H. B. KINNEAR AND A. J. TOWNSEND.

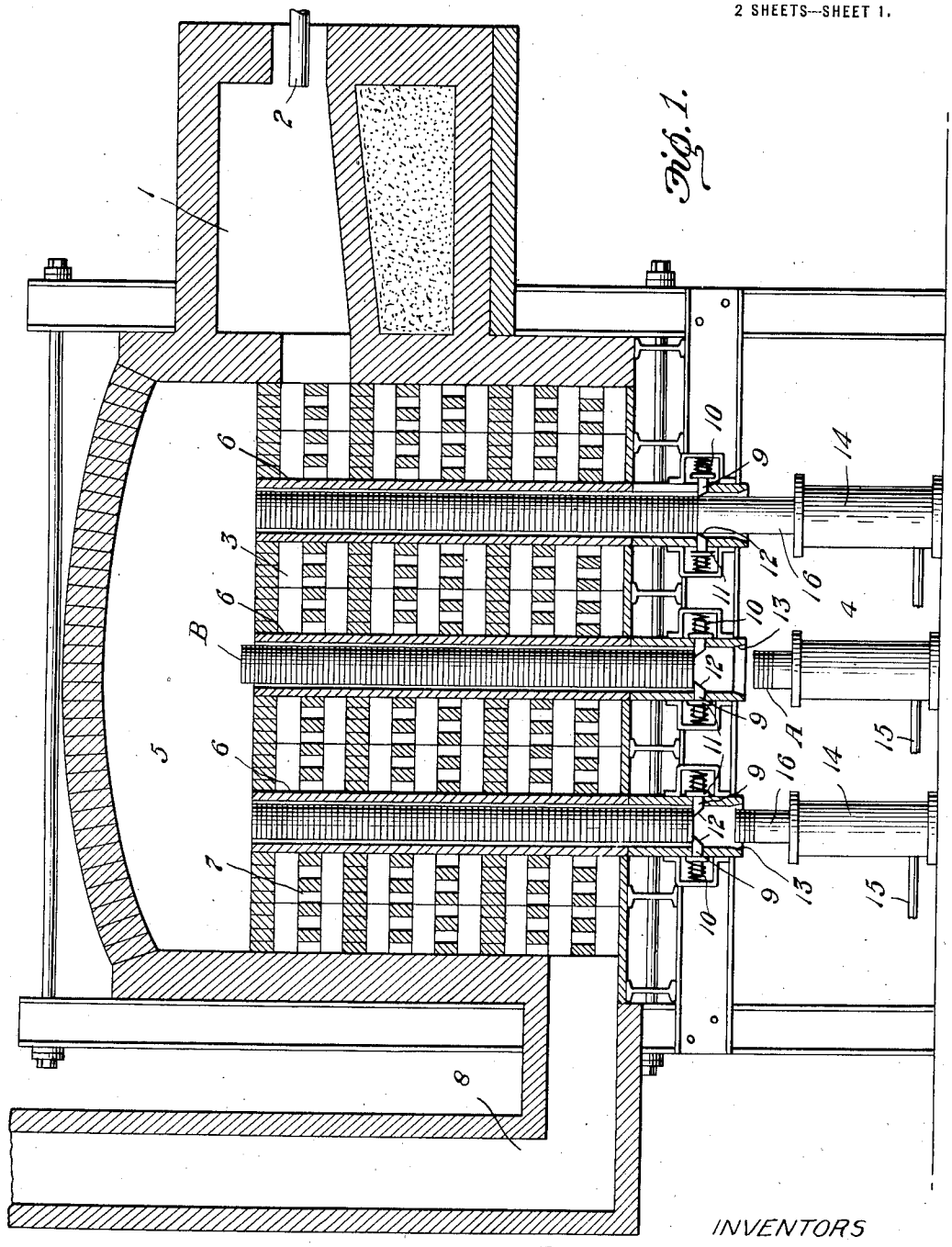
FURNACE.

APPLICATION FILED MAY 12, 1919.

1,339,564. **Patented May 11, 1920.**

2 SHEETS—SHEET 1.

Fig. 1.



