Aug. 27, 1940. S. A. SMITH 2,212,754

INGOT TONG BIT

Filed Feb. 21, 1939 2 Sheets-Sheet 1

Fig. 1.

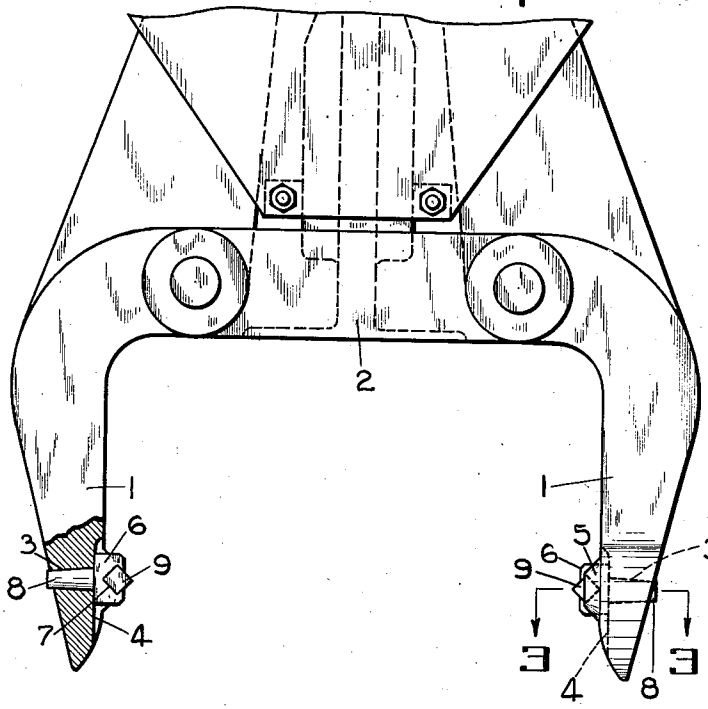


Fig. 2.

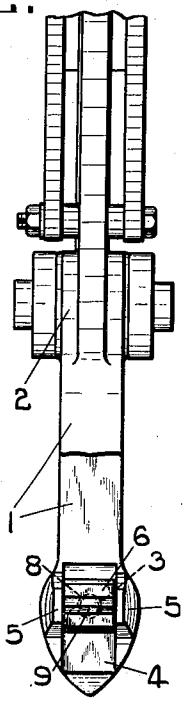


Fig. 5.

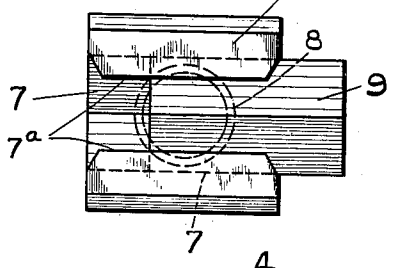


Fig. 4.

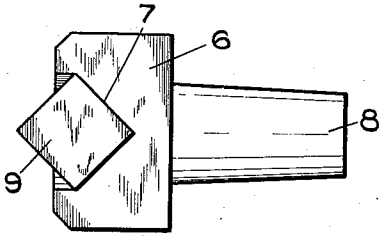


Fig. 3.

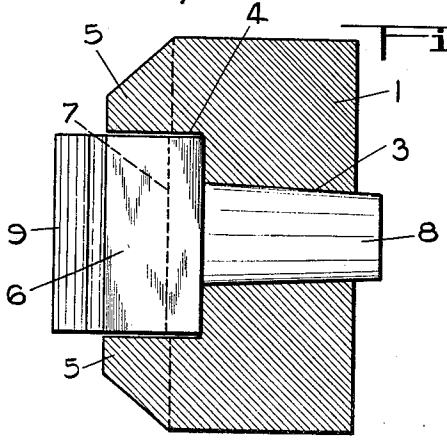
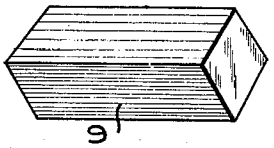


Fig. 6.



