

No. 715,004.

Patented Dec. 2, 1902.

L. BERTRAND.

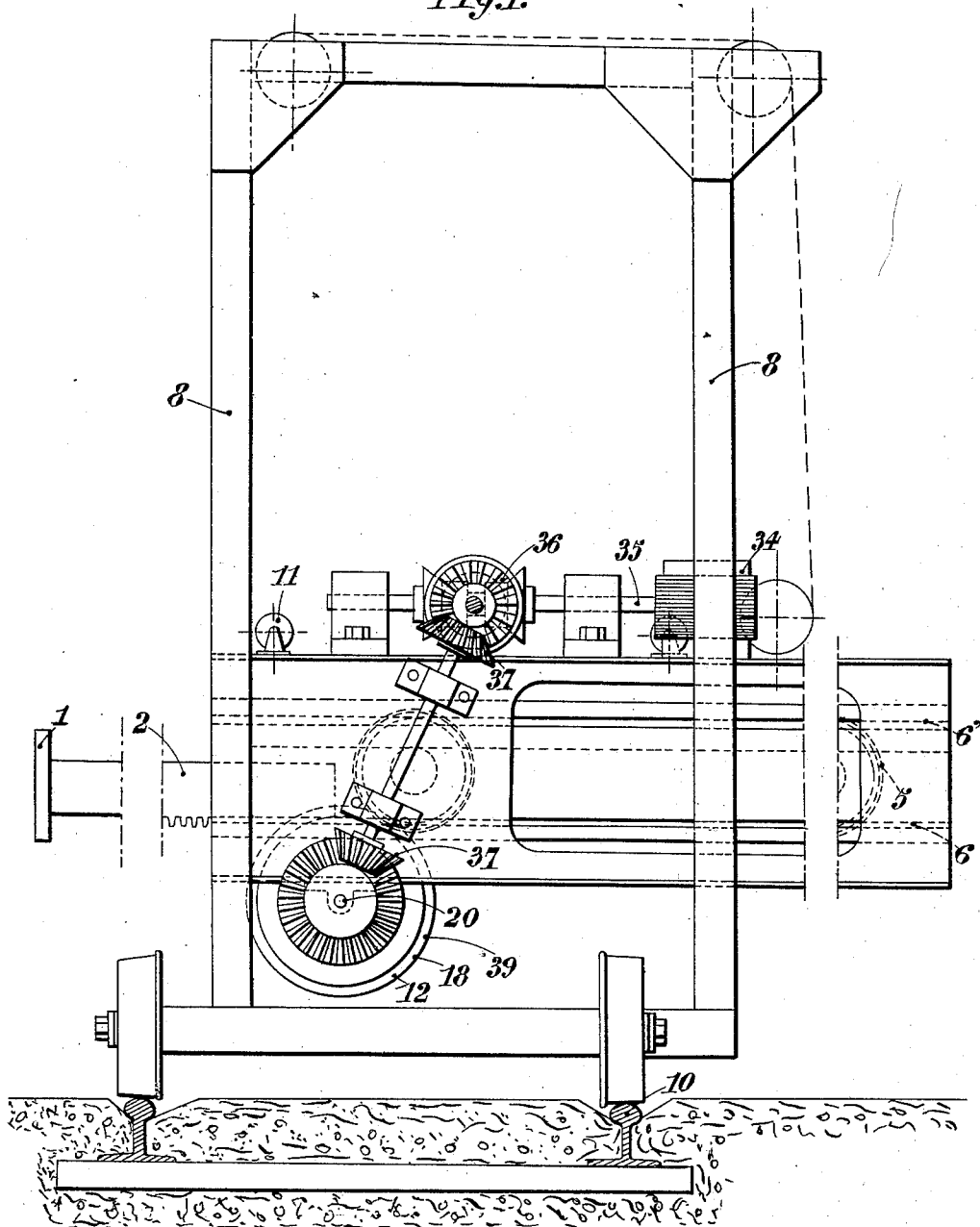
APPARATUS FOR DISCHARGING RETORTS.

(Application filed Feb. 5, 1902.)

(No Model.)

5 Sheets—Sheet 1.

Fig. 1.



Witnesses.

*Robert Everett*

*Inventor.*  
*Léon Bertrand.*

*By James L. Norris.*  
*Atty.*

No. 715,004.

Patented Dec. 2, 1902.

