

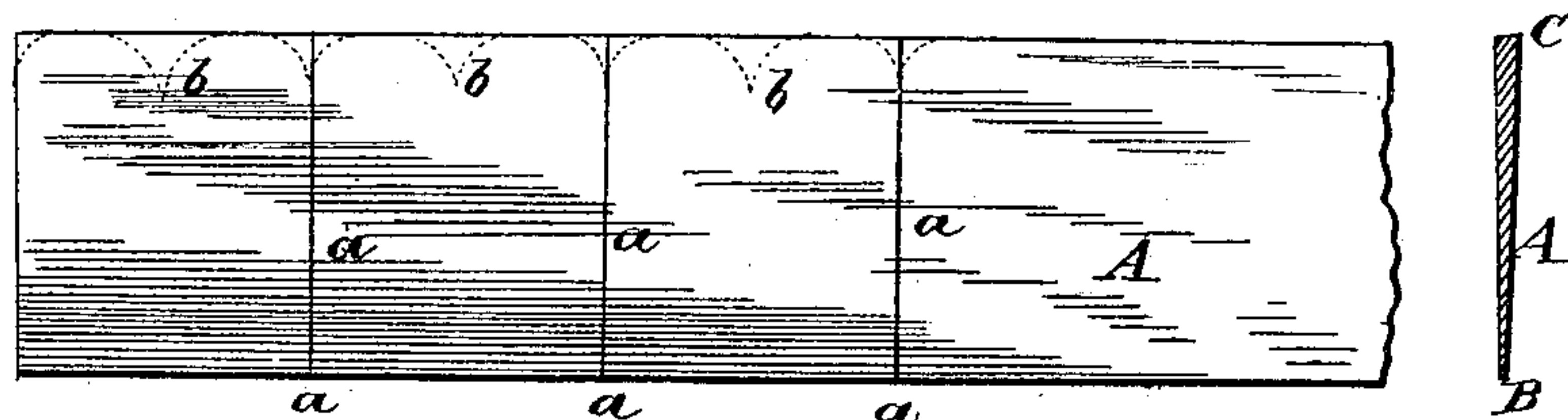
(No Model.)

J. J. JOHNSTON.  
GARDEN HOE.

No. 266,833.

Patented Oct. 31, 1882.

