H. B. & C. A. BARDEN.

PROCESS FOR MAKING TOOLS.

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1,171,764.

Patented Feb. 15, 1916.

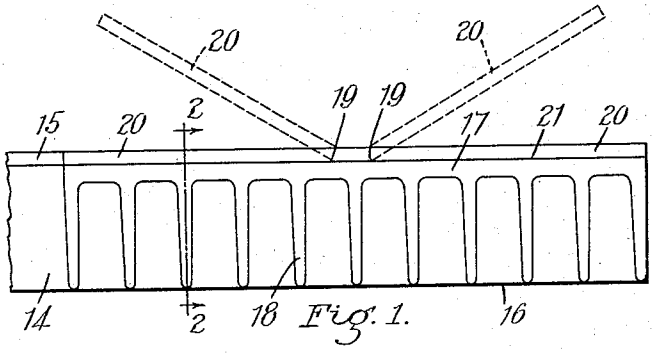


Fig. 1.

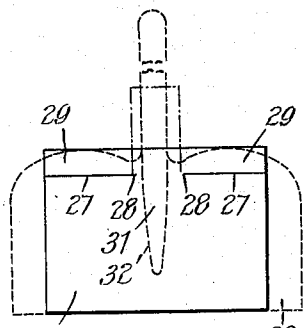


Fig. 7.

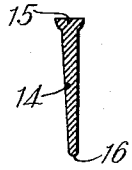


Fig. 2.

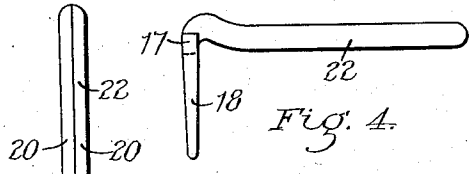


Fig. 4.

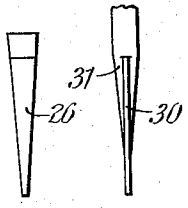


Fig. 8. Fig. 9.

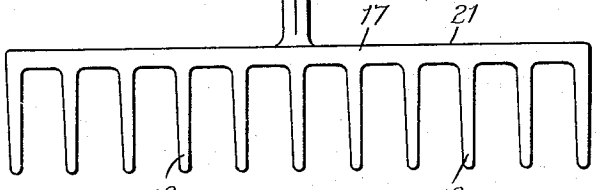


Fig. 3.

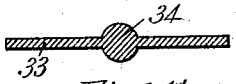


Fig. 11.

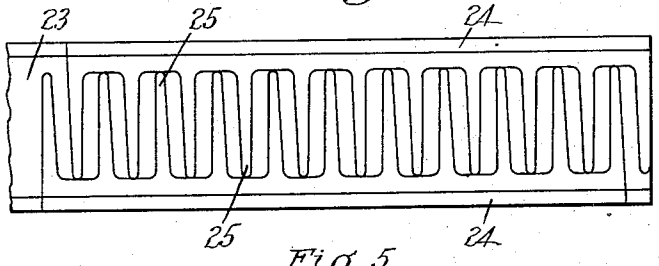


Fig. 5.

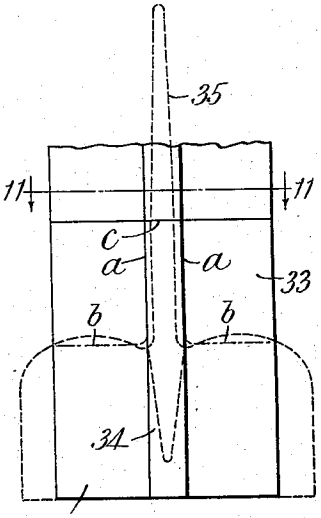


Fig. 10.

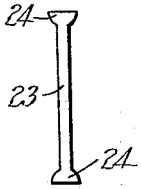


Fig. 6.

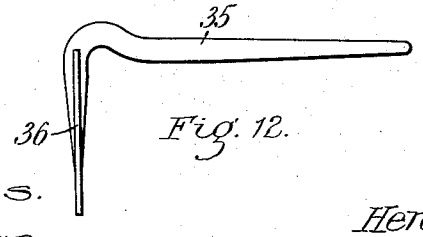


Fig. 12.

Witnesses.

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UNITED STATES PATENT OFFICE.

HENRY B. BARDEN AND CLIFFORD A. BARDEN, OF WALLINGFORD, VERMONT.

PROCESS FOR MAKING TOOLS.

1,171,764. Specification of Letters Patent. Patented Feb. 15, 1916.

