

(No Model.)

3 Sheets—Sheet 1.

C. A. MAYNARD.  
MANUFACTURE OF SHOVELS.

No. 373,530.

Patented Nov. 22, 1887.

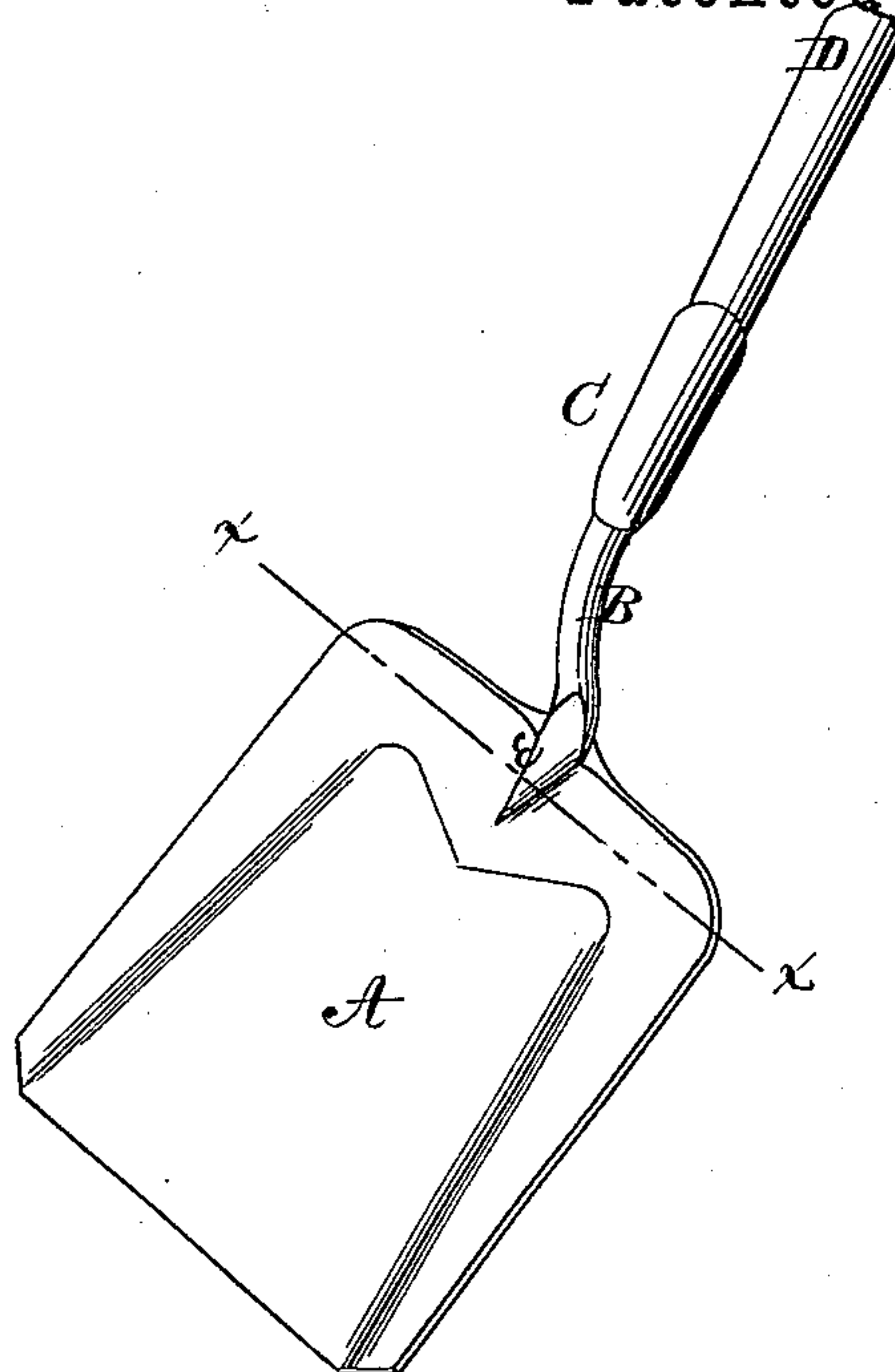


FIG. 1.



FIG. 3.

