

No. 645,945

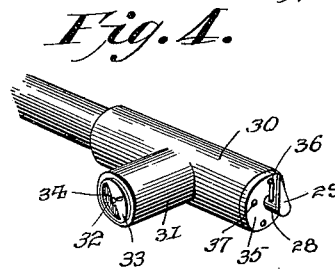
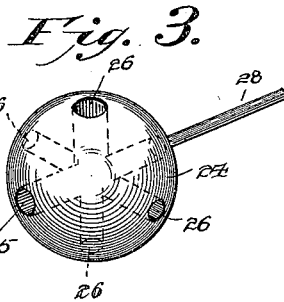
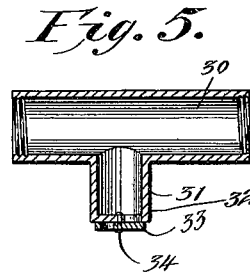
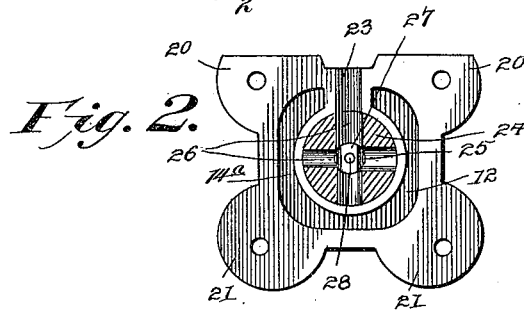
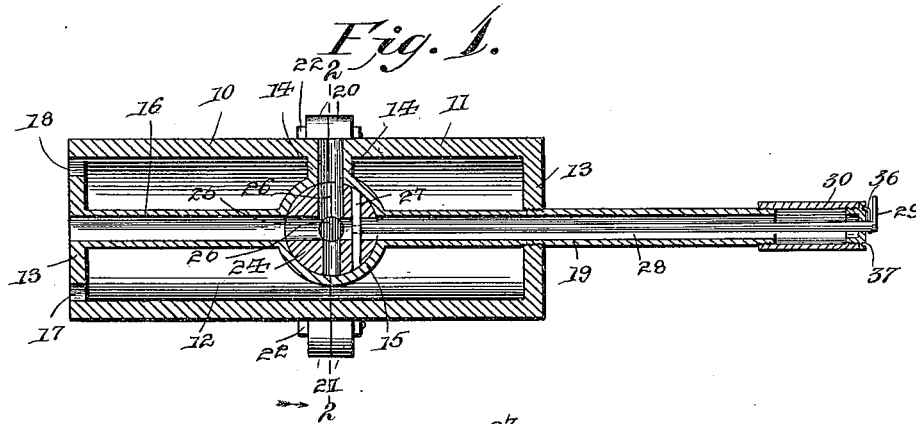
Patented Mar. 27, 1900.

J. EASTEP, H. A. DEITERS & O. BARTH.

TWYER FOR FORGE FURNACES.

(Application filed Dec. 2, 1899.)

(No Model.)



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UNITED STATES PATENT OFFICE.

JEHU EASTEP, HARRY A. DEITERS, AND OTTO BARTH, OF SPENCER, WEST VIRGINIA.

TWYER FOR FORGE-FURNACES.

SPECIFICATION forming part of Letters Patent No. 645,945, dated March 27, 1900.

Application filed December 2, 1899. Serial No. 738,985. (No model.)

To all whom it may concern:

Be it known that we, JEHU EASTEP, HARRY A. DEITERS, and OTTO BARTH, citizens of the United States, residing at Spencer, in the
5 county of Roane and State of West Virginia, have invented a new and useful Twyer for Forge-Furnaces, of which the following is a specification.

Our invention relates to twyers for appli-
10 cation to the bed or under side of a forge-furnace; and the primary object is to provide an improved construction for securing a circulation of water around and through the parts which are exposed to the furnace heat,
15 thereby cooling and minimizing the deterioration of the parts.

