J. S. SURBAUGH.

HANDLE AND BLADE CONNECTION.

APPLICATION FILED DEC. 13, 1919.

1,374,336. Patented Apr. 12, 1921.

2 SHEETS—SHEET 1.

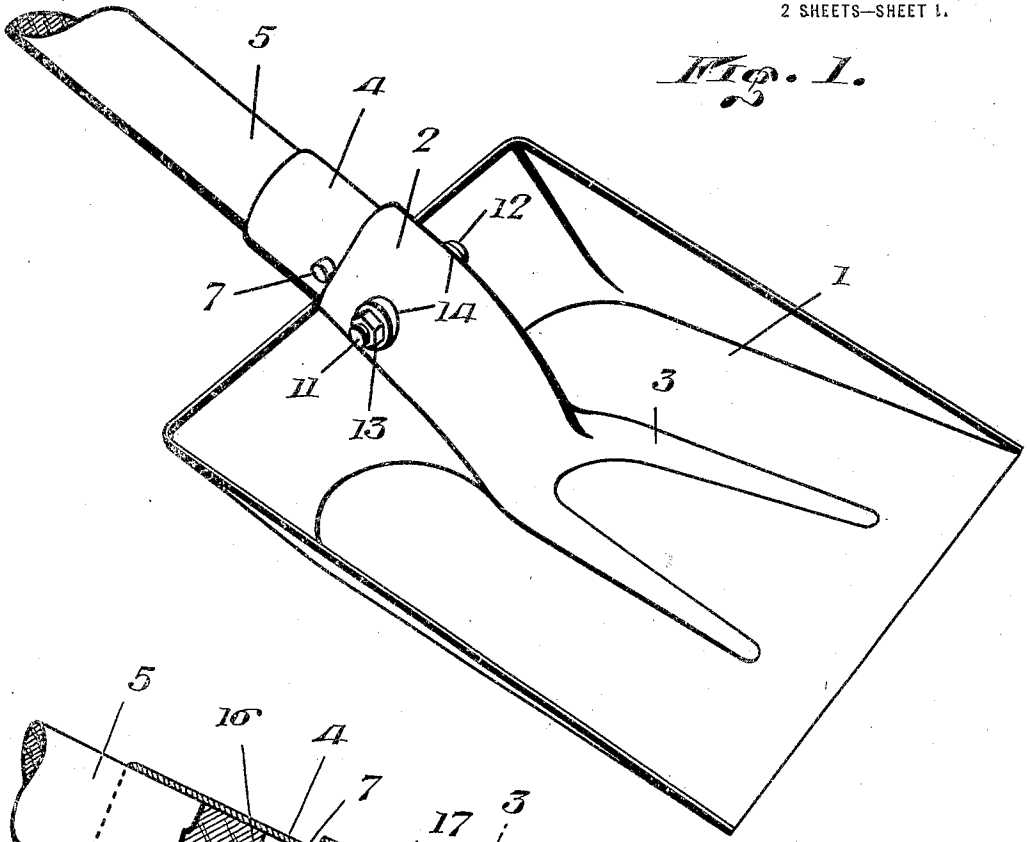


Fig. 1.