L. BERTRAND.

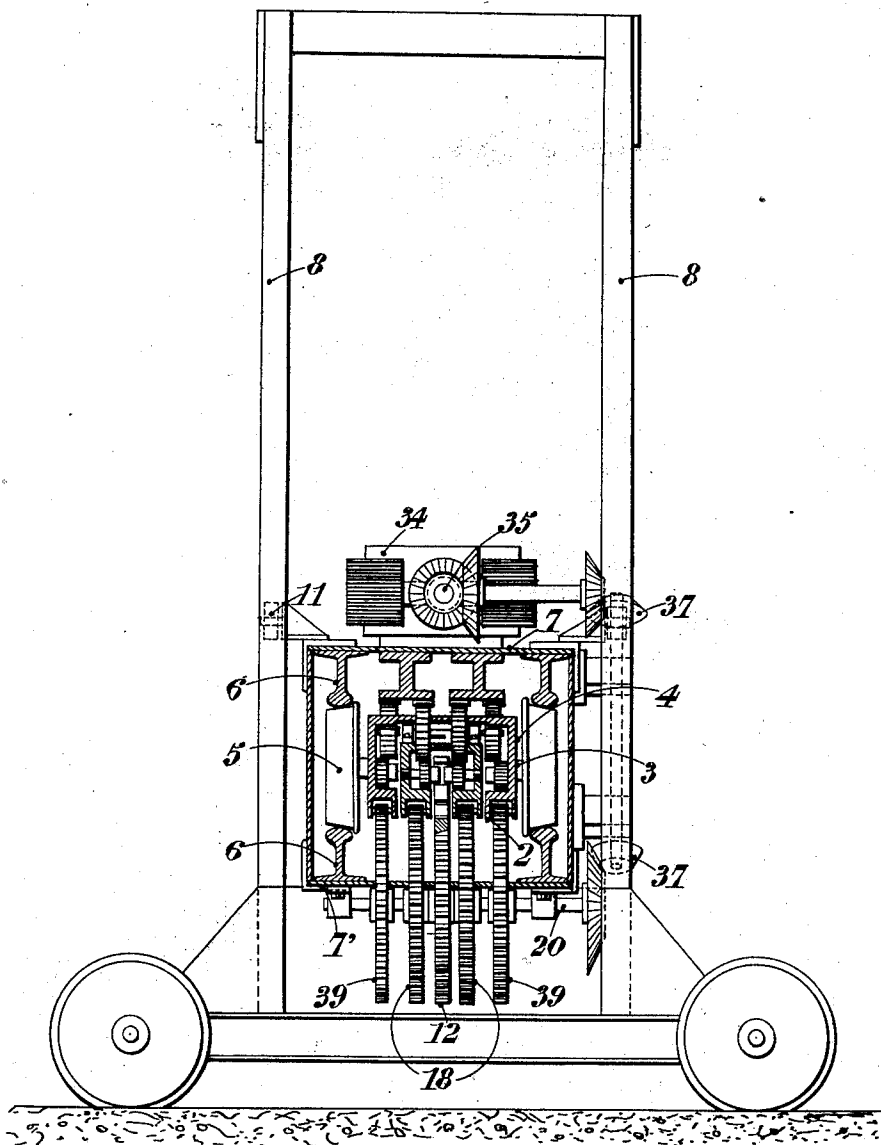
APPARATUS FOR DISCHARGING RETORTS.

(Application filed Feb. 5, 1902.)

(No Model.)

5 Sheets—Sheet 2.

Fig. 2.



Witnesses:

J. B. Keedy

Robert Corbett

Inventor,  
Léon Bertrand

By James L. Norris  
Atty.

No. 715,004.

