Aug. 19, 1952 C. C. HILL 2,607,278

CULTIVATOR TOOL CLAMP

Filed Aug. 16, 1947

FIG. 2.

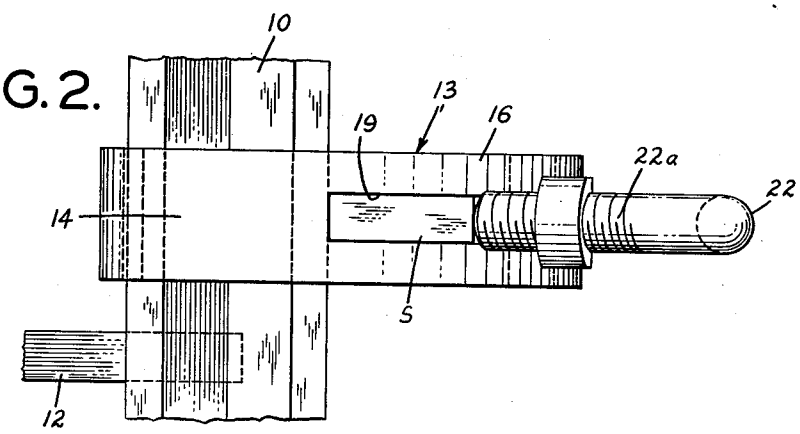
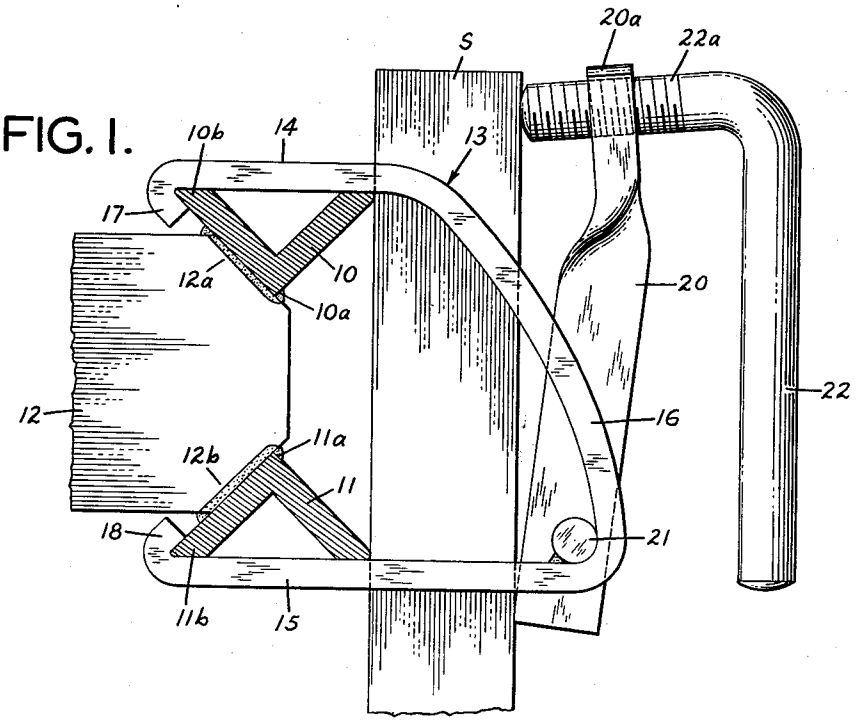


FIG. 1.



INVENTOR.
CHARLES C. HILL
BY
Campbell Brumbaugh & Free
HIS ATTORNEYS.

Patented Aug. 19, 1952 2,607,278

UNITED STATES PATENT OFFICE

2,607,278

CULTIVATOR TOOL CLAMP

Charles C. Hill, Ypsilanti, Mich.

Application August 16, 1947, Serial No. 769,061

5 Claims. (Cl. 97—198.1)

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This invention relates to improvements in clamps for cultivator tools, and it relates particularly to a novel type of tool clamp and tool-supporting bar construction for use on or with tractors and other farming equipment.

