

No. 692,746.

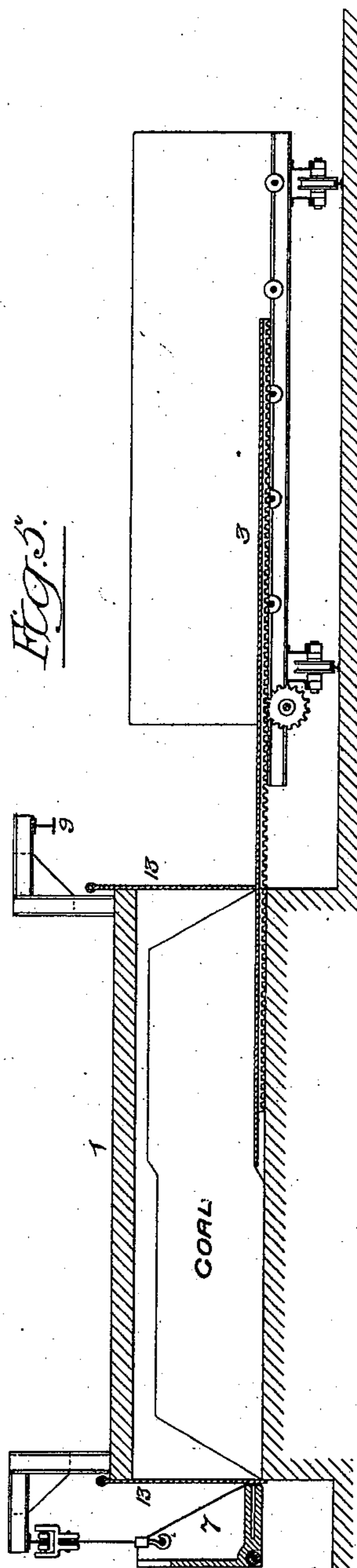
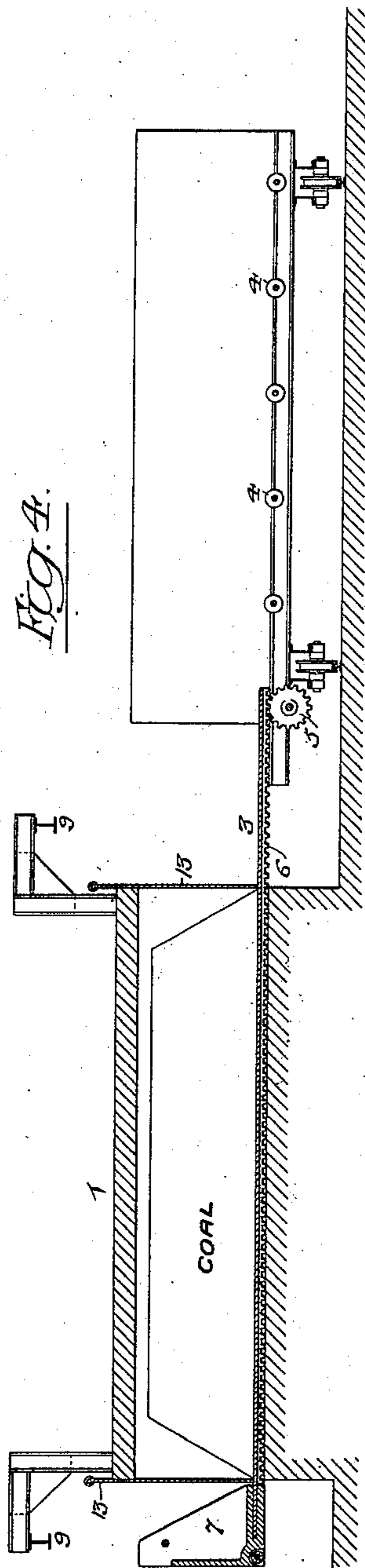
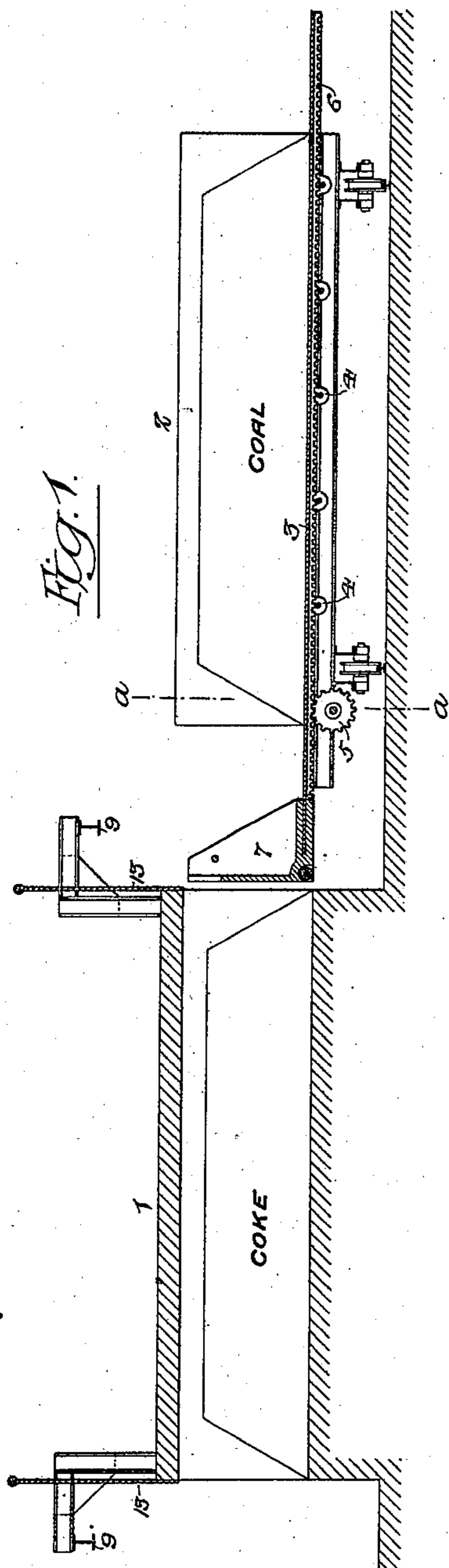
Patented Feb. 4, 1902.