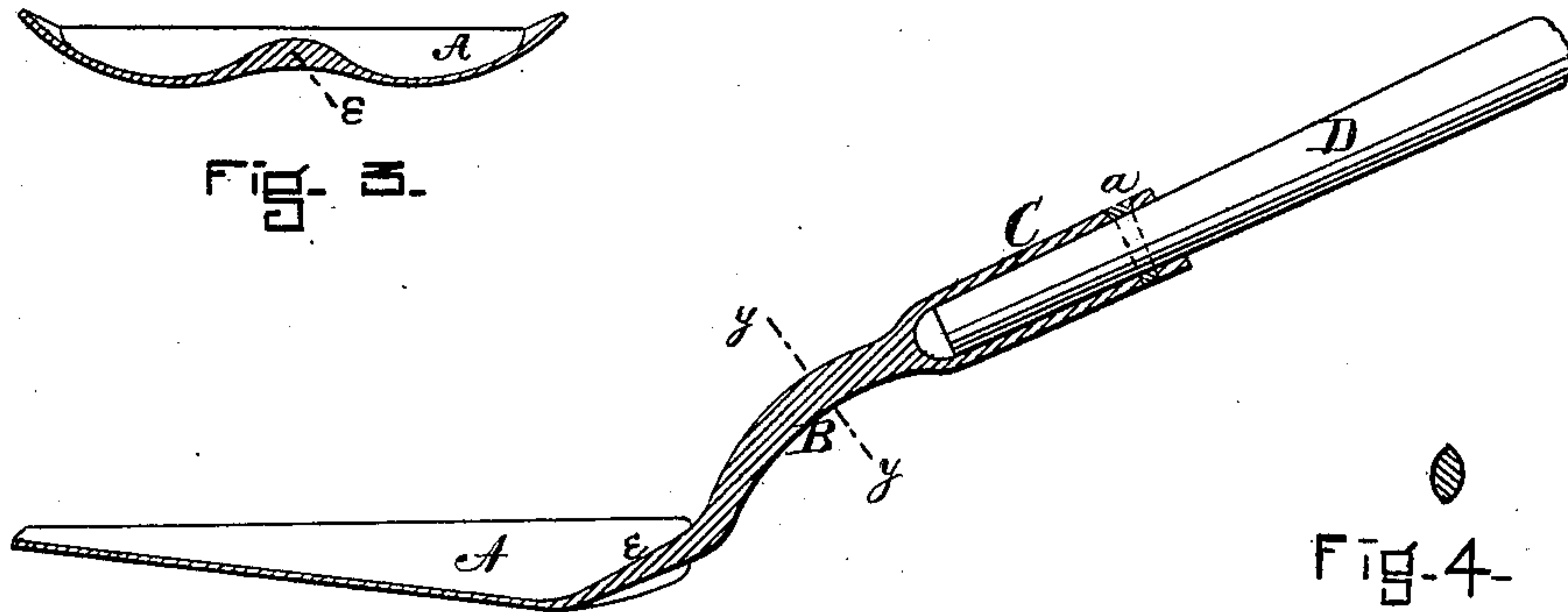


FIG. 2.

FIG. 4.

WITNESSES.  
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*Dana Malone*

INVENTOR.  
*Charles A. Maynard*  
*By Henry Winn*  
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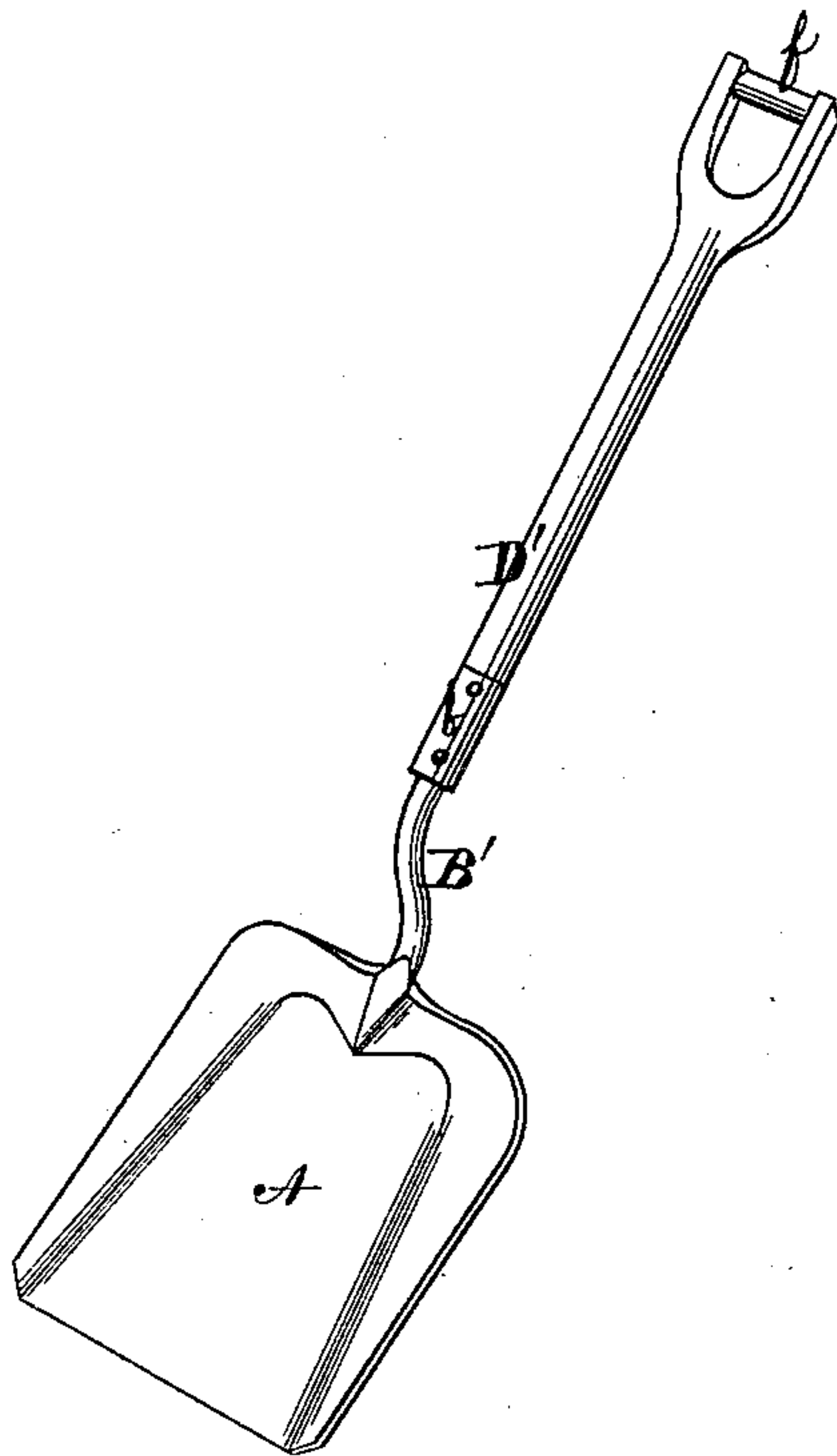


Fig. 5.

