Aug. 16, 1932. W. E. WUNDERLICH 1,872,210

OBJECT HEATING FURNACE

Filed May 28, 1930 3 Sheets-Sheet 1

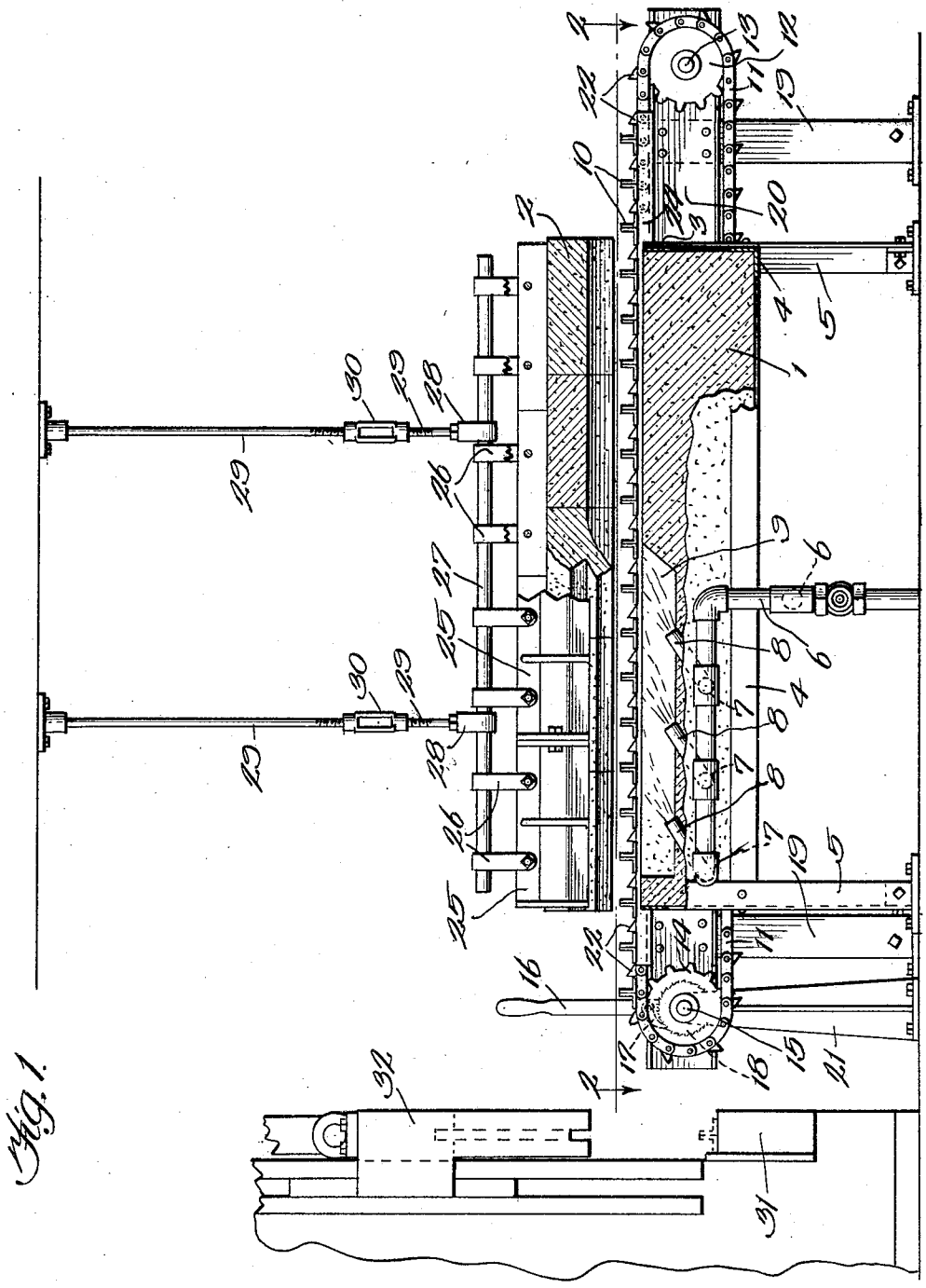


Fig. 1.