S. T. & C. H. WELLMAN & J. W. SEAVER.  
COMBINED CHARGING AND DISCHARGING DEVICE FOR COKE OVENS.

(Application filed Mar. 15, 1901.)

(No Model.)

3 Sheets—Sheet I.



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*Newton A. Johnson*

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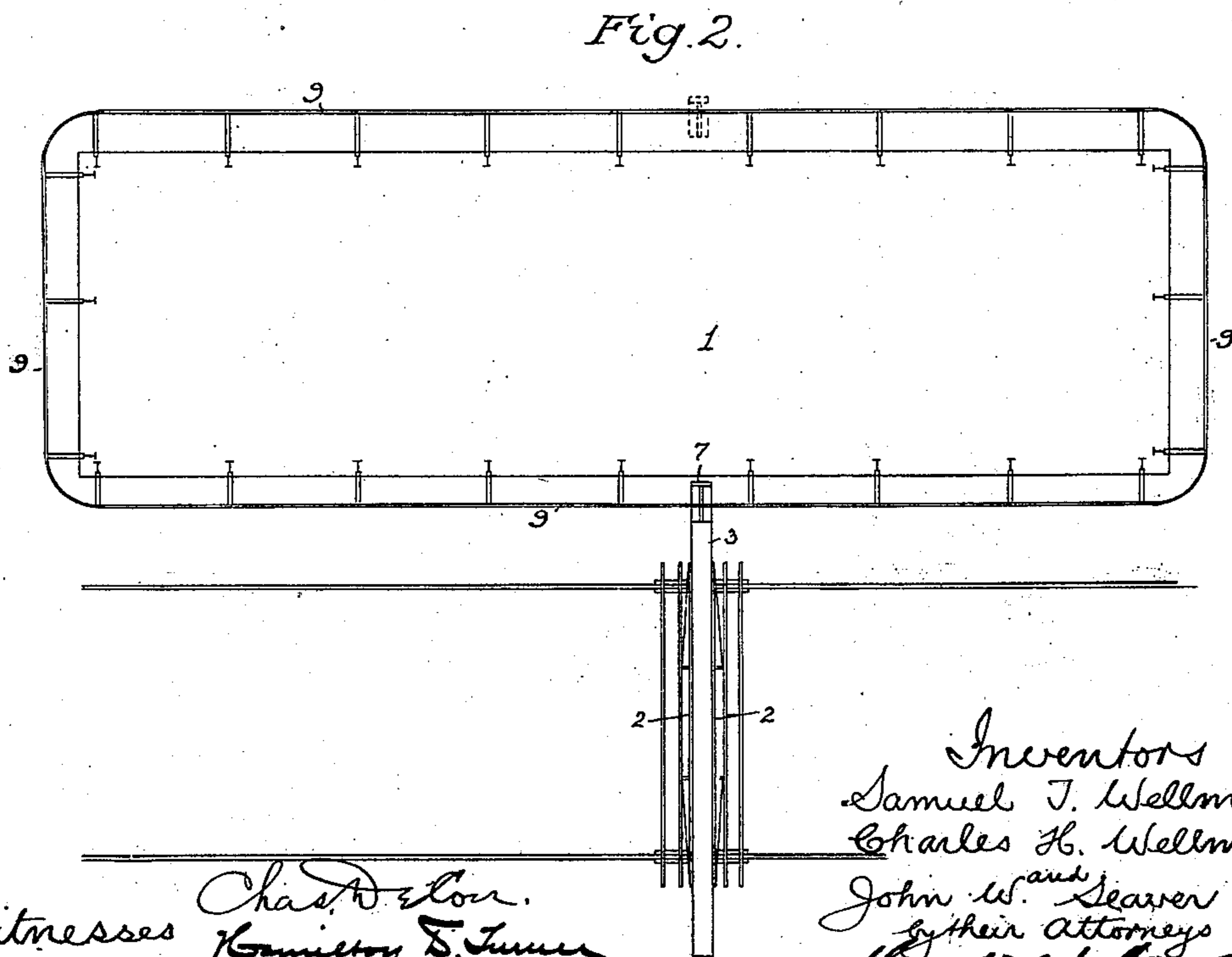
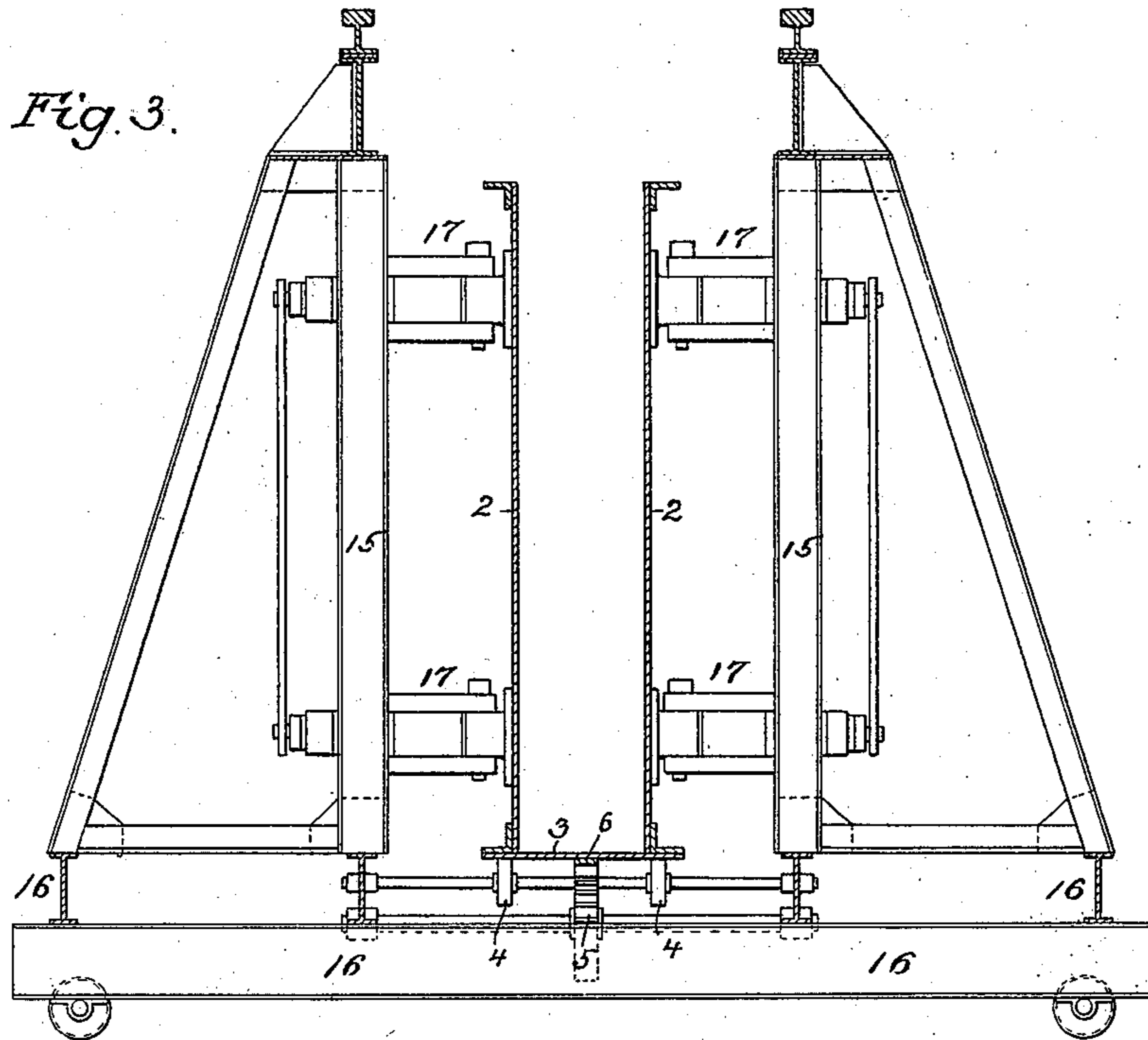
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3 Sheets—Sheet 2.



