No. 880,517. PATENTED MAR. 3, 1908.

R. J. GARDNER.

PIERCING MANDREL.

APPLICATION FILED OCT. 21, 1907.

FIG. 1.

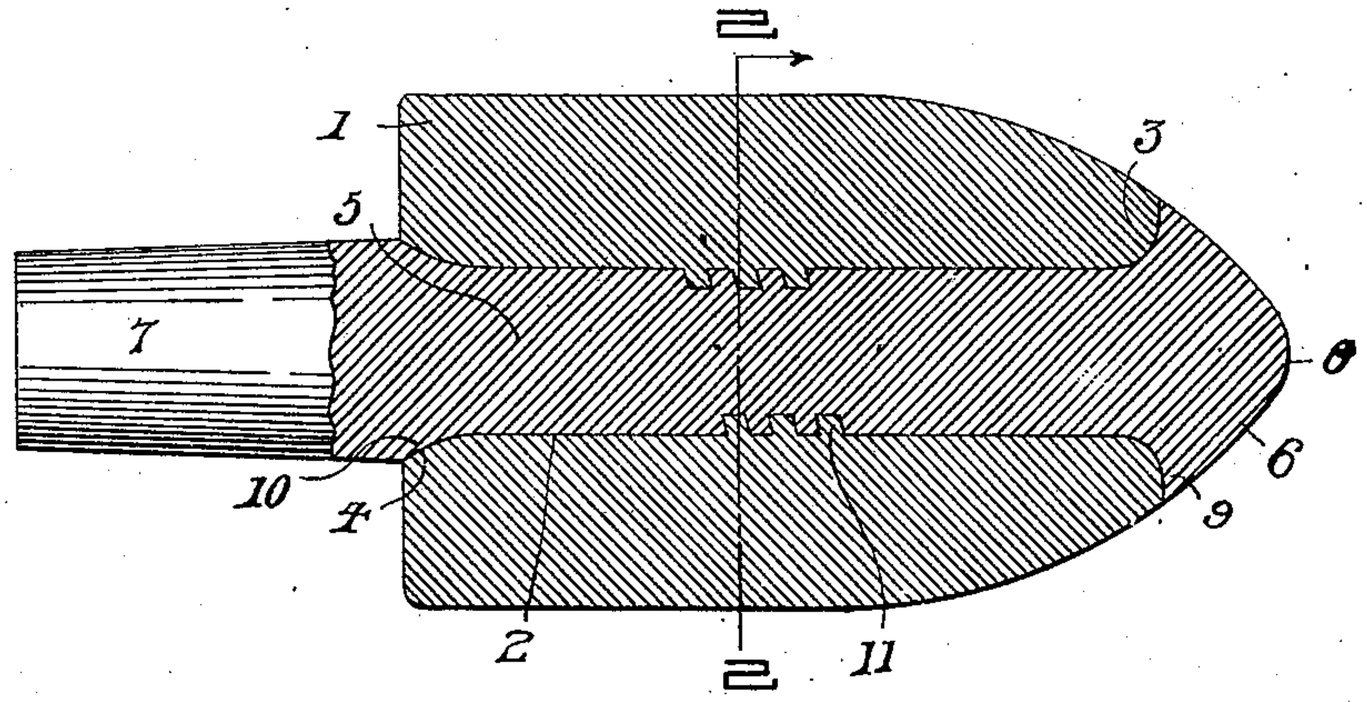
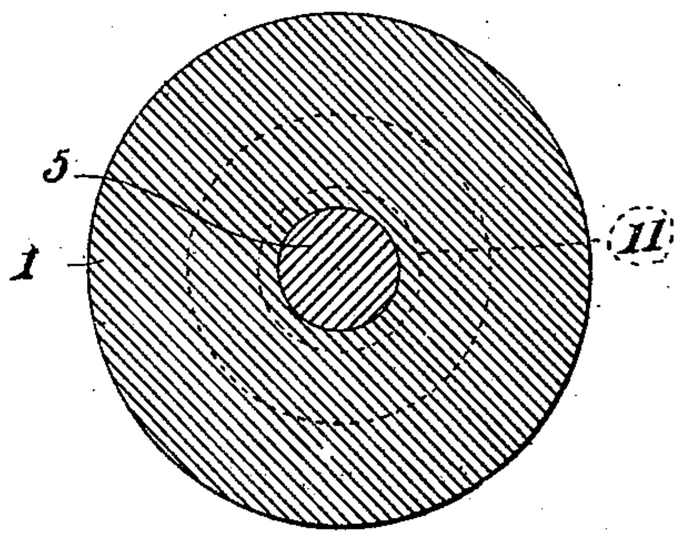


FIG. 2.