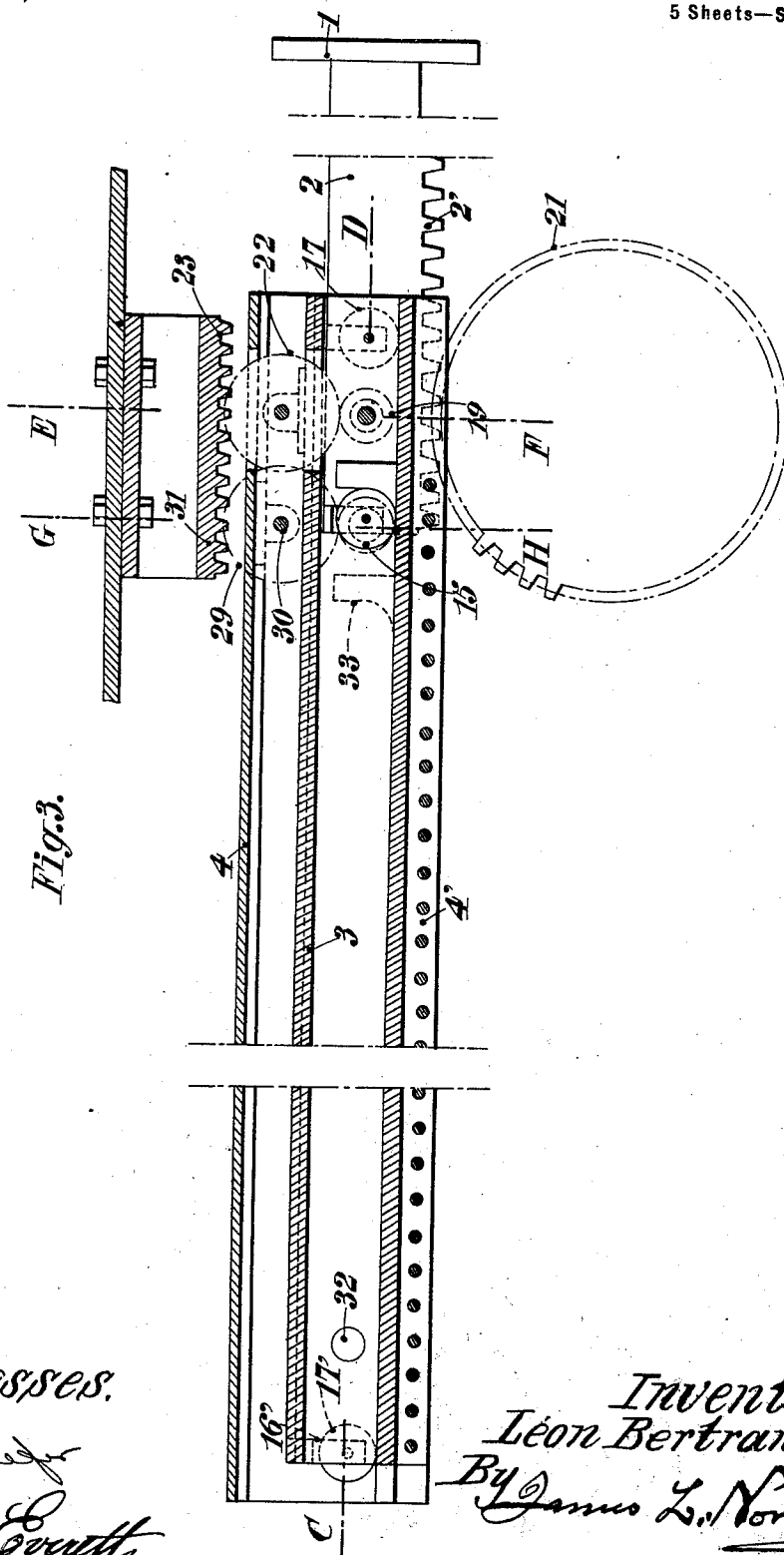
Patented Dec. 2, 1902.

L. BERTRAND.  
APPARATUS FOR DISCHARGING RETORTS.

(Application filed Feb. 5, 1902.)

(No Model.)

5 Sheets—Sheet 3.



Witnesses.