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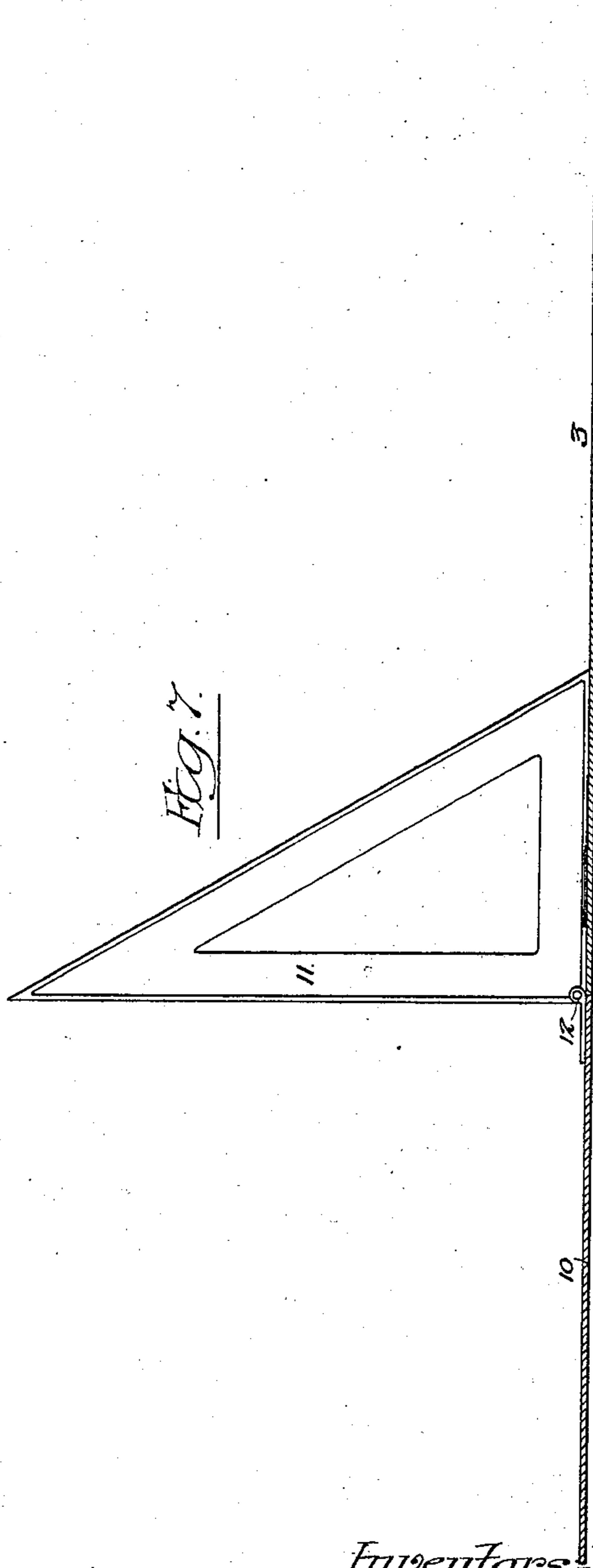