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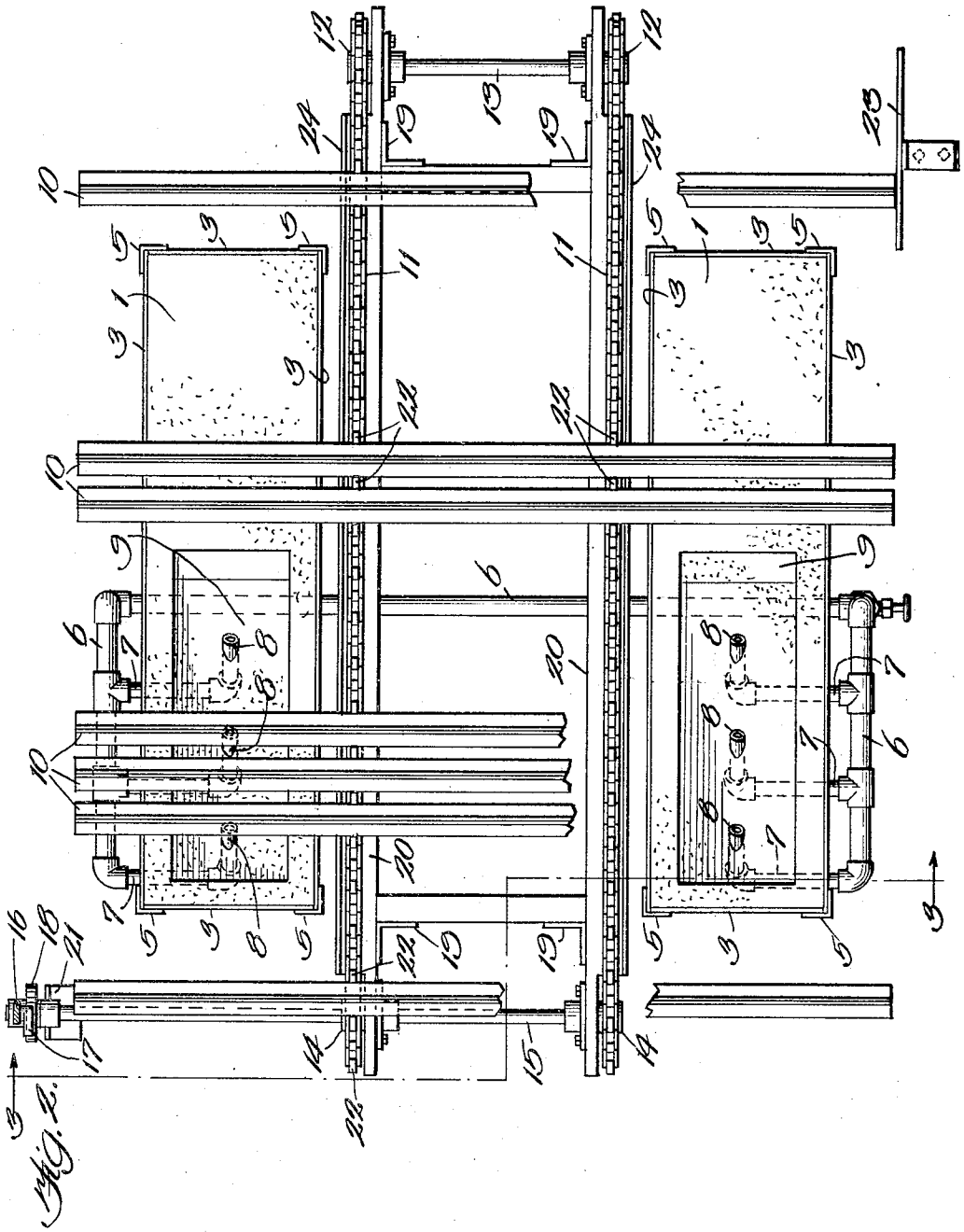


Fig. 2.

