No. 710,643. Patented Oct. 7, 1902.

J. F. WILCOX.

COAL RAMMING AND TRANSFER APPARATUS.

(Application filed Feb. 5, 1902.)

(No Model.) 3 Sheets—Sheet I.

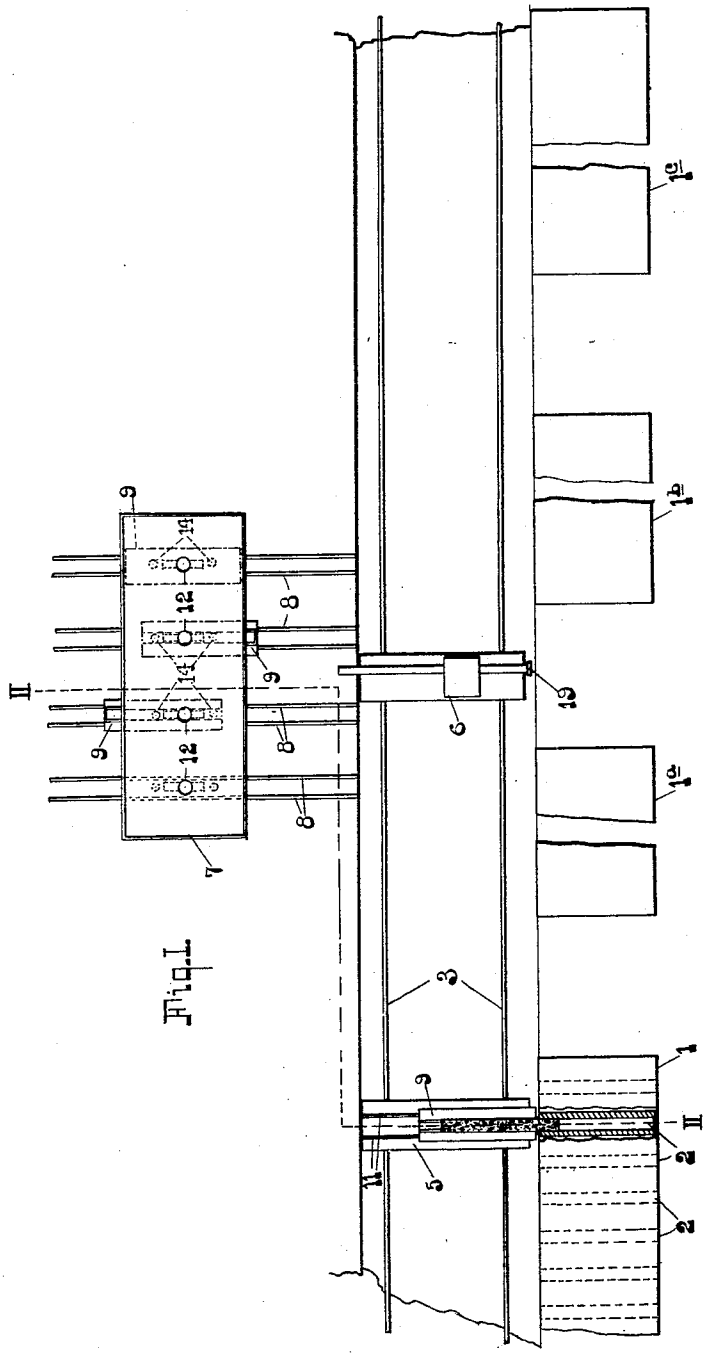

Fig. 1.

