# W. CHISHOLM.

## Machine for Making Shovels.

No. 219,069. Patented Sept. 2, 1879.

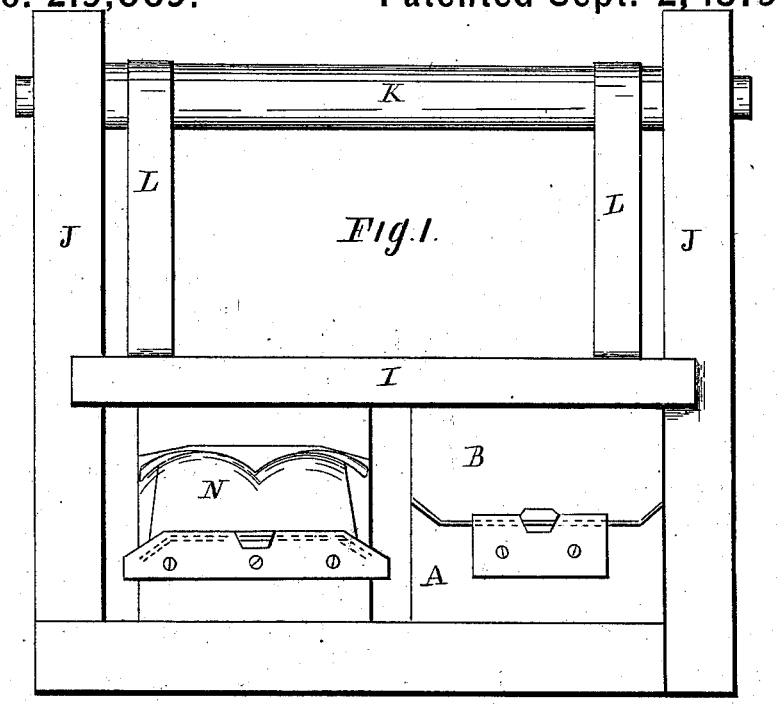


Fig. 1.

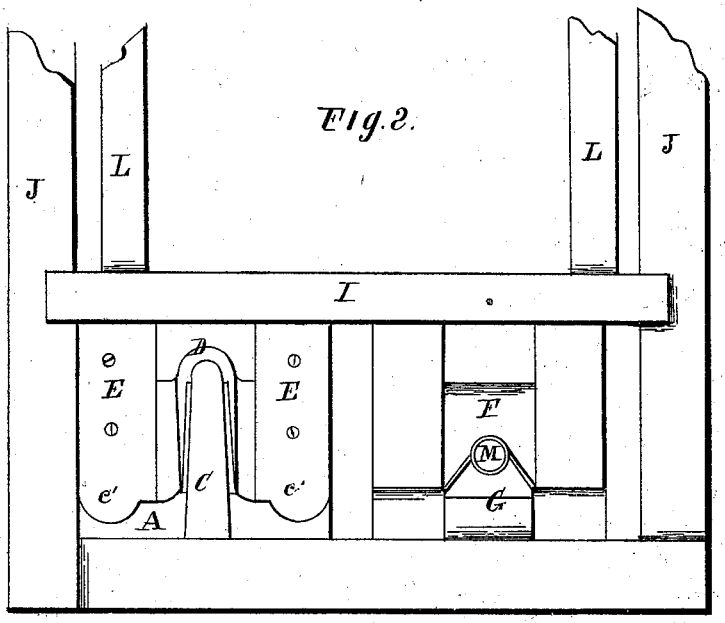


Fig. 2.

