No. 733,036. PATENTED JULY 7, 1903.

P. B. HASBROUCK.

COKE OVEN OPERATING APPARATUS.

APPLICATION FILED JAN. 21, 1903.

NO MODEL. 2 SHEETS—SHEET 1.

FIG. 1.

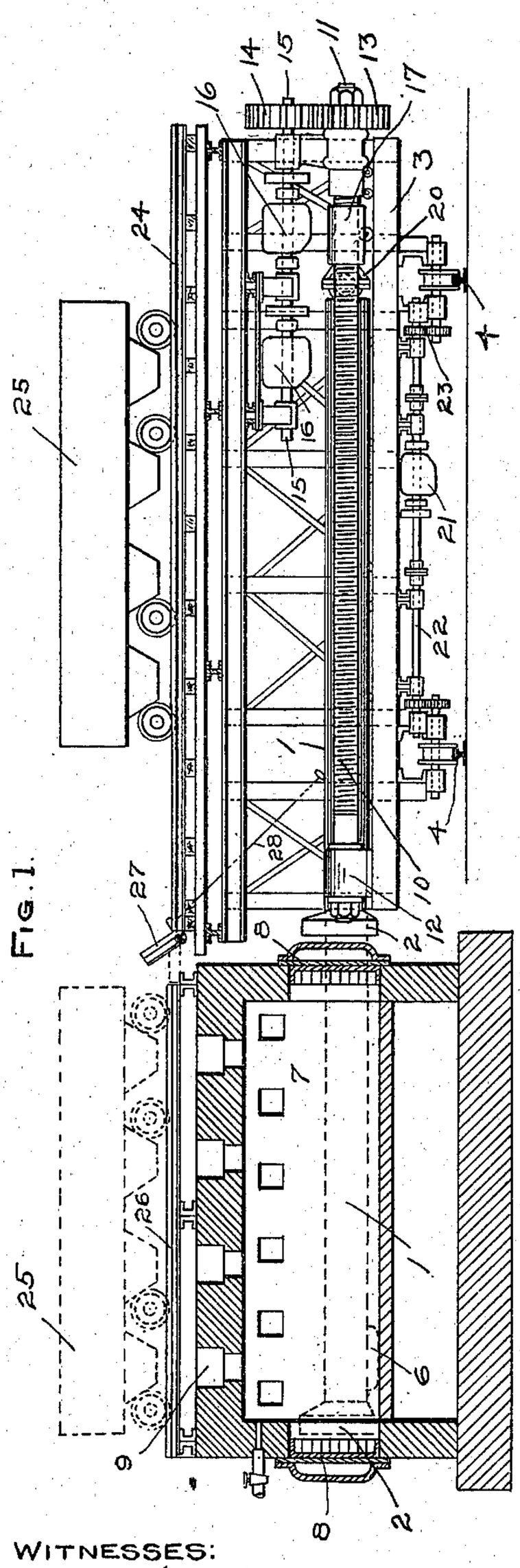

FIG. 2.