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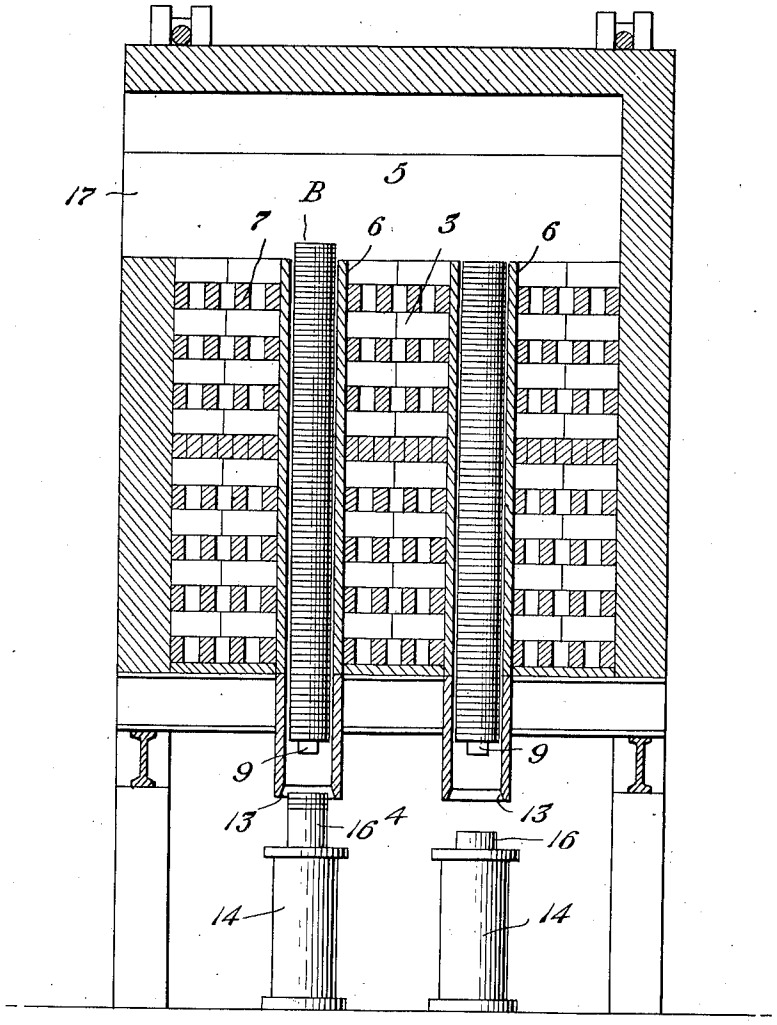
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2 SHEETS—SHEET 2.

Fig. 2.



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UNITED STATES PATENT OFFICE.

HARRY B. KINNEAR, OF MASSILLON, AND ARTHUR J. TOWNSEND, OF CANTON, OHIO.

FURNACE.

1,339,564. Specification of Letters Patent. Patented May 11, 1920.

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To all whom it may concern:

Be it known that we, HARRY B. KINNEAR, a citizen of the United States, residing at Massillon, Stark county, Ohio, and ARTHUR J. TOWNSEND, a citizen of the United States, residing at Canton, Stark county, Ohio, have invented a new and useful Furnace, of which the following is a specification.

The invention relates to furnaces and has more especial reference to a furnace designed to heat blanks for hot pressing.

The object of the invention is to provide a furnace especially designed for heating blanks for hot pressing and arranged to heat the blanks within channels or chambers unconnected from the heating chamber of the furnace, thus keeping the articles to be heated out of contact with the gases in the heating chamber and preventing scaling or oxidizing of the articles being heated.

A further object is the provision of a heating furnace of the character mentioned comprising a receiving chamber and a delivery chamber separated from the heating chamber and connected with each other by means of channels or tubes through which the articles being heated are passed, these tubes or channels being located through the heating chamber.

A further object is the provision of a furnace of this character comprising a plurality of vertical tubes or channels which receive the articles to be heated at their lower extremities and from the upper extremities of which the heated articles are discharged, means being provided for forcing the articles upward through the tubes and sustaining the weight of the articles within the tubes.

With these objects in view the invention consists in the novel construction and arrangement of parts, hereinafter described, illustrated in the accompanying drawings, and particularly pointed out in the appended claims, it being understood that various changes in the form, proportions, size and minor details of construction may be made within the scope of the appended claims, without departing from the spirit or sacrificing any of the advantages of the invention.

The invention thus set forth in general terms is illustrated in the accompanying drawings forming part hereof, in which—

Figure 1 is a longitudinal sectional view through a furnace embodying the invention; and

Fig. 2 a transverse sectional view through the same.