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Fig. 3.

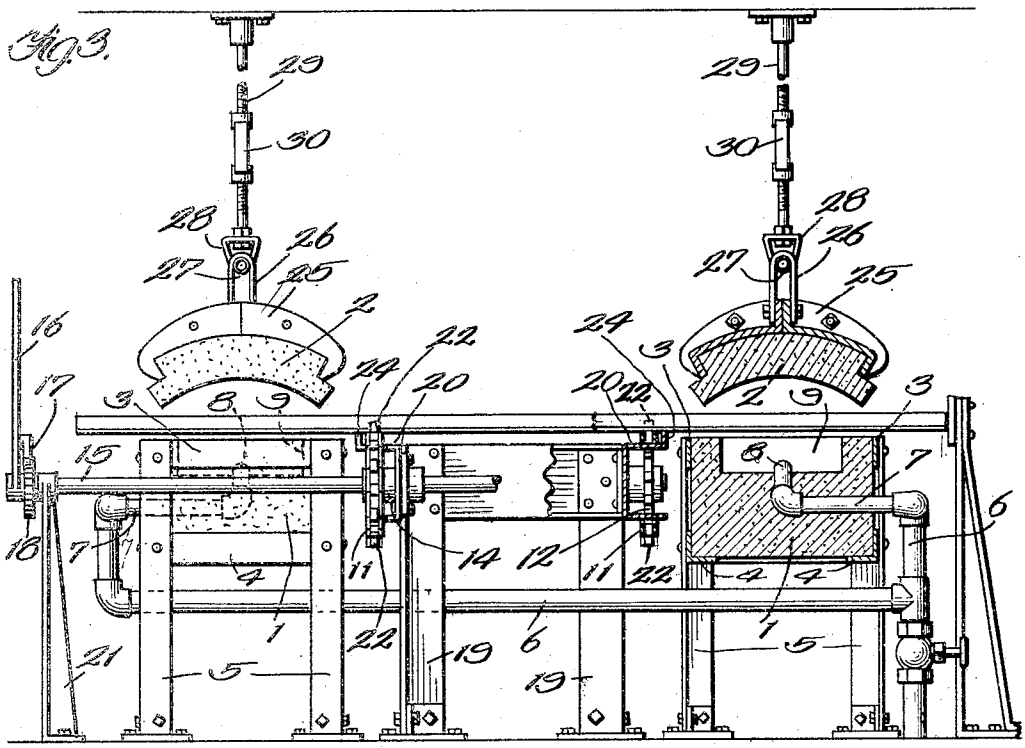
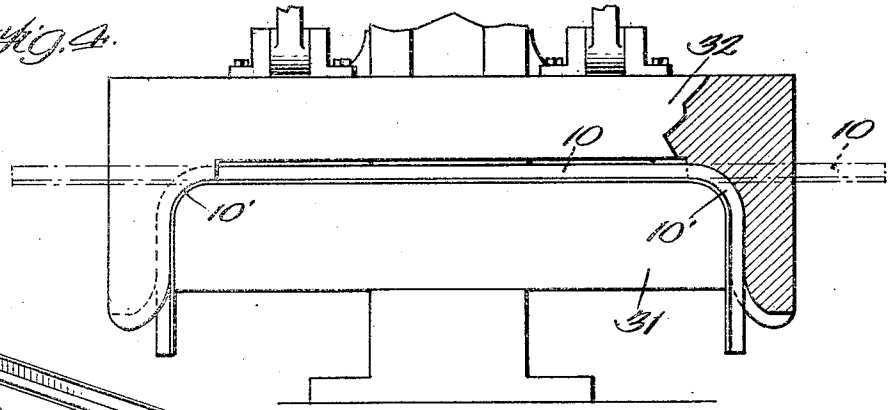


Fig. 4.