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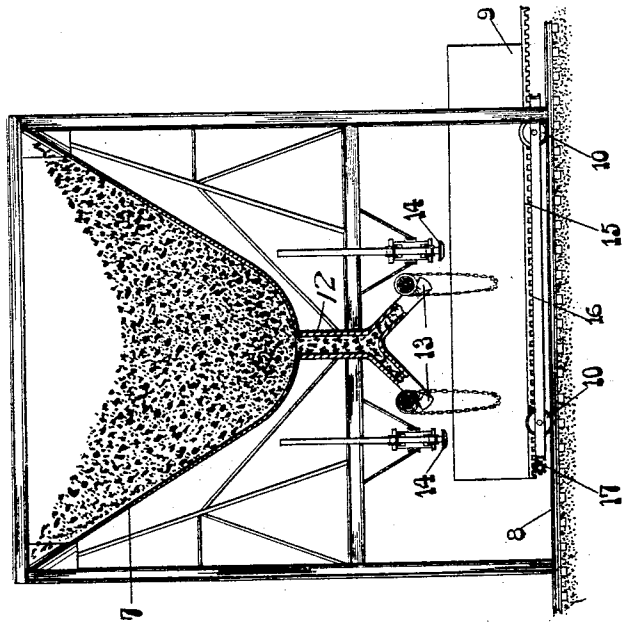
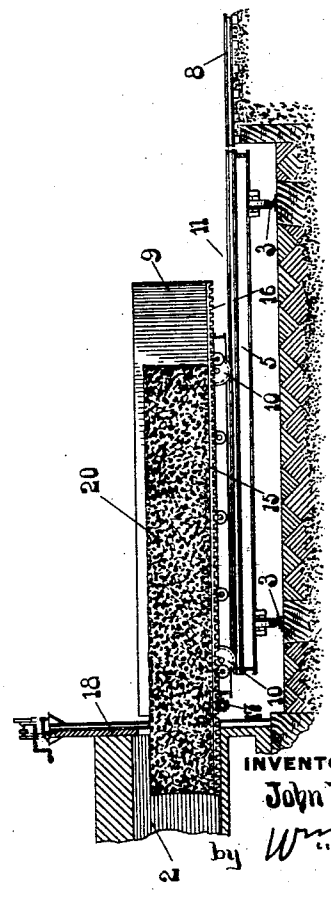


Fig. II.



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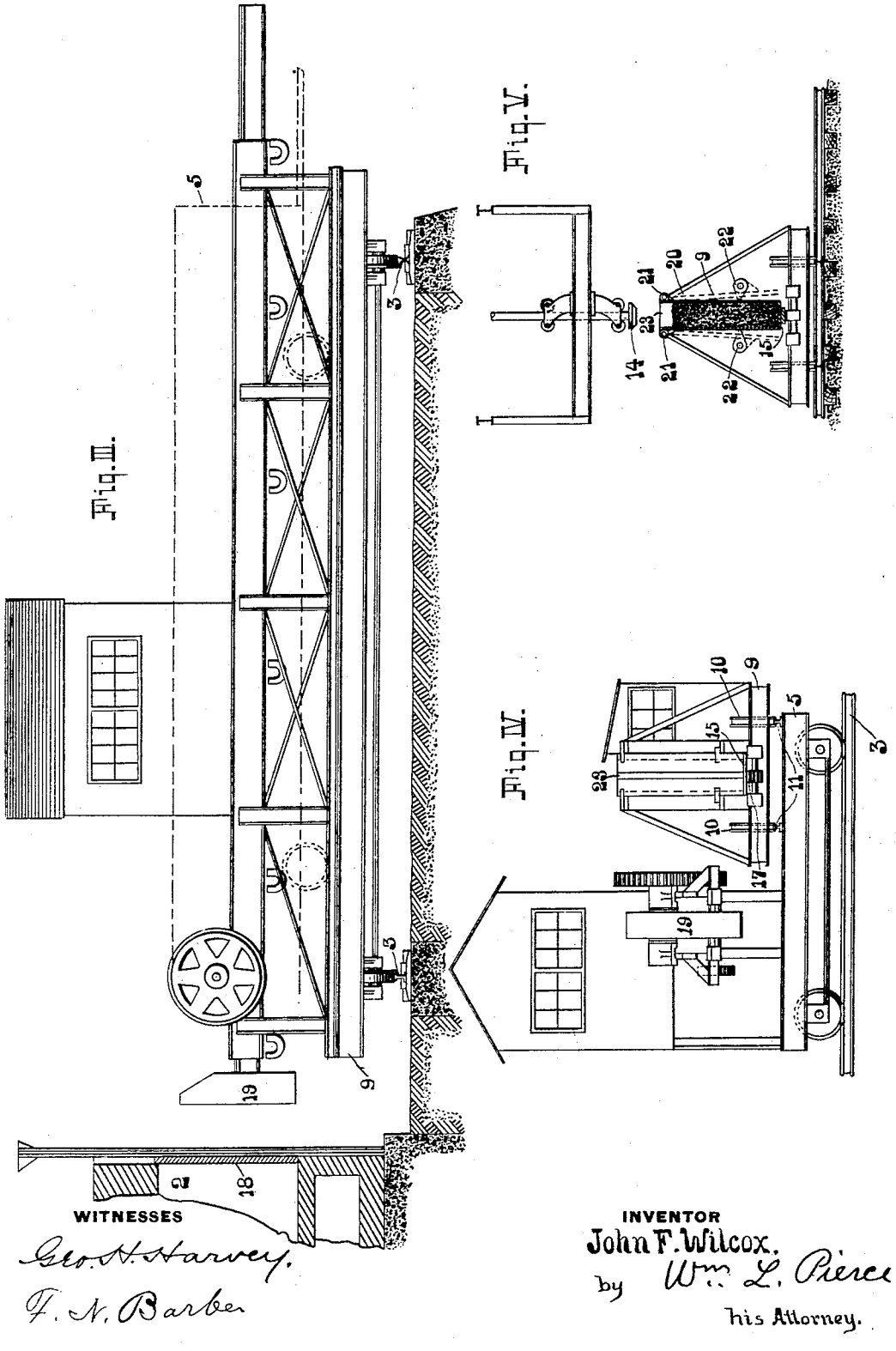