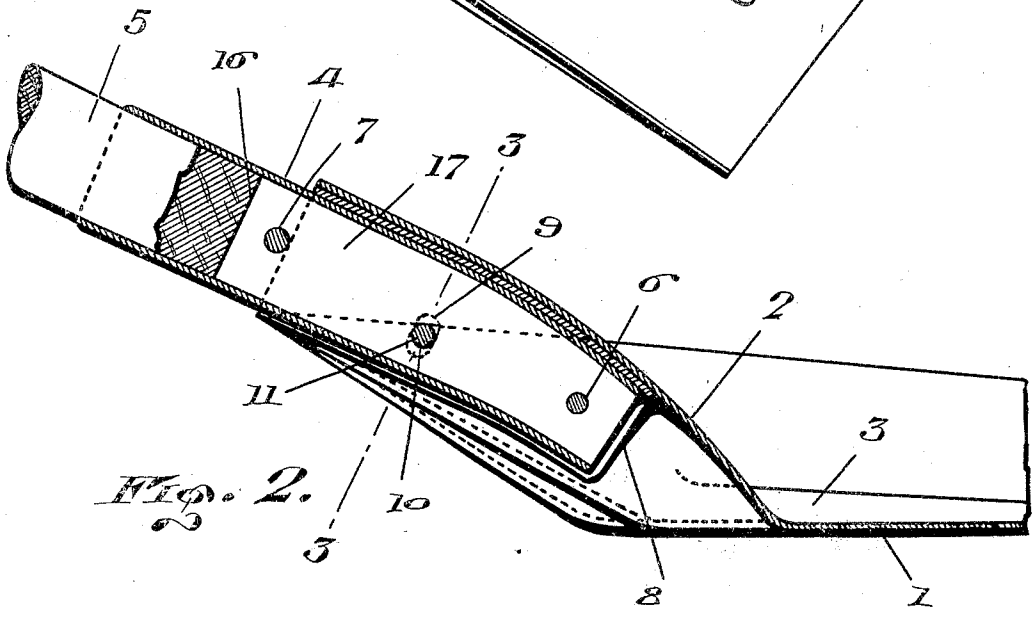


Fig. 2.

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Fig. 3.

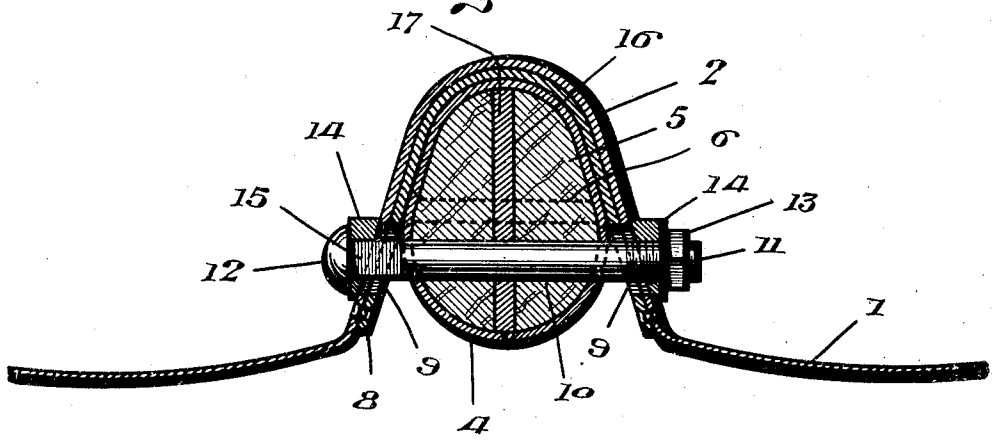


Fig. 5.

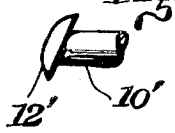
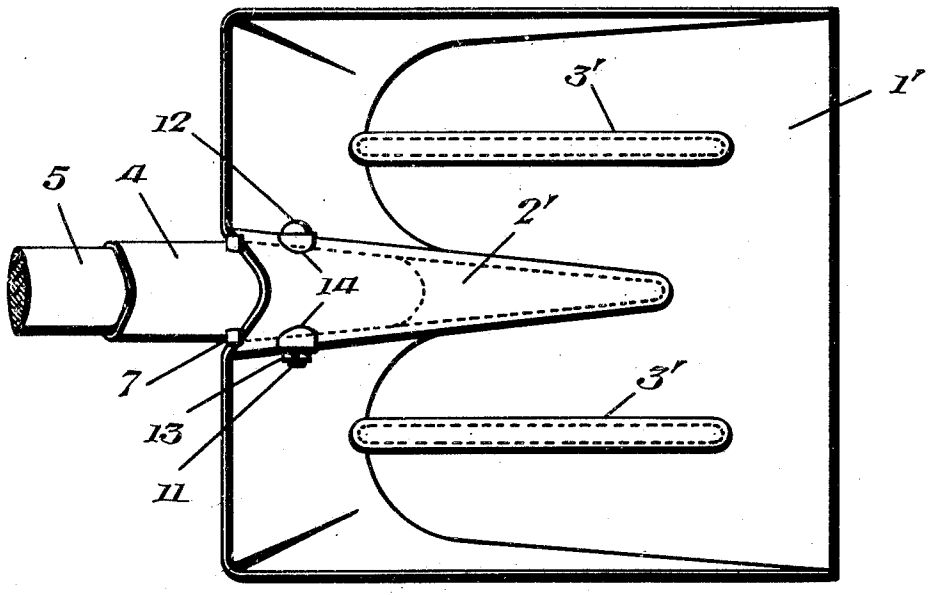