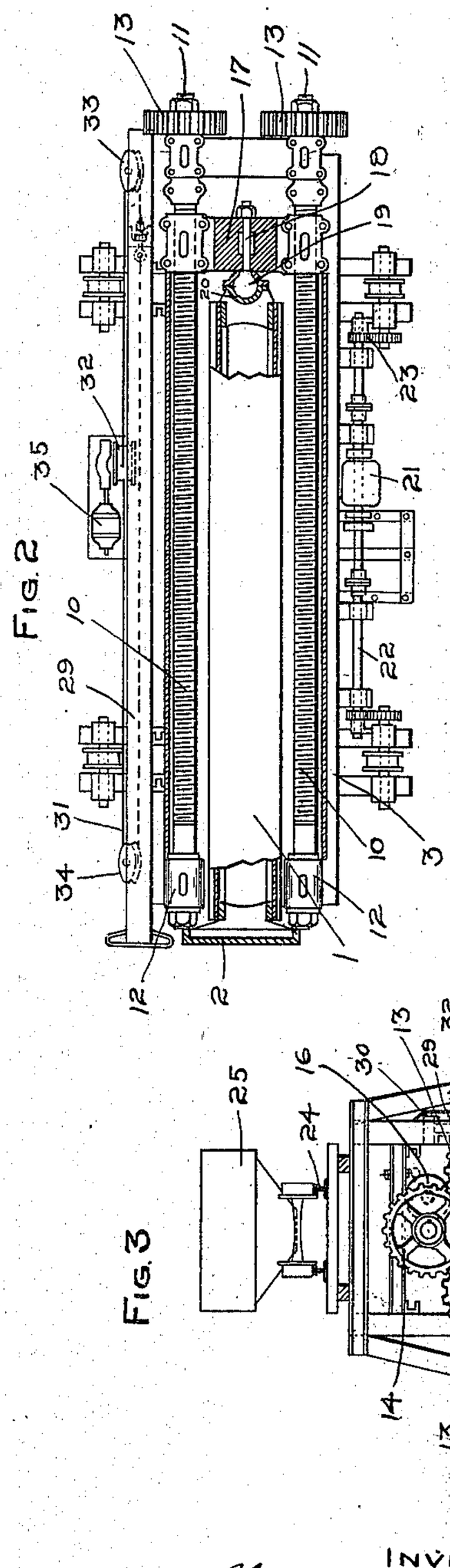

FIG. 3.

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NO MODEL. 2 SHEETS—SHEET 2.