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UNITED STATES PATENT OFFICE.

JOHN F. WILCOX, OF CLEVELAND, OHIO, ASSIGNOR TO THE RETORT COKE OVEN COMPANY, A CORPORATION OF OHIO.

COAL RAMMING AND TRANSFER APPARATUS.

SPECIFICATION forming part of Letters Patent No. 710,643, dated October 7, 1902.

Application filed February 5, 1902. Serial No. 92,647. (No model.)

To all whom it may concern:

Be it known that I, JOHN F. WILCOX, a citizen of the United States, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented or discovered new and useful Improvements in Coal Ramming and Transfer Apparatus, of which the following is a specification.

In the accompanying drawings, which make part of this specification, Figure I is a plan of a coke-oven plant, a portion being broken away. Fig. II is partly an elevation and partly a section taken on the line II II of Fig. I. Fig. III is a side view, partly in section, showing the coke-pusher in position before an oven, the dotted lines representing a ramming-box on the pusher-car. Fig. IV is an end view of a coke-pusher and a ramming-box on the same transfer-car. Fig. V is an elevation, partly in section, showing a full ramming-box with locked sides.

It is a well-known fact that certain coals (very high or very low in volatile matter) which under ordinary conditions would not coke at all, or give, at least, a very inferior coke, can be made to coke and fuse and give a marketable coke by bringing the particles of coal, before or during the coking period, into closer proximity. With ovens open at the top the compressing of the coal is an easy matter, since it may be rammed or compressed inside the ovens; but with ovens having closed tops the task is much more difficult. I have found it impracticable to compress the coal inside the ovens after charging and have secured success only by compressing the coal outside the retort-chambers and introducing the rammed cake or briquet therein. In small plants I have found it possible to transfer the briquet in its forming-box permanently attached to the car which transfers it to ovens; but with larger plants I have found that confusion and delays arose, the same as they arise when the limit has been passed on a single-track railroad.

If there were four hundred ovens to be charged, it would be absolutely necessary to depart from the above-mentioned practice in order to charge a rammed briquet every ten minutes. Considering the time occupied by the pusher and the time necessary to ram coal by past methods, it would be absolutely impossible to be in a position to charge or load the ovens with rammed briquets with the speed necessary to keep pace with the discharging thereof if a change were not made in the heretofore-recognized methods. I have avoided the confusion and delays above mentioned by providing a central ramming-station at which an indefinite number of briquets can be formed and from which they can be readily transferred to a desired oven regardless of the position of the oven with regard to the ramming-point.