Witnesses.
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*Fig. 3.*

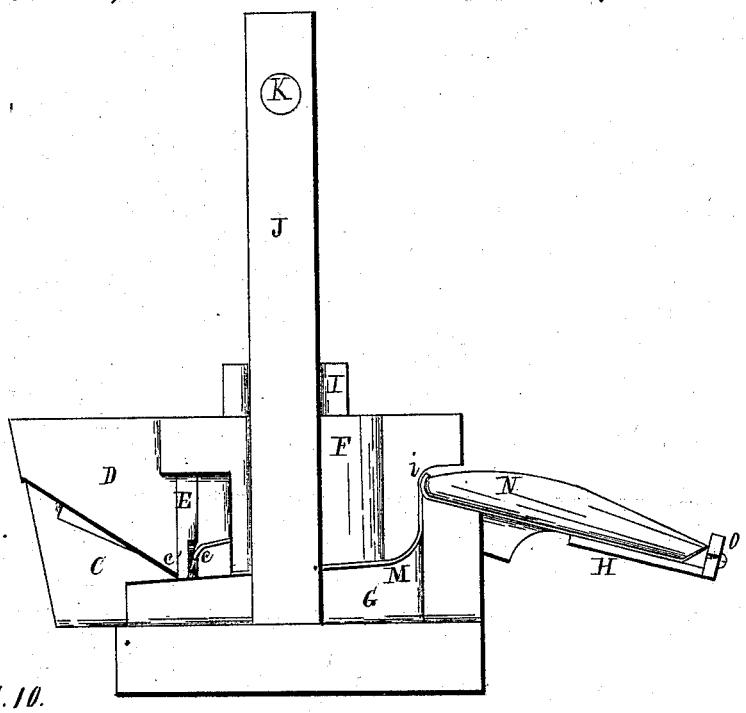


*Fig. 10.*

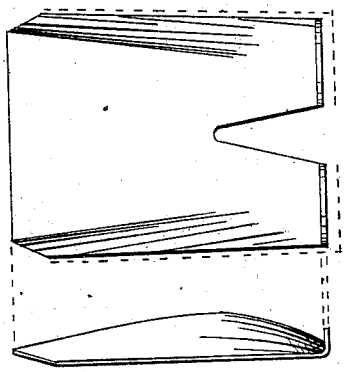

*Fig. 4.*

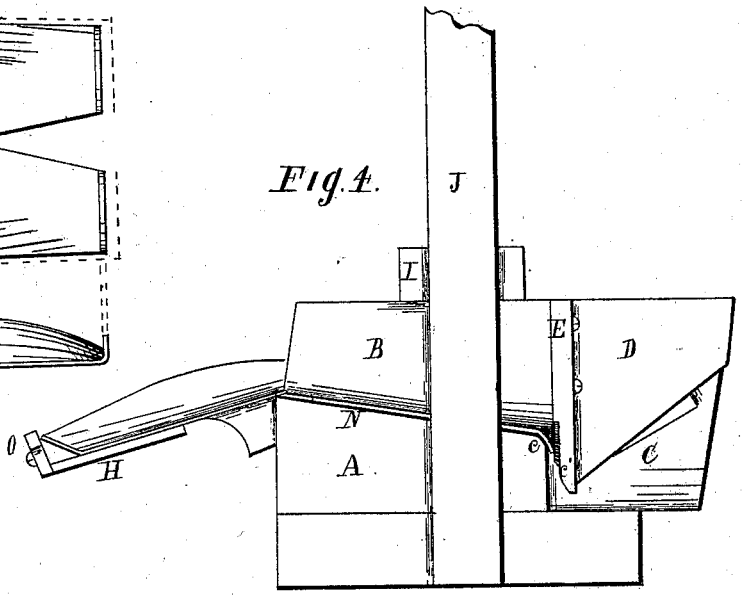


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*Fig. 5.*

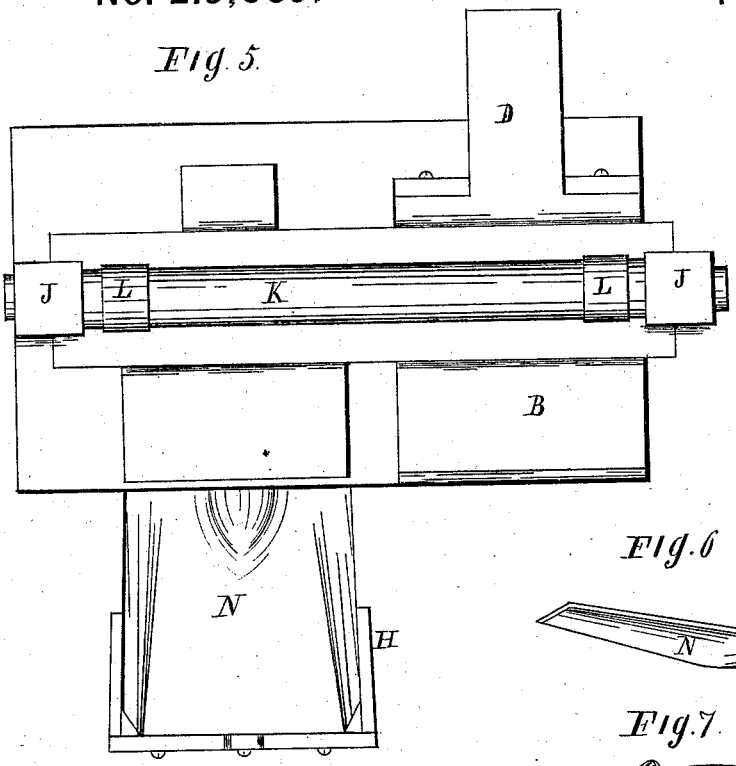



*Fig. 6*

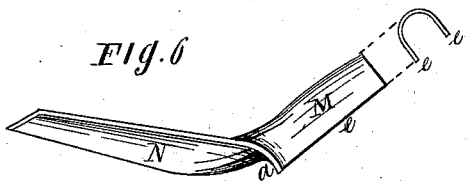



*Fig. 7.*


*Fig. 9*

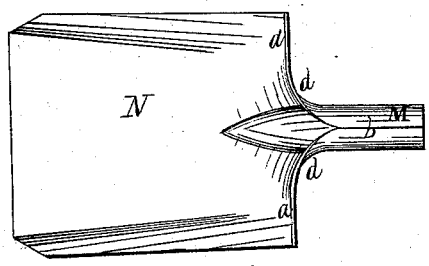
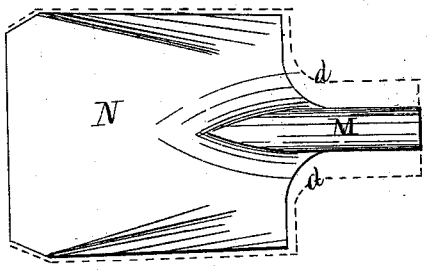



*Fig. 8.*




Witnesses
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# UNITED STATES PATENT OFFICE.

WILLIAM CHISHOLM, OF CLEVELAND, OHIO.

## IMPROVEMENT IN MACHINES FOR MAKING SHOVELS.

Specification forming part of Letters Patent No. **219,069**, dated September 2, 1879; application filed November 9, 1878.

*To all whom it may concern:*

Be it known that I, WILLIAM CHISHOLM, of Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new and useful Improvements in Mechanism for the Manufacture of Shovels, Scoops, &c.; and I do hereby declare that the following is a full, clear, and complete description thereof, reference being had to the accompanying drawings, making a part of the same.

The nature of this invention relates to new and improved dies for making shovels, scoops, &c., whereby said articles are made stronger and more durable. As an example, the shovel, scoop, spade, or other like article above alluded to, by means of the dies may each be constructed from a single piece of sheet metal or blank—that is to say, the blade of a shovel and the shank or socket thereof for the handle may all be formed of one piece or blank, with or without a foot-piece on the upper side of the blade. The article is made or formed by swaging in suitable dies, constructed and operated substantially as herein described, and shown in the accompanying drawings.

The operation of the dies in forming a flange or foot-piece, referred to, on a shovel or scoop, &c., with the socket or straps for the handle made of one piece of metal, is essentially the same as forming said flange by the said dies on a blade without the handle or shank being made of one piece with said blade; hence the description of the former is considered sufficient to embrace the latter.