Further objects are to provide a blast-regulator adapted for easy adjustment to supply the blast in variable volumes to the furnace, to provide for cleaning out cinders or
20 ashes which may drop into the blast-passage, and to provide an improved twyer of simple and durable construction capable of ready application and which is cheap of manufacture.
25

To the accomplishment of these ends the invention consists in the combination and construction of parts, which will be hereinafter fully described and claimed.

30 In the drawings, Figure 1 is a longitudinal sectional elevation through a water-jacketed twyer embodying our invention. Fig. 2 is a vertical transverse section taken in the plane of the dotted line 2 2 of Fig. 1. Fig. 3 is a
35 detail perspective view of the globular blast-regulator. Fig. 4 is a detail perspective view through the cap-tube having the valve-cleaning nozzle and adapted to support the outer extremity of the regulator-adjusting spindle.
40 Fig. 5 is a transverse section through the cap-tube to better illustrate the blow-out-valved branch thereof.

The same numerals of reference are used to indicate like parts in each figure of the
45 drawings.

The twyer of our invention comprises in its construction two complementary chambered members or sections assembled in abutting relation and constructed to produce a globular
50 seat adapted for the reception of a corre-

spondingly-shaped blast-regulator. The members of the twyer 10 11 are each cast in a single piece of metal, and they are hollow to produce the water-circulating chamber 12. The outer end of each member is formed with
55 an integral head 13, and the inner end of each member has an integral head 14. This inner head of each twyer member is substantially of annular form to leave an intervening opening 14^a between its edge and the
60 shell or wall of the chamber 12, and said inner head is furthermore provided with a concavity, as shown clearly by Fig. 1.

The two members or sections are assembled
65 for their inner ends to occupy abutting relation, thus bringing the heads 14 opposite each other, so that the openings 14^a and the concavities of the sections are coincident, whereby the chambers of said sections are in communication and the concavities of the inner
70 heads constitute a globular seat 15. The section 10 is also provided with a longitudinal blast-flue 16, which at one end opens into the globular seat 15 and at its other end extends through the outer head 13. This head
75 of the member 10 is provided at its lower edge with a water-inlet 17, and at its upper edge said head of the section has a water-outlet 18, whereby cold water may be supplied,
80 through the port 17, for circulation through the chambers of the twyer-sections and around the globular seat afforded by the inner heads 14, the hot water being free to escape from the twyer-chamber through the exit-port 18.

A tube 19 extends horizontally through the
85 chamber of the section 11, the inner end of said tube being joined to the head 14 of said member 11. This tube 19 extends a suitable distance beyond the head 13 of the member 11, so that it may pass through the masonry
90 of the furnace for the purpose of having its outer end extended for the reception of devices to be hereinafter described.

The twyer members are also provided with
95 integral flanges 20 21 at their inner ends and on the upper and lower sides thereof, and on the assemblage of the members into operative relation these flanges abut against each other, so that they may be drawn together by means
100 of the bolts 22 for the purpose of making a

water-tight joint between the two members. If desired, a suitable packing may be interposed between the members; but this is not essential when the parts are accurately fitted.

5 As will be seen by reference to Fig. 2, the flanges 20 on the upper side of the twyer-sections are straight for the purpose of enabling the twyer to be properly applied to the bed of a forge-furnace. A vertical blast-passage
10 23 is provided in the meeting ends of the complementary members, said passage extending in an upward direction from the chamber afforded by the globular seat 15. This discharge-passage is in a plane at right angles
15 to the blast-inlet passage 16, and said passage 23 opens upwardly through the twyer for the purpose of discharging the blast of air through the bed of the furnace.