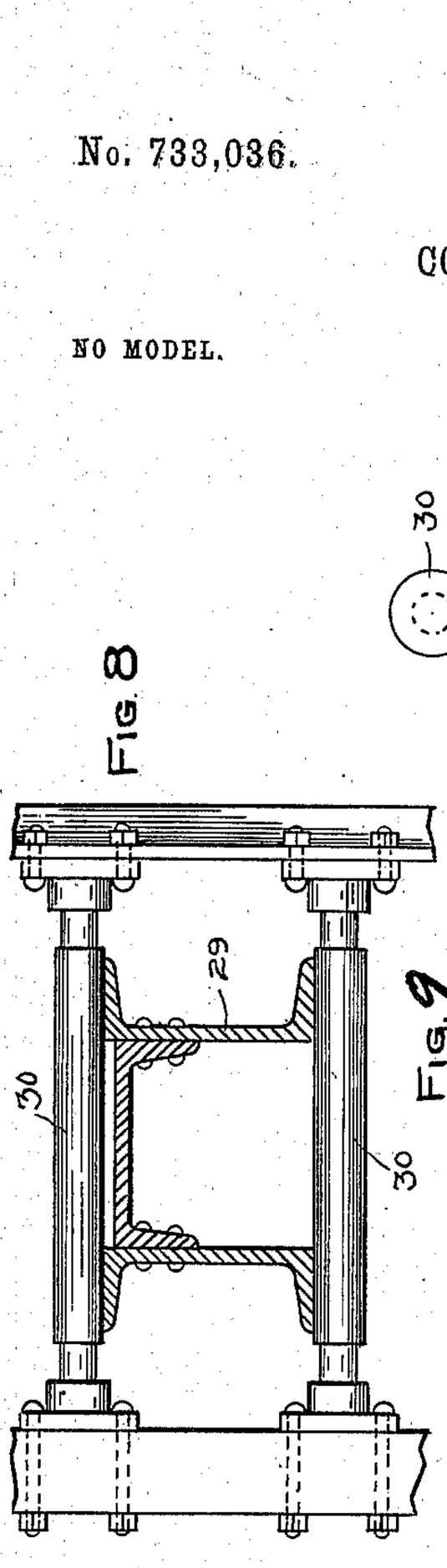


Fig. 8

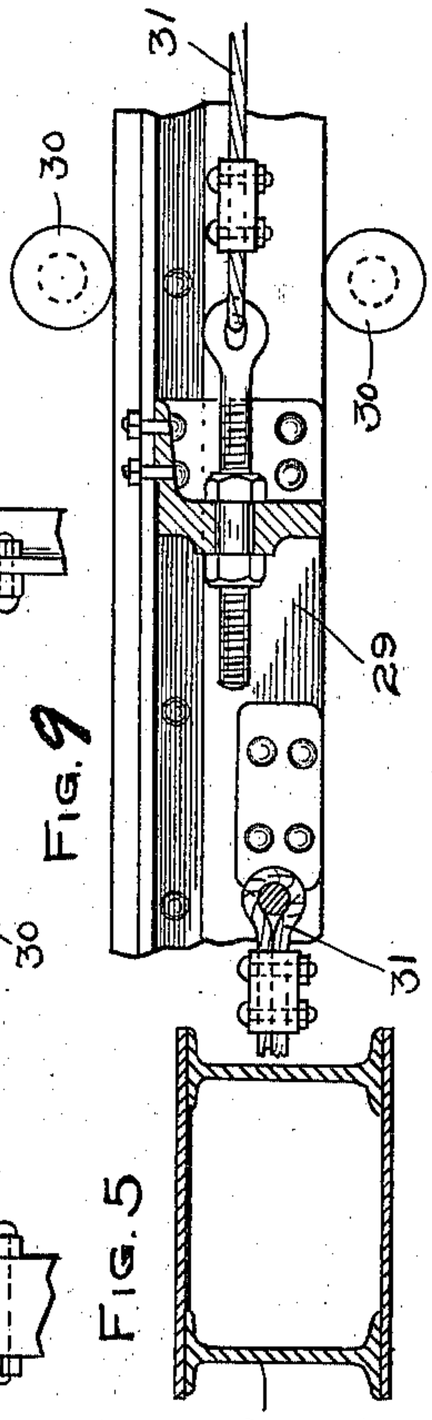


Fig. 9

Fig. 5