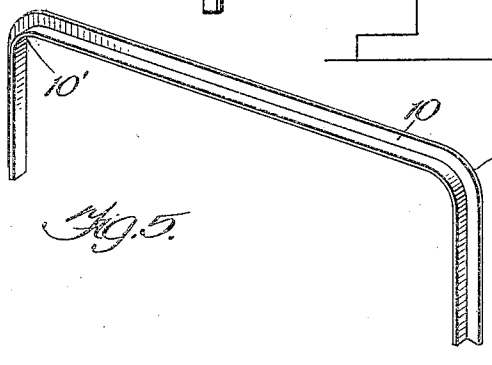


Fig. 5.

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UNITED STATES PATENT OFFICE

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OBJECT HEATING FURNACE

Application filed May 28, 1930. Serial No. 456,565.

My invention relates to object heating furnaces and has for one of its purposes the employment of a heating source whose temperature gradually rises to a maximum and in which the objects to be heated are progressively subject from the place of lowest temperature to the place of highest temperature. I realize this object of my invention by providing a furnace whose body portion contains the fire box or chamber and a massive heat retaining portion which is brought to a high but not excessive heat, due to the heat in the firebox or chamber, and whereat the objects to be heated are introduced, being gradually passed to increasingly hot portions of the furnace body until they reach the flames in the fire box, whereafter they are gradually withdrawn from the furnace to be worked upon as intended. The furnace of my invention is also equipped with a cap portion which is suspended from a hanger so as to be structurally distinct from the body of the furnace and yet held in such cooperative relation therewith as to efficiently heat the objects.

My invention also has for its object the provision of means for heating elongated objects which are to be bent in two or more places. In carrying out this object of my invention I employ two furnaces, each preferably of the construction generally specified, these two furnaces serving to concentrate the heat at the two selected places. This feature of my invention is of particular service in the formation of halves of frames that are provided for spring mattresses.

I will explain my invention more fully in connection with the accompanying drawings in which Fig. 1 is a view in elevation, partially in section, of the embodiment of the invention; Fig. 2 is a sectional view on line 2—2 of Fig. 1; Fig. 3 is a sectional view on line 3—3 of Fig. 2; Fig. 4 is a front elevation of a portion of a bull dozer which may be employed in connection with the equipment of my invention; and Fig. 5 is a perspective view of one form of product.

Each of the heating furnaces illustrated is inclusive of a body portion 1 which may be formed mainly of fire clay and a cap portion 2 also formed mainly of fire clay. Said body portion has its top side bound by iron strips 3 and its bottom corners seated within angle irons 4. The bordering elements 3 and 4 are riveted to pedestals 5 which support the body portion of the furnace a sufficient distance above the floor of the room in which it is contained.

The fuel employed is preferably gas, which is supplied from main piping 6 through branch pipes 7, which terminate in nozzles 8. I have illustrated three of such nozzles for each furnace and desirably sloping toward the rear end thereof. The nozzles of each furnace terminate in the combustion chamber or fire box 9 thereof and the rear end of the furnace toward which they project is about equal in length to the length of the fire box, the furnace being of substantially uniform cross sectional area, inclusive of the fire box or chamber 9, throughout the length of the furnace. The furnace is thus provided with a massive heat retaining portion which is gradually brought to high heat by the flames issuing from the nozzles, but this heat at the heavy part of the furnace body is more evenly distributed than in the region of the nozzles and is not as great. The objects 10 that are to be heated are introduced to the heating furnaces at the rear thereof so as to be first subject to the more equable and less violent heat at the rear portions of the furnace bodies. These objects are slowly moved along and over the top of each furnace body so as to be gradually heated to a point where they may be further heated by the flames issuing from the nozzles without distortion or injury. The objects to be heated are illustrated as being two angle iron strips assembled in pairs and designed for the construction of mattress supporting frames, one half of such a frame being illustrated in Fig. 5. The apparatus illustrated is intended to produce such halves of mattress frames which are suitably assembled into complete frames by means which has not been illustrated and which forms no part of my present invention. Means for effecting the progress of the objects, which are to be heated, are desirably inclusive of two sprocket chains 11