*W. B. Keefe*  
*Robert Corbett*

*Inventor.*  
*Leon Bertrand.*  
*By James L. Norris,*  
*Atty.*

L. BERTRAND.

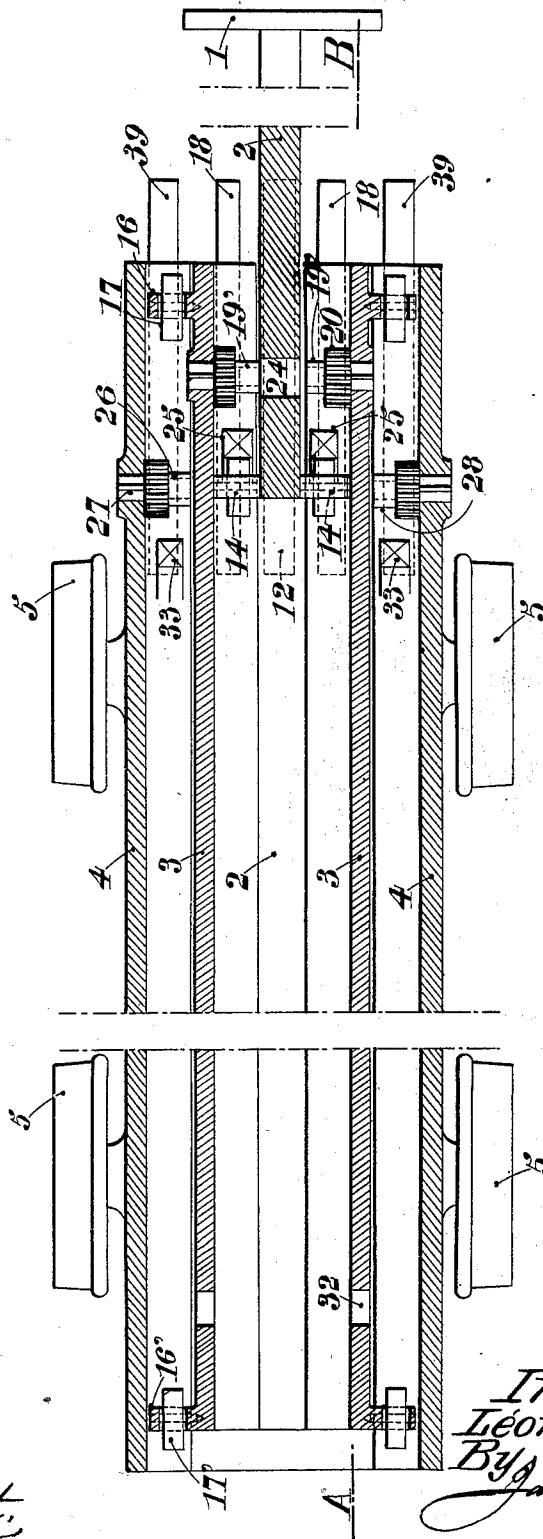
APPARATUS FOR DISCHARGING RETORTS.

(Application filed Feb. 5, 1902.)

(No Model.)

5 Sheets—Sheet 4.

Fig. 4.



Witnesses.  
*Robert Smith.*

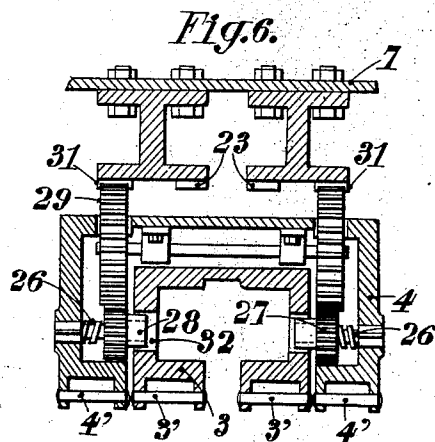
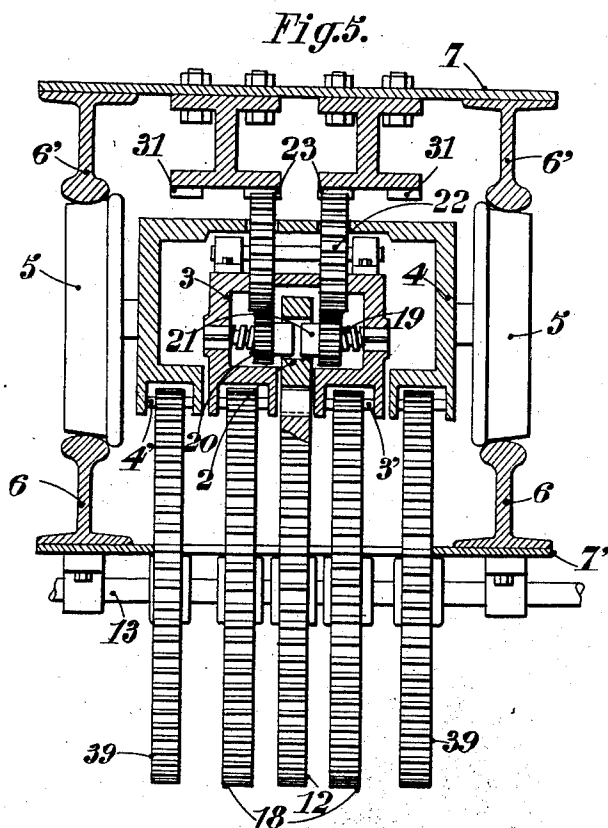
Inventor.  
*Leon Bertrand.*  
 By *James L. Noring*  
*Att'y.*

L. BERTRAND.  
APPARATUS FOR DISCHARGING RETORTS.

(Application filed Feb. 5, 1902.)