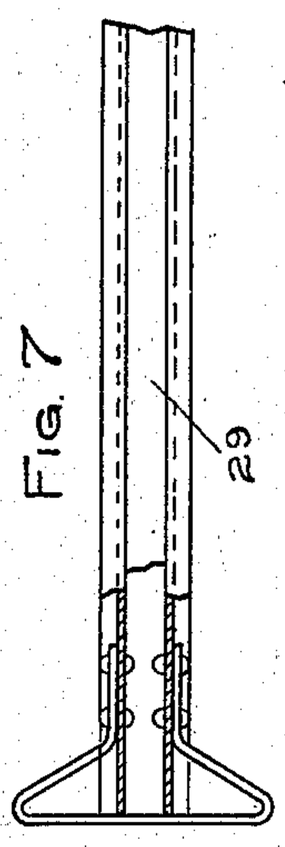


Fig. 7

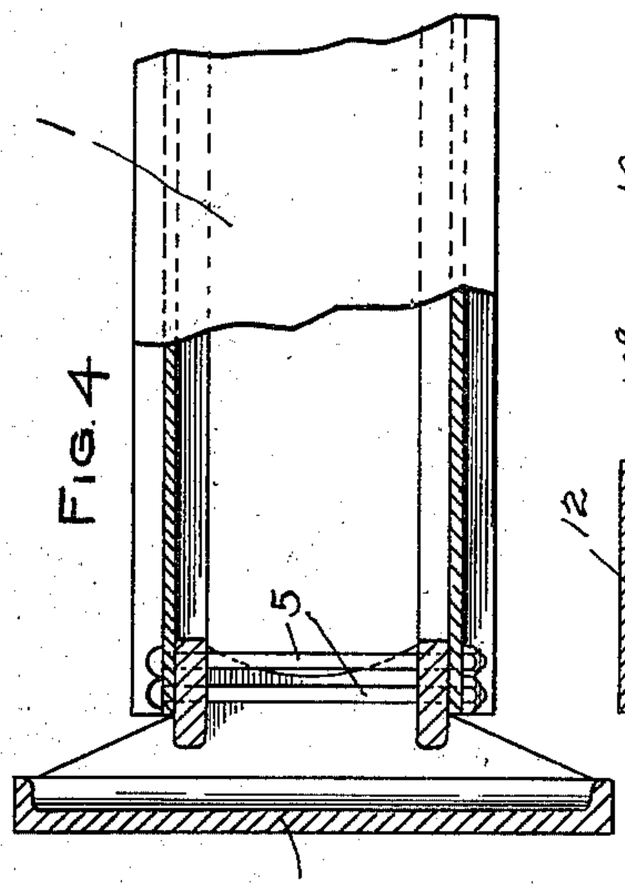
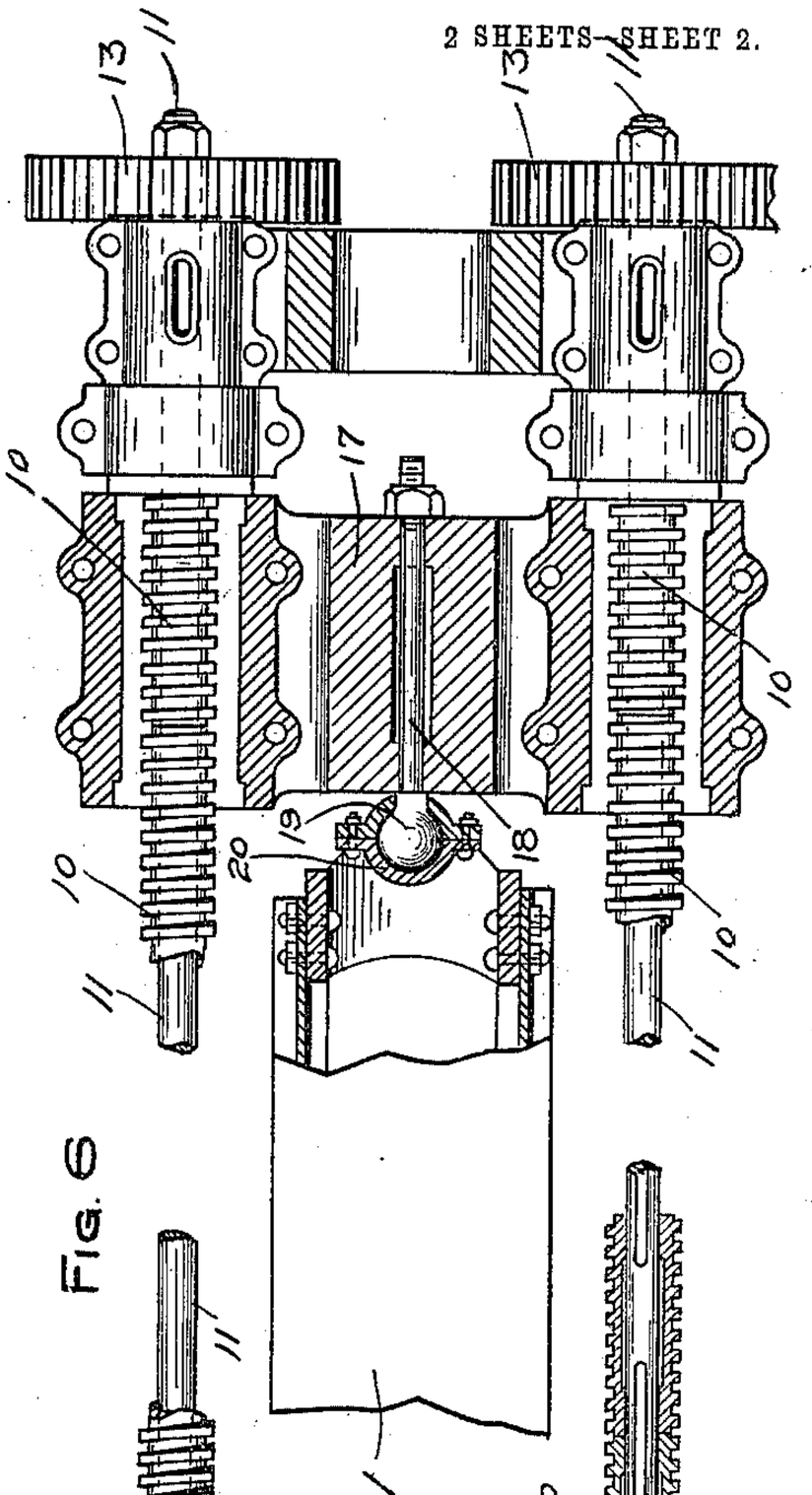