A practical embodiment of the invention is disclosed in the accompanying drawings, forming a part of this specification in which similar numerals of reference indicate corresponding parts throughout the several views.

The furnace comprises generally the fire box 1, a burner 2 being shown therein, the heating chamber 3 which is separated by walls from the receiving chamber 4 and the delivery chamber 5, and vertically disposed tubes 6 passing upwardly through the heating chamber from the receiving chamber and forming communication between the receiving chamber and the delivery chamber. A checker work 7 is provided within the heating chamber forming a tortuous passage through which the heat passes around the tubes 6 from the fire box 1 to the stack 8.

It will be noted that the tubes 6 have no communication with the heating chamber thus preventing the gases in the heating chamber from entering the tubes and coming into contact with the articles being heated within the tubes, while at the same time, the tubes being located entirely through the heating chamber and the heat passing back and forth through the checker work therein is carried entirely around all of the tubes heating them all evenly, the upper extremities of the tubes attaining the highest temperature in the heating chamber as they receive the heat directly from the fire box while the lower extremities of the tubes are only heated to a less degree as they receive only the heat which has passed through the tortuous passage formed by the checker work in the heating chamber.

A pair of diametrically opposed dogs 9 are slidably mounted through each tube, near its lower end and each dog is provided with a spring 10 which normally projects the end of the dog into the interior of the tube, supporting the column of blanks therein. A collar 11 upon each dog limits its inward movement and the inner extremity of each dog is beveled at 12. The lower extremity of each tube is internally beveled at 13.

Located beneath, and in alinement with each tube is an elevator which may be in the form of a fluid cylinder 14 connected

by means of a pipe 15 with any suitable source of fluid under compression, a piston 16 being provided in the cylinder to elevate the blanks into the tube.

From the above description and an inspection of the accompanying drawings the operation of the furnace will be clearly understood. The blanks to be heated are placed upon the pistons in small packs as shown at A. As each piston is raised the blanks carried thereon will engage the beveled faces 12 upon the dogs in the adjacent tube, forcing said dogs outwardly against their springs, as shown in the right hand tube in Fig. 1. The piston will continue to move upwardly until all of the blanks carried thereby have been raised above the level of the dogs. As the piston descends the dogs will be forced into place beneath the lower blank of the pack, sustaining the weight of the blanks within the tube as shown in the drawings. With each operation of the piston, moving a new pack of blanks into the tube, the column of blanks within the tube is raised within the tube. The blanks are thus brought into the lower end of the tube which is at a comparatively low temperature and are moved up through the tube through an increasing temperature and ejected from the upper end of the tube into the delivery chamber 5 as shown at B from which they are removed through the door 17.

Although the furnace is especially adapted for heating blanks for hot pressing, it will be readily seen that it is applicable for any heating or heat treating where it is desirable to keep the articles under treatment from coming into contact with the gases within the heating chamber, thus preventing scaling or oxidizing of the product. This furnace is especially efficient in heating sheet bars and tin bars.

We claim:

1. A furnace including a heating chamber, a receiving chamber and a discharging chamber, a tube located entirely through the heating chamber and connecting the receiving chamber and discharge chamber and means for passing articles to be heated upwardly through said tube.

2. A furnace including a heating chamber, a tube located entirely through said heating chamber and isolated therefrom, an elevator for passing articles to be heated into the lower end of the tube and spring pressed dogs for supporting the articles within the tube.

3. A furnace including a heating chamber, a tube located entirely through said heating chamber and isolated therefrom, an elevator for passing articles to be heated into the lower end of the tube and spring pressed dogs provided with beveled faces and arranged to support the articles within the tube.

4. A furnace including a heating chamber, a receiving chamber located beneath and isolated from said heating chamber, a discharging chamber located above and isolated from the heating chamber, a plurality of tubes connecting the receiving chamber and discharge chamber and located through the heating chamber, and means for passing articles to be heated, upward through said tubes.

5. A furnace including a heating chamber, a receiving chamber located beneath and isolated from said heating chamber, a discharging chamber located above and isolated from said heating chamber, a plurality of tubes connecting the receiving chamber and discharge chamber and located through the heating chamber and isolated therefrom, and means within the receiving chamber for passing articles to be heated up through the tubes and into the discharging chamber.

In testimony that we claim the above, we have hereunto subscribed our names.

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