(No Model.)

5 Sheets—Sheet 5.



Witnesses.

*J. B. Keady*

*Robert Everett*

Inventor.  
*Léon Bertrand.*

By *James L. Norris*

*Atty.*

# UNITED STATES PATENT OFFICE.

LÉON BERTRAND, OF PARIS, FRANCE.

## APPARATUS FOR DISCHARGING RETORTS.

SPECIFICATION forming part of Letters Patent No. 715,004, dated December 2, 1902.

Application filed February 5, 1902. Serial No. 92,731. (No model.)

*To all whom it may concern:*

Be it known that I, LÉON BERTRAND, engineer, a citizen of the French Republic, residing at 6 Rue Condorcet, Paris, France, have invented certain new and useful Improvements in Apparatus for Discharging Retorts, of which the following is a specification.

This invention has for its object an apparatus intended to rapidly draw off the coke from gas-retorts, and it is so arranged that it may be confined in a very small space when not in use, while being capable of extending throughout (from one end to the other) long horizontal retorts. Apparatus according to this invention comprises a piston attached to a rack-beam composed of several sections of which each pair of adjacent ones is provided with an automatic locking device, so that the coke can be drawn out by a continuous action of the piston, each succeeding section being moved by the next preceding one by means of its locking device; and in order that my invention may be fully understood I will describe the same with reference to the accompanying drawings, of which—

Figure 1 is a side elevation of the apparatus, the latter being mounted on a truck adapted to run upon rails on the charging-stage of the furnace. Fig. 2 is a cross-section of the same. Fig. 3 is, on an enlarged scale, a longitudinal section of the rack-beam or telescopic beam, taken on the line A B of Fig. 4. Fig. 4 is a horizontal section through line C D of Fig. 3. Figs. 5 and 6 are cross-sections of the same, taken on the lines E F and G H of Fig. 3, respectively.

The construction of the apparatus is as follows: The piston 1 for discharging the coke is carried by a beam composed of three sections, which are mounted telescopically one within the other and are moved in succession.

Referring first to Figs. 3, 4, 5, and 6, the inmost section is an iron bar 2, which is placed on its edge and is furnished at its lower portion with a rack 2'. The two other sections of the beam are, as seen from Figs. 5 and 6, in form of two large inverted channel-beams 3 4, provided along their lower edges with two racks 3' 3' and 4' 4', respectively. The outer section 4 is provided with four wheels 5, adapted to run between two pairs of upper and lower rails 6 6', screwed to up-

per and lower bed-plates 7 7', forming a part of the frame of the machine. Said machine is suspended within four posts 8, Figs. 1 and 2, rising vertically from the platform of a truck 9, adapted to run on rails 10 before the charging side of the retorts. A suitable wrench and wire arrangement (of any known device) enables the frame to be raised and lowered, according to the height of the retort to be emptied, and rollers 11 serve to guide said frame between the posts 8 during the vertical displacements.

The inmost portion 2 of the rack-beam bears with its forward end on a toothed wheel 12, keyed on a shaft 13, which turns in bearings secured to the lower bed-plate 7' of the frame. The said inmost portion 2 is provided at its rear end with two lugs 14, fitted with rollers 15, bearing on the horizontal parts of the beam 3. In a similar manner the part 3 of the beam is provided at both ends with lugs 16 16', fitted with rollers 17 17', which run on the horizontal flanges of the outer sections 4 of the beam. The pair of racks 3' 3' of said portion 3 are adapted to engage with toothed wheels 18 18, Fig. 5, keyed also on the shaft 13; but they are not engaged with these wheels when the beam is in its normal position. The pair of racks 4' 4' of the outer portion of the beam are adapted to engage with two toothed wheels 19 19 on the shaft 13 when the beam is pushed forward to a sufficient extent.

