

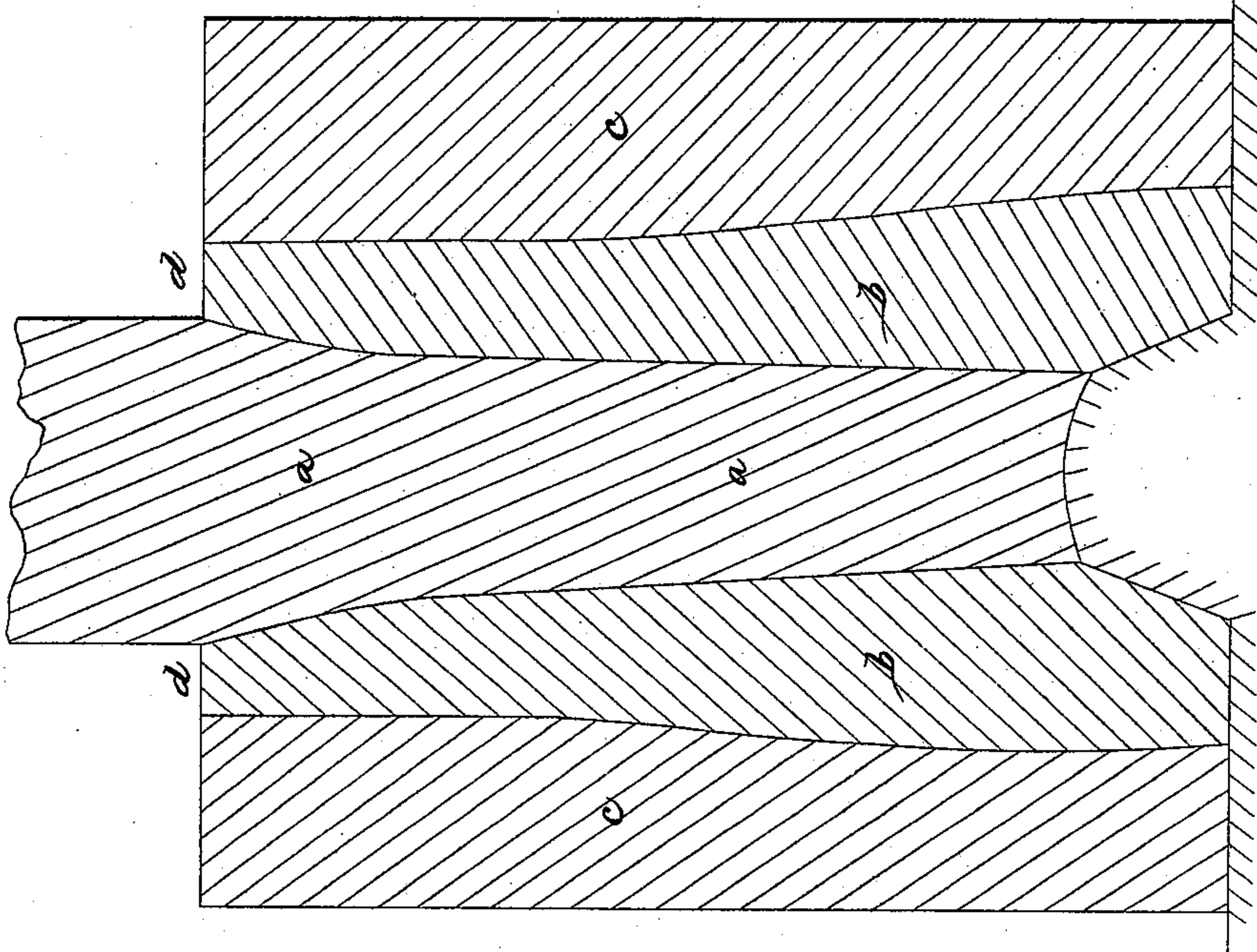
*J. Y. Smith,*

*Rock Drill.*

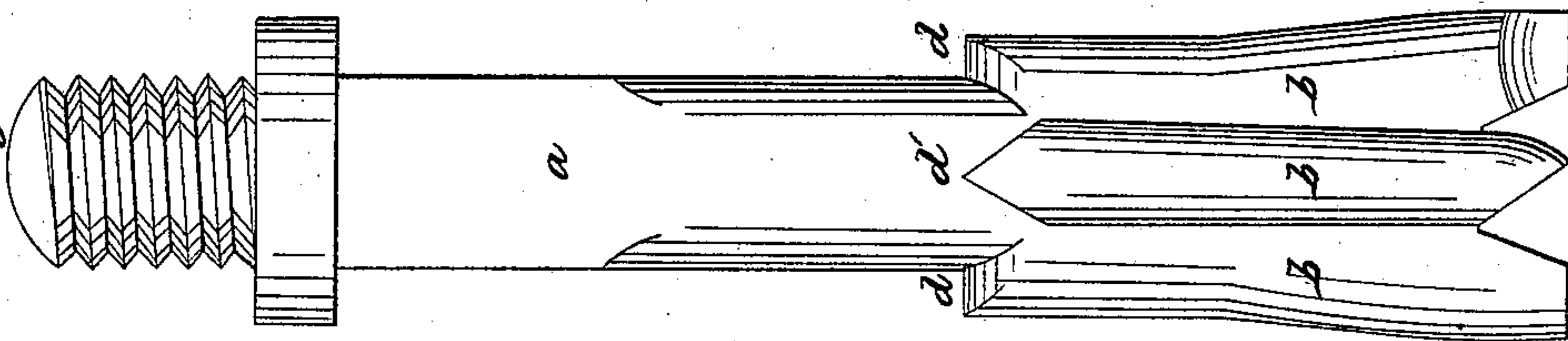
*N<sup>o</sup> 54,226.*

*Patented Apr. 24, 1866.*

*Fig. 2.*



*Fig. 1.*



*Witnesses.*

*Geo. M. Miggins*  
*Geo. L. Coville*

*Inventor.*

*J. Y. Smith*  
*by his Atty*  
*W. H. H. H.*



# UNITED STATES PATENT OFFICE.

JOHN Y. SMITH, OF ALEXANDRIA, VIRGINIA, ASSIGNOR TO HIMSELF AND HERMAN HAUPT, OF PHILADELPHIA, PENNSYLVANIA.

## IMPROVED ROCK-DRILL.

Specification forming part of Letters Patent No. 54,226, dated April 24, 1866.

*To all whom it may concern:*

Be it known that I, JOHN Y. SMITH, of Alexandria, in the county of Alexandria and State of Virginia, have invented certain new and useful Improvements in the Manufacture of Rock-Drills and other Kindred Implements or Tools; and I hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, in which—

Figure 1 represents an elevation of my invention, and Fig. 2 is a longitudinal section of part of the drill and the mold in which it is inclosed.

This invention relates to the manufacture of rock-drills and other boring or cutting instruments used in metallurgical and kindred operations. One of its objects is to intimately unite and properly combine the two metals—steel and iron—of which these instruments are composed, so as to secure great strength, toughness, and hardness in those parts where these qualities are essential. The other object is to prevent the loose earth and stones detached from the sides of the well by the motion of the drill-rod from being jammed and packed around and above the bits or wings of the drill. This often happens in the use of drills of ordinary construction, causing the forcible separation of the drill from its stem or otherwise injuring or impeding the working of the instrument.

To enable others to make and use my invention, I will now proceed to describe it, and at the same time referring to the accompanying drawings, in which—

*a* represents the rod, made of wrought-iron, which forms the drill-stem; *b b*, the bits or wings of the drill; *c c*, parts of the mold, and *d d* the inclined or deflecting faces of the wings. I take a rod of iron intended for the drill-stem, being of a cylindrical, polygonal or any other suitable cross-section, and first remove the scale from and roughen the surface of so much of one of its ends as may be needed for the formation of the wings or bits of the drill. It is not absolutely necessary to roughen the surface; but I prefer to do so whenever it is practicable. I then place this end, which should be heated to white or welding heat and formed into a cone, the apex toward the end of the stem, as represented at *a*, Fig. 2, in a cast-iron mold, *c c*, of the form