Application filed November 19, 1914. Serial No. 872,926.

To all whom it may concern:

Be it known that we, HENRY B. BARDEN and CLIFFORD A. BARDEN, citizens of the United States, residing at Wallingford, in the county of Rutland and State of Vermont, have invented new and useful Improvements in Processes for Making Tools, of which the following is a specification.

This invention relates to improvements in the process for making tools.

The object of the invention is to provide an improved process for making tools such, for instance, as rakes, hoes, forks or the like constructed of sheet metal having a shank formed integral with the work member, but in two parts which two parts are subsequently welded together their entire lengths to form a solid shank.

The invention consists in the combination and arrangement of parts whereby the above objects and certain other objects hereinafter appearing may be attained, as set forth in the following specification and particularly pointed out in the claims.

Referring to the drawings: Figure 1 is a side elevation of a strip of sheet metal illustrating in full lines the outline of one type of tool which may be produced from said sheet metal, the dotted lines in said figure illustrating the manner in which portions of said sheet metal are partially detached from the strip and bent outwardly to form a shank. Fig. 2 is a section taken on line 2—2 of Fig. 1. Fig. 3 is a front elevation of a tool, preferably a rake, which has been formed in accordance with the process embodying this invention, the stem of said rake being shown straight or as it appears just before it is bent to fit a handle. Fig. 4 is a side elevation of a rake embodying our invention, the shank of said rake having been bent into a position to receive the handle. Fig. 5 is a plan view of a strip of sheet metal which has been rolled double in order that two rakes may be simultaneously formed therefrom with the teeth of one rake being cut from the material between the teeth of the other rake. Fig. 6 is an end elevation of the strip of metal illustrated in Fig. 5. Fig. 7 is a plan view of a strip of sheet metal slightly different in form from that illustrated in the preceding figures. This form of metal is particularly adapted for the construction of hoes or like tools and the design of a finished hoe is shown in dotted lines in connection with said figure. Fig. 8 is an end elevation of the metal strip illustrated in Fig. 7. Fig. 9 is a side elevation of the finished tool as illustrated in dotted lines Fig. 7. Fig. 10 illustrates another form of sheet metal from which certain tools may be constructed, the type of tool to which this form is best adapted is illustrated in dotted lines in said figure. Fig. 11 is a section taken on the line 11—11 of Fig. 10. Fig. 12 is a side elevation of one type of tool adapted to be constructed from the form of metal illustrated in Figs. 10 and 11.

Like numerals refer to like parts throughout the several views of the drawings.

To accomplish the results desired and in the simplest and most practical manner, the metal from which the tools are to be constructed is prepared in sheets or strips, the cross sections of which may be varied according to the type of tool to be constructed therefrom. The preferred method of forming said sheet material is by rolling the metal into long strips, which may be subsequently cut into short lengths just long enough for a single tool, or said strips may be formed in the shorter lengths.

In Figs. 1 and 2, 14 represents a strip of metal which has been formed for the purpose of producing a rake and has a semi-cylindrical rib or enlargement 15 substantially symmetrically disposed along one edge of said strip with the flat face thereof outermost, from which enlargement the strip gradually decreases in thickness toward the opposite edge 16 and of the desired taper to produce a tooth of the correct formation. The next step in the operation of constructing a tool, or more especially a rake, is to place the strip between suitable dies and stamping from said strip the work member as shown at 17, Fig. 1. If the strip of metal 14 is longer than the tool which is being formed, the operation just referred to severs the amount of said strip necessary to form said tool from the remaining portion thereof and may at the same time form the teeth 18 of the tool, provided said tool is a rake. Simultaneously with this, said dies preferably detach the rib or enlargement 15 from opposite ends of the strip constituting the work member of said tool inwardly to points 19 adjacent to the center of said work member. The portions of said rib 15

which are thus detached and marked 20 are then bent outwardly laterally relatively to the edge 21 of the work member or in the plane containing said strip and in the direction indicated by the dotted lines, Fig. 1. The next step in the operation is to bend said detached portions until the flat faces thereof contact with each other and weld the same in this relation, as shown in Fig. 3, thus forming a solid shank 22 integral with the work member 17 of the rake. The shank may then be bent relative to the work member 17 in any direction desired, but preferably as shown in Fig. 4 into a position to receive the handle thereof.

If desired the rough or sharp corners produced by the stamping operation may be removed by the "sand blast method", or any other suitable finishing process. In the majority of rakes it is desirable that the shank 22 be cylindrical or substantially cylindrical in cross section and this may be accomplished by producing the rib or enlargement 15 in a semi-cylindrical form, as illustrated in Fig. 2, the flat face outermost, thus when the strips 20 are detached and drawn together as in Fig. 2 and the welding process completed the finished shank will be substantially cylindrical.