The portions 2 and 3 and 3 and 4, respectively, may be locked together by means of the following locking device:

In the two vertical walls of the section or channel 3 are secured screw-threaded pins 19, on which run pinions 20, integral with pins 21. Said pinions engage with pinions 22, keyed on a shaft in bearings mounted on the horizontal upper flange of the channel 3, said pinions 22 being adapted to come into gear with racks 23, secured under the upper bed-plate 7 of the frame of the machine.

The inner part 2 of the beam is fitted near its rear end with a hole 24, the position of which is such that when the said part 2 has been pushed forward and its rollers 15 are stopped by the abutments 25 on the channel 3, Figs. 4 and 3, the said hole is just opposite to the two pins 21. It is understood that

when in this position if the pinions 20 are turned (rotated) on the screws 19 the pins will engage in the hole 24, and the portions 3 and 2 of the beam are keyed together. A similar locking device is provided for the portions 3 and 4, as shown in Figs. 4 and 6.

On the vertical walls of the section or channel 4 are secured screws 26, on which run pinions 27, integral with pins 28, said pinions engaging with pinions 29 on a shaft 30, secured to the upper flange of the channel 4. These pinions are adapted to come into gear with racks 31, arranged parallel to the afore-said racks 23.

The two flanges of the portion 3 are provided with holes 32 near their rear end in such a position that when the rollers 17' at the rear of the channel 3 strike against the stationary abutments 33 of the channel 4 the holes 32 are just opposite the pins 28, which can engage therewith if the pinions 27 are rotated on the screws 26.

The successive movements of the telescopic beams 2 3 4 are effected in the following manner: On the upper bed-plate 7 of the machine-frame is an electric motor 34, Figs. 1 and 2, which drives, by means of a shaft 35, a reversible clutch 36, and bevel-wheel gear 37 37 the shaft 13, which carries the series of wheels 12, 18 18, 19 and 19. The rack 2' of the inner portion 2 of the beam being always in engagement with the gear-wheel 12, as soon as the motor is set in motion the said section 2 is pushed forward. When the rollers 15 15 at the rear end of said portion 2 strike against the abutments 25 on the channel 3, this latter is also carried forward. During this displacement the pinions 22 22 on the channel 3 roll on (or under) the stationary racks 23 23, Figs. 3 and 5, and cause the pinions 20 to run on the screw-threads 19, and as the pins 21 are opposite to the holes 24 in the portion 2, as aforesaid, they engage therewith, and the portions 2 and 3 of the beam are locked together. The channel 3 having been displaced to a slight extent, its racks 3' 3' are brought into gear with the toothed wheels 18 18, and as the latter are in movement the section 3 (together with the portion 2, the rack of which has left the wheel 12) is pushed forward. When the rollers 17' 17' of the channel 3 strike the stationary abutments 33 of the channel 4, the latter is withdrawn and the pinions 29 29 roll under the stationary racks 31 31, Fig. 6, and these cause the pinions 27 to run on the threads 26 and their pins to engage the holes 32 32 in the channel 3. The portions 3 and 4 are thus locked together in the same manner as the portions 3 and 2. During this movement of the channel 4 its racks 4' 4' have been brought in engagement with the wheels 19 19, and as the latter are also rotated from the shaft 12 the channel 4 is pushed forward, together with the two sections 3 and 2, locked thereto. As stated above, the channel 4 is supported by wheels 5 running between two rails 6 6'.

It will be understood that if by means of the clutch 36 the rotation of the gear 37 is reversed, the several portions of the beam are retracted and that they become unlocked from each other in the same manner they were locked during their forward movement.

Having thus described my invention, what I claim is—

1. In an apparatus for discharging coke from gas-retorts, a plurality of extensible sections; independent advancing means for each of said sections; and means for locking said sections together.

2. In an apparatus for discharging coke from gas-retorts, a plurality of extensible sections; operating means for advancing one of said sections; means for locking said section to the next succeeding section; means for releasing said operating means; and operating means acting upon the last-mentioned section for advancing both of said sections.

3. In an apparatus for discharging coke from gas-retorts, a plurality of extensible sections; operating means for advancing one of said sections; means for locking said section to the next succeeding section when said initially-advanced section has moved a certain distance; and operating means acting independently of the first-mentioned operating means for advancing said locked sections.

4. In an apparatus for discharging coke from gas-retorts, a plurality of extensible sections; a rack on each of said sections; a separate gear-wheel engaging with each of said racks; and means for successively locking said sections together as they are advanced.