The most commonly used form of tool bar constructions includes a pair of bars usually of T-shaped cross-section with the tops of the T's in opposition and supported by a pair of spacer bars which may be mounted on a tractor or other device.

The tool clamp is a U-shaped member having outwardly directed hook-like free ends which engage the inner edges of the T-shaped tool bars when the base of the clamp is disposed between the tool bars. The U-shaped clamp is provided with a pair of opposed slots in its sides through which the shank of the cultivator tool is passed to engage the side or edges of the tool bar opposite to the edge engaged by the hooks on the ends of the U-shaped clamp. The base of the U is usually provided with a square head bolt which may be tightened by means of a wrench to engage the edge of the cultivator tool shank and force it against the tool bar to retain the tool in position.

The above-described construction, while better than many of the clamps devised heretofore, has a number of disadvantages. For example, the cultivator tools cannot be placed in alignment with the spacer bars because the bars interfere with the clamps. Therefore, if it is desired to lock the cultivator tool in alignment with the spacer bars, a tool with an offset shank must be used.

If it is desired to move a clamp from one side of a spacer bar to the other side of the spacer bar, it is necessary to remove the cultivator tool and the clamp completely from the tool bar.

Sometimes, with the above described clamp, it is not possible to obtain sufficiently strong pressure on the shank of the tool to prevent vibration. The maximum pressure that can be obtained with any convenient wrench and a single bolt is about 1,000 to 1,300 pounds, and in many cases, such pressure is not enough.

An object of the present invention is to overcome the above-noted disadvantages of the above-described clamp and tool bar construction.

Another object of the invention is to provide a clamp by means of which substantially increased holding power or pressure for retaining the cultivator tool in position may be obtained.

Another object of the invention is to provide a clamp and tool bar construction which permits the clamp and the tool held therein to be positioned any place along the tool bar without removing the clamp or the tool from the tool bar.

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Other objects of the invention will become apparent from the following description of a typical form of clamp and tool bar construction embodying the present invention.

In accordance with the present invention, I have provided a clamp for cultivator tools which is of generally C-shaped construction having inturned hook-like ends to permit the clamp to be positioned around the exterior of the tool bar so that the clamp can be shifted lengthwise of the bar without interference from the spacer bars. The clamp is further provided with a lever construction producing a power multiplying effect, whereby a hand screw mounted in the lever can exert a substantially greater pressure on the shank of the tool to retain it in position than is possible with an ordinary bolt construction of the type commonly used heretofore.

The invention also includes an improved form of tool bar which may be formed of a pair of angle irons positioned with their apices or angles in opposition so that in cross-section they form oppositely disposed V's. These angle irons may be secured to the spacer bars in such relationship that the flanges of the angle members are disposed outwardly of the spacer bars for engagement by the hook-like ends on the new clamp. In this way, the clamp may be easily slid into any desired position along the tool bar without interference from the spacer bars, thereby facilitating the use of cultivator tools in any desired position and eliminating the need for cultivator tools having offset shanks. Moreover, because of the use of a simple hand screw construction with the power multiplying lever, there is less possibility of stripping the threads on the hand screw, and a wrench is not required for shifting the position of or locking the clamp and supported tool in a desired position.

For a better understanding of the present invention, reference may be had to the accompanying drawings, in which:

Figure 1 is a view in side elevation of a typical form of cultivator tool clamp embodying the present invention illustrated as applied to the new spacer bar construction shown in cross-section and retaining a portion of a shank of a tool in operating position; and

Figure 2 is a plan view of the clamp, shown applied to a portion of the new form of spacer bar.