In forming tined implements from sheet metal there must necessarily be a small amount of wasted material, due to the sections which are removed to form said tines. This waste may however be materially reduced by making the strip of metal 14 a little wider as at 23, Fig. 5, and forming on said strip ribs 24, 24 along opposite sides thereof, while the teeth 25 of one of the work members is stamped from the waste material between the teeth 25 of the other member, as Fig. 5 indicates. The shanks of the rakes in this form are constructed in the same manner as that described in connection with Fig. 1.

In Figs. 7, 8 and 9, 26 illustrates a strip of sheet metal which is rolled, preferably wedge-shaped. The thickest side of said strip is severed along the lines 27, 27 from the opposite ends of said strip inwardly to points 28 and the severed portions 29 formed thereby are bent outwardly as in Fig. 1 to form a shank, said strips being welded together along their entire lengths. From this strip sod cutters, hoes or spades may be formed and in all of the tools referred to it is preferable that the central portion or juncture of the shank with the blade be reinforced. It is for this purpose therefore that this strip is first rolled in tapered form. The detached portions 29 are not as long as the finished shank will be, but are much larger in diameter permitting the same to be drawn out until the desired length and diameter have been obtained and the shank afterward bent in the desired shape. Previous to the bending of said shank the strip of metal 26 is placed beneath the hammer and thinned out from the central portion thereof toward the edges to form a blade 30, leaving the central portion 31 reinforced as indicated by the dotted lines 32, while the sides of said blade 30, from said reinforced portion outwardly, are of substantially uniform thickness, as indicated in Fig. 9. The blade is then trimmed to the desired shape and polished by any of the numerous finishing processes.

In Figs. 10 and 11 is illustrated another manner of producing a hoe or the like. In this form the strip of sheet metal 33 is provided with an enlargement 34 extending substantially lengthwise through the center of said strip, said enlargement being substantially larger in diameter than the finished shank will be. The first step in the operation for this type of strip is in partially detaching portions of said enlargement from its neighboring metal along the lines "*a*—*a*" and broken lines "*b*—*b*" and in severing just enough of the metal from said strip to form the tool desired, as indicated by the lines "*c*". The metal constituting said enlargement is then drawn out both at the shank, as indicated by the dotted lines 35, and at the portions of said enlargement connected with the blade 36. This operation increases the size of the blade from the full lines illustrated in Fig. 10 beyond the dotted lines illustrating the finished shape of the tool, after which said blade is trimmed to said dotted lines and finished as in the previous cases and the shank bent at the desired angle relatively to the blade, one form of which is shown in Fig. 12.

It will be evident to those skilled in the art that much material will be saved by forming the shanks of tools in the manner hereinbefore described and that a much stronger and more durable implement may be constructed.

Having thus described our invention what we claim and desire by Letters Patent to secure is:

1. A process for making tools which consists in forming a strip of metal with a rib extending along one edge thereof, then in detaching said rib from said strip inwardly from opposite directions substantially to the center thereof, then in bending said detached portions into contact with each other, and then in welding said portions together their entire lengths to form a solid shank.

2. A process for making tools which consists in forming a strip of metal with an enlargement, then in stamping said strip to form a work member and to sever said enlargement from opposite directions inwardly substantially to the center of said strip, then in bending the severed portions of said enlargement outwardly and into contact

with each other, and then in welding said severed portions together their entire lengths to form a solid shank.

3. A process for making tools which consists in forming a strip of metal having a semicylindrical enlargement symmetrically disposed along one edge of said strip with the flat face thereof outermost, then in severing portions of said enlargement from said strip, then in bending said severed portions to bring the flat faces thereof in contact with each other to form a cylindrical shank, and then in welding said flat faces together.

4. A process for making tools which consists in forming a strip of metal having an enlargement symmetrically disposed along one edge of said strip, then in placing said strip between dies to form teeth thereon and to sever said enlargement from opposite ends of said strip inwardly to points adjacent to the center thereof, then in bending the severed portions of said strip outwardly in the plane of said strip and into contact with each other, and then in welding said severed portions together to form a solid shank.

In testimony whereof we have hereunto set our hands in presence of two subscribing witnesses.

HENRY B. BARDEN.
CLIFFORD A. BARDEN.

Witnesses:
MARGARET E. HORN,
SYDNEY E. TAFT.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."