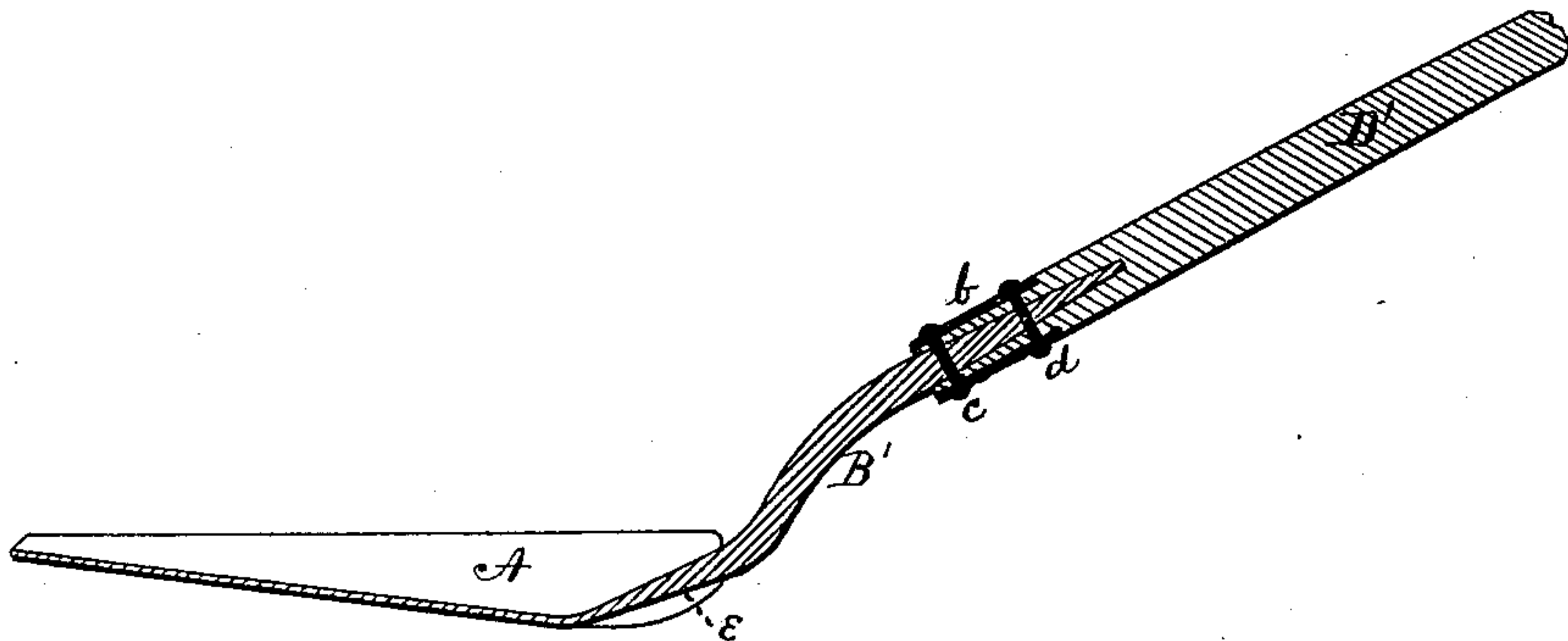


Fig. 6.

WITNESSES.

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(No Model.)

3 Sheets—Sheet 3.

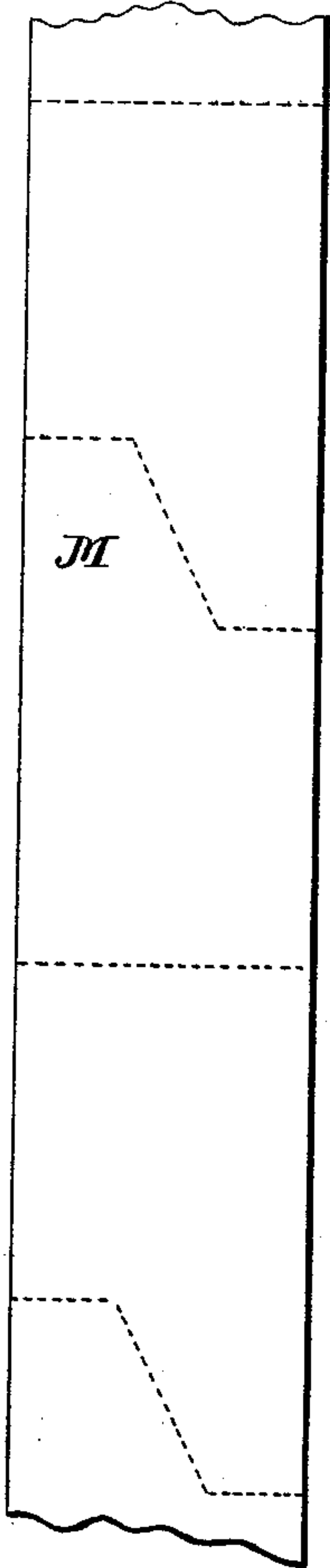
C. A. MAYNARD.

MANUFACTURE OF SHOVELS.

