H. B. KINNEY.

Machines for Making Pitch-Forks.

No. 202,658. Patented April 23, 1878.

Fig 1

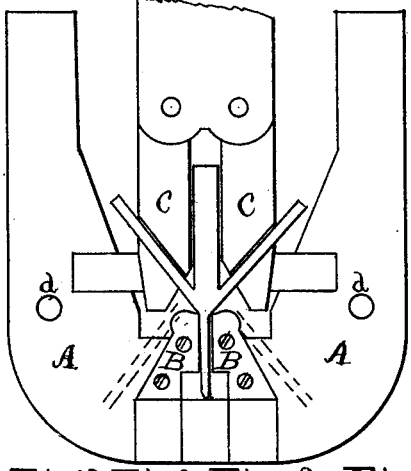


Fig 3

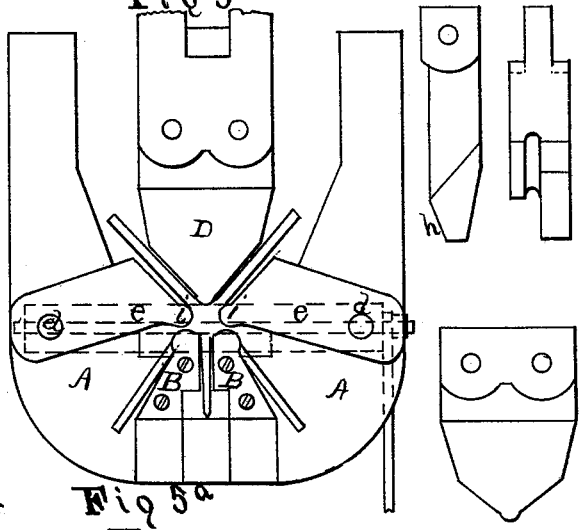


Fig 1a Fig 2 Fig 3a Fig 4 Fig 5a

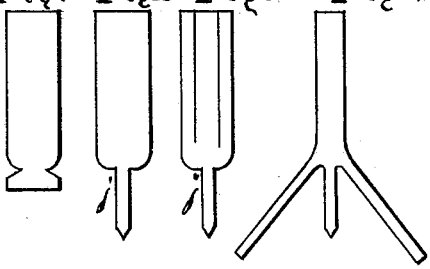


Fig 6a

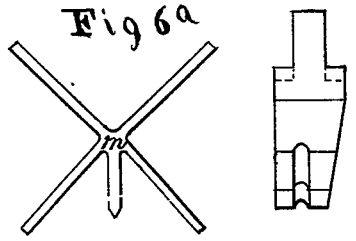


Fig 6

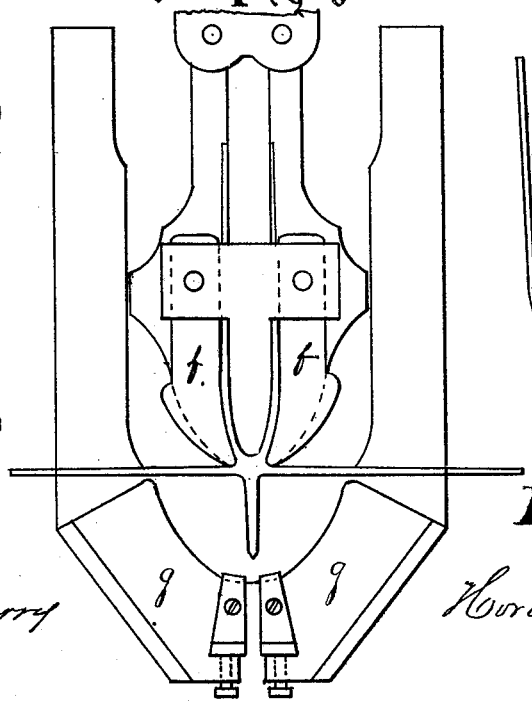


Fig 5

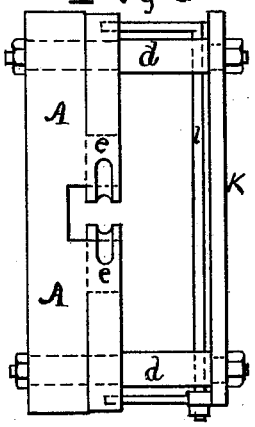
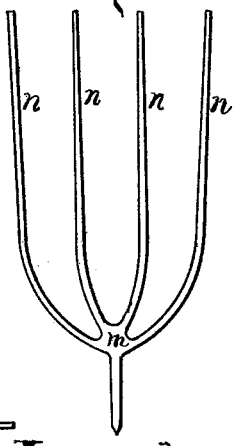


Fig 7



Attest.

Marshall Lewis

William P. Curry

Inventor.

Horace B. Kinney

UNITED STATES PATENT OFFICE.

HORACE B. KINNEY, OF COLUMBUS, OHIO.

IMPROVEMENT IN MACHINES FOR MAKING PITCHFORKS.

Specification forming part of Letters Patent No. **202,658**, dated April 23, 1878; application filed July 9, 1877.

To all whom it may concern:

Be it known that I, HORACE B. KINNEY, of Columbus, in the county of Franklin, State of Ohio, have invented a new and useful method, with new and improved devices, for making certain kinds of four or many pronged or tined pitching-forks from a blank of sheet metal; and I do hereby declare the following, when taken in connection with the accompanying drawings and letters of reference marked thereon, to be a full, clear, and exact description of the same, and which said drawings constitute a part of this specification, and represent, in—

Figures 1, 3, and 6, plan views of all the dies and pins in their relative positions. Fig. 5 represents a vertical end view of Fig. 3. Figs. 1ª, 2, 3ª, 4, 5ª, and 6ª represent the article in the different stages of the process.

Upon yoke A A, Fig. 1, is placed a shoulder-die, B B, with slot passing through its center for the reception of shank *j*, Fig. 3ª representing the first stage of the process after shank is formed.

