

No. 875,571.

PATENTED DEC. 31, 1907.

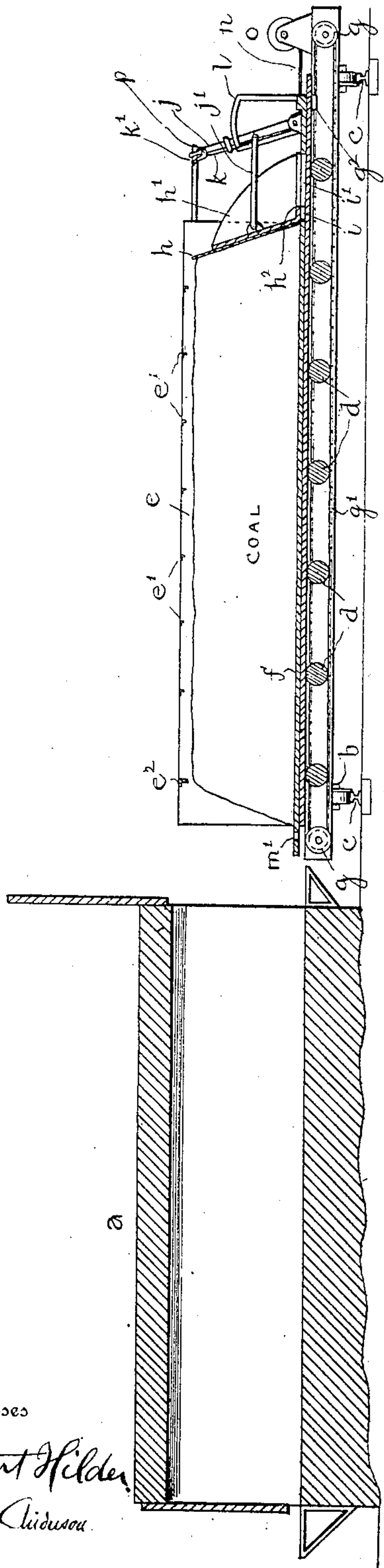
A. ERNST.

MACHINE FOR CHARGING COKE OVENS.

APPLICATION FILED APR. 25, 1907.

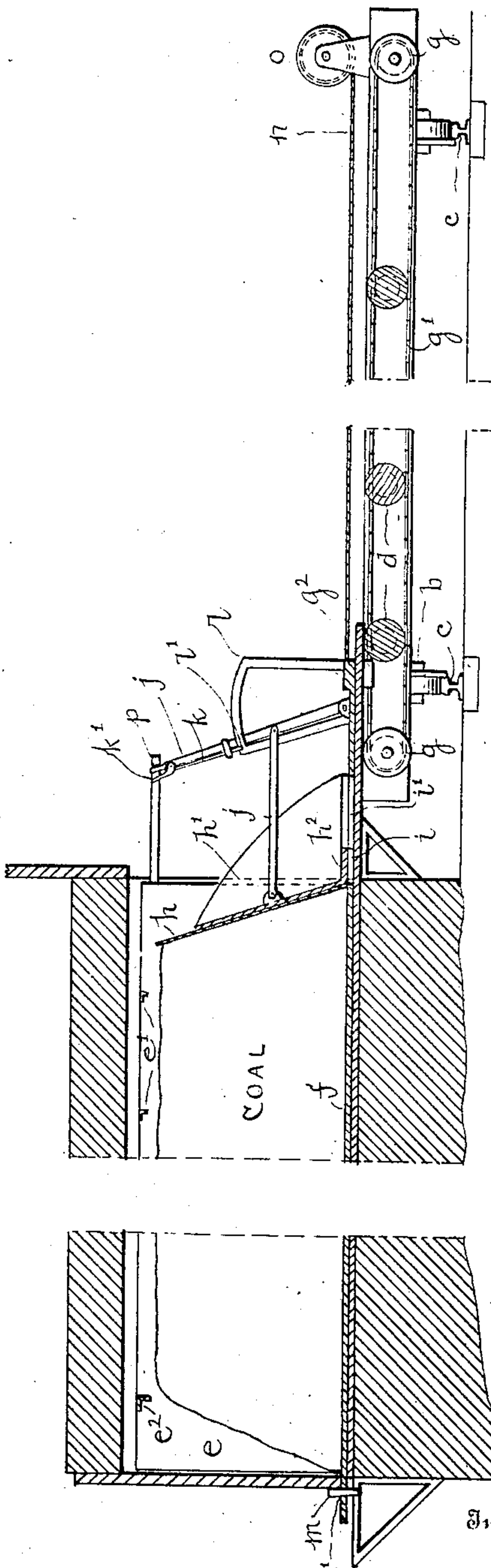
3 SHEETS—SHEET 1.

