

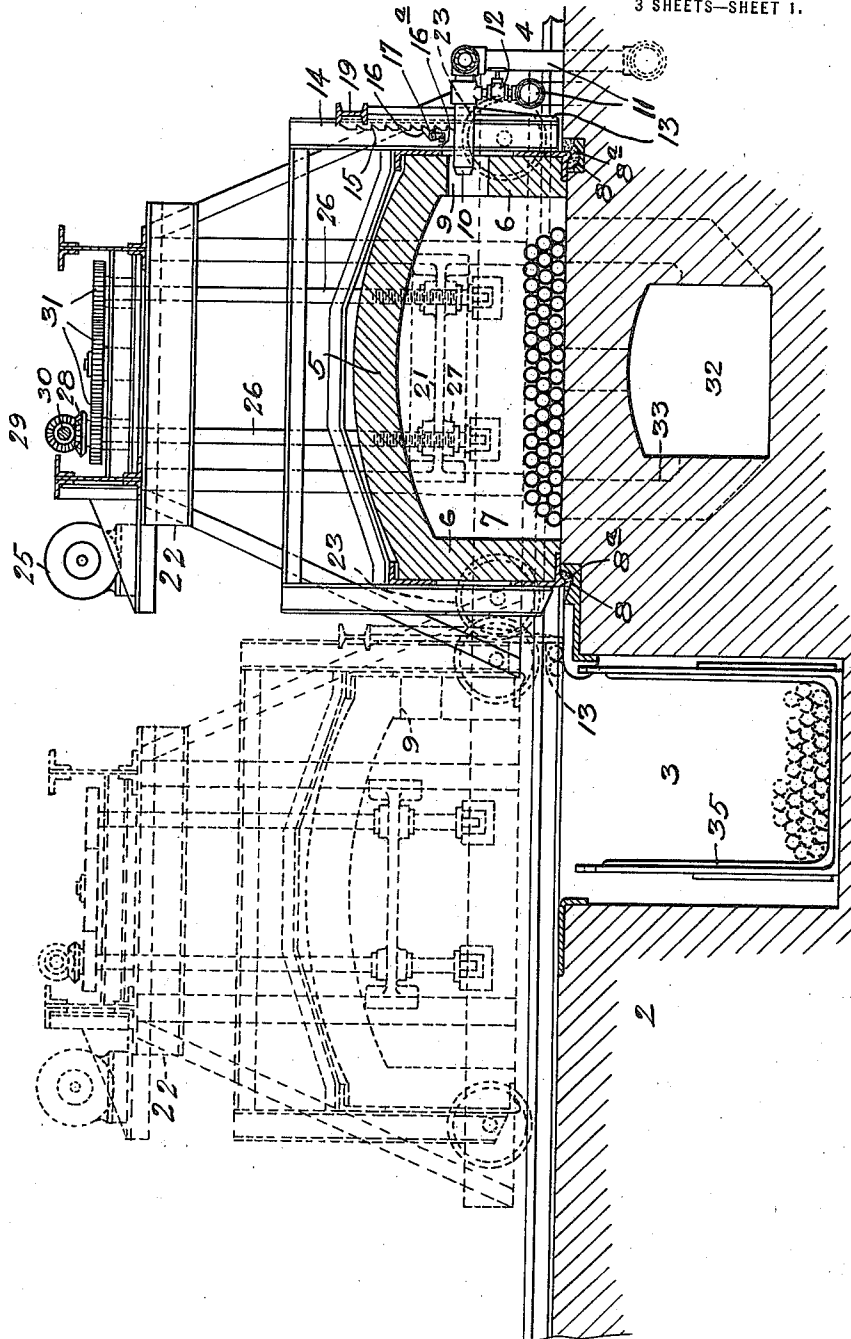
M. U. WIKSTROM.
 ANNEALING FURNACE.
 APPLICATION FILED FEB. 1, 1918.

1,343,019.

Patented June 8, 1920.