The blank sheet, after the shank has been formed upon one end, is divided into three prongs, the center prong being sufficiently wide to admit of being divided again, as shown in Figs. 3ª and 4. Before being again divided it is taken by the shank *j* and placed in the slot of shoulder-die B B of yoke A A, Fig. 1, and adjusted in line with the reciprocating dies *c c*, which are attachments to other parts referred to hereinafter. The dies *c c*, upon their ends opposite to shoulder-die B B, are wedge-shaped upon the upper one-half in depth, while the lower half is a reverse angle upon their ends.

The dies *c c*, in their forward movement, enter the two incisions made in the blank, Fig. 3ª, upon the upper wedge-shaped ends, and receive the middle prong (still undivided) between them. Thus the outside prongs are opened far enough for the second forward movement of the dies *c c* to bring the pattern in contact with the reversed angles, thereby turning them backward, as shown in Fig. 4, representing the second stage of the process.

In the first stage of cutting and opening the blank (represented in process, Fig. 2) the dies *c c* are adjusted to sliding head running in bed A of my Patent No. 56,954, dated August 7, 1866, by means of two pins passing down through the circled end of sliding head, and also passing through the tenoned ends of dies *c c*, thus forming a hinge against the curved shoulders, to allow a lateral movement. The dies *c c*, being adjusted in line with sliding head, receives a forward movement, which brings the reverse angle upon dies *c c*, as shown by *h*, in contact with shoulder-die block B, that is placed upon yoke A, said yoke A having a vertical movement by means of cam underneath operated by foot-lever. By this means the yoke A is raised vertical, and brings the cut blank to be opened in line with the pointed ends of upper one-half of dies *c c*, to be accomplished in the forward movement, opening the prongs sufficient for the second forward movement of dies *c c;* and while the dies are receding for said purpose the yoke A is allowed to drop to its original position, which brings the blank or prongs in line with the lower one-half of dies *c c* for the reversed angle at *h*, causing the prongs to be pressed backward, corresponding to angle of dies at *h*.

