May 4, 1954 J. B. LEE 2,677,174

DEVICE FOR PULLING BLAST FURNACE BOSH PLATES

Filed Feb. 26, 1951

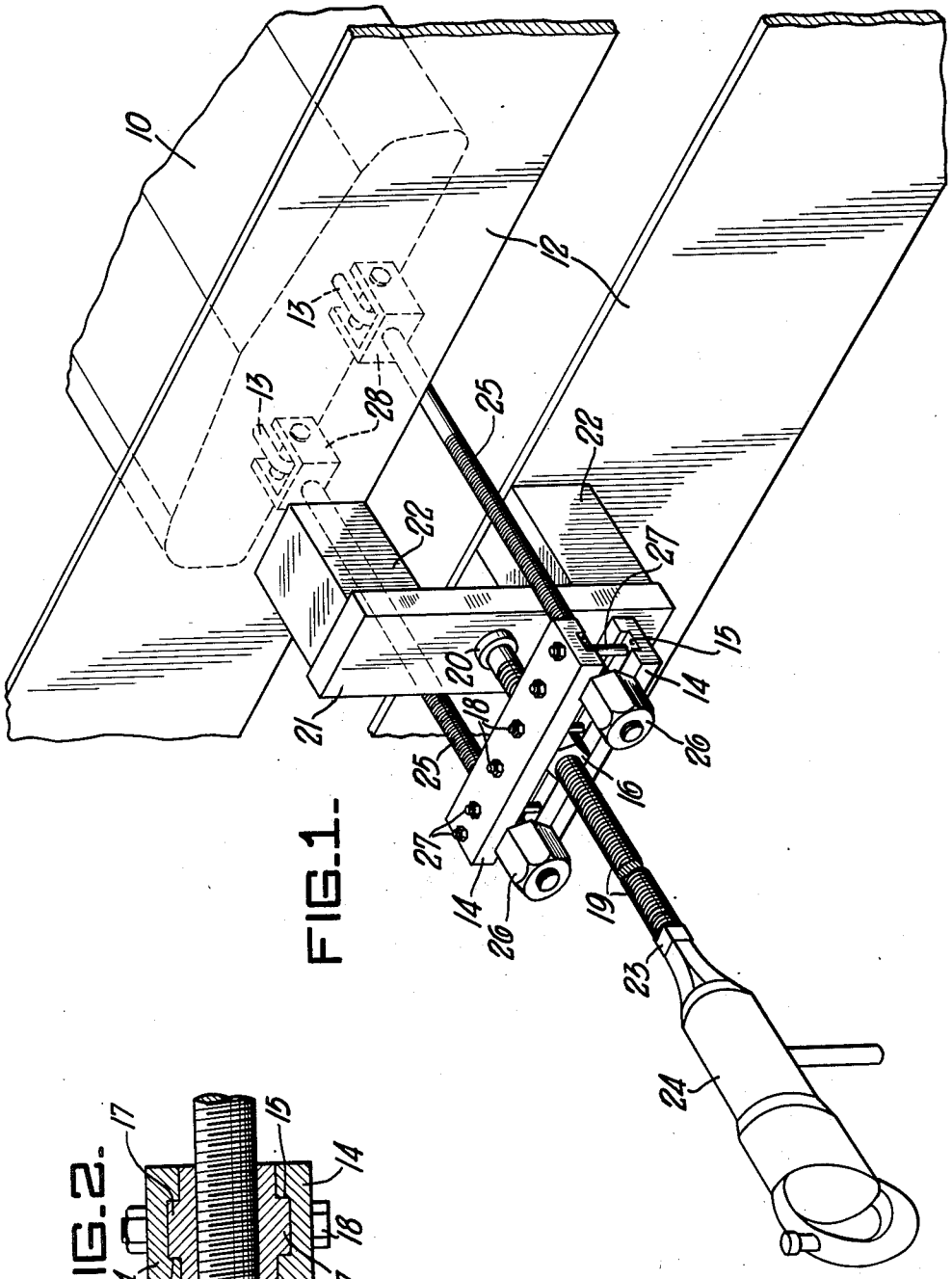


FIG. 1.

FIG. 2.

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Patented May 4, 1954 2,677,174

UNITED STATES PATENT OFFICE

2,677,174

DEVICE FOR PULLING BLAST FURNACE BOSH PLATES

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Application February 26, 1951, Serial No. 212,794

2 Claims. (Cl. 29—259)

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This invention relates to improved devices for pulling blast furnace bosh plates.

As understood in the blast furnace art, a bosh is the part of a furnace immediately above the hearth and is one of the hottest parts of a furnace. To protect the refractories of the bosh wall against overheating, this wall contains water-cooled plates, which commonly are hollow brass bodies providing a water circulation path. During a furnace campaign it is necessary to replace these plates periodically, since their inner faces burn out or erode away and permit leakage. Since the plates are cemented in the wall, their removal may be quite difficult. It is customary to take furnace off blast while plates are being changed, but even so, the task is very arduous for workmen. The time the furnace is off blast, of course, represents production loss.