Fig. 4



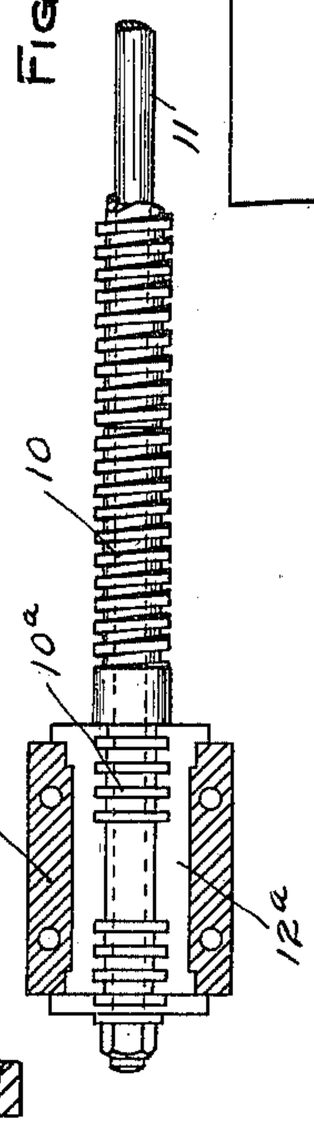
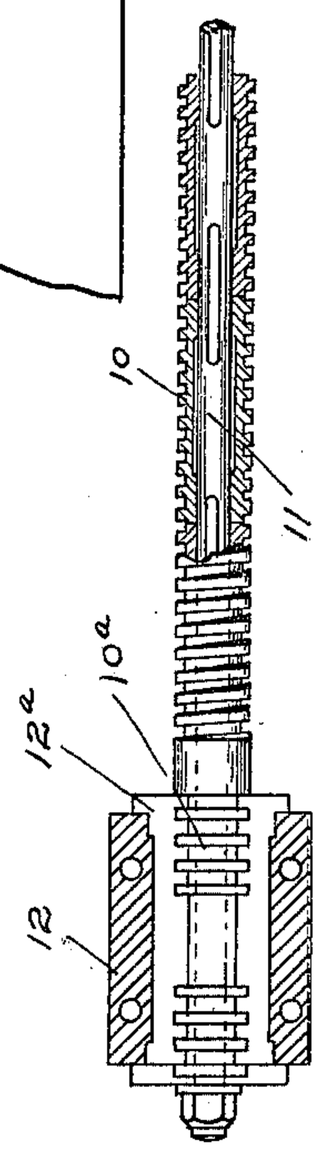


Fig. 6



WITNESSES:

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No. 733,036. Patented July 7, 1903.

UNITED STATES PATENT OFFICE.

PHILIP B. HASBROUCK, OF PITTSBURG, PENNSYLVANIA.

COKE-OVEN-OPERATING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 733,036, dated July 7, 1903.

Application filed January 21, 1903. Serial No. 139,976. (No model.)

To all whom it may concern:

Be it known that I, PHILIP B. HASBROUCK, a citizen of the United States, residing at Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Coke-Oven-Operating Apparatus, of which the following is a specification, reference being had therein to the accompanying drawings.

The object of my invention is to provide new and improved means for handling coal and coke for coke-ovens; and to this end the invention consists of a new and improved coke-oven-operating apparatus and in the construction and combination of parts, all as fully hereinafter described and claimed.

In the accompanying drawings, which illustrate applications of my invention, Figure 1 is a sectional view of a coke-oven and a side elevational view of the apparatus constructed in accordance with my invention; Fig. 2, a top plan view; Fig. 3, an end elevational view; Fig. 4, a detail view of pusher bar or ram; Fig. 5, a detail cross-sectional view showing preferred construction of ram; Fig. 6, a part plan view and a part longitudinal sectional view of ram-operating mechanism; Fig. 7, a detail view of coal-leveling device; Fig. 8, detail view showing supporting-rollers for locking device; and Fig. 9, a detail view of leveling device, showing connection of actuating means therefor.

Referring to the drawings, the pusher or ram 1, provided with a pusher-head 2, is carried on a truck 3, which latter is adapted to travel on rails 4, which form a track extending in front of a row or between two rows of coke-ovens. The preferred form of pusher is particularly illustrated by Figs. 4 and 5, and comprises two I-beams and a top and bottom plate, the pusher-head being joined thereto by bolts 5. Near the forward end of the pusher I employ one or more shoes 6, preferably of sufficient length to bridge the space between the truck and an oven 7.

The form of coke-oven illustrated in connection with my invention comprises doors or openings 8 on opposite sides thereof through which the pusher may be introduced and the coke discharged therefrom. The oven is charged through openings or charging-holes 9.