WITNESSES:

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UNITED STATES PATENT OFFICE.

ROBERT J. GARDNER, OF PITTSBURG, PENNSYLVANIA, ASSIGNOR TO THE S. JARVIS ADAMS COMPANY, OF PITTSBURG, PENNSYLVANIA, A CORPORATION OF PENNSYLVANIA.

PIERCING-MANDREL.

No. 880,517. Specification of Letters Patent. Patented March 3, 1908.

Application filed October 21, 1907. Serial No. 398,340.

To all whom it may concern:

Be it known that I, ROBERT J. GARDNER, a citizen of the United States, residing at Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented or discovered new and useful Improvements in Piercing-Mandrels, of which the following is a specification.

My invention relates to mandrels for piercing blanks in the manufacture of seamless tubes. Its object is to provide a composite piercing mandrel which shall have the advantages of both steel and cast-iron mandrels, and which shall be simple in construction and comparatively cheap to manufacture.

Referring to the drawings, Figure 1 is a longitudinal section partly in elevation of the preferred construction of my invention and Fig. 2 is a section on the line 2—2 on Fig. 1.

On the drawings, 1 represents the cast-iron body of a piercing mandrel embodying the principles of my invention. This body is cylindrical preferably for approximately two-thirds of its length, its upper end being the frustum of a cone or similar figure. It has an axial bore 2 with its ends flaring as shown as 3 and 4. Within this bore is the steel support 5, having at one end the steel piercing point 6 and at the other end the shank 7. The point 6 forms a continuation of the tapering end of the body 1 and terminates in an apex 8. The external form of my piercing mandrel does not differ essentially from those known to the art but it may have any desired shape.

The support 5 is shaped to fit the flared ends 3 and 4 of the bore 2 whereby shoulders 9 and 10 are formed, the former beneath the point 6 to prevent the forward movement of the body 1 on the support and the latter at the juncture of the shank and the support to restrain the body from rearward movement on the shank.

The body 1 may be prevented from rotation on the support 5 in many ways but I prefer to provide the support with a short threaded section 11.

The shank 7 is preferably tapered as shown, but it may be shaped otherwise, if desired.

I prefer to manufacture my mandrel as follows: I first form the body 5 with the point 6, the shank 7, the shoulders 9 and 10 and the threads 11. I then use this as a core for casting thereon the body 1 in a manner well understood by those conversant with the art of founding. In this manner, I cause the body 1 to be rigidly held on the support, because portions of the body are cast in the threads of the portion 11 of the support, and I cause the shoulders 9 and 10 to be in close contact with the body so as to form a rigid structure.

In operation the steel point will be employed for causing the initial flow of the metal along the entire axis of the blank while the cast-iron body will be employed for the work of expanding the metal opened or pierced by the steel point.

By making the body of cast-iron instead of making the whole mandrel of steel, I save a large expense and at the same time I have all the advantages of a steel mandrel by the use of the steel point. As cast-iron produces less friction than steel in piercing, I provide a mandrel having the advantages of a cast-iron mandrel.

The described mandrel is to be used on the end of the usual mandrel bar while piercing blanks in the well-known process of manufacturing seamless tubing; it may be used wherever a mandrel-head or pipe-ball is required in the manufacture of tubing.

I claim—

In a piercing mandrel, a cast-iron body, and a steel core or center piece extending through the same and having at one end a steel piercing point and at the other end a shank.

Signed at Pittsburg, Pa., this 17th day of October, A. D. 1907.

ROBERT J. GARDNER.

Witnesses:

ALICE E. DUFF,

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