The second stage of the process having been completed, it is now ready for the incision to be made in the middle prong running on a line with shank, which is effected by reheating and making the incision, stopping it short, as shown in Fig. 5ª, of the incision made to form outer prongs, in order to give stock for the formation of solid brace-head at junction of prongs with shank. This being done, it is now ready to be received in the dies, Fig. 3, for the opening and squeezing of shoulders, as shown in Fig. 6ª of process.

Yoke A A and die B B, Fig. 3, are duplicate drawings of yoke A A and die B B, Fig. 1, in order to show the additional fixtures attached thereto, comprising all the fixtures in position, relative with each other, for the continuance of process.

It will be observed that in yoke A A, Fig. 1, are two apartments or holes, *d d*, passing down through yoke-bed, for the reception of two bolts or posts *d d*, represented vertical in Fig. 5, and represented as being attached in the plan view, Fig. 3. These bolts rise vertical, when adjusted to yoke-bed, sufficiently for the reception of work, Fig. 5ª, to pass under a bar that ties the bolts together at top ends

Upon these bolts *d d*, Figs. 3 and 5, are hinged two levers, *e e*, made of steel and grooved at their points, placed so as to approximate each other in the act of pressing the side shoulders between middle and outside prongs, said levers tending to a straight line by the pressure of plunger D, Fig. 3, in its forward movement in the act of opening the middle prongs, as shown in Fig. 6ª, representing the fourth stage of the process. In Fig. 5, representing a vertical end view of Fig. 3, will be seen a rod or shaft, *l*, passing through the bolts *d d* near top end and under cross-bar *k*, with right angles turned at each end, passing down into levers *e e* at outer ends of same. The object of this device is to control the levers *e e* in the act of putting in and taking out work, to be opened and pressed into shape, as shown in Figs. 5ª and 6ª, representing the different stages of the process, said shaft *l* being rotated by means of another lever (not shown in drawings) that a weight is attached to, which keeps the levers *e e* closed, thereby avoiding any danger of their coming in contact with plunger D, Fig. 3, by any carelessness of operator.

In construction of this attachment (shown in Fig. 5 and adjusted to Fig. 3) the yoke A A and die B B being duplicate drawings of Fig. 1, it will be readily understood that all the forging represented by Figs. 3ª, 4, 5ª, and 6ª of the different stages of the process can be done by the use of one yoke, A A, and one die, B B, as shown in Figs. 1 and 3.

After the prongs have been drawn under a trip-hammer, (and for this purpose the devices shown in Fig. 6 are employed,) the side arms are to be bent parallel, as shown in Fig. 7. *g g* represent a longer yoke and inside forms to fit the inside form of yoke for the refitting of brace-head *m* at junction of tines *n n n n*, thereby giving the tines their relative position with each other, diverging in curves at the base of each tine, giving them the appearance of symmetry and workmanship, as well as forming a solid brace-head with neatness and dispatch. In the forward movement of inside forms the side wings or levers *f f*, Fig. 6, are forced together by friction caused by their running between and against the taper of yoke *g g*, Fig. 6, side wings being grooved at sides and points deep enough to admit full size of tines, which completes process of forging, as shown in Fig. 7.

The nature of my improvement relates to a new and useful machine for making a four or many pronged or tined pitching-fork from a blank of sheet metal, as shown in drawings, and the various devices shown and described, which I propose to use in connection with bed and sliding head driven by the major part of Patent No. 56,954, granted me, bearing date August 7, 1866, and specifications accompanying said Letters Patent describe the application and operation of the various devices.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The combination of the plunger D, pivoted levers *e*, grooved die B, and yoke A, capable of a vertical movement, substantially as set forth.

2. The combination of the dies *c*, having reversed angles *h* and *z i*, grooved die B, and adjustable yoke A, as described.

3. The combination of the plunger D, die B, pivoted levers *e*, bolts *d*, cross-piece *k*, and rock-shaft *l*, having the arms X and weighted lever, substantially as described.

HORACE B. KINNEY.

Witnesses:
P. OSGOOD,
G. L. EDICK.