required for the shape of the wings *b b b* of the drill. The liquid or melted steel which has been prepared for the casting is then poured into the mold forming the wings of the drill, as seen at Fig. 2, and becoming intimately and closely united with the iron stem. The remainder of the process I will not describe, as it does not differ from the ordinary process of molding.

By using the above-described method, instead of the ordinary process of welding, in the manufacture of instruments or tools of this class, not only a finer and better quality of steel is produced, but, which is of even greater importance, a more intimate combination of the iron and steel is effected than is usually found in such instruments.

To prevent the jamming and packing of earth, stones, &c., around and above the drill, and the consequent injury to the instrument, I make the bits of the drill of a peculiar shape. Instead of causing the wings to taper gradually toward the stem, I make them of such a shape that the upper ends of the wings project some distance from the surface of the stem, and they are so formed as to have each two inclined faces, *d d'*, which deflect the earth falling from above, allowing it to fall through the spaces between the wings and preventing it from accumulating and jamming around and above the wings.

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

1. The construction of a drill or reamer or kindred implement of any form having a wrought-iron stem combined with steel bits or cutting-edges, by casting the steel which forms the bits or cutting part of the drill around the wrought-iron stem when at a white or welding heat, as and for the purposes herein set forth.

2. In combination with a drill or kindred tool of otherwise ordinary or suitable construction, the wings formed with deflecting-surfaces at their upper ends, as and for the purposes herein set forth.

In testimony whereof I have signed my name to this specification before two subscribing witnesses.

J. Y. SMITH.

Witnesses:

EDM. F. BROWN,  
JOS. L. COOMBS.