Our twyer contemplates the employment
20 of an adjustable regulator for admitting air in regulated volumes in the furnace-bed, according to the will of the smith. This regulator 24 is of globular form to accurately fit the seat 15 in the twyer, and said regulator
25 is provided with a transverse passage 25, which under all conditions of adjustment of the regulator is in communication with the blast-inlet passage 16. The regulator is capable of adjustment on a horizontal axis and
30 in a direction at right angles to the plane of the blast-inlet passage 16, so that the transverse passage 25 of said regulator will remain in alinement and in communication with the blast-inlet passage. This regulator is formed
35 with a series of blast-discharge passages 26, which are disposed in a plane radially to the center of the regulator and at right angles to the passage 25. These blast-discharge passages of the regulator are of different cross-sectional areas, as shown clearly by Fig. 2,
40 and all of these passages are in communication with the transverse passage 25. The regulator is normally disposed in a position for one of its passages 26 to be in communication with the blast-passage 22 of the twyer,
45 so that the air-blast may pass through the passage 25 and one of the passages 26 into the passage 23, thus establishing communication from the blast-inlet passage 16 to the furnace-bed. It is evident, however, that
50 the regulator may be rotated partly for the purpose of bringing either of the other passages 26 in communication with the passage 23, and as the passages 26 are of different cross-sectional areas it is evident that the
55 volume of air supplied by the twyer to the furnace may be controlled by proper adjustment of the regulator.

The means which we prefer to employ for
60 the adjustment of the regulator consists of the cross-bar 27 and the stem 28. This cross-bar is fastened in the globular regulator across the passage 25 thereof on one side of the passages 26, and to this cross-bar is firmly
65 secured the inner end of the stem 28, said stem extending longitudinally through the

tube 19 and having its outer end equipped with an indicator 29. A cap-tube 30 is secured firmly to the protruding end of this tube 19, and said cap-tube is provided with
70 a lateral branch 31. Said branch has an opening 32 formed therein, which is adapted to be closed by a cut-off plate 33, pivoted centrally, as at 34, to an end portion of the branch 31, and by adjusting this plate 33 in
75 one direction an opening in the plate is brought in alinement with the hole 32 for the purpose of forcing air through the branch 31, the cap-tube, and the tube 19 into the regulator and the several blast-passages thereof,
80 whereby cinders or ashes which may drop from the furnace into the twyer may be blown out of place. This construction provides for ready cleansing of the twyer, so as to prevent choking thereof by an accumula-
85 tion of cinders; but normally the plate 33 is adjusted to close the opening 32, thus preventing the escape of the blast.

The outer end of the cap-tube is closed by a plate 35, through which the stem 28 passes,
90 so as to be supported therein, and, if desired, this plate may be inscribed to indicate the adjustment of the blast-regulator. A locking-spring 36 is made fast either with the indicator or the adjusting-spindle 28, and this
95 spring may take into one of the series of notches 37, provided on the cap-plate to hold the spindle and the blast-regulator in their adjusted positions.

It is of course understood that suitable pipes
100 should be coupled to the twyer member 10 for communication with the inlet 17 and the outlet 18, so as to convey cold water to and hot water from the chamber of the twyer, whereby the water may circulate around the
105 globular seat and the twyer members, so as to keep the parts in a comparatively-cool condition. A blast-pipe should be coupled to the inlet-passage 16 for conveying a blast of air from a suitable compressing or forcing
110 means to the twyer.

Changes within the scope of the appended claims may be made in the form and proportion of some of the parts while their essential features are retained and the spirit of
115 the invention is embodied. Hence we do not desire to be limited to the precise form of all the parts as shown, reserving the right to vary therefrom.

Having thus described the invention, what
120 we claim is—

1. A twyer having a globular, internal seat for a blast-regulator, blast inlet and outlet passages in said seat, a tube extending through the twyer from said seat, a chamber surrounding
125 said seat, means for adding a cooling fluid to said chamber, a globular blast-regulator in said globular seat and having blast inlet and outlet passages, and an operating-stem attached to the regulator and passing
130 through the tube, substantially as described.

2. A chambered twyer having an internal

seat and blast inlet and outlet passages, a
regulator fitted to the seat and having blast
inlet and outlet passages, a tube extending
through the twyer from the seat and having
5 a valved outer end, and a stem attached to
the regulator and passing through the tube,
substantially as described.

In testimony that we claim the foregoing as

our own we have hereto affixed our signatures
in the presence of two witnesses.

JEHU EASTEP.
H. A. DEITERS.
OTTO BARTH.

Witnesses:

WALTER PENDLETON,
W. L. STARKEY.