

(No Model.)

2 Sheets—Sheet 2.

W. H. COWDERY.

FORK OR RAKE AND THE ART OF MAKING THE SAME.

No. 304,993.

Patented Sept. 9, 1884.

Fig. 10.

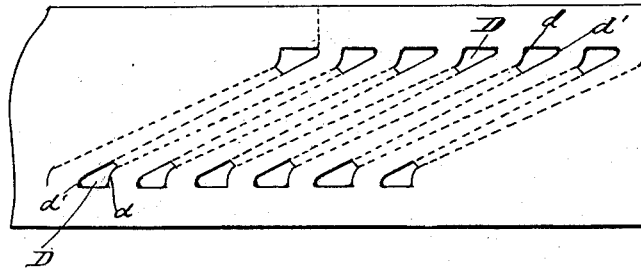


Fig. 11.

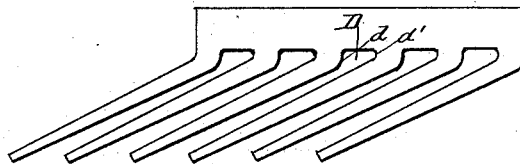
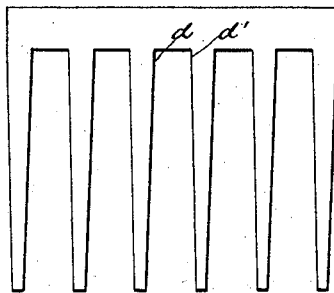


Fig. 12.



Attest:

W. H. Knight

W. J. Bernhard

Inventor:

Warren H. Cowdery

per Edoen Bros.

Attorneys.

UNITED STATES PATENT OFFICE.

WARREN H. COWDERY, OF ASHTABULA, OHIO, ASSIGNOR OF ONE-HALF TO
SAMUEL R. HARRIS, OF SAME PLACE.

FORK OR RAKE AND THE ART OF MAKING THE SAME.

SPECIFICATION forming part of Letters Patent No. 304,993, dated September 9, 1884.

Application filed February 1, 1884. (No model.)

To all whom it may concern:

Be it known that I, WARREN H. COWDERY, a citizen of the United States, residing at Ashtabula, in the county of Ashtabula and State of Ohio, have invented certain new and useful Improvements in Manufacture of Rakes and Forks; and I do 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, reference being had to the accompanying drawings, and to the letters and figures of reference marked thereon, which form a part of this specification.

My invention relates to the manufacture of rakes and forks known as "dung-forks," "hay-forks," "earth-forks," and the like; and the novelty consists in the process by which the blank is treated, as will be more fully hereinafter set forth, and specifically pointed out in the claims.

The object is to cheapen the construction of such articles by so arranging the steps of treatment as to require a less number of heats, to afford a stronger article with a better finish, and to economize both time and labor.

The invention is illustrated in the accompanying drawings, which form a part of this specification, and in which—

Figure 1 is a plan view of a blank, showing in dotted lines the manner in which the blank is cut by dies to have the portion cut out of the longitudinal center of one blank to form the shank of another; Fig. 2, a plan view showing in full lines the blank as formed by the first complete action of the dies and cutters, and showing in dotted lines the parts bent for subsequent operations. Fig. 3 is a plan view showing the blank in a still further stage of progress and Fig. 4 a four-tined fork thus made. Fig. 5 is a view illustrating a form in which the blank has heretofore been cut. Fig. 6 is a view of a blank from which forks or rakes having five or more tines are cut, and Fig. 7 the fork-blank separated. Fig. 8 represents the fork-blank shown in Fig. 7 at a later stage of treatment. Fig. 9 represents the form in which blanks similar to that shown in Fig. 8 have heretofore been

cut. Fig. 10 is a diagram showing the manner of cutting the blanks for two forks out of a single piece of metal. Fig. 11 shows one of such blanks separated, and Fig. 12 a finished fork from such blank.

The invention is designed as an improvement upon the process and product set forth in Patents No. 84,377 and 85,400, of 1878. In this art it is not only desirable to form the entire fork—that is to say, the body, shank, and tines—out of a single piece of metal, but a maximum of strength and a minimum of finishing are things to be desired. It is necessary, further, that the tines should be of uniform width at their junction with the body, and that they should be properly spaced at uniform distances from each other. To accomplish these ends at small expense and with the fewest number of heatings is a desideratum.

As shown in Fig. 9, the several teeth may be cut and the body and shank formed at one operation of proper dies; but the spacing of the teeth and their proper manipulation to draw them out to suitable shape and length are difficult, as the spacing-hammer must be driven between each adjacent pair of teeth, and frequent heatings of the blank are required; or, as shown in Fig. 5, the amount of metal in the body must be properly hammered out to form the spacing-recess, as seen at *pp'*. In any of these methods where the simple slit is made to mark the teeth the manipulation of the metal at the inner end of the slit is liable to leave the material rough and broken, requiring a considerable amount of labor necessary to give the proper finish. Added to this is the objection that the abrupt bendings of the metal at such points tend to break and destroy the tough texture or fiber of the metal, and render the completed tool weak and liable to break or bend.

