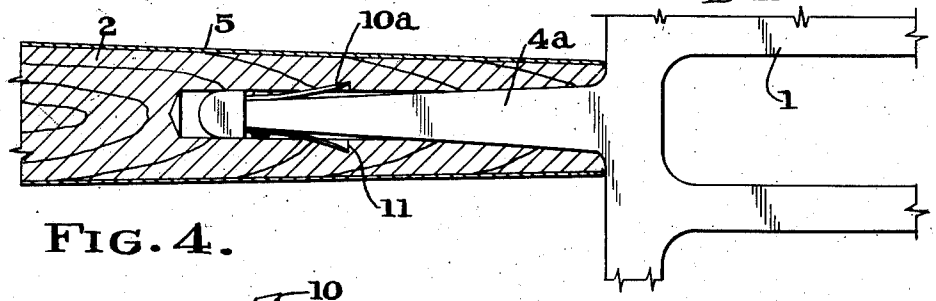
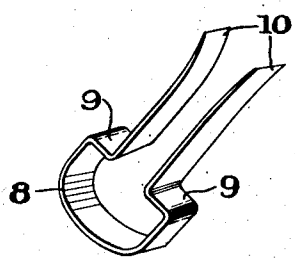


FIG. 4.



Inventor

EDWARD J. ARMSTRONG

By W. J. McDowell

Attorney

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SELF-LOCKING TOOL SHANK

Edward J. Armstrong, Columbus, Ohio, assignor to The Union Fork and Hoe Company, Columbus, Ohio, a corporation of Ohio

Application February 13, 1941, Serial No. 378,779

1 Claim. (Cl. 306—41)

This invention relates to hand-wielded tools or implements, particularly those having separate handle and body members, such as in farm and garden tools, wherein the body or blade member of such a tool is formed with a shank adapted to be received within a close-fitting socket formed in the contiguous end of a handle.

Considerable difficulty is encountered in tools of this description in the matter of securely and permanently uniting such tool parts so that under conditions of use or severe service, the same will not separate or come apart. In many tools of the type specified, a tapering metallic tool shank, usually polygonal in cross section is, at the time of manufacture of the tool, forcibly driven into a longitudinally and axially disposed socket formed in one end of a wooden handle. While this arrangement is simple and economical (factors which industry requires), it is open to the objection that the shank readily becomes loosened in the socket, as the result of wood shrinkage or the movement or working of the shank in the socket when the tool is in use, causing the tool body or blade to separate from the handle.

Accordingly, it is a primary object of the present invention to provide improved means, in association with the shank of such a tool, by which, when the shank is inserted in the handle socket, relative separating movement between the handle and the shank in a longitudinal direction is precluded.

Another object resides in providing the tool shank with a tang or prong member, the latter being so disposed that when the shank is driven into the handle socket, the said member will not interfere with the inserting operation but, further, is so formed that following such an insertion, any force tending to withdraw the shank will result in causing the prong or prongs of said member to bite or be forced into the wooden body of the handle, thereby establishing such high forces of resistance as to render it virtually impossible for the shank and handle to separate under ordinary anticipated conditions of tool service.

Still a further object of the invention resides in the provision of an improved self locking tool shank which is simple in construction, convenient to apply and economical in design.

For a further understanding of the invention, reference is to be had to the following description and the accompanying drawing, wherein:

Fig. 1 is a view partly in horizontal section and in plan, disclosing the improved shank fastening means comprising the present invention;

Fig. 2 is a transverse sectional view taken on the plane indicated by the line II—II of Fig. 1;

Fig. 3 is a detail perspective view of the tool shank;

Fig. 4 is a similar view of the pronged fastening member for the shank;

Fig. 5 is a detail plan view illustrating a modified form of the invention.

Fig. 6 is a fragmentary longitudinal sectional view taken through a tool shank and handle of a further modified form.

Referring more particularly to the drawing, the numeral 1 designates the body or blade of a handled tool such, for example, as a pitch fork, hoe, shovel, or other hand-welded tool, and the numeral 2 designates a wooden handle of any suitable length, depending upon the uses to which the tool is placed. Preferably, the handle 2 is of wood, although other suitable materials may be used.