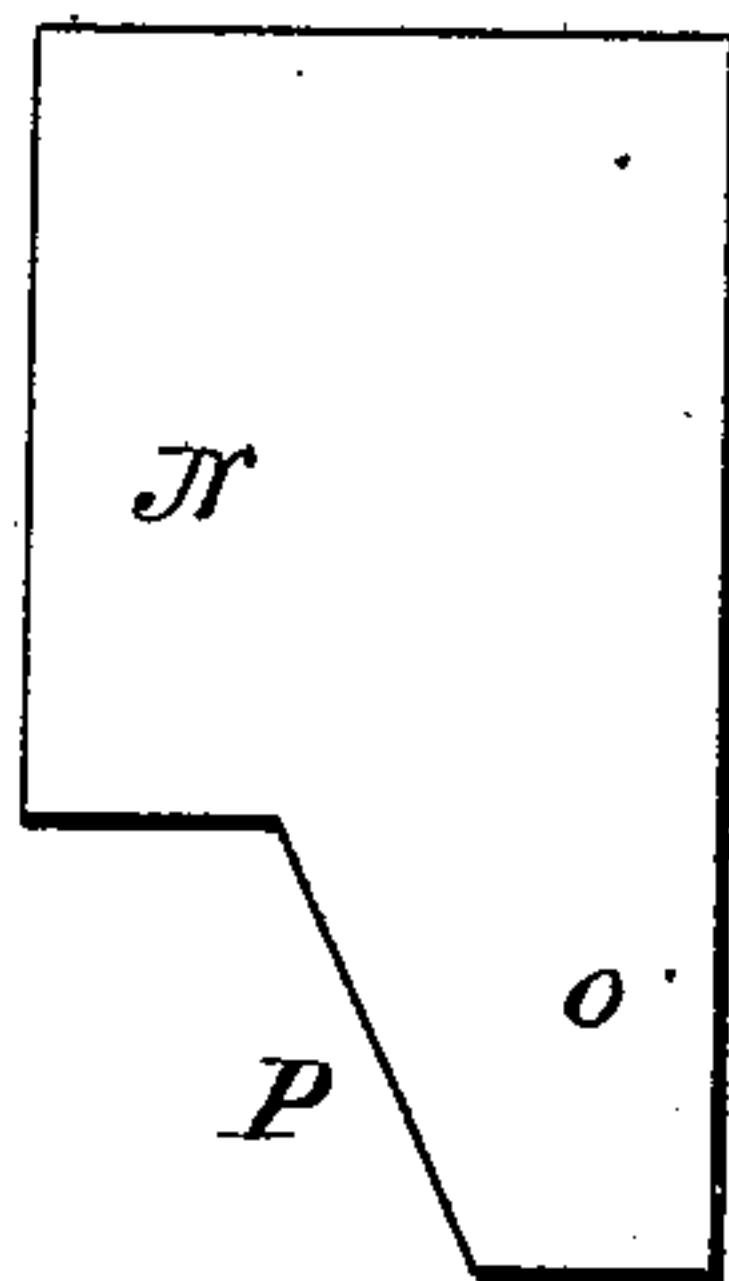
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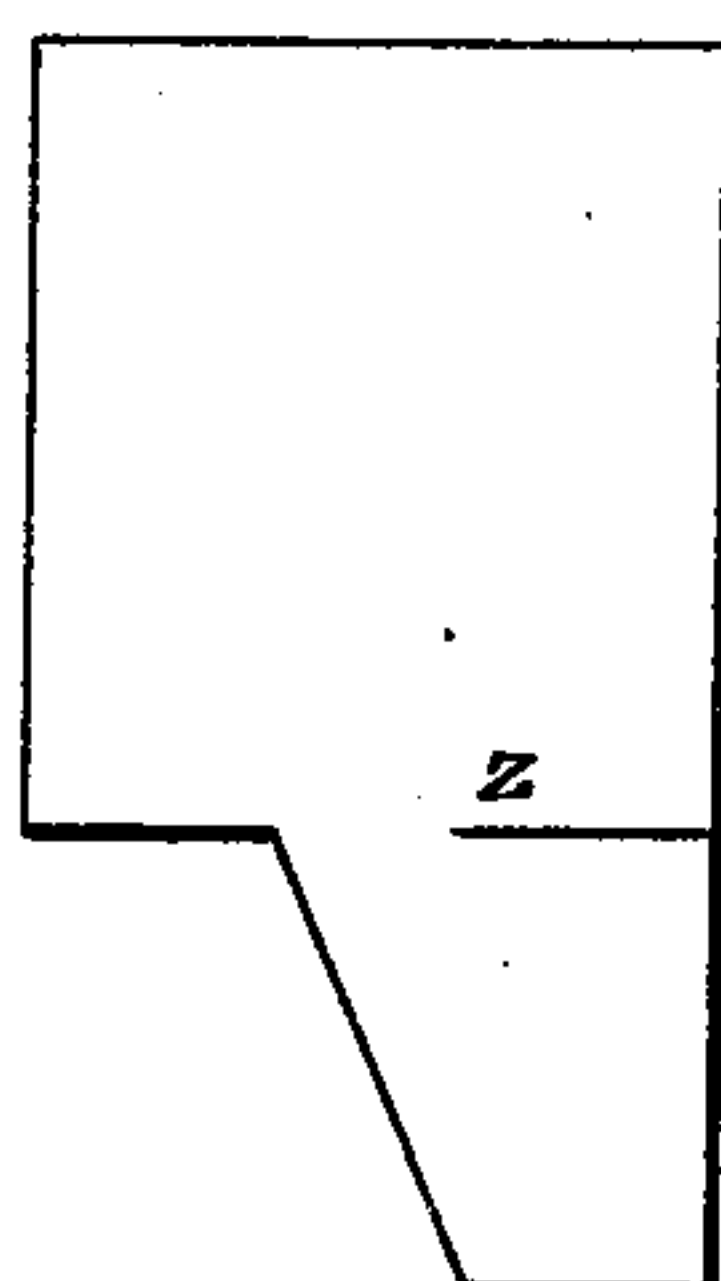
*Fig. 7.*