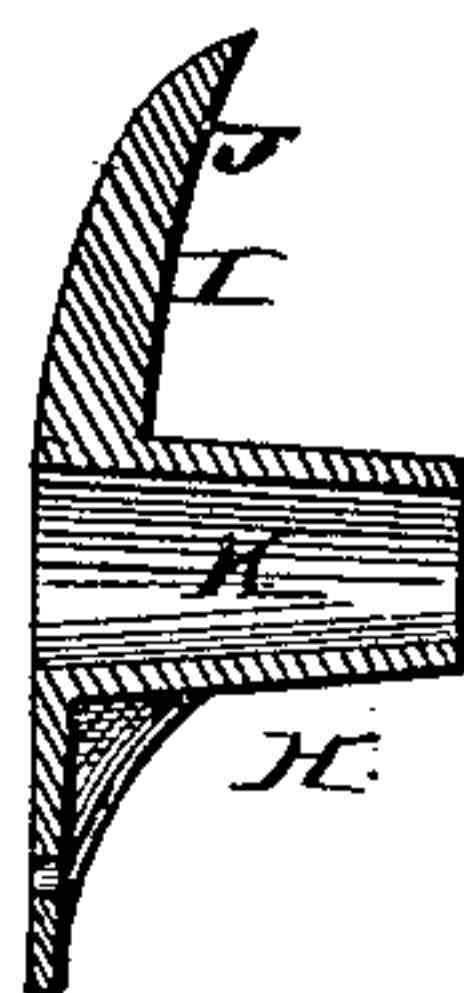
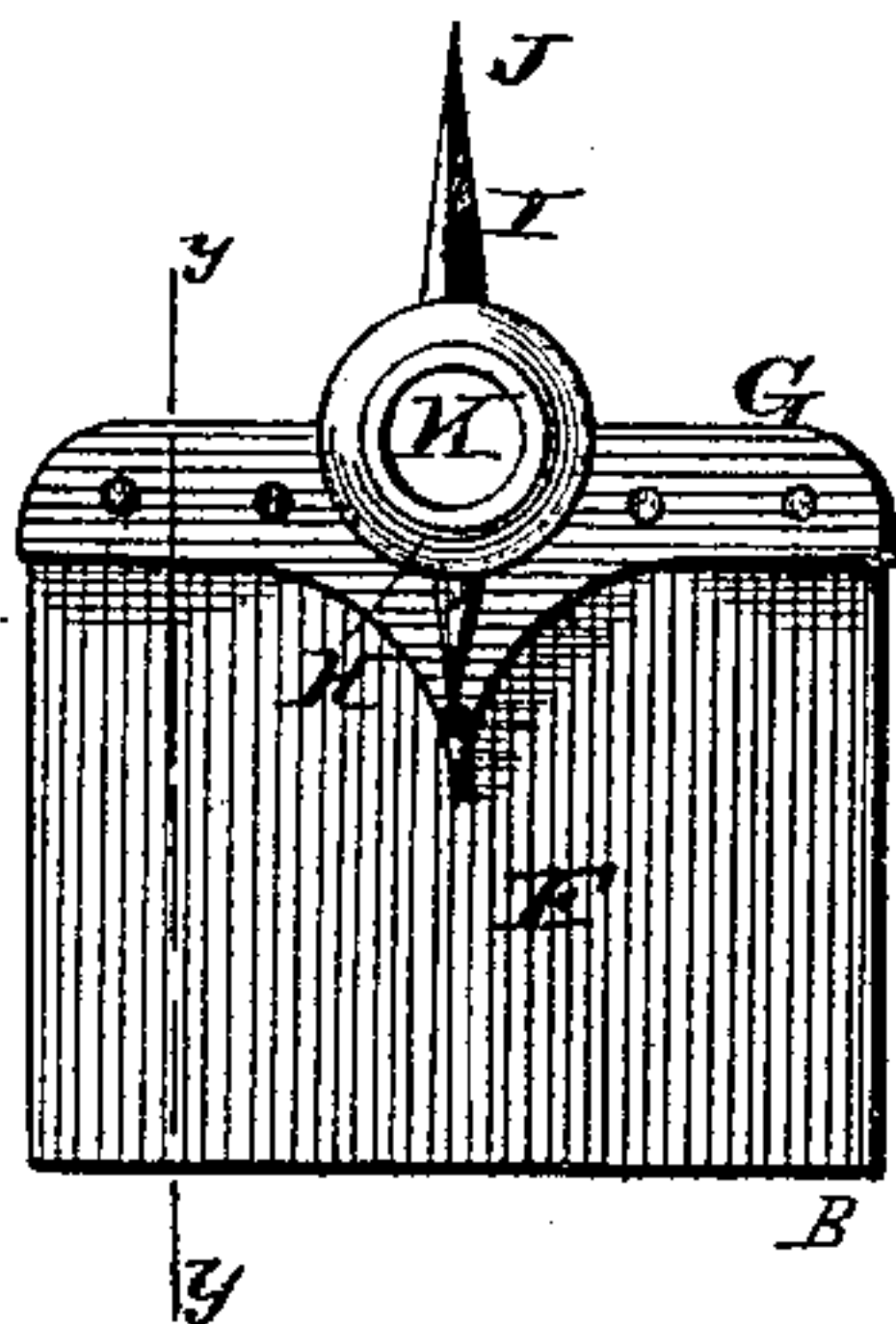
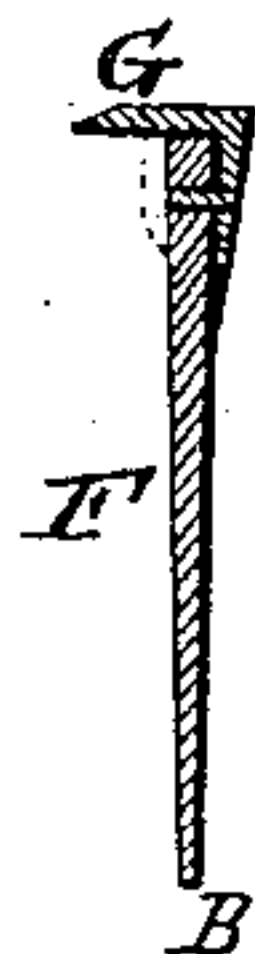
*Fig. 1.*