A typical form of tool bar and clamp construc-

tion may include a pair of angle iron members 10 and 11 of suitable V-shaped cross-section and thickness which are mounted with their corners or apices 10*a* and 11*a* in opposition upon the tapered or chamfered ends 12*a* and 12*b* of one or more spacer bars 12. Usually two of such spacer bars are mounted in spaced relationship lengthwise of the angle members 10 and 11. If desired, a greater number of the bars 12 may be provided, and the structure may be further reinforced by a plate, not shown, extending lengthwise of the angle members 10 and 11 between their apices 10*a* and 10*b*. As shown particularly in Figure 1, the edges of the spacer bar 12 are disposed inwardly of edges of the angle irons 10 and 11, so that the inner flanges 10*b* and 11*b* extend outwardly beyond the edges of the bar 12.

A typical form of cultivator tool clamp embodying the present invention and usable with the spacer bar construction described above includes a generally C-shaped member 13 which, as illustrated, may have a substantially flat upper portion 14, a longer flat lower portion 15 and a curved or straight portion 16 joining or connecting the portions 14 and 15. The left-hand ends of the portions 14 and 15 are provided with inturned hook portions 17 and 18 which are adapted to engage around the flanges 10*b* and 11*b* to prevent the clamp 13 from being moved to the right relatively to the angle members 10 and 11. The inclination of the hook portions may be the same as the inclination of the surfaces of the members 10 and 11 engaged by the hook portion, or the hooks may be inclined at a sharper angle so that they are drawn inwardly by forces exerted thereon to press the flat portions 14 and 15 tightly against the outer edges of the members 10 and 11. The flat portions 14 and 15 of the clamp 13 bear against the edges of both of the angle members 10 and 11, and, if desired, these edges may be bevelled to fit against the inside of the clamp 13.

As shown in Figure 2, the clamp 13 is provided with a slot 19 which extends through the curved portion 16 and partially through the flat portions 14 and 15 to a position preferably slightly inwardly of the right-hand edges of the angle members 10 and 11, as shown in Figure 1. The slot 19 receives the shank S of a suitable cultivator tool.

The shank S is retained in engagement with the tool bar construction by means of a lever 20 disposed in the slot 19 and pivotally supported upon a rod or shaft 21 in the lower corner or portion of the clamp 13 at about the junction of the flat portion 15 and the curved portion 16 of the clamp. The rod or shaft 21 may be spot or tack welded or otherwise permanently secured to the clamp 13. The upper end 20*a* of the lever is twisted at a right angle to the remainder of the lever 20 and is drilled and tapped to receive the threaded end 22*a* of a hand screw 22 so that the end of the threaded portion 22*a* may be screwed up against the edge of the shank S by rotation of the hand screw.

The lever 20 extends downwardly below the rod or shaft 21 to form a short lever arm so that as the upper end 20*a* is rocked clockwise by rotation of the hand screw 22, the lower end of the lever is forced into engagement with the shank S of the tool. By properly proportioning the distances between pivot shaft 21, the end 22*a* of the hand screw and the lower end of the lever 20, a power multiplication is obtained by means of which extremely high pressure may be exerted against the shank S urging it tightly against the tool bar in opposition to the direction that the tool would normally be displaced when the cultivating tool is in use. Thus, if the length of the lever 20 above the rod or shaft 21 is five times the length of the lever below the bar 21, a force of 5,000 to 6,500 pounds may be applied to the tool shank by means of the hand screw. This is several times the maximum pressure or force that can be applied by means of a bolt, as used in the conventional tool clamp.

In use, the clamp 13 may be slipped over the end of the tool bar and shifted to any desired position along the tool bar without interference from the spacer bar or bars 12. The shank S of the tool may then be inserted through the slot 19, and the hand screw 22 is turned up tightly so that the shank is forced against the outer edges of the angle members 10 and 11, and the hooks 17 and 18 are drawn up tightly against the inner edges of the angle arm members 10 and 11, thereby holding the clamp and the tool securely in position. If it is desired to adjust the clamp to another position along the tool bar, it is only necessary to back off the hand screw 22 and slide the clamp along the tool bar to the desired position, after which the clamping screw is again tightened to fix the tool and the clamp in the adjusted position.