1, 1^a, 1^b, and 1^c are each batteries of a number of coke-ovens 2, having open ends and closed tops.

3 is a track which extends along the whole length of the plant and in front of the batteries of ovens and on which the coke-pusher car or cars 6 are operated.

7 is a central coal-bin, which may be filled with coal by an elevator, belt conveyer, or other mechanism. Under the bin 7 are a number of parallel tracks 8, depending upon size of plant, each preferably at right angles to the tracks 3. On each of the tracks 8 is operated back and forth a ramming-box 9, mounted on wheels 10 and transferable to track 11 on the pusher or car 5 when tracks 8 and 11 register.

The bin 7 has a spout 12 over each track, each spout having two outlets 13 13, from which the boxes 9 are filled while traveling on tracks 8, the machine-driven stationary rammers 14, of any selected type, at the same time compressing the coal. The boxes are pushed back and forth under the spout 12 while the coal is rammed, the rammers constantly beating down the coal along the whole length of the box. After the box is filled it is pushed onto a car 5, which may carry the box alone, as shown in Figs. I, II, and V, or the box and the coke-pusher, as shown in Figs. III and IV. Each ramming-box has a slidable bottom 15, provided with a rack 16, meshing with pinion 17 on the box. The sides of the box are hinged at their upper edges at 21, so that their bottom edges may swing out and allow the briquet to be moved past the

sides. The sides are locked by means of cams 22, operated in any preferred manner. The ends of the boxes are closed by doors 23.

The front of each oven 2 is closed by a door 18. The car 6 is propelled in any desired way and carries any preferred kind of coke-pusher 19.

The operation of the apparatus described is as follows: The boxes are filled as described and one of them is run out onto a car 6. The car is then moved on track 3, so that the briquet 20 in the box is opposite an empty oven, the hinged sides of the box are swung out, and the front door removed. Then the pinion 17 is turned, and the bottom 15 of the box, with the briquet thereon, is carried into the oven. When the briquet is within the latter, the door 18 is lowered to near the bottom 15, so as to form a stop or stripper for the briquet, and the bottom is then slid out from under the charge. The car, with the empty box, now moves opposite to an empty track 8, and the box is transferred thereto. The car then moves opposite another track 8, and a filled box is transferred thereto and the empty one charged, as described. When the coke in an oven is ready to be discharged, the car 6 is moved up and the pusher 19 operated in a well-known manner.

In Figs. III and IV, I have shown the coke-pusher carried by the transfer-car. The coke-pusher may be operated by any suitable mechanism, and as the particular mechanism for moving the coke-pusher forms no part of this invention I need not describe it further. When a filled ramming-box is run onto the car 5, the latter moves with the coke-pusher 19 opposite an oven to be discharged. After the oven is cleared the car is brought, with the briquet, opposite the open oven, which is then charged, as hereinabove described.

There will be as many boxes as there are tracks 8. Some of the boxes are being filled while others are being discharged, a result not possible when the box and the car are united permanently.

Having described my invention, I claim—

1. The combination, in a coking plant, of a ramming-station a plurality of rammers and ramming-boxes, a series of ovens, a main track for the delivery of charges to the ovens, and auxiliary tracks for the delivery of the ramming-boxes to the main track.

2. The combination, in a coking plant, of a battery of ovens, a ramming-station, a plurality of molds and rammers, a transfer-car, and means for transferring the molds to the car and the car to the battery.

3. The combination, in a coking plant, of a battery of ovens, a ramming-station provided with a series of tracks and a plurality of rammers, a plurality of mold-boxes adapted to the tracks, a transfer-car adapted to receive the boxes from the tracks, and a track for transferring the car to the battery.

Signed at Cleveland this 29th day of January, 1902.

JOHN F. WILCOX.

Witnesses:
SAMUEL F. SCOTT,
C. W. COMSTOCK.