The movement of the pusher into and out of the oven is effected by means of two screw-shafts 10, located on opposite sides of the pusher. These screw-shafts are preferably made in sections and mounted on and keyed to shafts 11, as shown by Fig. 6. Thrust-bearings 12, comprising bushing 12^a and a section 10^a, are provided at the forward ends of the shafts. Shafts 11 at one end are each provided with a gear-wheel 13. These gear-wheels are arranged to mesh with a gear-wheel 14, mounted on driving-shaft 15. Shaft 15, as illustrated, is driven by one or more electric motors 16. Screws 10 extend through and mesh with internal threads in a movable cross-piece or collar 17, said cross-piece in turn being flexibly connected with the pusher, said connection comprising a rod 18, having a round head 19, located in a casing 20, which latter is attached to the end of the pusher.

I desire to call attention to the facts that in my construction as herein set forth no part of the pusher-actuating mechanism enters the oven, and, further, that I do not employ toothed rack-bars or chains for driving the pusher. Both of these features of my invention are important in that the driving mechanism is not affected in any manner by the heat of the ovens, and, secondly, by the employment of the screws, as shown, in place of toothed rack-bars or chains I obviate the liability of the pusher becoming "stuck" within the furnace on account of some of the teeth being torn or wrenched from the rack-bar or the chains being broken, as frequently happens in the employment of mechanical pushers driven by such means. Owing to the manner of coupling up the pusher with the cross-piece 17, the strain on the two screws 10 is equalized and prevents binding on the screws.

The truck 3, carrying the pusher, is driven along the rails 4 by means of an electric motor 21, shaft 22, and gearing 23, and when in operative position in front of an oven, as shown by Fig. 1, the ram or pusher is introduced into and caused to travel through the oven by the force exerted upon the rear end

thereof caused by the forward movement of the cross-piece 17 on the screws 10. This movement of cross-piece 17 is effected by motor 16, shaft 15, intermediate gear 14, gears 13, and shafts 11.

I have shown the truck 3 provided with a suitable frame-work for carrying and supporting a track 24, on which a transfer-car 25 travels. This construction enables a car to be passed to the track 26 over the oven. A pivoted section of track 27 is also carried on the framework and is operated by means of a rod 28.

For the purpose of leveling the coal after the ovens have been charged I provide a leveling device 29, arranged to be moved on suitably-supported rollers 30, as particularly shown by Fig. 8. The leveling device is operated by means of a rope 31, which extends around drum 32 and over-sheaves 33 and 34. This rope is preferably attached to the leveler in the manner shown by Fig. 9. The rope is driven by an electric motor 35, carried on the truck.

What I claim is—

1. A coke-oven-operating apparatus comprising, a movable supporting structure, a pusher or ram carried on said structure, screw-shafts, means for actuating the screw-shafts, means mounted on the screw-shafts arranged to travel thereon, said pusher or ram flexibly connected with said latter means, substantially as set forth.

2. A coke-oven-operating apparatus comprising, a movable supporting structure, a pusher or ram carried on said structure, screw-shafts, means for actuating the screw-shafts, a threaded cross-piece arranged to travel on the screw-shafts, and means for flexibly connecting the cross-piece with the pusher or ram, substantially as set forth.

3. A coke-oven-operating apparatus comprising, a movable supporting structure, a pusher or ram comprising two I-beams and a top and bottom plate, said pusher or ram carried on said structure, screw-shafts disposed on opposite sides of the pusher or ram, means for actuating the screw-shafts, an internally-threaded cross-piece mounted on the screw-shafts and adapted to travel thereon as the screw-shafts are turned, and means for flexibly connecting the cross-piece with the ram or pusher, substantially as set forth.

4. A coke-oven-operating apparatus comprising, a movable supporting structure, a pusher or ram carried on said structure, screw-shafts, one on each side of the pusher or ram, means for actuating the screw-shafts, a threaded cross-piece arranged to travel on the screw-shafts, means for flexibly connecting the cross-piece with the pusher or ram, and end-thrust bearings for said shafts, substantially as set forth.

In testimony whereof I affix my signature in presence of two witnesses.

PHILIP B. HASBROUCK.

Witnesses:
MARGARET HUGHES,
EDWIN L. ALLEN.