Inventor
S. A. SMITH
By J. E. M. Fetherstonhaugh
Attorney

Aug. 27, 1940. S. A. SMITH 2,212,754

INGOT TONG BIT

Filed Feb. 21, 1939 2 Sheets-Sheet 2

Fig. 7.

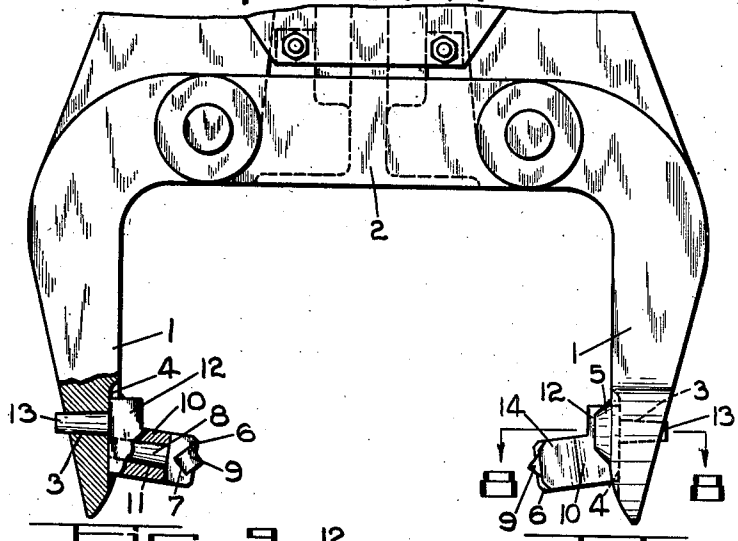


Fig. 9.

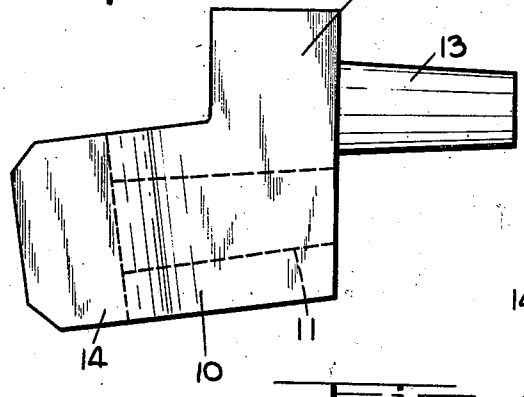


Fig. 10.

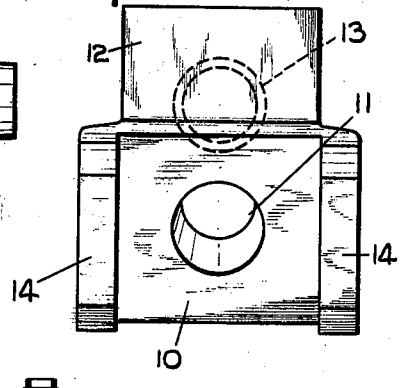
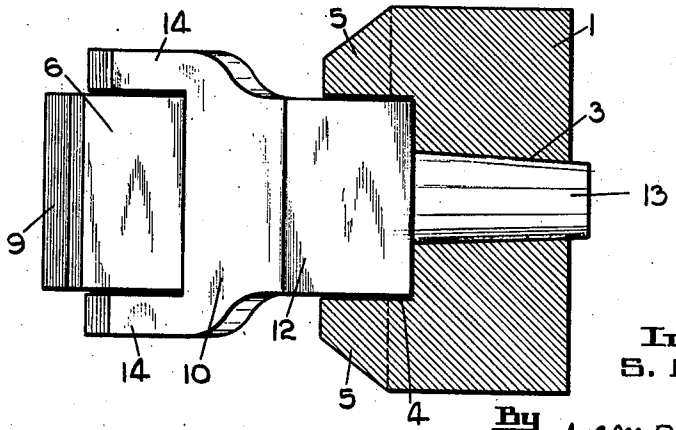


Fig. 8.