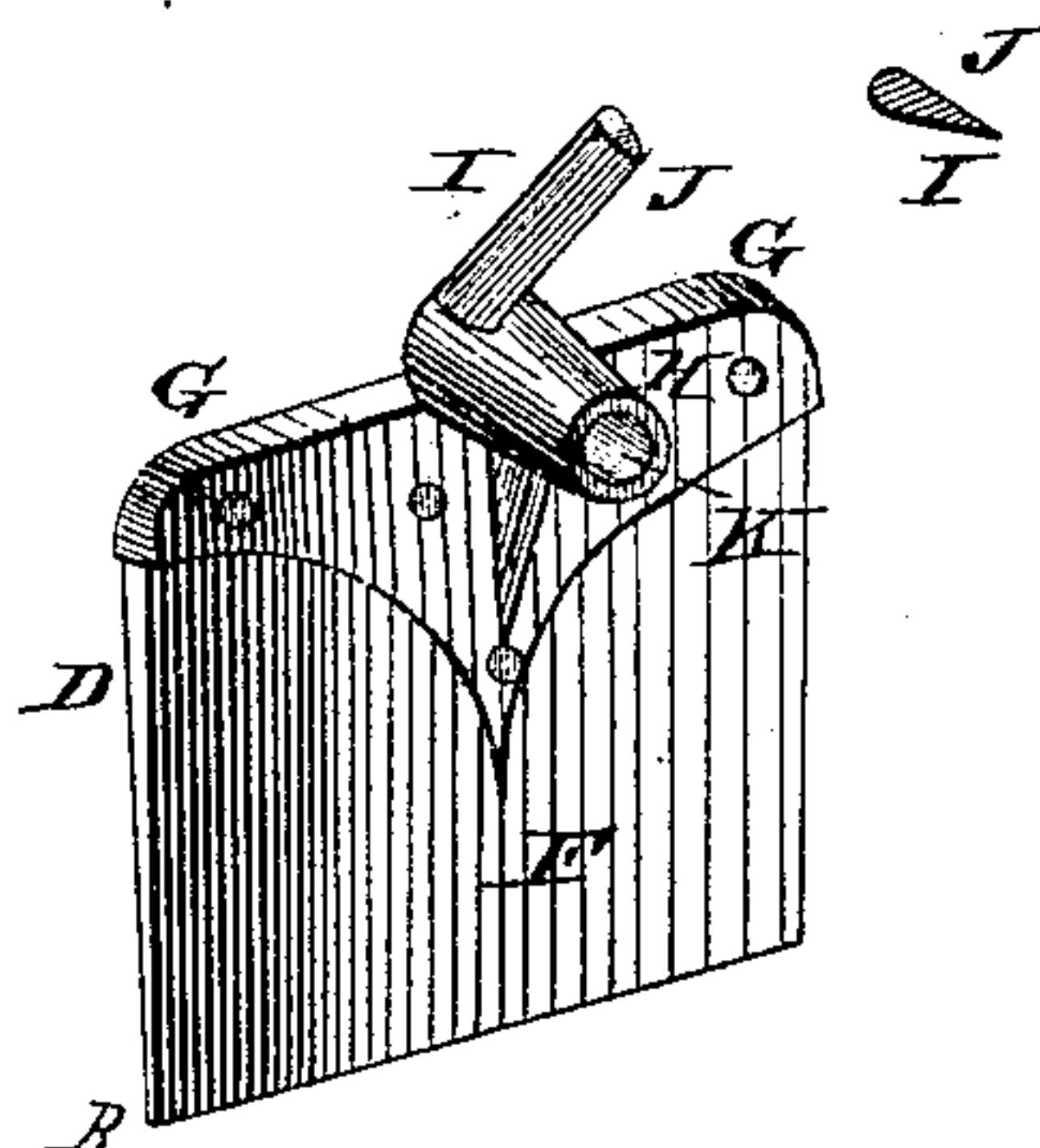
*Fig. 3.*

*Fig. 4.*

*Fig. 2.*



*Fig. 5.*



WITNESSES

*Med. G. Dieterich,*  
*P. C. Dieterich.*

INVENTOR

*James J. Johnston*

# UNITED STATES PATENT OFFICE.

JAMES J. JOHNSTON, OF COLUMBIANA, OHIO, ASSIGNOR TO THE UNITED STATES IMPROVEMENT COMPANY, (LIMITED,) OF SAME PLACE.