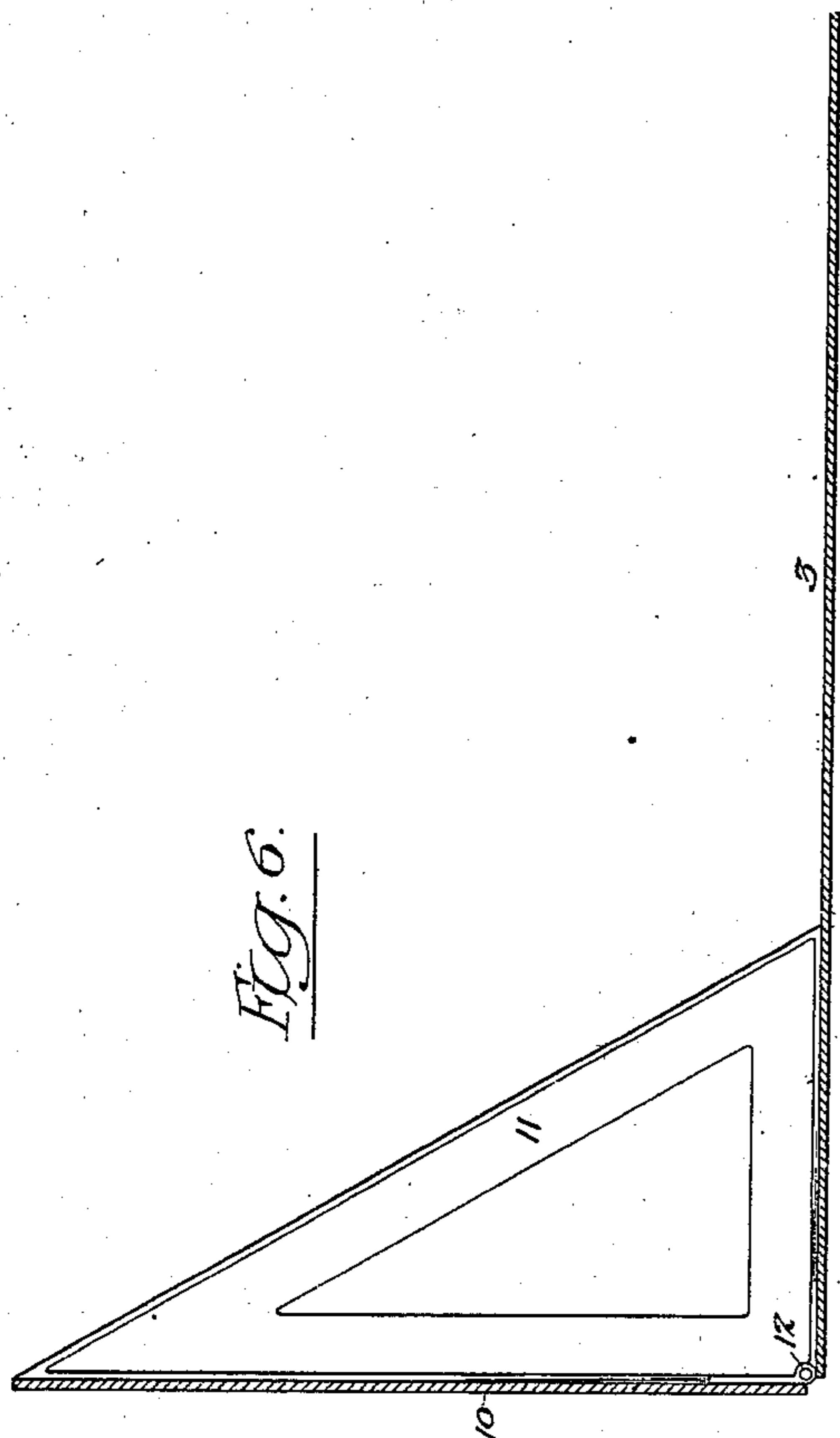
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(No Model.)