Fig. 4.



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UNITED STATES PATENT OFFICE.

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HANDLE AND BLADE CONNECTION.

1,374,336. Specification of Letters Patent. Patented Apr. 12, 1921.

Application filed December 13, 1919. Serial No. 344,684.

To all whom it may concern:

Be it known that I, JOHN S. SURBAUGH, a citizen of the United States, residing at Vincennes, in the county of Knox and State of Indiana, have invented certain new and useful Improvements in Handle and Blade Connections; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to handle and blade connections for use in shovels, scoops, spades and other tools, this invention being an improvement over the shovels, scoops, etc., disclosed in my previous Patents Nos. 1,247,032, and 1,312,766, granted Nov. 20, 1917, and Aug. 12, 1919, respectively.

This invention has for its object to improve and simplify the connection of the handle and blade or head of the tool, permitting either the blade or handle to be removed and replaced when worn out or damaged, thereby providing for economy in that either part of the tool can be replaced without discarding the remaining sound part.

A further object is to provide thoroughly efficient and convenient means for securing the handle member within the roll of the blade in a rigid and substantial manner, to withstand prying, tortional, leverage and other strains to which the connection is subjected in use, and the connection being, at the same time, extremely simple and inexpensive.

A further object is the provision of such a connection utilizing a single securing bolt or member for retaining the handle member within the roll and clamping said parts tightly together by the simple operation of tightening said bolt.

A still further object is the provision of novel means for reinforcing the roll.

Another object is the provision of novel means for reinforcing the handle member where it is fitted within the roll, to assist the handle member in withstanding the strains.

With the foregoing and other objects in view, which will be apparent as the description proceeds, the invention resides in the construction and arrangement of parts hereinafter described and claimed, it being understood that changes can be made within the scope of what is claimed without departing from the spirit of the invention.

The invention is illustrated in the accompanying drawings, wherein:—

Figure 1 is a perspective view of a shovel or scoop embodying the improvements.

Fig. 2 is a longitudinal section through the connection between the handle member and blade.

Fig. 3 is an enlarged cross section on the line 3—3 of Fig. 2.

Fig. 4 is a plan view of a modified form.

Fig. 5 is a detail view of a modification.

The invention can be used in shovels, scoops, blades and other tools, having a similar blade, and as shown, the blade 1 is of the "hollow back" type, such as used in shovels and scoops, said blade being provided with an upstruck roll 2 extending forwardly from its rear end and the roll, as shown, has a fork 3, the branches of which stiffen and reinforce the body of the blade to make it thoroughly rigid with the roll and back. A tubular handle member 4 is fitted within the roll 2, being preferably of sheet metal having its longitudinal edges meeting at the bottom, and said tubular member 4 may be extended to constitute the shank, or a wooden shank or core 5 can be fitted within said tubular member 4 as illustrated, it being apparent to those skilled in the art, that the handle may be composed of a shank 5 fitted within the tubular member 4, or may be composed of a tubular metal member, similar to the member 4, or may be simply a wooden shank as at 5, without using the tubular member 4. The construction illustrated, however, is preferable for several reasons, in that the wooden and surrounding metal members reinforce and stiffen one another to withstand the strains. The tubular member 4 is of a shape to fit snugly under the roll 2 against the sides and crown thereof, and is of a length to project rearwardly from under said roll. Transverse rivets 6 and 7 or other similar securing elements extend through the member 4 and shank 5 for securing them together, the rivet 6 being located near the lower or outer end of the tubular member, and the rivet 7 at the rear end of the roll 2. The ends of the rivet 7 extend from the tubular member 4 to abut against the rear edge of the roll, as seen in Fig. 1, whereby to transmit the forward or downward longitudinal strains and pressure from the handle member to the rear end of the blade in an effective manner.