3 SHEETS—SHEET 1.

FIG. 1



INVENTOR

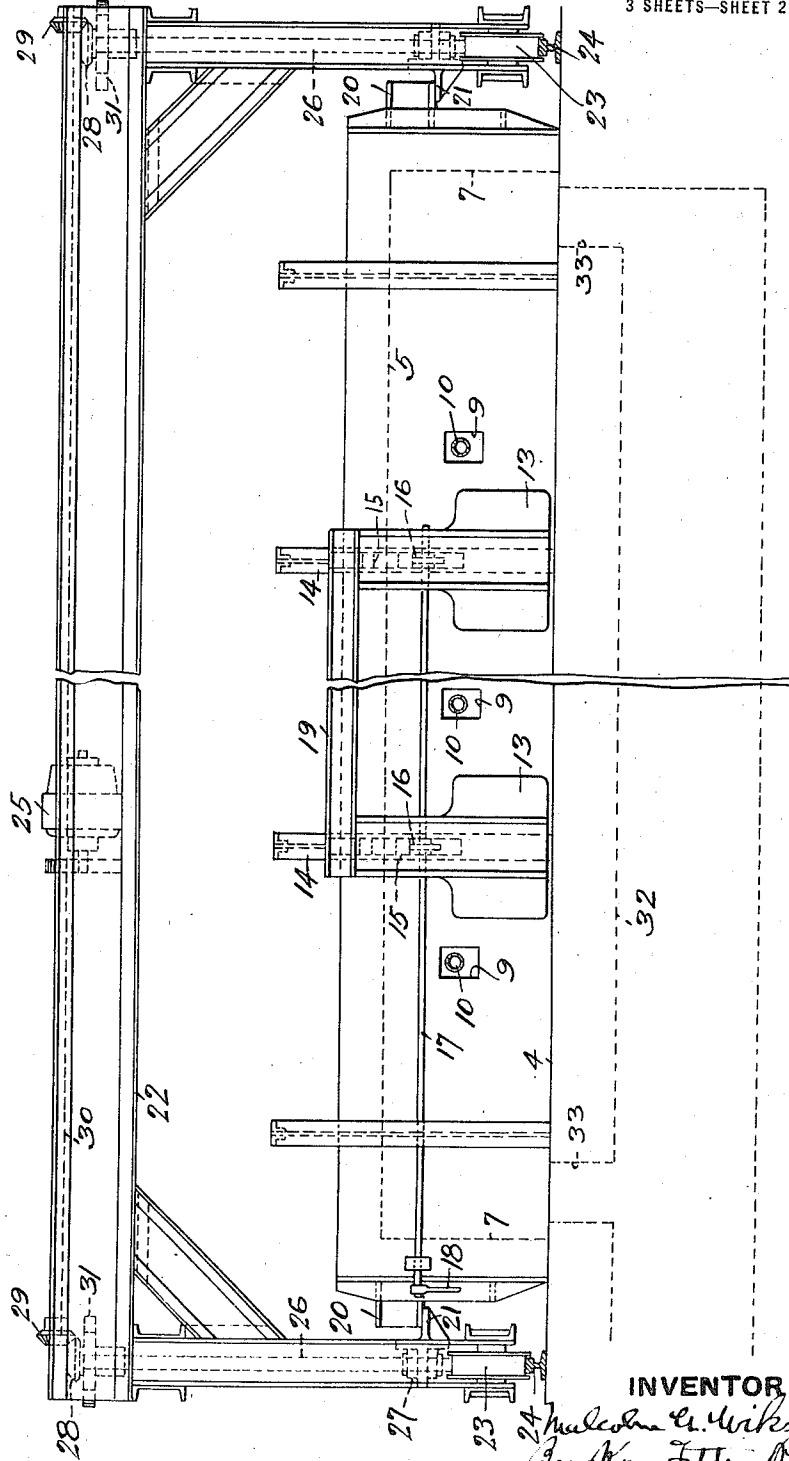
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3 SHEETS—SHEET 2.