3 Sheets—Sheet 3.



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# UNITED STATES PATENT OFFICE.

SAMUEL T. WELLMAN, CHARLES H. WELLMAN, AND JOHN W. SEAVER, OF  
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COMBINED CHARGING AND DISCHARGING DEVICE FOR COKE-OVENS.

SPECIFICATION forming part of Letters Patent No. 692,746, dated February 4, 1902.

Application filed March 15, 1901. Serial No. 51,272. (No model.)

*To all whom it may concern:*

Be it known that we, SAMUEL T. WELLMAN, CHARLES H. WELLMAN, and JOHN W. SEAVER, citizens of the United States, and residents of Cleveland, Ohio, have invented a Combined Charging and Discharging Device for Coke-Ovens, of which the following is a specification.

The object of our invention is to provide a machine which can be used for charging and discharging a coke-oven at substantially the same time, thereby rendering it unnecessary to keep the oven open for so long a time as when the charging and discharging machines are independent of each other, and one operation has to be completed before the other can be begun, the single machine being at the same time less expensive than the independent machines ordinarily employed.

In the accompanying drawings, Figure 1 is a longitudinal section of a coke-oven with combined charging and discharging device therefor in accordance with our invention. Fig. 2 is a plan view, on a smaller scale, of the coke-oven structure and machine. Fig. 3 is a transverse section of the machine on the line *a a*, Fig. 1, and on a larger scale than said figure. Figs. 4 and 5 are views similar to Fig. 1, but illustrating different stages in the operation of the machine; and Figs. 6 and 7 are views illustrating a modification of the invention.

If a coke-oven is kept open for a considerable length of time during the operation of discharging the mass of coke and introducing the fresh mass of coal, the inrush of cold air will so lower the temperature of the bricks, especially at the ends of the oven, as to cause the same to crack, and the more refractory the character of the brick the greater will be such tendency. It becomes of importance therefore to keep the oven open for the shortest possible length of time necessary to discharge the load of coke and supply a fresh load of coal to be coked, and our invention has therefore been devised with the view of furnishing a machine whereby the two operations can, in effect, be simultaneously performed and the time during which the oven is kept open thereby reduced one-half or more as compared with the time required for discharging and charging the oven in the usual way—that is to say, by the employment of

one machine for pushing the mass of coke out of the oven and a separate and independent machine for supplying the fresh charge of coal after the pusher has been retracted and moved out of the way. In our improved machine that portion of the charging apparatus which carries the mass of coal also carries a pusher, and as the machine is operated to carry a fresh mass of coal into the oven the pusher ejects from the oven the mass of coke already contained in the latter, the pusher being then detached, so that the coal-carrying element of the charging device can be withdrawn from the oven, leaving the mass of coal therein.

In Fig. 1 part of a coke-oven structure is represented at 1, and in front of this structure are tracks for the wheels of the charging-machine, which as to its general structure may be of any desired character consistent with the proper carrying out of our invention, the machine shown in the present instance consisting of a box or trough 2, open at the top and having a longitudinally-movable bottom 3, on which the coal is deposited. The trough also has, by preference, laterally-movable sides, so that after the coal has been compacted in the trough the sides can be slightly withdrawn, so as to free the mass of coal from lateral confinement and permit it to be carried forwardly into the oven by the longitudinally-movable bottom 3. This movable bottom may be supported and operated in any desired manner, the means of support shown in the present instance being a series of rollers 4, mounted upon transverse shafts or spindles carried by the fixed frame of the charging-machine, and the means employed for imparting movement to the bottom being a pinion 5, engaging with a longitudinal rack 6 on said movable bottom. It will be understood that the coal is compacted in the trough so as to retain its form when the sides 2 are withdrawn laterally and that said sides are withdrawn only far enough to clear the mass of coal and prevent frictional contact with the sides of the same when it is carried forwardly into the oven by the movable bottom 3. The sides 2 are in the present instance supported upon vertical structures 15, rising from the base structure 16 of the charging-machine and connected to the sides 2 by interposed pivoted links 17 or other suitable

form of connection whereby lateral movement of the sides 2 in respect to the structures 15 is permitted.