Fig. 1



Witnesses  
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Fig. 2.



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3 SHEETS—SHEET 2.

Fig. 3.

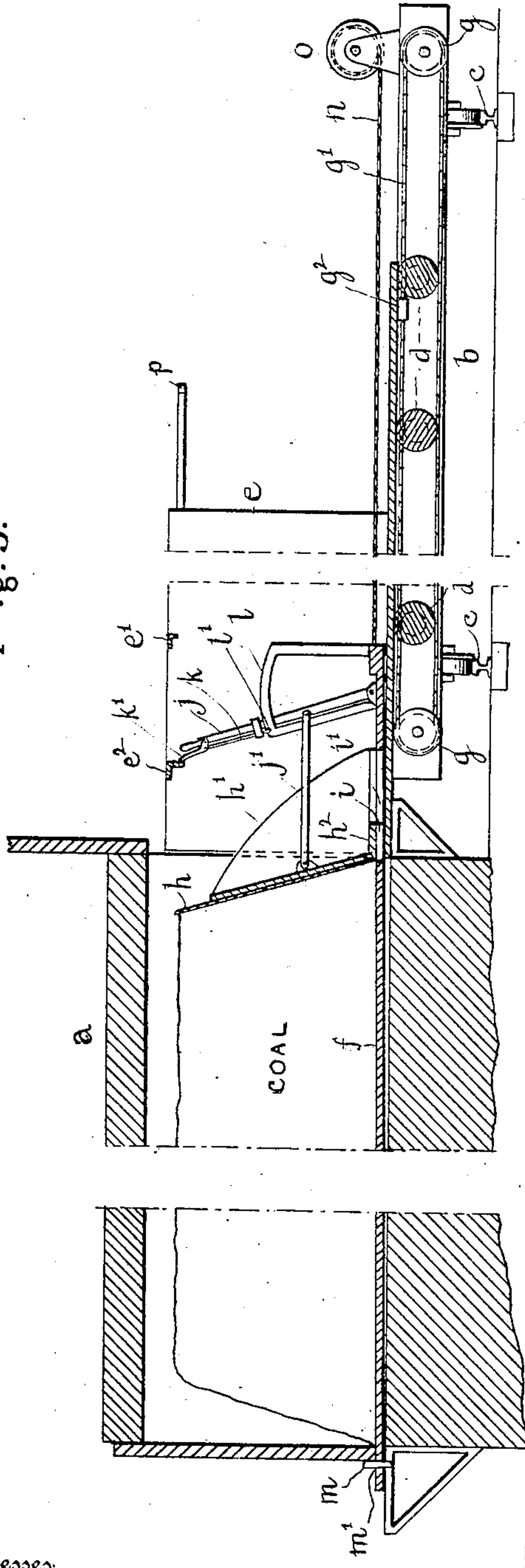
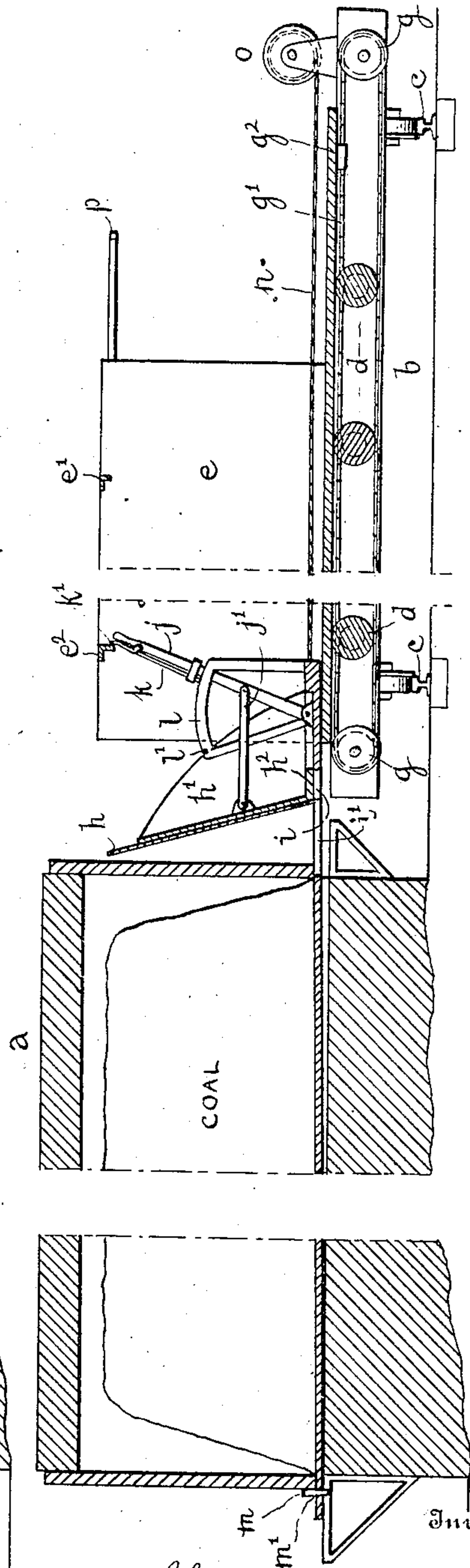