Inventor
S. A. SMITH

By J. E. M. Fetherstonhaugh

Attorney

Patented Aug. 27, 1940 2,212,754

UNITED STATES PATENT OFFICE

2,212,754

INGOT TONG BIT

Sheridan Augustin Smith, Hamilton, Ontario, Canada

Application February 21, 1939, Serial No. 257,682

12 Claims. (Cl. 294—106)

My invention relates to improvements in ingot tong bits and an object of the invention is to devise a bit which will be more durable than orthodox bits and which can be renewed at considerably less expense when it becomes worn.

A further object is to devise a bit which will enable the tongs to exert a better gripping action on the ingots.

A still further object is to devise means which will permit the tongs to grip ingots of smaller diameter than is ordinarily within their range.

The bits at present usually employed in connection with ingot tongs comprise conical tipped studs having tapered shanks insertable into correspondingly tapered orifices in the jaws of the tongs. The disadvantages of such construction are that the pointed ends of the bits only engage the ingots over a very small area and, moreover, when the bit is worn it has to be either replaced by a new bit or the worn bit has to be reground and resized. New bits, being of special form, are costly as is the regrinding and resizing of worn bits. An object of the present invention is to obviate this expense by employing bits cut from a standard bar of cold or hot rolled steel of square cross-section, available in any steel mill and which will thus entail only a very small expense to replace them.

With the above and other objects in view which will appear as the specification proceeds, my invention, in its preferred embodiments, consists of the construction and arrangement all as hereinafter more particularly described and illustrated in the accompanying drawings in which:

Fig. 1 represents a front elevation of a pair of ingot tongs showing my bits applied to the tong jaws.

Fig. 2 is a side elevation of the tongs illustrated in Fig. 1, one jaw being broken away to show the inner face of the other jaw.

Fig. 3 is an enlarged horizontal section through the line 3—3 (Fig. 1) showing the means for applying one of my bits to a jaw of the tongs.

Figs. 4 and 5 are respectively enlarged front and side views of one of my bits and its holder for attaching it to a tong jaw, said figures being drawn to the same scale as Fig. 3.

Fig. 6 is a similarly enlarged perspective detail of one of my bits.

Fig. 7 is a similar view to Fig. 1 showing my bits applied to the tong jaws wherein a subsidiary holder is employed in addition to the bit holder.

Fig. 8 is an enlarged horizontal section through the line 8—8 (Fig. 7), and

Figs. 9 and 10 are respectively enlarged front and side views of the subsidiary holders shown in Fig. 7 drawn to the same scale as Fig. 8.

Like characters of reference indicate corresponding parts in the different views of the drawings.

In carrying out my invention the jaws 1 of the tongs 2 are provided with the usual tapered orifices 3 extending transversely therethrough and the inner side faces of such jaws are preferably vertically recessed at 4. Vertical spaced apart ears 5 extend inwardly from the vertical margins of such recesses.

Bit holders are provided, each comprising a body portion 6 of substantially rectangular form having a cross-slot 7 extending inwardly from the face of such body portion and being of substantially square cross-section with the diagonals disposed vertically and horizontally leaving a cross aperture 7a in the face of such body portion. A tapered stem 8 extends outwardly from the opposite face of the body portion.

My bit 9 comprises a bar of steel of square cross-section of a length substantially equal to the length of the cross-slot 7 in the body portion of the holder and such bit is inserted into such slot with one corner edge protruding out through the cross aperture 7a as clearly illustrated in the drawings. In Fig. 5 of such drawings, for sake of clarity, the bit 9 is shown as partially removed from the holder.

The stem 8 of the bit holder is then inserted into the tapered orifice 3 in the jaw of the tongs and the holder is pressed in to abut the bottom of the recess wherein the body portion 6 of the holder is located between ears 5 on the jaw and prevented turning thereby. The ears 5 also prevent the bit 9 being dislodged from the slot 7 in the holder.