To the front end of the movable bottom or coal-carrier 3 of the charging device is detachably connected a pusher 7, which may be constructed in any available way, the pusher shown in the drawings being a right-angled casting having its base slotted for the reception of the front end of the said bottom 3, whereby when the latter is pushed forward it will carry the pusher 7 ahead of it; but if rearward movement of the pusher is prevented and the movable bottom is drawn rearwardly said bottom will be withdrawn from engagement with the pusher.

The operation of the apparatus is as follows: The fresh charge of coal having been deposited in the trough of the charging-machine and the pusher secured to the front end of the movable bottom 3, the doors 13 of the oven are opened, as shown in Fig. 1, and the movable bottom is projected forwardly into the oven, the pusher shoving the mass of coke ahead of it through the oven as the fresh charge of coal is being introduced into said oven. As soon as the fresh charge has been fully inserted and the pusher is beyond the delivery end of the oven the doors 13 of said oven are closed as far as the bottom 3 of the charger will permit, as shown in Fig. 4, and the pusher is hooked onto the trolley on a trolley-runway 9, extending around the oven structure, the movable bottom of the charging-machine being then retracted, so as to free it from engagement with the pusher and withdraw it from the oven, leaving the fresh mass of coal therein.

Fig. 5 shows the bottom 3 of the charger partially withdrawn and a portion of the charge of coal delivered onto the bottom of the oven. The doors 13 at the rear end of the oven being closed, the mass of coal is retained in the oven as the movable bottom of the charging-machine is withdrawn. When the bottom 3 of the charger has been fully retracted, the doors 13 may be fully closed, and by means of the trolley and its runway the pusher can then be brought around to the front of the oven, so as to be again attached to the movable bottom of the charging-machine preparatory to a repetition of the operation.

While we prefer in all cases to use in connection with the movable bottom or other coal-carrying element of the charging-machine a detachable pusher, other constructions within the scope of our invention may be devised. For instance, the front end 10 of the coal-carrying element of the machine may be hinged, as at 12, so as to be turned to a vertical position, as shown in Fig. 6, in order to serve as a pusher, and after having pushed the coke from the oven may be dropped down to a horizontal position, as shown in Fig. 7, so as to be drawn rearwardly under the mass of coal deposited in the oven, any suit-

able form of brace—such, for instance, as a bracket 11 at each side of the coal-carrier—being employed to enable the hinged end of said carrier to resist the thrust upon it when it is being used as a pusher. In either case, however, the pusher has no connection with the machine other than the movable or removable connection with the bottom plate. Hence it can be readily released or turned down when the coke has been discharged. In fact, in both of the constructions shown the pusher is self-detachable or self-movable to inoperative position by contact with the end door of the oven. Hence no time is lost in effecting the release or adjustment of the pusher, as would be the case if connecting-rods or other fastenings had first to be released.

Having thus described our invention, we claim and desire to secure by Letters Patent—

1. A coke oven or retort charging machine having a movable coal-carrier whereby the charge of coal is carried into the oven or retort, and a pusher combined with said coal-carrier whereby the charge of coke may be pushed from the oven at the same time that the fresh charge of coal is being introduced into the same.

2. A coke oven or retort charging machine having a pusher detachably connected to the coal-carrying element of the machine, whereby the coke can be pushed from the oven while the fresh charge of coal is being carried into the same and the coal-carrier then withdrawn from the oven without bringing the pusher with it.

3. The combination in an oven or retort charging machine, of a coal-receiving box having a longitudinally-movable bottom for supporting the coal and carrying it into the oven, with a pusher movably connected to the forward end of said bottom but having no other connection with the machine.

4. The combination in an oven or retort charging machine of a coal-receiving box having a longitudinally-movable bottom for supporting the coal and carrying it into the oven, with a pusher detachably connected to the forward end of said bottom but having no other connection with the machine.

5. The combination of a coke-oven structure, a charging-machine having a coal-carrying element with pusher detachably connected to its forward end, and a trolley-runway and trolley whereby the detached pusher may be conveyed from the delivery end of an oven to the receiving end of the same.

In testimony whereof we have signed our names to this specification in the presence of two subscribing witnesses.

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Witnesses:

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