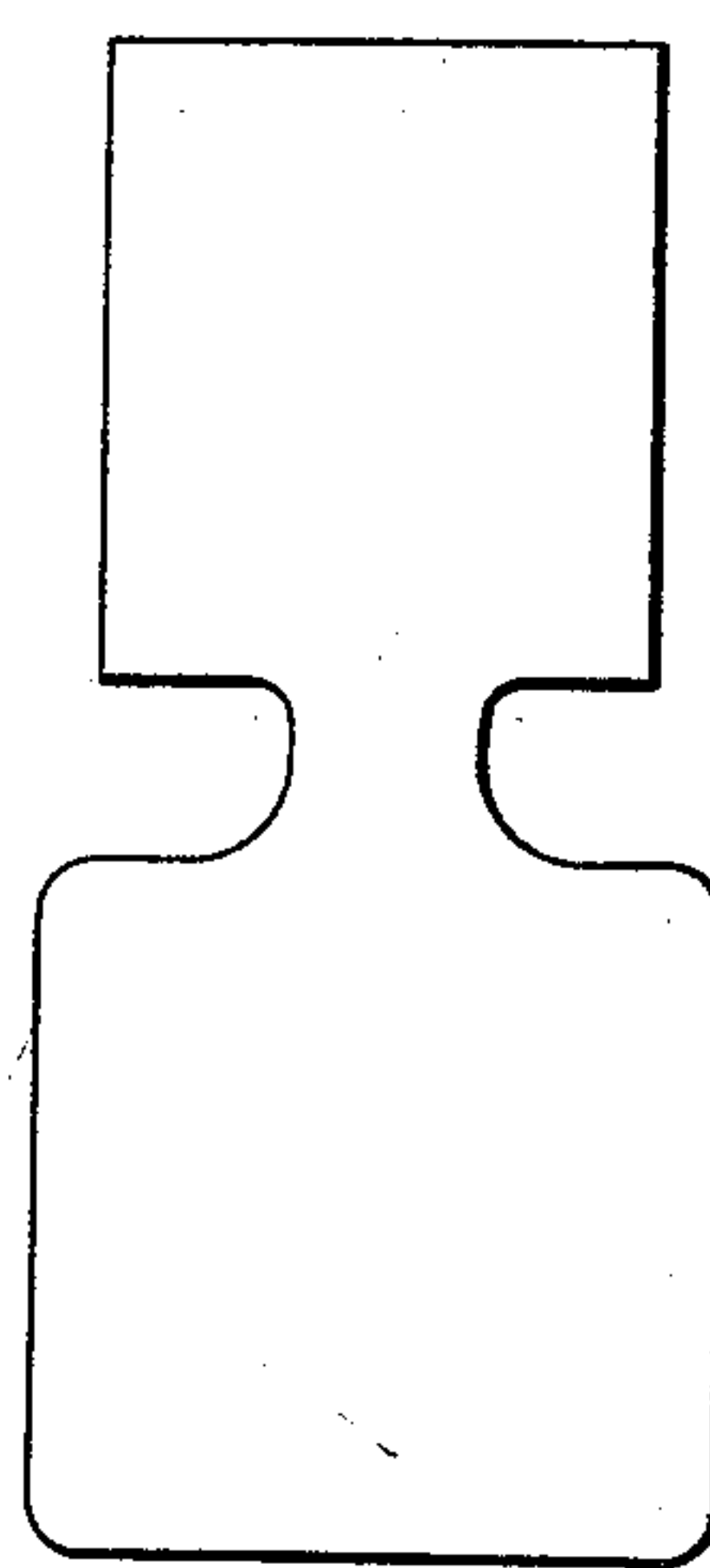
*Fig. 8.*



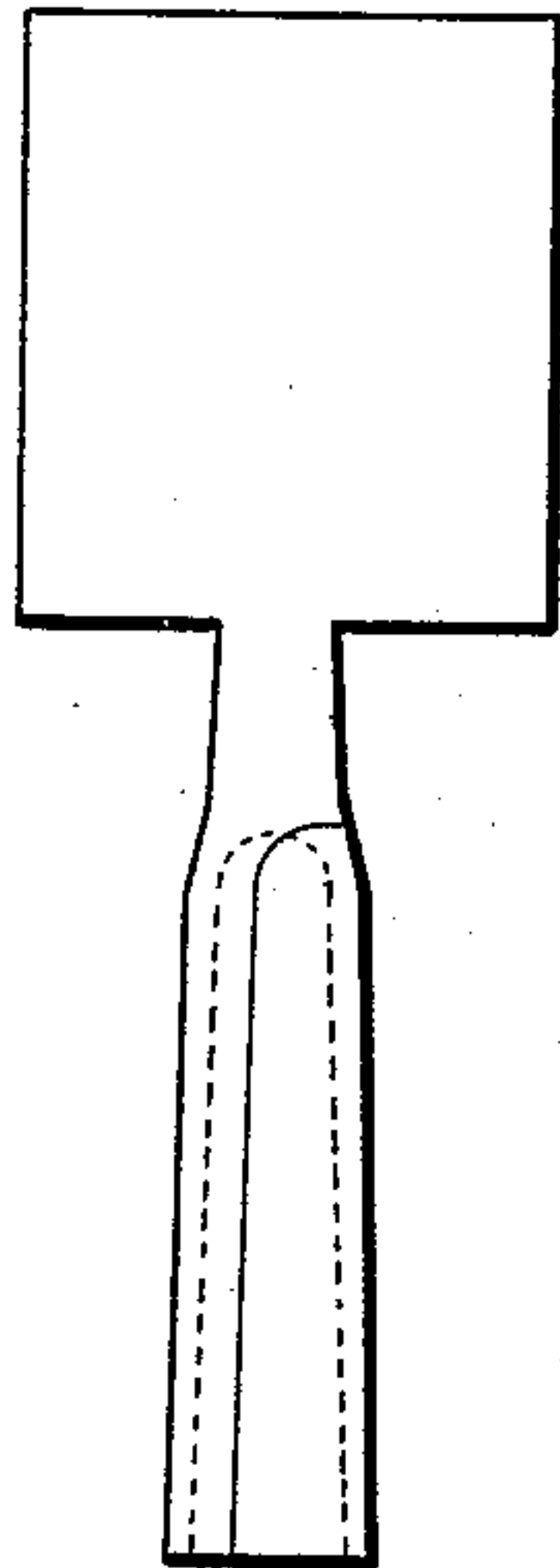
*Fig. 9.*



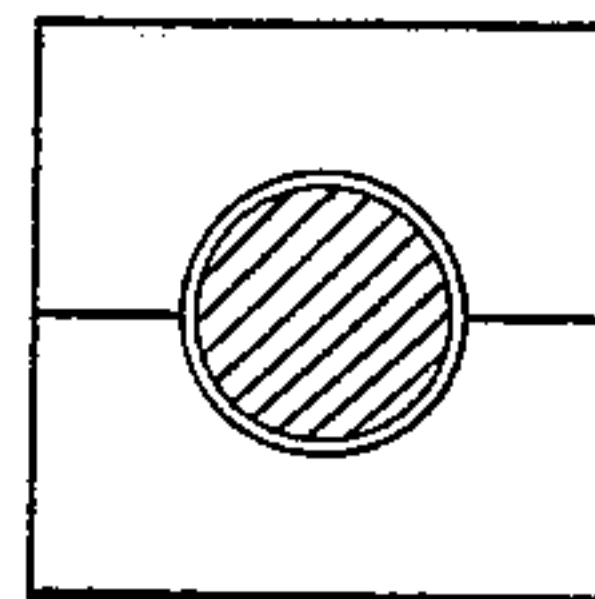
*Fig. 10.*



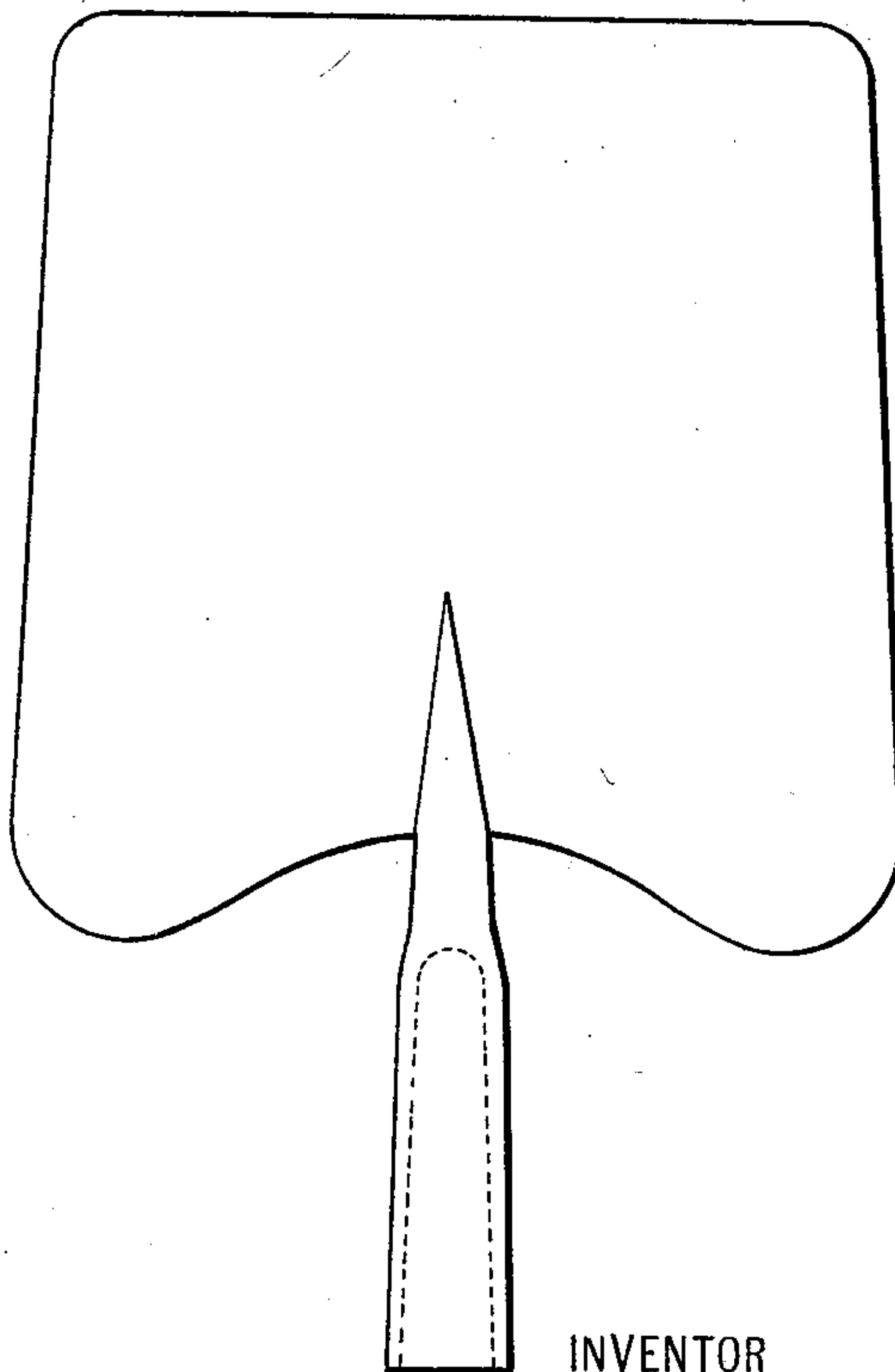
*Fig. 11.*



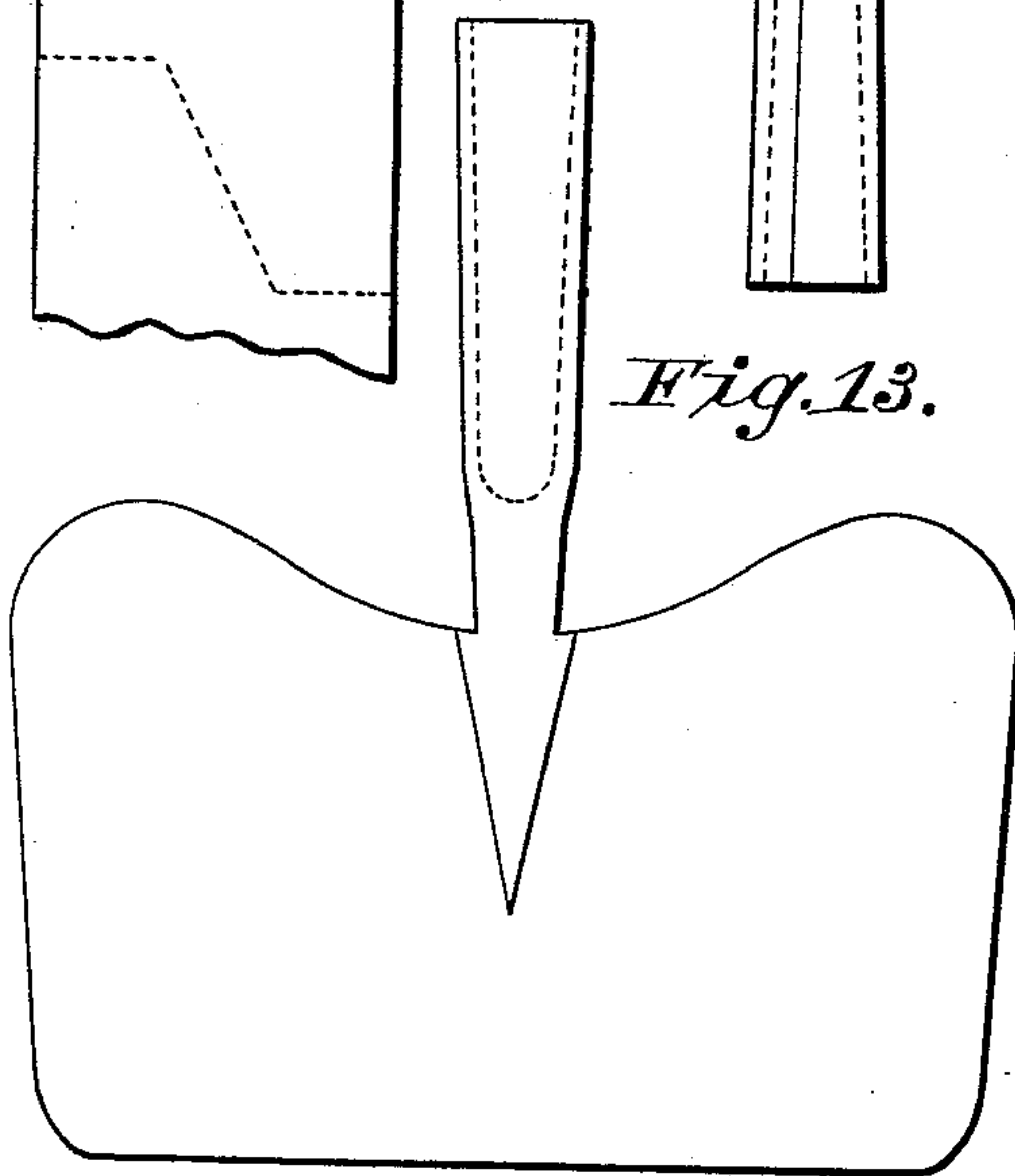
*Fig. 12.*



*Fig. 14.*



*Fig. 13.*



WITNESSES

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INVENTOR

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# UNITED STATES PATENT OFFICE.

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HENRY G. MAYNARD, OF SAME PLACE.

## MANUFACTURE OF SHOVELS.

SPECIFICATION forming part of Letters Patent No. 373,530, dated November 22, 1887.

Application filed February 14, 1885. Serial No. 155,869. (No model.)

*To all whom it may concern:*

Be it known that I, CHARLES A. MAYNARD, of Northampton, in the county of Hampshire and Commonwealth of Massachusetts, have invented certain new and useful Improvements in the Manufacture of Shovels, of which the following is a specification, reference being had to the accompanying drawings, in which—