On referring to the drawings, Figures 1 and 2 are side elevations of the machine or dies in which the article is made. Figs. 3 and 4 are side elevations of the machine. Fig. 5 is a plan view.

The rest of the figures are different views of a shovel, &c., while in process of being made and completed, and will be hereinafter referred to.

Like letters of reference refer to like parts in the several views.

The mechanism referred to consists of a pair of dies, A and B, arranged in synclinal planes, operating conjointly, upper and lower, or male and female, the faces of which are of the form of the blade or shovel, &c., such as are in ordinary use.

The shank of the instrument is hollow, and is formed over the projecture C, Fig. 3, projecting from the end of the lower die, A. A corresponding projecture, D, projects from the upper die, B, which, together with the lower projecture, forms a pair of dies, upper and lower, for partially forming the socket and neck of the shovel, in which to insert the handle.

On each side of the projecture D is secured an adjustable lip or flange turner, E, Figs. 2 and 4, the operation of which will presently be shown.

F and G, Figs. 2 and 3, are also a pair of dies, in the faces of which is a groove about half a circle in depth, and of a diameter adapted to receive and form the neck and socket of the shovel, as hereinafter described. Projecting from the end of the said die G is a rest, H, Figs. 3 and 4, the surface of which is of the form of the upper side of a shovel, so that when the article is laid thereon it will fit closely to the rest, while the part for the socket will project over into the grooves of the dies F and G for being operated thereon by them for forming or completing the neck and socket for the handle.

The two sets of dies or swages above described are used consecutively for forming the blade or shovel from a blank consisting of a single piece of sheet metal, (indicated by dotted lines in Figs. 8 and 10,) and formed into the contour of a shovel or blade, as indicated in Figs. 8 and 10.

It will be seen that the upper section of each of the pair of dies is attached to a cross-head, I, adapted to and arranged to slide between the standards or posts J, in the top of which the cross-head and dies are connected by the belts L, whereby they are operated for the purpose designed.

The weakest place in shovels, scoops, &c., is where the socket or handle joins the blade. This weak part of the article is strengthened by the re-enforcing flange or foot-piece *a*, which is formed upon the blade by the dies, and by which the continuity of the metal is unbroken from the shank to the outside edges, which gives a stiffness and strength to the entire blade.

The practical operation of the dies for shap-

ing the shovel and forming on the rear of the upper edge thereof the foot or re-enforcing flange, *a*, Figs. 6, 7, and 9, is substantially as follows: The blank for the blade or shovel, in either a heated or cold state, depending upon the nature of the metal, is first submitted to the action of the forming-dies A B, by which the blank is swaged into shape for the blade of the shovel. At the same time is partially formed the socket M for the handle of the dies D and C, over the lower die, C, of which the metal for the shank or socket is bent to the configuration shown at M in Fig. 6, thereby half forming the socket for the handle. During this effective operation of the dies the foot-flange *a* is partially turned by the lip E, which, as the die B descends, impinges upon the projecting edge *c*, Fig. 4, of the blade, and bends it downward to the position shown in said Fig. 4. The form of the lip and the part of the die connected thereto conforms to the curvature of the neck, as shown at *d* in Figs. 8 and 9. The part *c'* of the lip acts as a guide or stop to prevent the blade from projecting too far beyond the dies. Thus the joint action of the lip and dies causes the flanges to be all of uniform size and width. The body of the shovel, by this operation of the dies, is fully formed or shaped, whereas the flange and the shank are but partially so. The flange has yet to be further bent, and the shank to be closed round for a socket—that is, from its condition as seen in Fig. 6 to that shown in Fig. 7, in which the two edges *e* are brought together, forming the seam *h*, Fig. 9, completing the shank for the handle. This finishing of the shovel is effected by the dies F and G. To this end the unfinished article is laid upon the rest H, back upward, as shown in Fig. 3, in which N is the article. In this position of the shovel the shank extends forward between the dies F and G, alluded to.