To unite the body or blade 1 with the handle 2, the latter is provided at one end with an axially disposed, longitudinally extending socket 3, one end of the socket being closed and the other, at the end of the handle, being open. This socket is adapted to receive the shank 4 of the body or blade 1 of the tool. Preferably, the shank 4 is integrally formed with the body or blade 1 and tapers toward its outer end, being polygonal in transverse cross section. As usual, the shank is somewhat greater in cross sectional dimensions than the original corresponding dimensions of the socket 3, so that when the shank is driven into the socket, the walls of the latter will exert a compressive action on the surfaces of the shank to hold the latter frictionally in connection with the handle. Also, the outer portions of the handle 2, around the socket 3, are reenforced by a metallic sleeve or ferrule 5 to prevent the handle from splitting when the shank is driven into the socket or when the tool is subjected to the practical uses for which it is adapted.

In a preferred form of the present invention, as shown in Fig. 1, the outer end of the shank 4 is provided with a head 6 which terminates in lateral shoulders 7. Applied to the outer end of the shank is a metallic fastening clip 8, the medial portion of which is shaped to conform to the configuration of the head 6, the clip being further formed to include inwardly and laterally directed lips 9 which engage with the shoulders 7 and retain the clip on the outer end of the shank, the lips 9 terminating in oppositely disposed resilient arms 10, the free ends of which tend to spread apart and constituting retaining prongs or tangs.

It will be evident that when the shank is forcibly driven into the handle socket, the arms 10, because of their resiliency, will lie in close engagement with opposite side walls of the shank so that the clip will not interfere with the normal insertive movement of the shank into the socket. However, any force tending to effect relative longitudinal separation between the shank and the handle, that is, to draw the shank out of the socket, will result in causing the sharpened outer ends of the arms 10 to bite or be forced into the wooden body of the handle adjacent the socket, as indicated in Fig. 1, thereby establishing such high forces of resistance as to render it virtually impossible for the shank and handle to separate under all ordinary conditions of tool usage. If desired, and to accentuate this feature, the socket 3 may be provided with shoulders 11 with which the free ends of the resilient arms 10 may engage. It will be understood, however, that the shoulders 11 may or may not be employed. The construction here disclosed provides simple and effective means for permanently connecting a tool blade or body with an associated handle.

The invention is, of course, subject to certain modifications without departing from its essential features of construction. As illustrated in Fig. 5, the resilient arms 10*a* may be secured to the opposite sides of a shank 4*a* by means of welding or riveting, the arms 10*a*, in this instance, being formed from separate pieces, rather than the integral one-piece construction disclosed in Fig. 1.

In both forms of the invention above described, the retaining prongs or tangs have been carried on the outer sides of a tool shank formed for insertion in a socketed handle. The reversal of this structure will work equally well as illustrated in Fig. 6, wherein the tool head extension 4*b* has a longitudinally extending socket 12 with converging side walls for the reception of the tapered end 13 of a handle 14. An annular shoulder 15 may be provided, if desired, adjacent to the end of the handle for engagement by retaining tangs 16 which are formed with the socket walls. The free ends of the tangs 16 are directed toward the inner end of the socket and may be sharpened or not as desired. Due to the resiliency of the material from which the tool head is constructed and the construction of the tangs 16, the latter will snap behind the shoulder 15 when the handle is fully inserted and serve to positively retain the handle and head in assembled relationship. If a pulling force is applied to the handle in an attempt to effect the withdrawal from the socket, the sharpened ends of the tangs will dig into the handle and resist movement thereof relative to the tool head.

Other modifications may be resorted to without departing from the scope of the invention as the latter has been set forth in the following claim.

What is claimed is:

In a tool of the type having a wooden handle member and a separate metallic body member, the handle member being provided with a longitudinally extending axially disposed socket in one end thereof, a shank projecting from said member for reception within said socket, a tapering shank projecting from said body member, a head on the outer end of said shank, said head providing perpendicularly disposed shoulders facing toward said body member, a handle-securing metallic clip positioned on the outer end of said shank, said clip having an intermediate portion shaped to receive the head on the shank, said intermediate portion terminating in a pair of spaced resilient arms arranged on the opposite sides of said shank, the combined thickness of said head and clip conforming substantially to the width of the handle socket, shoulder means formed on said clip at the junctures of the arms thereof with said intermediate portion and adapted for engagement with the shoulders on said shank, the outer ends of said arms being sharpened and adapted to project angularly away from said shank in order to be embedded in and partially penetrate the wooden body of said handle member upon initial withdrawal movement of said shank from said socket.

EDWARD J. ARMSTRONG.