The roll 2 is reinforced to stiffen and strengthen same, by means of a liner plate 8 arched transversely to fit snugly within the roll, and secured thereto by rivets or other means, this reinforcing plate 8 strengthening the roll and having the handle member fitted therein. This reinforcing plate 8 could be used on the outside of the roll, but is preferably used underneath the roll so as not to obstruct the upper surface of the blade, the function of said plate being to increase the thickness of the roll.

In order to secure the handle member within the roll, the opposite sides of the roll, which are inclined so as to converge upwardly, are provided with vertical or transverse locks 9, and the tubular member 4 and shank 5 of the handle have a transverse opening 10 therethrough to register with the slots 9 for the insertion of a transverse bolt 11 through said slots and opening, said bolt fitting snugly within the opening 10 of the handle member. The bolt 11 has a suitable head 12 at one end, and a nut 13 is threaded on the other end thereof, any suitable bolt being used. The shank of the bolt is preferably provided with a flattened or square portion 15 on the shank adjacent to the head 12 to fit in the corresponding slot 9 for preventing the bolt from turning when the nut is loosened or tightened. Washers 14 are fitted on the bolt 11, or other equivalent clamping member, and are disposed between the opposite side walls of the roll and the head and nut of the bolt, said washers being of wedge shape so that their opposite faces are disposed at right angles to the axis of the bolt 11 to bear against the head and nut, while adjacent faces are inclined to bear against the inclined sides of the roll, as seen in Fig. 3. Consequently, when the bolt is inserted through the roll and handle member, it locks the handle member within the roll, and when the nut 13 is tightened, the washers 14 will be brought under pressure against the sides of the roll, being forced toward one another. Due to the inclined side walls of the roll and wedge shape or inclined surfaces of the washers, the pressure of the washers against the roll will have a tendency to shift the bolt 11 laterally toward the crown of the roll, thereby moving the handle member with it and bringing it with considerable pressure against the crown of the roll. This will clamp the handle member and crown of the roll together tightly throughout the length of their contacting surfaces, and the use of this single securing element will provide a thoroughly rigid and substantial connection to withstand the various strains. Should the connection become loosened, the bolt can be readily tightened again to take up the loose play. The opening 10 of the handle member is preferably located near the bottom thereof, and can be located at the bottom or lower surface of the handle member in the form of a notch, so that the handle member passes over said bolt, and the bolt can be of a suitable cross section to resist the pressure exerted against it tending to bow said bolt away from the crown of the roll. The bolt 11 can be readily removed for detaching the blade and handle, whereby either one can be replaced by a new one when worn out or damaged.

In order to reinforce and strengthen the handle where it is secured in the roll, an elongated reinforcing plate 17 is fitted within a longitudinal vertical slot 16 cut in the shank 5 and extending from its forward or lower end to a point adjacent to or beyond the rear end of the roll 2. The upper edge of the plate 17 bears against the tubular member 4, and the rivets 6 and 7 extend through said plate 17 to secure it in place. The opening 10 also extends through the plate 17 so that the bolt 11 is fitted within the plate 17, and in this way, the plate 17 will take up the strains and strengthen the handle member considerably.

In Fig. 4, a modified form of blade 1′ is shown, wherein the roll 2′ is plain, and the blade has longitudinal upstruck ribs or braces 3′ at opposite sides of the roll, assisting the roll in strengthening the blade between the bottom or body and the back. The handle connection can thus be used with various forms of blades, and with either plain or forked rolls.

Fig. 5 shows how the head 12′ of the bolt 10′ can be disposed obliquely to eliminate the use of the washer at this end of the bolt.