When the jaws of ingot tongs are provided with bits constructed according to my invention as illustrated in Fig. 1 of the drawings, a much more positive grip will be exerted by such tongs on the ingot. Upon the corner edge of the bit 9 becoming worn it is only necessary to tap the free end of the stem 8 and remove the holder from the jaw. The bit is then removed from the holder by sliding it out of the slot 7. The bit may then be turned axially and reinserted into the slot 7 wherein an unworn corner edge protrudes from the aperture 7a to grip the ingot. Thus one bit is capable of presenting four sharp edges

to the ingot to be gripped before it need be discarded.

The form of construction illustrated in Figs. 7 to 10 of the drawings is provided where it is desired to grip a smaller part of the ingot or ingots of smaller size which would not ordinarily be capable of being gripped by tongs as illustrated. In such form instead of the bit holders comprisin the body portion 6 and the stem 8 being directly applied to the jaws 1, subsidiary holders for the bit holders are provided, the bit holders being attached to the subsidiary holders which are then applied to the jaws or alternatively the subsidiary holders may be applied to the jaws and the bit holders with the bits therein are applied to the subsidiary holders.

Each subsidiary holder comprises a body portion 10 having a tapered orifice 11 therethrough and an upwardly extending portion 12 having a tapered stem 13 extending rearwardly therefrom adapted to be inserted into the tapered orifice 3 of the jaw 1. The axis of the tapered orifice 11 is preferably inclined downwardly towards its inner end with respect to the axis of the stem 13 which is substantially horizontal. Spaced apart vertical ears 14 are provided on the inner faces of the body portion 10 on each side of the orifice 11.

As above described the subsidiary holders are then applied to the jaws 1 by inserting the stems 13 into the orifices 3 in such jaws, and the bit holders with the bits therein are applied to the subsidiary holders by inserting their stems 8 into the orifices 11 of the subsidiary holders, the ears 14 in this case preventing rotation of the bit holders in the subsidiary holders and also preventing the bits being dislodged from such bit holders. In such construction the ears 5 of the jaws prevent rotation of the subsidiary holders in the jaws 1, and the purpose of inclining the subsidiary holders is so that when the jaws are swung inwardly to cause the bits to grip the ingot the bits will be located with their cross-sectional diagonals substantially horizontally and vertically.

While I have described and illustrated my bit as being square in cross-section, it is obvious that such cross-section could be any polygonal shape. Such term polygonal is here employed in a broader sense than the accepted definition as defining any multi-sided multi-angular figure which would include a triangle, square, pentagon or hexagon.

What I claim as my invention is:

1. The combination with a jaw of an ingot tongs, of a bit holder adapted to be detachably secured to the jaw and having a transverse bit receiving slot of polygonal cross-section in its inner face extending from side to side of the holder, a bit comprising a bar of polygonal cross-section slidably insertable into and removable from the slot in the holder with one edge protruding inwardly therefrom to engage the ingot to be gripped, and means on the jaw adapted to abut the sides of the holder for preventing dislodgment of the bit from the latter.

2. The combination with a jaw of an ingot tongs, of a bit holder adapted to be detachably secured to the jaw and having a transverse bit receiving slot of polygonal cross-section in its inner face extending from side to side of the holder, a bit comprising a bar of polygonal cross-section slidably insertable into and removable from the slot in the holder with one edge protruding inwardly therefrom to engage the ingot to be gripped, and ears extending inwardly from the jaw and adapted to abut the sides of the holder for preventing dislodgment of the bit from the latter.

3. The combination with a jaw of an ingot tongs, of a bit holder adapted to be detachably secured to the jaw and having a transverse bit receiving slot of square cross-section with its diagonals horizontal and vertical in the inner face of the holder and extending from side to side thereof, a bit comprising a bar of square cross-section insertable into the slot in the holder with one edge protruding inwardly therefrom to engage the ingot to be gripped, and means on the jaw adapted to abut the sides of the holder for preventing dislodgment of the bit from the latter.

4. The combination with a jaw of an ingot tongs, of a bit holder adapted to be detachably secured to the jaw and having a transverse bit receiving slot of square cross-section with its diagonals horizontal and vertical in the inner face of the holder and extending from side to side thereof, a bit comprising a bar of square cross-section insertable into the slot in the holder with one edge protruding inwardly therefrom to engage the ingot to be gripped, and ears extending inwardly from the jaw and adapted to abut the sides of the holder for preventing dislodgment of the bit from the latter.