## GARDEN-HOE.

SPECIFICATION forming part of Letters Patent No. 266,833, dated October 31, 1882.

Application filed February 23, 1882. (No model.)

*To all whom it may concern:*

Be it known that I, JAMES J. JOHNSTON, of Columbiana, in the county of Columbiana and State of Ohio, have invented a certain new and useful Improvement in Garden-Hoes; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon.

My invention relates to an improvement in garden-hoes; and it consists in forming blanks for the blade from beveled strips of sheet-steel, and providing said blanks with malleable cast-iron cap having a socket for the hoe-handle, on the upper side of which socket, at the outer end, is a hooked blade or prong, for the cutting of roots and the withdrawing of the same from the ground, all constructed, arranged, and combined as will hereinafter more fully and at large appear.

To enable others skilled in the art with which my invention is most nearly connected to make and use it, I will proceed to describe its construction and operation.

In the accompanying drawings, which form part of this specification, Figure 1 represents a strip of steel having one side beveled. Fig. 2 represents a vertical section of the hoe at line *yy*, Fig. 3. Fig. 3 is a face view of the hoe. Fig. 4 is a vertical section of the socket and its cutting hooked blade. Fig. 5 is a perspective view of the hoe.

Reference being had to the accompanying drawings, A represents a strip of sheet-steel, the width of which should be equal to the depth intended for the blade of the hoe. This strip is beveled from the point B to the point C, as indicated at D in Figs. 2 and 5, whereby the thin edge will always keep sharp. The blades F are cut from the strip of steel, as indicated by the lines *a* and dotted lines *b*, the latter showing but a small waste of the stock in forming the blade of the hoe. The cap G, having handle-socket H and hooked blade or prong I, with sharp-cutting edge J, is constructed of malleable cast-iron, the hooked blade of which I convert into steel by placing all of the cap G except said hooked blade in earth placed in an iron vessel, and then covering said

hooked blade with a mixture of pulverized charcoal and oxide of iron, using about ninety parts of charcoal and ten parts of the oxide of iron, thoroughly mixing said ingredients together, which mixed mass is packed closely around said blade. The vessel is then covered with a metal lid, which is carefully secured in place on the vessel, and care taken to thoroughly lute the joints around said lid. The vessel is then placed in an oven and subjected to a high degree of heat for about twenty-four hours. It is then withdrawn from the oven and, with its contents, allowed to gradually cool, after which the caps G are taken from the vessel and cleaned. The hooked blade is then heated to a cherry red and immersed in a strong brine, formed by dissolving a pure salt in pure soft water. The cap G is then riveted on the hoe-blade F, as indicated in Figs. 2, 3, and 5, which will complete the construction of the hoe ready for the reception of its wooden handle.

By constructing a hoe as hereinbefore described it will have a steel blade, F, which will be self-sharpening, and will have a steel hooked blade or prong, with sharp cutting-edge for cutting roots and the withdrawing of them from the ground, the advantage of which will be apparent to the skillful gardener.

The hoe hereinbefore described can be manufactured with great facility and at a diminished cost when compared with the making of a hoe having a hooked blade by the plating and forging process.

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

In a garden-hoe, the combination of the blade F, cut from beveled strips of sheet-steel, and the malleable-iron cap piece G, having the socket H, and formed thereon the hooked blade or prong I, hardened into steel, and provided with cutting-edge J, all substantially as herein described and shown, for the purpose set forth.

JAMES J. JOHNSTON.

Witnesses:

T. D. D. OURAND,  
FRED. G. DIETERICH.