An object of the present invention is to provide improved devices which expedite and facilitate removal of blast furnace bosh plates.

A further object is to provide improved bosh plate pulling devices which enable air impact wrenches to be used as a means for furnishing the pulling force.

A further object is to provide improved bosh plate pulling devices which include means adapted to bear against the bosh bands, means adapted to engage a bosh plate, and screw-threaded means which on rotation exerts a pulling force on the plate.

In accomplishing these and other objects of the invention, I have provided improved details of structure a preferred form of which is shown in the accompanying drawing in which:

Figure 1 is a perspective view of part of a blast furnace bosh and of a plate pulling device embodying features of the present invention; and

Figure 2 is a sectional view through the nut which carries the spindle of the device.

Figure 1 shows a part of the bosh wall of a blast furnace. This wall includes bosh plates 10 (only one of which is shown) embedded in the refractory, and bosh bands 12. The plates are equipped with lugs 13 adapted to be engaged by a pulling device. Since the furnace can be of any standard or desired construction, it is not shown nor described in greater detail.

The plate pulling device of the present invention comprises two spaced-apart parallel plates 14, which have grooves 15 on their inner opposed faces. An internally screw-threaded nut 16 is clamped between said plates midway of their length. This nut has parts of two of its opposed faces cut away to furnish tongue sections 17

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which fit within grooves 15 (Figure 2). A pair of bolts 18, one of which is situated on each side of nut 16, assist in holding plates 14 together and confine the nut against movement lengthwise of the plates.

Nut 16 carries a screw-threaded spindle 19. The inner end of this spindle is rotatably received in a bearing 20 which is fixed in a plate 21 adapted to straddle the space between the bosh bands 12. Spacers 22 preferably are interposed between plate 21 and bands 12 when the device is set up ready for use.

The outer end of spindle 19 has a wrench engaging section 23. Preferably an air impact wrench 24 is utilized for turning the spindle. Since such wrenches per se are known and are not part of the present invention, no detailed description is deemed necessary.

A pair of rods 25 extend between the outer portions of plates 14 on opposite sides of nut 16 and have screw-threaded sections which receive nuts 26. The latter nuts bear against the outer edges of plates 14. Additional bolts 27, one of which is situated on each side of each rod 25, assist bolts 18 in holding plates 14 together and confine rods 25 against movement lengthwise of said plates. The inner ends of rods 25 carry yokes 28 which are adapted to engage lugs 13 on the bosh plate 10.

In operation, when it is necessary to replace a bosh plate 10, the furnace first is taken off blast. Next, with the nuts 26 loosened, yokes 28 are engaged with lugs 13, spacer blocks 22 are interposed between plate 21 and the bosh bands 12, and nuts 26 are tightened. Wrench 24 is engaged with section 23 of spindle 19 and operated in a direction to exert a pulling force on the bosh plate.

From the foregoing description it is seen that the device of the present invention affords an especially simply and yet effective device for pulling bosh plates. The use of an air impact wrench enables the spindle to be turned for pulling the plate with very little exertion by the operator. Practical experience has demonstrated that a bosh plate can be pulled in as little as five or six minutes by only one man, which is a decided improvement over past practice with which I am familiar.

While I have shown only a preferred embodiment of the present invention it is apparent modifications may arise. Therefore I do not wish to be limited by the disclosure set forth, but only by the scope of the appended claims.

I claim:

1. A device for pulling blast furnace bosh plates, said device comprising a pair of spaced-apart plates having lengthwise grooves on their opposed faces, a nut having tongue sections fitting within said grooves between said spaced-apart plates, a screw-threaded spindle engaged with said nut, a wrench engaging section on the outer end of said spindle adapted to be engaged by a wrench for turning the spindle, a plate having a bearing rotatably receiving the inner end of said spindle, said last named plate being adapted to straddle the spaces between a pair of bosh bands, a pair of rods extending between said spaced-apart plates on opposite sides of said spindle and having nuts on their outer portions adapted to bear against the outer edges of said spaced-apart plates, bolts holding said spaced-apart plates together and clamping said nut therebetween and confining said spindle and said rods against movement endwise of these plates, and means on the inner ends of said rods adapted to attach theses rods to a bosh plate.

2. A device for pulling blast furnace bosh plates, said device comprising a pair of spaced apart plates, a nut fitted between said plates, said plates and nut having a tongue and groove connection therebetween, a screw-threaded

spindle engaged with said nut, a wrench engaging section on the outer end of said spindle adapted to be engaged by a wrench for turning the spindle, a plate having a bearing rotatably receiving the inner end of said spindle, said last named plate being adapted to straddle the spaces between a pair of bosh bands, a pair of rods extending between said spaced-apart plates on opposite sides of said spindle and having nuts on their outer portions adapted to bear against the outer edges of said spaced-apart plates, bolts holding said spaced-apart plates together and clamping said nut therebetween and confining said spindle and said rods against movement endwise of these plates, and means on the inner ends of said rods adapted to attach these rods to a bosh plate.

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