Fig. 4.



Witnesses

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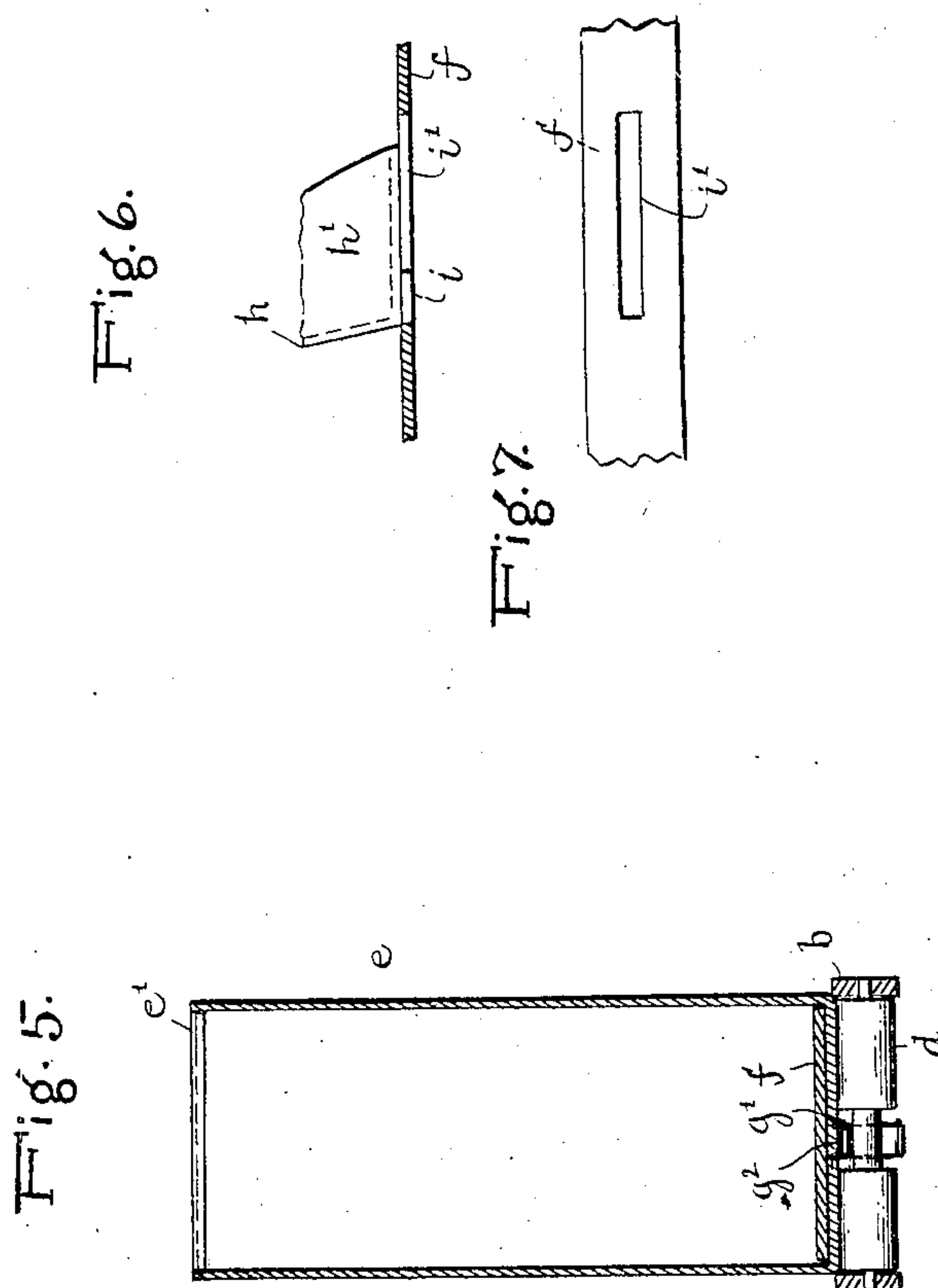
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3 SHEETS—SHEET 3.