Figure 1 is a view in elevation of the form of my improved shovel in which a socket is used, a part of the handle being broken away, which, when complete, is as seen in Fig. 5, but may be a straight cylinder. Fig. 2 shows a longitudinal central section of the blade, shank, and socket of my shovel as shown in Fig. 1, with the handle appearing in place in the socket. Fig. 3 shows a cross-section of the blade, taken through the lines *x x* of Fig. 1. Fig. 4 shows a cross-section of the shank, taken through the lines *y y* of Fig. 2. Fig. 5 is a view in elevation of another form of my improved shovel, which is the same as shown in Fig. 1, except that the shank is finished in form of a tang instead of a socket, and has a different mode of fastening to the handle. Fig. 6 shows a longitudinal central section of the blade, shank, and part of the handle, with its fastening to the shank, as said parts are shown in Fig. 5. Fig. 7 shows a metal bar, preferably of steel or iron, suitable for cutting out blanks of the proper size to make my improved shovel. Fig. 8 shows the blanks after they are cut from the bar by means of suitable dies or shears in order not to waste the metal. Fig. 9 shows a blank with a slit or cut, *z*, in one side, preparatory to being drawn out for shank and socket, or shank and tang, as the case may be. Fig. 10 shows the shank drawn out and the metal flattened preparatory to forming a socket by bending up and welding it into a socket, as shown in Fig. 11. To finish up the socket I prefer to insert into it a steel or iron pin and then to press it between two half-dies, as indicated in Fig. 12. Fig. 13 shows the stock for the blade partially spread by being rolled. In rolling out the blade the stock is left heaviest in the center, next where the shank projects, so as to form a sort of re-enforce or rib tapering from the shank toward the center of the blade. Fig. 14 shows the finished blade rolled out to proper size, afterward to be shaped up and trimmed at the corners, as shown in Figs. 1 and 5.

In the drawings, A is the blade, B is the shank, C is the socket, and D the handle.

The mode shown of fastening the handle in the socket is by a rivet, *a*, and to the shank (when a socket is not used) is by the ferrule *b* and the rivets *c* and *d*, all which are applied in the usual way; but any other mode of fastening may be used.

In the alternate mode of fastening the blade and shank together (shown in Figs. 5 and 6) the blade A is the same as in Fig. 1. The shank B' is the same, except it has a tang added instead of a socket, through which rivets are passed, and the handle D' is the same, except as to means of fastening.

