

R. J. GARDINER.
PIERCING MANDREL.
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945,932.

Patented Jan. 11, 1910.

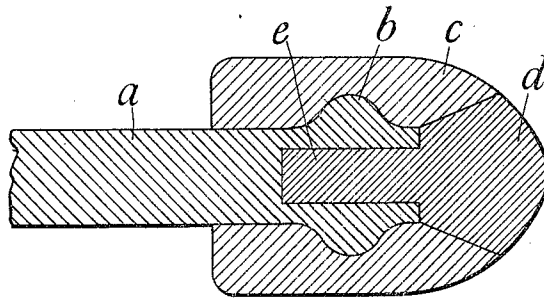


Fig. 1

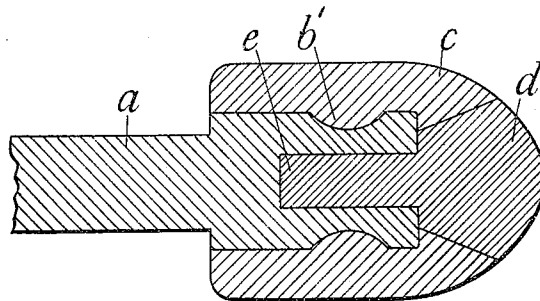


Fig. 2

WITNESSES

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UNITED STATES PATENT OFFICE.

ROBERT JAMES GARDINER, OF TINSLEY, NEAR SHEFFIELD, ENGLAND, ASSIGNOR TO
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PIERCING-MANDREL.

945,932.

Specification of Letters Patent.

Patented Jan. 11, 1910.

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To all whom it may concern:

Be it known that I, ROBERT JAMES GARDINER, subject of Great Britain, residing at 9 Sheffield road, Tinsley, near Sheffield, England, have invented new and useful Improvements in Piercing-Mandrels, of which the following is a specification.

This invention relates to the production of steel or other metal tubes and has for its object to provide an improved mandrel for use more especially in the piercing operation of weldless tube manufacture. Previously such a mandrel has comprised a bar fitted at its operative end with a detachable bulb or enlargement made of chilled cast iron. To increase the durability of the bulb it has been proposed to provide a hard steel nose or point forming part of a steel core having the body part of the bulb cast thereon.

The present invention comprises the formation of the cast iron portion of the bulb on or around the end of the mandrel bar as hereinafter described, and the provision within a central socket formed in the bulb and extending if required into the bar, of a steel or equivalent nose piece or point.

Referring to the accompanying sheet of explanatory drawings;—Figures 1 and 2 are respectively sectional diagrams illustrating two ways of carrying the invention into effect.

The same reference letters in the two views indicate the same or similar parts.

In the application of the invention as shown at Fig. 1 the end of the ordinary mild steel bar *a* is provided near its forward extremity with an annular enlargement or collar *b* and around such end is cast in any convenient manner the body part of the bulb *c*. At the point of the bulb a central tapered socket is left for the reception of a suitable steel nose or point *d*. Coaxially with the socket in the bulb a socket or hole may be formed in the end of the mandrel bar for the reception of the stem or rear extremity or elongation *e* of the steel nose. Preferably the nose is placed in position first and the bulb cast around the same and the bar, leaving the point of the nose exposed. Fig. 2 shows a mandrel with a groove *b'* around its end portion instead of a collar as aforesaid. A mandrel having its operative end con-

structed as herein described is more convenient in service than one having a detachable bulb on account of the rigid connection provided between the bulb and stem. For renewal the case iron portion is broken away and replaced by the casting of another on the bar, and the steel point may also be withdrawn when required. Security of the connection between the bulb and bar is insured by the collars or recesses above referred to.

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

1. In piercing mandrels for use in the manufacture of weldless steel or other metal tubes, the combination with a mandrel bar, of a bulb cast on one end of the bar, means formed with the bar for insuring the security of the bulb, a socket formed in the bulb, and a steel nose secured in the socket, substantially as described.

2. In piercing mandrels for use in the manufacture of weldless steel or other metal tubes, the combination with a mandrel bar, of a collar formed near one end of the bar, a bulb cast over the said end and collar, a socket formed in the bulb, and a steel nose secured in the socket, substantially as described.

3. In piercing mandrels for use in the manufacture of weldless steel or other metal tubes, the combination with a mandrel bar, of a bulb cast on one end of the bar, means formed with the bar for insuring the security of the bulb, coaxial sockets formed in the bulb and bar, and a steel nose secured in said sockets, substantially as described.

4. In piercing mandrels for use in the manufacture of weldless steel or other metal tubes, the combination with a mandrel bar of a collar formed near one end of the bar, a socket in the said end of the bar, a steel nose inserted in said socket, and a bulb cast around the bar end, collar and steel nose, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

ROBERT JAMES GARDINER.

Witnesses:

JOHN MORGAN,
HARRY DAVIS.