FIG. 2



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3 SHEETS—SHEET 3.

FIG. 3

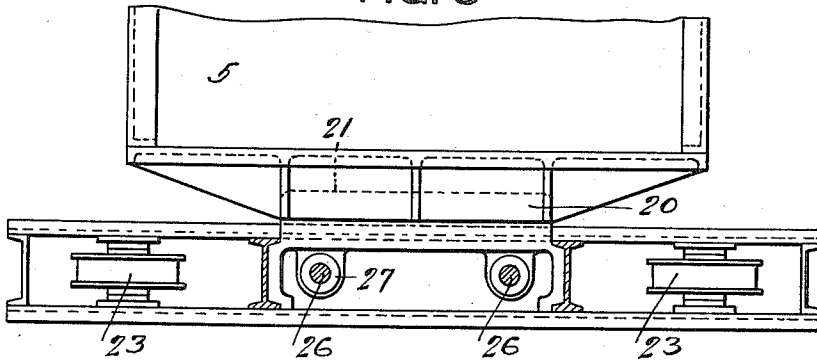
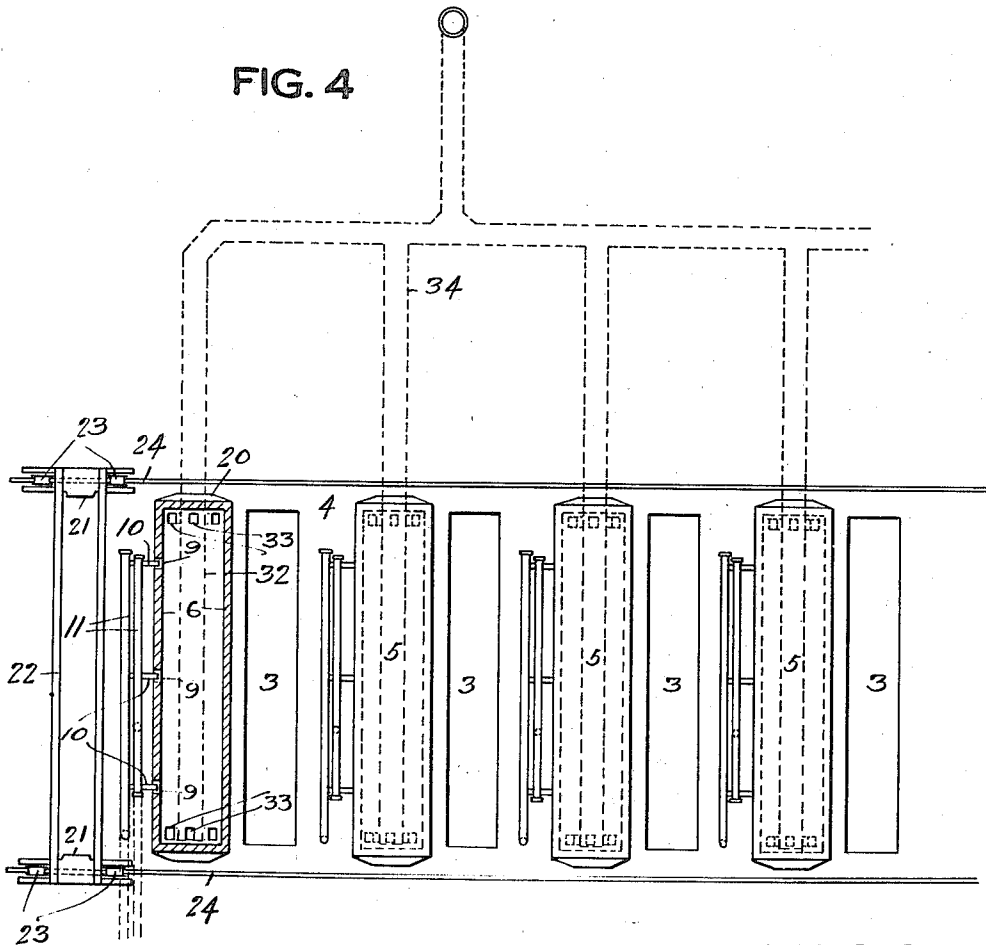


FIG. 4



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UNITED STATES PATENT OFFICE.