The term "handle" in this specification does not include the shank or socket, but refers to the usual wooden part, whether it be a straight handle, as shown in Fig. 5, with its means of attachment to the socket or shank. The back point of grasp, which in Fig. 5 is *f*, is the part of the handle usually grasped for steadying with one hand while lifting in use with the other.

The blades of shovels are usually rolled or plated of substantially uniform thickness of metal, like the blades made of sheet-steel, a pocket being often opened after plating to admit a part of the wooden handle, the thickness of both sides of the cross section of the pocket, however, only equaling the general thickness of the blade; but in my shovel I use a solid shank integral with the blade, and to give additional strength against breakage liable at or near the connection of a blade with a small solid shank I leave a re-enforce or rib, *e*, (shown in cross section in Fig. 3) consisting of an increased thickness of the metal of the blade greatest at or near the junction of the shank and blade and gradually diminishing in all directions on the blade therefrom until the general thickness of the blade is reached.

This shovel is one in which the blade and shank in one form and the blade, shank, and socket in the other are made, by rolling, forging, plating, and other processes out, of a single piece of steel or iron, the blade and shank in the one case and the blade, shank, and socket in the other being absolutely integral each with each without any attachment of one part to another by brazing or otherwise soldering, by screws, by welding, riveting, or fastening in any way in the process of manufacture, and



without any such attachment of either of said parts to itself, except in the case of the socket, which is first plated out into a flat form and then shaped into a hollow cone or tube by folding over a former and welding the edges of the flat metal together; but said parts are united only each to each and each portion of each part to each other portion (except in the single case of welding described) by their original molecular union as parts of one piece of metal.

In my improved shovel so constructed the imperfect union of parts existing in all the known methods of fastening, the liability of rivets and screws to loosen, and of breakage at welds, which is frequently caused by the burning of the iron or steel in the process of welding, and the inconvenient projections rendered necessary by the fastenings often used, are entirely avoided, and a perfect blade is secured, smooth inside and out, with a much stronger attachment to the parts connecting it with its handle than has hitherto been manufactured.

The additional strength secured in the union of the shank and blade, as described, as well as the saving of stock and labor made by avoiding the need of broad surfaces for a strong weld, render feasible in shovels of moderate cost the use, in connection with the blade, of a small curved shank, which takes less room at the blade than the straps and wooden handle, which usually project down to the blade, thereby enabling the power to be applied in use nearer centrally on the blade and making a lighter and less clumsy tool. This use of a curved shank, furnishing in that portion wherein it is independent of the handle all or as much as may be desired of the curvature required between the back point of grasp of the handle and the blade, also enables the use of a straight handle and saves the cost of bending, enabling a person without skill to replace a broken handle. The identity of the socket and shank tends also to the strength of their union and enables the use of a smaller shank. Being the most substantial fastening for the handle, I prefer it to the ferrule, and when a socket is used a new handle may be more easily fitted by an unskilled person in case of breakage. Of course the shank may be short enough to allow a grasp of the hand upon the handle or socket as near to the blade as desired.

The shank not being re-enforced by the handle, is constructed to endure alone without breakage the stress required in the use of the shovel in the portion in which it is an independent part, and may be made large enough, therefore, with a circular cross-section, or having its section elongated or oval, as shown in Fig. 4, with its longest diameter in line with the plane in which loads on the blade would be lifted in use of the shovel, or the shank may be made hollow as an extension of the socket or otherwise, which construction, however, would practically require a weld in it.

The process by which I make my improved

shovel is already indicated in the above description of the drawings; but I will state it more explicitly. I first take a steel or other suitable metal bar, M, of convenient dimensions as to width and thickness, the exact dimensions not being material, and cut from it, by means of certain suitable shears, blanks N—such as shown in the drawings—of suitable weight and dimensions to be forged into an integral shovel blade, shank, and socket, or tang. By cutting the bar in the manner indicated in the dotted lines of Fig. 7 no stock is wasted, and each blank will have a projection, O, inclined on one side at P. Each blank is then cut, as indicated at z, which leaves it in shape to forge or draw out parts for the shank, blade, and socket. I next draw out the stock for the shank, then plate or spread the stock preparatory to bending it to form the socket. I then fold and lap the edges of the flat part to form the socket. I then preferably employ half-dies and a pin within the socket to perfectly form the socket and weld the lap, as indicated in Fig. 12. I next spread the stock for the blade, and I use roller-dies formed so as to leave the stock heaviest in the center of the blade near where the shank projects, so as to form a re-enforce or rib tapering toward the center of the blade, as shown in Figs. 2 and 3. By the rolling process, or it might be by hammering or forging, the shovel blade is plated or drawn down to the proper thickness and size, and then is shaped and trimmed at the corners in the usual manner. I thus get a complete shovel-blade, shank, and means for fastening them to a wooden handle, all of one piece of metal, and that disposed to the best advantage to combine lightness and strength. The attachment of the blade to the shank is firm and secure, and the shape of the shank is such as to give it the requisite strength with the minimum weight of metal. If I form a tang instead of a socket for fastening on a wooden handle, then the metal is simply elongated and pointed, instead of being flattened and folded to form a socket.

What I claim as my invention, and for which I pray Letters Patent, is—

1. As an improvement in the art of manufacturing shovels, the herein-described method, which consists, first, in taking a steel or other suitable metal bar of convenient dimensions, and cutting from it a blank with a projection inclined on one side, such as shown in Fig. 8 of the drawings, then cutting a slit in the blank, as indicated at z, Fig. 9, then forging or drawing out the stock for the shank, and then forging or drawing out the metal for the blade, substantially as set forth.

2. A blank for the manufacture of shovel-blades and handle-fastenings of one piece of metal, consisting of the parts N and O, the latter being inclined at P, substantially as set forth.

Witnesses:

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