Having thus described the invention, what is claimed as new is:—

1. A tool including a blade having a roll with converging sides having slots, a handle member fitted within the roll, and a securing member extending through the slots in the sides of the roll having portions bearing against said converging sides of the roll to shift the securing member toward the crown of the roll for clamping the handle member against same.

2. A tool including a blade having a roll with converging sides having slots, a handle member fitted within said roll, and a bolt extending through the slots in the sides of the roll for clamping the handle member against the crown of the roll, said bolt having portions thereon bearing slidably against the sides of the roll for shifting the bolt toward the crown of the roll when the bolt is tightened.

3. A tool including a blade having a roll with converging sides having slots, a handle member fitted within said roll, and a bolt extending through said slots in the sides of

the roll for clamping the handle member against the crown of the roll and wedge-shaped washers on the bolt to bear slidably against the sides of the roll for shifting the bolt toward the crown of the roll when the bolt is tightened.

4. A tool including a blade having a roll with converging sides provided with transverse slots, a handle member fitted within the roll and having a transverse opening to register with said slots and means extending through said slots and opening and having portions to bear under pressure against and slide on the converging sides of the roll for shifting the handle member to clamp it against the crown of the roll.

5. A tool including a blade having a roll with converging sides provided with transverse slots, a handle member fitted within the roll having a transverse opening to register with said slots, and a bolt extending through said slots and opening, and having inclined portions bearing against the sides of the roll to shift the bolt for clamping the handle member against the crown of the roll when the bolt is tightened.

6. A tool including a blade having a roll, a handle member fitted within the roll, and means extending through the sides of the roll and arranged to hold the handle member against the crown of the roll, said means and sides of the roll having coöperating portions operable for shifting said means toward the crown of the roll to clamp the handle member against said crown.

7. A tool including a blade having a roll, a handle shank extending into said roll and having a longitudinal slot, a reinforcing plate in said slot, means for securing said shank and plate within the roll, and a securing member extending through the shank and plate and extending therefrom to bear against the end of the roll.

8. A tool including a blade having a roll, a tubular handle member fitting within the roll, a shank fitted within said member, means for securing said member within the roll, and a securing member extending through said handle member and shank and extending therefrom to bear against the rear end of the roll.

9. A tool including a blade having a roll, a handle having reinforcing means to be disposed within the roll, means engaging said reinforcing means for securing the handle within the roll, and securing means for fastening said reinforcing means to the handle and also arranged to bear against the rear end of the roll to transmit pressure from the handle to the blade.

10. A tool including a blade having a roll, an arched plate secured to the roll to strengthen it, a handle member fitted within the roll, and securing means extending transversely through said roll and plate, for securing the handle member in place.

11. A tool including a blade having a roll, a handle shank extending into the roll and having a longitudinal slot, a reinforcing plate secured within said slot, and means extending through the sides of the roll and engaging said plate to apply pressure to said plate for holding the handle shank against the crown of the roll, said means and sides of the roll having coöperable portions operable for raising said means toward the crown of the roll to raise said plate and clamp the handle shank up under said crown.

12. A tool including a blade having a roll, a tubular handle member fitted within said roll, a shank or core extending within said member and having a longitudinal slot, a reinforcing plate fitted in said slot, means securing the handle member, shank and plate together, and securing means extending through the sides of the roll and engaging said plate to apply pressure to the plate for holding the handle member against the crown of the roll, said last named means and sides of the roll having coöperable portions operable for raising said means toward said crown to raise said plate and clamp the handle member against said crown.

13. A tool including a blade having a roll with converging sides provided with transverse slots, a tubular handle member fitted within the roll, a shank fitted within said handle member and having a longitudinal slot, a reinforcing plate fitted within said slot and within said handle member, securing means fastening said handle member, shank and plate together and extended to bear against the rear end of the roll, said handle member, shank and plate having an opening to register with said slots, and a bolt to extend through said slots and opening and having inclined portions to bear against the sides of the roll for shifting the bolt toward the crown of the roll to clamp the handle member against said crown when the bolt is tightened.

In testimony whereof I hereunto set my hand.

JOHN S. SURBAUGH.