Witnesses

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# UNITED STATES PATENT OFFICE.

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## MACHINE FOR CHARGING COKE-OVENS.

No. 875,571.

Specification of Letters Patent.

Patented Dec. 31, 1907.

Application filed April 25, 1907. Serial No. 370,315.

*To all whom it may concern:*

Be it known that I, ALFRED ERNST, a citizen of the United States, resident of Pittsburg, in the county of Allegheny and State of Pennsylvania, have made a certain new and useful Invention in Machines for Charging Coke-Ovens; and I declare the following to be a full, clear, and exact description of the same, such as will enable others skilled in the art to which it appertains to make and use the invention, reference being had to the accompanying drawings, and to letters or figures of reference marked thereon, which form a part of this specification.

Figure 1 is a longitudinal vertical section of the invention, with the parts of the machine in their initial position with relation to the oven. Fig. 2 is a similar view on a larger scale, with parts broken away, and showing the charging box within the oven, and the false bottom secured in place therein. Fig. 3 is a similar view showing the charging box withdrawn from the oven, leaving the false bottom and the coal charge thereupon within the oven. Fig. 4 is a similar view, showing the head plate withdrawn from the coal charge and the oven and the adjacent oven door closed. Fig. 5 is a vertical transverse section of the charging box, showing the anti-friction rollers thereunder. Fig. 6 is a detail fragmentary view of the bottom portion of the head plate and the false bottom upon which it rests. Fig. 7 is a detail fragmentary plan view of the false bottom, showing the slot therein.

The invention relates to means for charging coke ovens with loose coal through the end openings or doors of the same. At present the ovens are charged with coal through holes in the top thereof by coal lorries provided with chutes and having movement on top of the ovens. In such cases, the top of the coal charge is naturally of an irregular shape, more coal accumulating directly below the charging holes than in other places. Therefore the top of the charge must be finally leveled by means of a reciprocating bar introduced into the oven through an opening in the door. Both of these operations require considerable time and labor, and cause loss of gas and coal.

The object of the invention is the provision of an efficient and practical combination of devices which will accomplish the desired result in the manner stated in a

minimum amount of time. Other objects and advantages will hereinafter appear.

The invention consists in the novel construction and combinations of parts, as hereinafter set forth.

In the accompanying drawings illustrating the invention, the letter *a*, designates one of an alined series or battery of coke ovens, and *b*, a carriage or car designed to be moved along the front of the battery to be successively brought into alined position with relation to the end openings or doors thereof, a suitable trackway *c*, being provided for this purpose. The car *b*, is provided with a series of anti-friction rollers *d*, upon which rests a longitudinally movable charging box *e*, adapted to travel upon such rollers and provided with a false bottom *f*, having independent longitudinal movement with relation to the charging box. This box is open at the top and ends, the sides being braced at the top by means of transverse angle bars *e'*, as shown.

In the operation of the invention, the charging box filled with loose coal, which filling is accomplished usually by means of overhead hoppers, is carried into the coke oven through the open door at the end thereof until it occupies the position in which the coal is designed to rest. To accomplish this result and to withdraw the charging box and false bottom leaving the coal in its proper position in the oven, the following mechanism is provided. Sprocket wheels *g*, are arranged at each end of the car *b*, a chain *g<sup>1</sup>*, connecting such sprocket wheels, and the bottom of the charging box having connection at the rear end portion thereof with said chain at *g<sup>2</sup>*. At the rear end portion of the false bottom *f* is provided an oblique or inclined head plate *h*, which forms a closure for the rear end of the charging box during the charging operation and is provided with lateral bracing flanges *h<sup>1</sup>*, connecting the same with bottom flange *h<sup>2</sup>*, thereof, said bottom flange having a downward projecting lug *i*, working in a slot *i'*, of the false bottom. A lever *j*, is fulcrumed at its lower end to the false bottom, such lever having a connecting rod *j'*, with the head plate *h*, and being provided with a reciprocatory pawl rod *k*, operated by lever handle *k'*, and adapted to engage a notch *l'*, at one end of the quadrant *l*, whereby the head plate is secured against movement in its position at the rear end of