MALCOLM U. WIKSTROM, OF CHARLEROI, PENNSYLVANIA, ASSIGNOR TO PITTSBURGH STEEL PRODUCTS COMPANY, OF PITTSBURGH, PENNSYLVANIA, A CORPORATION OF PENNSYLVANIA.

ANNEALING-FURNACE.

1,343,019.

Specification of Letters Patent.

Patented June 8, 1920.

Application filed February 1, 1918. Serial No. 214,856.

To all whom it may concern:

Be it known that I, MALCOLM U. WIKSTROM, a citizen of the United States, and resident of Charleroi, in the county of Washington and State of Pennsylvania, have invented a new and useful Improvement in Annealing-Furnaces; and I do hereby declare the following to be a full, clear, and exact description thereof.

My invention relates to annealing furnaces.

The invention has particular reference to furnaces adapted for annealing tubing or like articles, its object being to provide for the charging and discharging of the furnace, so as to greatly reduce the amount of time as well as the handling of the same.

In the accompanying drawings, Figure 1 is a cross section of my improved furnace; Fig. 2 is a side view; Fig. 3 is a plan view of one end of the furnace and the means for lifting the same partly in section; and Fig. 4 is a diagrammatic plan view partly in section.

In the drawing the numeral 2 designates a suitable base or foundation which is provided at intervals with the pits 3. This foundation forms the support for the bottom 4 of the furnace, and while there are a number of furnaces illustrated on the bottom arranged side by side a description of one will apply to all.

The furnace proper consists of a movable section comprising the top 5, the side walls 6 and end walls 7 formed of refractory material and braced in the ordinary manner by angles, buckstaves, etc.

The furnace bottom is provided with the gutters or grooves 8 to receive the luting 8^a which seals the furnace along the sides and ends and prevents the escape of the heat or the entrance of air.

Openings 9 are formed in one of the walls 6 of the furnace at suitable intervals for the introduction of the gas-pipes 10 for heating the furnace. These pipes 10 are connected up with a system of supply pipes 11 extending up from the furnace bottom. The openings 9 are of sufficient height to permit of the raising of the furnace a proper height for the purpose, more fully hereinafter set forth. The supply of gas through pipes 10 is controlled by a suitable valve 12.

At one side of the furnace are the scrapers 13 which are adapted to move up and down

in suitable guides 14, said scrapers having the ratchet teeth 15 with which the pawls 16 engage, said pawls being held normally in engagement with the teeth by the springs 16^a. The pawls are connected up by a rod 17 which extends out to one end of the furnace where a handle 18 is provided for the turning of said rod. The scrapers are connected by the bar 19 and operate together.

At the ends 7 of the furnace are the projections 20 which are adapted to be engaged by the shelves 21 on the crane 22. The crane 22 may be of any suitable construction having the wheels 23 which travel on the rails 24 on the furnace bottom at the front and rear of the furnace. The crane is driven by a suitable motor 25.

In order to raise and lower the furnace by means of the crane, I provide the screw-shafts 26 which are threaded into the threaded sleeves 27 on the shelves 21. The upper ends of the screw-shafts 26 have the beveled pinions 28 which mesh with the beveled pinions 29 on the shaft 30 driven by the motor. Gears 31 transmit movement from one screw-shaft to the other, so that both shafts are driven simultaneously in the same direction. It will be apparent that by the rotation of the screw-shafts the shelf 21 is raised and lowered and with it the furnace engaging therewith by means of the projections 20.

Within the foundations 2 at intervals are the flues 32 which communicate with the furnace chamber through the flues 33 at each end thereof.