5. In an apparatus for discharging coke from gas-retorts, a plurality of extensible sections located one within the other, the inner section having a depression therein; an inwardly-extending pin on the outer section; a pinion on said pin, having a screw-threaded connection therewith; a projection on said pinion adapted to fit within the depression in said inner section; a stationary rack in proximity to said pinion; operating means for advancing the inner section; means thrown into operation when said inner section approaches the limit of its movement for advancing the outer section to throw said pinion into engagement with said stationary rack and thereby move the projection on said pinion into the depression in said inner section; and operating means for advancing the locked sections.

6. In an apparatus for discharging coke from gas-retorts, a plurality of extensible sections located one within the other, the inner section having a depression therein; an inwardly-extending pin on the outer section; a pinion on said pin, having a screw-threaded engagement therewith, and having a projection thereon adapted to fit into the depression in said inner section; a gear-wheel in engagement with said pinion; a stationary rack in proximity to said gear-wheel; a projection on the rear end of the inner section; an abut-

ment on the forward end of the outer section; means for advancing the inner section, so that the projection thereon engages the abutment on the outer section, causing the outer  
 5 section to move forward and the gear-wheel and pinion thereon to be thrown into engagement with said stationary rack, whereby the projection on said pinion is advanced into the depression of said inner section; and operat-  
 10 ing means for advancing the locked sections.

7. In an apparatus for discharging coke from gas-retorts, a plurality of extensible sections located one within the other, the inner section having a depression near the rear end  
 15 thereof; an inwardly-extending pin on the outer section, near the forward end thereof; a pinion on said pin, having a screw-threaded engagement therewith and having a projection thereon adapted to fit into the depres-  
 20 sion in said inner section; a gear-wheel mounted on said outer section, in engagement with said pinion; a stationary rack in proximity to said gear-wheel; a projection on the rear end of the inner section; an abutment on the  
 25 forward end of the outer section; means for advancing the inner section, so that the projection on the rear end thereof engages the abutment on the forward end of the outer section causing the outer section to move for-  
 30 ward and the gear-wheel and pinion thereon to be thrown into engagement with said stationary rack, whereby the projection on said pinion is advanced into the depression of said inner section; and operating means, acting  
 35 upon the second section, for advancing said locked sections.

8. In an apparatus for discharging coke from gas-retorts, a truck; a plurality of extensible sections mounted on said truck, said  
 40 sections being located one within the other; a rack on each of said sections; a plurality of gear-wheels on said truck, each adapted to engage with the rack on one of said sections; and means controlled by the movement of  
 45 said sections for locking the first and second sections together when the first section passes

out of engagement with its gear-wheel and the second section comes into engagement with its gear-wheel.

9. In an apparatus for discharging coke 5c  
 from gas-retorts, a truck; a plurality of ex-  
 tensible sections mounted on said truck, said  
 sections being located one within the other  
 and the inner section having a depression  
 therein; a rack on each of said sections; a 55  
 plurality of gear-wheels on said truck, each  
 adapted to engage with the rack on one of said  
 sections; a motor for operating said gear-  
 wheels, mounted on said truck; an inwardly-  
 extending pin on the outer section near the 60  
 forward end thereof; a pinion on said pin,  
 having a screw-threaded engagement there-  
 with and having a projection thereon adapt-  
 ed to fit into the depression in said inner sec-  
 tion; a gear-wheel mounted on said outer sec- 65  
 tion, in engagement with said pinion; a sta-  
 tionary rack in proximity to said last-men-  
 tioned gear-wheel; a projection on the rear  
 end of the inner section; and an abutment on  
 the forward end of the outer section; where- 70  
 by, when the inner section is advanced, the  
 projection on the rear end thereof comes into  
 engagement with the abutment on the for-  
 ward end of the outer section, causing the  
 outer section to move forward and the gear- 75  
 wheel and pinion thereon to be thrown into  
 engagement with said stationary rack to move  
 the projection on said pinion into the depres-  
 sion in said inner section, and causing the  
 rack on the outer section to move forward 80  
 into engagement with its gear-wheel, which  
 movement causes the rack of the inner section  
 to move out of engagement with its gear-  
 wheel.

In testimony whereof I have hereunto set 85  
 my hand in presence of two subscribing wit-  
 nesses.

LÉON BERTRAND.

Witnesses:

EDWARD P. MACLEAN,  
 HIPPOLYTE ZOTTE.