The above-described device is highly effective in operation in that it permits quick and easy adjustment of a cultivator tool to any desired position along the tool bar. Moreover, such adjustment can be accomplished without the need for tools which may be lost or displaced, and the whole clamp assembly is so formed that there is little likelihood that any portion thereof will be lost except through extreme carelessness on the part of the user. In addition, the construction described above provides a more rigid support for the cultivator for the reason that the zones of contact between the tool shank and the tool bar are more widely spaced than with prior arrangements and thereby prevents relative twisting or rocking movement between them. From the foregoing, it will be clear that the new form of spacer bar and clamp construction has many advantages over prior constructions and overcomes the deficiencies of such prior clamps and tool bars.

It will be understood that the clamp and the tool bar are susceptible to considerable modification in their size, shape and proportions without departing from the invention. Therefore, the above-described form of the invention should be considered as illustrative and not as limiting the scope of the following claims.

I claim:

1. A support for a cultivator tool having a shank portion comprising a tool bar having flanges at its upper and lower edges, a substantially C-shaped clamp adapted to extend around the outside of said tool bar and having hook-like ends converging inwardly at an acute angle toward the back of said clamp to engage behind at least one of said flanges at each of said upper and lower sides of said bar, a slot through said clamp for receiving said shank, a lever pivotally mounted on said clamp and disposed on the opposite side of said shank from said tool bar, and a member adjustably mounted at one end of said lever for engaging said shank to rock the other end of said lever against said shank.

2. A clamp for use in connection with a tool bar having a pair of angle iron members, and

at least one spacer member connecting said angle iron members with their angle portions in opposition and their edges directed oppositely and disposed outwardly of said spacer member, said clamp comprising a substantially C-shaped clamping member adapted to extend around the outside of said bar and having hook-like ends converging inwardly at an acute angle toward the back of said clamp adapted to engage a flange on each of said angle iron members outwardly of said spacer member in all positions of said clamping member lengthwise of said angle iron members, a lever having a short lever arm portion and a longer lever arm portion pivotally mounted on said clamp in spaced relation to said hook-like ends, means forming a slot through said clamping member for receiving said tool shank between said tool bar and said lever, and a screw member threaded through the outer end of said longer lever arm portion for adjustment into engagement with said shank to rock said shorter lever arm portion against said shank.

3. A tool support for a cultivator tool having a shank, comprising a tool bar having forwardly and outwardly directed flanges at its upper and lower edges, a substantially C-shaped clamp adapted to extend partially around said bar and having inturned, rearwardly inclined free ends adapted to engage behind said flanges, a lever pivotally mounted in the back of said clamp having opposite ends forming a long lever arm and a shorter lever arm, a screw member threaded into the outer end of said longer lever arm, and means forming a slot through said clamp for receiving said tool shank between said inturned ends and said lever.

4. A tool clamp for detachably connecting a cultivator tool to a tool bar comprising a member having free end portions extending in substantially the same direction in spaced relation and a connecting portion therebetween, rearwardly inclined hook-like portions on said free

end portions to engage said tool bar, a lever pivotally mounted on said member between said free ends and having substantially oppositely directed short and long lever arms, a slot through said member between said hook-like ends and said lever for receiving said tool, and a member mounted adjustably in said longer lever arm for engagement with said tool to rock said lever and urge said shorter lever arm against said tool.

5. A tool clamp for supporting a cultivator tool on a tool bar comprising a substantially C-shaped clamp member having forwardly projecting end portions and a curved back portion, hook-like ends inclined inwardly toward the back portion on said free end portions for engaging said tool bar, a slot extending through said back portion and partially through said forwardly projecting end portions for receiving said tool, a lever pivotally mounted on said clamping member for rocking movement on said slot, said lever having oppositely directed long and short lever arms, and a screw member threaded in the outer end of said long lever arm for adjustment into engagement with said tool to rock said shorter arm into engagement with said tool.

CHARLES C. HILL.

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