5. The combination with a jaw of an ingot tongs having a tapered orifice therethrough, of a bit holder having a tapered stem insertable into the tapered orifice in the jaw, a bar-shaped bit of polygonal cross-section, and means for detachably securing the bit to the holder with one corner edge of the bit exposed and disposed substantially horizontally for engaging the ingot to be gripped.

6. The combination with a jaw of an ingot tongs having a tapered orifice therethrough, of a bit holder having a tapered stem insertable into the tapered orifice in the jaw, a metal bar-shaped bit of square cross-section, and means for detachably securing the bit to the holder with one corner edge of the bit exposed and disposed substantially horizontally for engaging the ingot to be gripped, the cross-sectional diagonals of the bit being located substantially horizontally and vertically.

7. The combination with a jaw of an ingot tongs having a tapered orifice therethrough, of a bit holder having a tapered stem insertable into the tapered orifice in the jaw, a bar-shaped bit of polygonal cross-section, means for detachably securing the bit to the holder with one corner edge of the bit exposed and disposed substantially horizontally for engaging the ingot to be gripped, and means on the jaw for simultaneously preventing the rotation of the bit holder on the jaw and dislodgment of the bit from the bit holder.

8. The combination with a jaw of an ingot tongs having a tapered orifice therethrough, of a bit holder having a tapered stem insertable into the tapered orifice in the jaw, a metal bar-shaped bit of square cross-section, means for detachably securing the bit to the holder with one corner edge of the bit exposed and disposed substantially horizontally for engaging the ingot to be gripped, the cross-sectional diagonals of the bit being located substantially horizontally and vertically, and means on the jaw for simultaneously preventing the rotation of the bit holder

on the jaw and dislodgment of the bit from the holder.

9. The combination with a jaw of an ingot tongs having a tapered orifice therethrough and spaced apart vertical ribs on the inner surface of such holder on each side of the orifice, a bit holder of rectangular shape having a tapered stem insertable into the tapered orifice in the jaw and a horizontal transverse slot of polygonal cross-section in the holder, and a bar-shaped bit of polygonal cross-section freely inserted into the slot in the holder with one corner edge protruding through a horizontal aperture in the holder joining the slot for engaging an ingot to be gripped, said ribs simultaneously preventing the holder turning in the jaw and preventing dislodgment of the bit from the slot in the holder.

10. The combination with a jaw of an ingot tongs having a tapered orifice therethrough and spaced apart vertical ribs on the inner surface of such holder on each side of the orifice, a bit holder of rectangular shape having a tapered stem insertable into the tapered orifice in the jaw and a horizontal transverse slot of square cross-section in the holder with its cross-sectional diagonals disposed horizontally and vertically, and a bar-shaped bit of square cross-section freely inserted into the slot in the holder with one corner edge protruding through a horizontal aperture in the holder joining the slot for engaging an ingot to be gripped, said ribs simultaneously preventing the holder turning in the jaw and preventing dislodgment of the bit from the slot in the holder.

11. A device for detachable connection to a jaw of an ingot tongs comprising a bit holder adapted to be detachably secured to the jaw and having a transverse bit receiving slot of polygonal cross-section in its inner face extending from side to side of the holder, and a bit comprising a bar of polygonal cross-section slidably insertable into and removable from the slot in the holder with one edge protruding inwardly therefrom to engage the ingot to be gripped.

12. A device for detachable connection to a jaw of an ingot tongs comprising a bit holder adapted to be detachably secured to the jaw and having a transverse bit receiving slot of square cross-section with its diagonals horizontal and vertical in the inner face of the holder and extending from side to side thereof, and a bit comprising a bar of square cross-section insertable into the slot in the holder with one edge protruding inwardly therefrom to engage the ingot to be gripped.

SHERIDAN AUGUSTIN SMITH.