the charging box. This box having been moved into the oven by means of the sprocket gear aforesaid having a suitable motor connection (not shown) a locking pin *m* is  
 5 passed through a perforation *m'* at the forward end of the false bottom *f*, which projects at such end through the door at the corresponding end of the oven, such door being slightly raised to admit of the passage of the  
 10 end of the false bottom thereunder. The sprocket gear is then reversely operated by the motor connection to withdraw the charging box from the oven, the false bottom of such box remaining in the oven owing to the  
 15 locking pin aforesaid. The charge of coal also remains in position in the oven resting upon the false bottom, the inclined head plate *h*, abutting against the rear end of the coal charge. As the charging box is com-  
 20 pleting the last portion of its movement of withdrawal, a transverse bracing angle bar *e'*, at the forward end portion thereof contacts with the pawl lever *k'*, as shown in Fig. 3 of the drawings, releasing the locking  
 25 engagement of the pawl rod of such lever with the quadrant and carrying the lever *j*, back to position at the rear end of the quadrant, as shown in Fig. 4 of the drawings. At the same time the head plate *h* is moved  
 30 backward from the coal charge by the lever connection to a position in rear of the oven, which enables the door of the oven to be dropped into position in rear of the coal charge upon the false bottom *f*. Owing to  
 35 the slight forward inclination of the head plate *h*, amounting to about twenty degrees to the vertical, the rear end of the coal charge against which the head plate normally abuts and which has a similar inclination  
 40 will be rendered stable and prevented from disintegration or toppling over underneath the oven door, which would prevent entire closure thereof. The false bottom *f* upon which rests the charge of coal is now with-  
 45 drawn from the oven by means of a rope *n*, having windlass connection *o*, at the rear end of the car, the locking pin *m*, being first withdrawn from its seat, the door at the forward end of the oven dropping down behind the  
 50 false bottom as it is withdrawn to entirely close this end of the oven. The coal charge is at the same time stripped from the false bottom, and remains in its proper position within the oven. The charging of the oven  
 55 is thus complete it remaining only to suitably secure the doors at the ends of the ovens by the usual devices for this purpose. As the false bottom of the car completes the last portion of its movement of withdrawal, the  
 60 lever *j* strikes projection *p* at the rear end of the car, and is moved to position at the forward end of the quadrant (see Fig. 1 of the drawings), the head plate *h* moving forwardly therewith to position normally closing the rear end of the charging box.  
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Having thus described my invention, what I claim as new and desire to secure by Letters Patent, is:

1. In a charging machine for coke ovens, the combination of a longitudinally adjustable charging box having a false bottom carrying a slidable head plate normally closing one end of the charging box, means for reciprocating said charging box into and without the oven, and means for discharging  
 70 the coal therefrom. 75

2. A charging machine for coke ovens having in combination a longitudinally adjustable charging box provided with a false bottom having independent longitudinal movement, said false bottom carrying a head plate normally closing one end of the charging box, means for reciprocating the charging box into and without the oven, detachable means for securing the false bottom in position in  
 80 the oven, and means for withdrawing the false bottom from the oven. 85

3. A charging machine for coke ovens having in combination a longitudinally adjustable charging box provided with a false bottom having independent longitudinal movement, said false bottom carrying an inclined head plate normally closing the rear end of the charging box, means for reciprocating the charging box, detachable means for se-  
 90 curing the false bottom in position in the oven, and means for withdrawing the false bottom from the oven. 95

4. A charging machine for coke ovens having in combination a longitudinally adjustable charging box provided with a false bottom having independent longitudinal movement, said false bottom carrying an inclined slidable head plate normally closing the rear end of the charging box, means for reciprocating the charging box, detachable means for securing the false bottom in position in the oven, means for withdrawing the false bot-  
 100 tom from the oven, and means for reciprocating said head plate. 105 110

5. A charging machine for coke ovens having in combination a longitudinally adjustable charging box provided with a false bottom having independent longitudinal movement, said false bottom carrying an inclined slidable head plate normally closing the rear end of the charging box, means for reciprocating the charging box, means for securing the false bottom in position in the oven, means operated by the charging  
 115 box for withdrawing the head plate from the oven, means for withdrawing the false bottom from the oven, and means upon the charging box for restoring the means for withdrawing the head plate from the oven  
 120 and the head plate to normal position. 125

6. A charging machine for coke ovens having in combination a longitudinally adjustable charging box provided with a false bottom having independent longitudinal  
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movement, said false bottom carrying an inclined slidable head plate normally closing the rear end of the charging box, means for reciprocating the charging box, means for securing the false bottom in position in the oven, a lever device adapted to be operated by the charging box for withdrawing the head plate from the oven, means for withdrawing the false bottom from the oven, and

means upon the charging box for restoring said lever device and the head plate to normal position.

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

ALFRED ERNST

Witnesses:

M. E. ROTHBERG,

G. B. DAMON.