In my invention the blank A is, by proper dies, cut into fork-blanks, as shown in dotted lines in Fig. 1—that is to say, with a curved body, a shank, and sufficient metal upon either side of the junction of the shank with the body to make two teeth. At this same operation of the dies holes are made in the blank, as

shown at C, and these holes are designed to not only mark the width of the tines when finished, but when the sides B are turned down, as shown in Fig. 2 in dotted lines to the right, to give the proper width to the body. These holes are preferably of oblong form, are cleanly cut, and when the teeth are turned to be drawn out provide an incline which will prevent "backing" of the metal when being hammered, as shown in Fig. 3.

The slits *c*, which sever the material from the holes C to the end of the blanks, may be made at the same operation of the dies.

It will be observed that with a single heat the blank may be put into the form shown in Fig. 3, after which it is only necessary to draw out the teeth and bend the outer ones, as seen in Fig. 4.

Referring to the drawings, in which I have shown several forms of blanks in which my invention is employed, A, Fig. 1, represents a bar of steel, from which blanks B are cut by suitable dies in the form shown in Fig. 2—to wit, having a curved edge provided with a projecting portion, *b*, which forms the shank or tang of a four-tined fork when finished, and the portion *b* is cut from the middle of the succeeding blank between the middle tines thereof. The lower end of the portion *b* is enlarged and curved at its lower edge in lines concentric with the edge of the blank, the points *m m* determining the distance or space between the teeth while the curved lower edge of the blank is straightened out into the position shown in Fig. 3.

C represents apertures, preferably pear-shaped, which are about on a line which, if extended downwardly therefrom, would touch the lower edge of the enlargement upon the tang *b*, and the distance between the points *m m* before named and the points *n n* in the apertures C determines the thickness of the teeth at their bases. When the blank shown in Fig. 2 is being bent into the form shown in Fig. 3, the angles at the points *m m n n* are easily finished, leaving a smooth surface instead of rough and uneven angles having flaws, cracks, and fissures.

In Figs. 6, 7, and 8 I have shown another form of fork or rake blank to be used in making rakes or forks having more than four teeth or tines, said blank having apertures C at the base of each tooth or tine, and also determining the thickness of the tooth at its junction with the head. Fig. 8 shows the blank thus formed in one stage of its manufacture, and it will be seen that "cold-shuts" will not be formed when the teeth are being drawn out, and also that the angles between the teeth and head will be smooth and even.

Fig. 9 represents old forms in which blanks are cut.

Figs. 10, 11, and 12 represent still another form of blank in which my invention is employed, the apertures D being somewhat different in form from those shown in Figs. 1,

2, and 7, although placed in the same relative position—to wit, at the inner terminus of each cut—to form the teeth, and also determining the thickness of each tooth where they join the head or body. The form last shown is applicable to forks or rakes of any number of teeth, the curved portions *d d'* of the apertures D insuring a smooth angle between the teeth and head when finished, as shown at *d d'* in Fig. 12.

I have found by practice that the use of my improvement serves to reduce the expense of manufacturing the class of implements named herein by enabling me to make such implements in less time, more durable, cheaper, and with a better finish than follows from the practice of any method heretofore used.

I do not limit myself to the exact form of rake or fork blanks herein shown, since my invention consists, essentially, in the formation of two or more apertures to determine the length of cut to form the teeth or tines and the thickness thereof at their junction with the head and the space between the teeth or tines, as well as insure smooth, even angles.

I am aware that fork-blanks have been made in which the tang or shank of one blank is cut from the middle of the next succeeding blank, and do not claim such form.

From the foregoing description it will be observed that the gist of my invention lies in the process by which time and labor are saved and a better result attained, and in a blank having substantially the forms shown in Figs. 2, 7, and 11, adapted to be forged into the forms shown in Figs. 3, 8, and 12 at one heating, and having its junctions of the body and teeth formed by a perforation of the material, which gives a finish to the corners and allows a ready forging or drawing out of the teeth.

What I claim as new is—

1. The improvement in the art of making rakes and forks consisting in punching holes in the blank to thereby indicate the width of the body and the width of the teeth at their junction, and serve at the same time as terminations to the slits made to separate the teeth.

2. The fork-blank herein described, as shown in Figs. 1 and 2, having the body spaced by the material cut away to form the shank of the preceding blank, and having the apertures C formed by cutting out a portion of the material, and having splits from said apertures to the end of the blank, the said blank being adapted to be bent, as shown in Fig. 3, to bring the apertures C on a line with the central aperture, and forged to form the finished article with little reheating, as set forth.

In testimony whereof I affix my signature in presence of two witnesses.

WARREN H. COWDERY.

Witnesses:

JOSEPH FORREST,
JOS. R. EDSON.