A system of pipes 34 severally enter the flues 32.

In the operation of my improved furnace, a bundle of pipes carried on an overhead crane is brought over the furnace bottom and lowered into position, and when the chains surrounding said pipes are released the pipes will spread out and assume substantially the position indicated in Fig. 1 of the drawing. The movable furnace section in the position shown in dotted lines Fig. 1 is then moved over in position to be lowered so as to inclose the pipes, and when moved over to said position the motor is operated to rotate the screw-shafts 26 which will lower the furnace in proper position with reference to the gutters 8. The clay or other material is then applied to the gutters to seal the joint. In moving the furnace over in this

position the gas-pipes 10 thus enter the openings 9 in the furnace wall. Heat is then applied to the furnace to bring it up to the proper temperature until the pipes are heated to the proper annealing heat. When the pipes have been properly annealed, power is again applied to rotate the screw-shaft 26 which will raise the furnace section sufficiently to allow the side walls to clear the pipes on the bottom.

When the furnace has been raised to this height, the operator turns the rod 17 releasing pawls 16, whereupon the scrapers 13 will of their own weight drop, and when the crane is moved to move the furnace sidewise, the scrapers moving along the furnace bottom will scrape the pipes along with them; and the pipes will be discharged into the pit 3 onto a basket or frame 35 lowered in said pit to receive the pipes. The furnace continues to move along in this direction until the pipes have all be discharged into the pit, whereupon the furnace is in the position indicated in dotted lines, Fig. 1. When the new bundle of pipes have been deposited on the furnace bottom, the furnace is again moved back and lowered and the annealing operation again takes place. Meantime, the annealed pipes are lifted from the pit 3 and conveyed away.

It is apparent that as illustrated in Fig. 4 any number of furnaces may be arranged side by side to be lifted and moved by one traveling crane, and the furnaces may be charged and discharged in regular order.

What I claim is:

1. In a furnace, the combination with a suitable bottom, of a movable furnace inclosing section adapted to rest thereon, a receptacle below said bottom, and means for moving said movable section laterally whereby the articles on said bottom engaged by said moving section will be discharged into said receptacle.

2. In a furnace, the combination with a suitable bottom, of a movable section adapted to rest thereon, means for raising and moving said section laterally in raised position, and means moving with said section for moving the contents of the furnace along the furnace bottom when said section is moved laterally.

3. In a furnace, the combination with a suitable bottom, of a movable section adapted to rest thereon, means for raising and moving said section laterally in raised position, and means carried by said section for moving the contents of the furnace along the furnace bottom, when said section is moved laterally.

4. In a furnace, the combination with a suitable bottom, of a movable section adapted to rest thereon, means for raising said section and moving same laterally in raised position, and a scraper adapted to engage the contents on the bottom when the section is moved laterally.

5. In a furnace, the combination with a suitable bottom, of a movable section adapted to rest thereon, means for raising said section and moving same laterally in raised position and a gravity operated scraper adapted to engage the contents on the bottom when the section is moved laterally.

6. In a furnace the combination with a suitable bottom, of a movable section resting thereon, means for lifting the section, means for moving the same laterally in lifted position, a scraper carried by said section at one side thereof, locking means for holding said scraper in raised position, and means for releasing said locking means.

7. In a furnace the combination with a suitable bottom, of a movable section resting thereon, means for raising said section, means for moving the same laterally when in raised position, a vertically movable scraper, means for locking said scraper in raised position, and means for releasing same.

8. In a furnace, the combination with a suitable bottom, of a movable section adapted to rest thereon, means for raising said section, means for moving the same laterally when in raised position, means carried by said section when raised for moving the material along said bottom, and a receptacle below the bottom level to receive the contents.

In testimony whereof, I, the said MALCOLM U. WIKSTROM, have hereunto set my hand.

MALCOLM U. WIKSTROM.

Witnesses:

ROBT. D. TOTTEN,
JOHN F. WILL.