On descent of the movable die F, the open shank is closed up by the action of the grooves in the dies, as seen at M in Fig. 2, which represents the shank of the shovel closed up, forming a socket for the handle, as seen in Figs. 7 and 9. The foot-flange is turned farther down and partially under by the curve *i*, Fig. 3, of the die, which, as the die descends, said curve impinges upon the partially-formed flange and bends it still farther—that is to say, from its condition shown in Fig. 4 to that shown in Fig. 3, also Figs. 6 and 7—thereby completing the flange, as shown in the figures of the shovel on Plate Fig. 3. The shape of the dies for forming the blade-flange, and also the neck and shank of the shovel, is of the proper shape and curvature for completing the article by two consecutive operations; hence there is nothing left to be done in shaping the implement on leaving the dies last referred to.

It will be observed that the faces of the dies for forming the blade of the implement are not in a horizontal plane—that is to say, in a plane at right angles to the vertical movement of the upper die; but, on the contrary, the faces of the dies have an oblique relation thereto, for the following-described purpose, viz: It is found, on using the dies in a horizontal position, that the tendency of the metal to buckle or crimp by the stamping action of the die is greater than when the dies are in an oblique position. In this latter position the metal is more easily controlled, and the buckle or crimp in the blade is drawn toward the shank or neck, where it is taken up or disposed of in forming a smooth neck and shank. The oblique position of the die causes it to give a drawing blow upon the metal, tending to force the crimp or buckle toward the shank. This, however, is not the case when the blow of the die is a vertical one. So, also, in forming the shank or socket for the handle, the blow of the die D falls upon the inclined position of the metal, causing what crimp or buckle there may be to work toward the neck of the shank, where it is forced out in forming the neck and foot-flange, as the crimp is disposed of in shaping the blade of the implement.

Articles the blades of which are of different length may be made in these dies by simply lengthening the dies A and B more or less, in accordance with which the rest must be lengthened. This may be done by removing the foot-piece O, and placing between it and the edge of the rest shims more or less in number or thickness, as the length of the blade may require. So, also, may the lips E be shimmed out for turning the flange, as the thickness of the blade may render it necessary. Also, the gage H can be shimmed out for the same purpose.

The flange *a*, by means of the described mechanism and dies, may be applied to blades of shovels, Fig. 10, and to other similar articles, which strengthens the blade and forms a rest for the foot.

I am aware that dies for making shovels, spades, and other like articles from sheet metal have been in use; hence I do not claim such, broadly; but I do claim an improvement in so constructing the dies that the shovel, &c., may be made with a flange or foot-piece along the upper end of the blade from the socket or shank at one and the same time that the said article is being compressed or struck into the desired shape, or the article formed without the flange.

By means of the foot-piece, shovels and other like articles are strengthened at that part subject to the greatest strain in using, and also present a smooth, broad, and easy surface to the foot.

The two sets of dies may be worked conjointly, as herein shown, or separately, so that they may operate alternately in the same consecutive order as though in joint action, as set forth. In either mode the operation would be essentially the same.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The die A, lying in synclinal planes jointly with the die B, corresponding thereto, and

provided with the lip E, as and for the purposes set forth.

2. In mechanism for making shovels, scoops, and other like articles, the die B, provided with lips E E, and lower die, A, formed with a curve at *c*, constructed and arranged to operate conjointly with the die G and upper die, F, having an overlapping concave, *i*, corresponding to the upper part of the said article, whereby the foot-rest or re-enforcing flange is formed in the same successive operation as that required in compressing the article into the desired shape from a sheet-metal blank, substantially as described, and for the purpose set forth.

3. For forming or shaping shovel-blades, scoops, and other like articles, an anvil-die of the shape required lying in synclinal planes, as indicated at A in the drawings, jointly with a hammer or male die corresponding thereto, as indicated at B in the drawings, substantially as and for the purpose specified.

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Witnesses:

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