which turn in upright planes and are disposed between the two furnaces. These sprocket chains pass over idler sprocket wheels 12 which are carried upon the shaft 13. Said chains also pass over driving sprocket wheels 14 which are provided upon a shaft 15. An operating lever 16 is journaled upon this shaft 15 and carries an actuating pawl 17 which is in actuating relation with a ratchet wheel 18 that is fixed upon this shaft. Pedestals 19 support the channel iron beams 20 upon which the shafts 13 and 15 are journaled. Another pedestal 21 is also provided within which the extended portion of the shaft 15 is journaled adjacent the ratchet wheel 18. Alternate links of the sprocket chains 11 carry dogs 22 which are arranged abreast in pairs. The objects 10 that are to be heated are positioned to be respectively engaged by pairs of said dogs, these objects being brought into uniform position by being abutted against a gauge stop 23. The tops or caps 2 of the furnaces are, similarly to the bodies of the portions, located abreast and are spaced apart from these furnace body portions a distance which is slightly greater than the width of the objects being heated. The spaces between the furnace bodies and furnace caps are desirably straight, the beams 20 being formed with wings 24 which terminate slightly above the furnace bodies and sufficiently below the furnace caps to afford supports for the objects or work 10 to give these objects a straight line to travel, while being heated, and to relieve the sprocket chains of their weight while such objects are in travel. The furnace caps are desirably also made of fire clay or fire brick and are suspended from hangers which are inclusive of jaw portions 25 that grip the furnace caps, the stirrups 26 which are carried by said jaw portions, a rod 27 passing through said stirrups, stirrups 28 through which the rod 27 also passes, and hanger rods formed in sections 29 which are connected by the turn buckles 30. These turn buckles serve to adjust the width of the gaps between the bodies and caps of the two furnaces. The bottom surfaces of the furnace caps are desirably concave, being preferably of cylindrical curvature with the axes of such curvature, respectively at the mouths of each group of nozzles 8. The nozzle flames strike the bottoms of the objects 10 and the heat therefrom is reflected from the furnace caps downwardly upon said objects and also upon the heavy rear portions of the furnace bodies, whereby the objects are thoroughly, gradually and properly heated before they are passed to the bull dozer or other machine that is to work upon such objects. The bull dozer illustrated is inclusive of an anvil member 31 and a hammer member 32 which cooperate to shape each heated object as illustrated in Fig. 5, but it is to be understood that my invention is not to be limited to the shape of any particular object which is produced with its aid. It is observed that the heat is applied to the elements 10 where the bends 10′ are to occur and is not elsewhere directly applied, whereby the heat is conserved as much as possible. The heating is gradually commenced and gradually increased so that the objects are not distorted or injured when finally subjected to the hottest portions of the heat sources, the flames from the nozzles 8.

Changes may be made without departing from the invention.

Having thus described my invention, I claim:

In a structure of the class described, a plurality of heating furnaces arranged abreast, each of said furnaces including a body portion and a separated cap portion, a conveyor arranged to travel between the furnaces longitudinally thereof and to convey an object therealong, said object having portions passing simultaneously through each of the furnaces, said furnaces having at their entrance end a massive heat retaining portion through which the object portions first pass and at their exit end a fire box portion through which the object portions thereafter pass, whereby the portions of the object passing through the furnaces are gradually heated.

In witness whereof I hereunto subscribe my name.

WILLIAM E. WUNDERLICH.