

No. 721,519.

PATENTED FEB. 24, 1903.

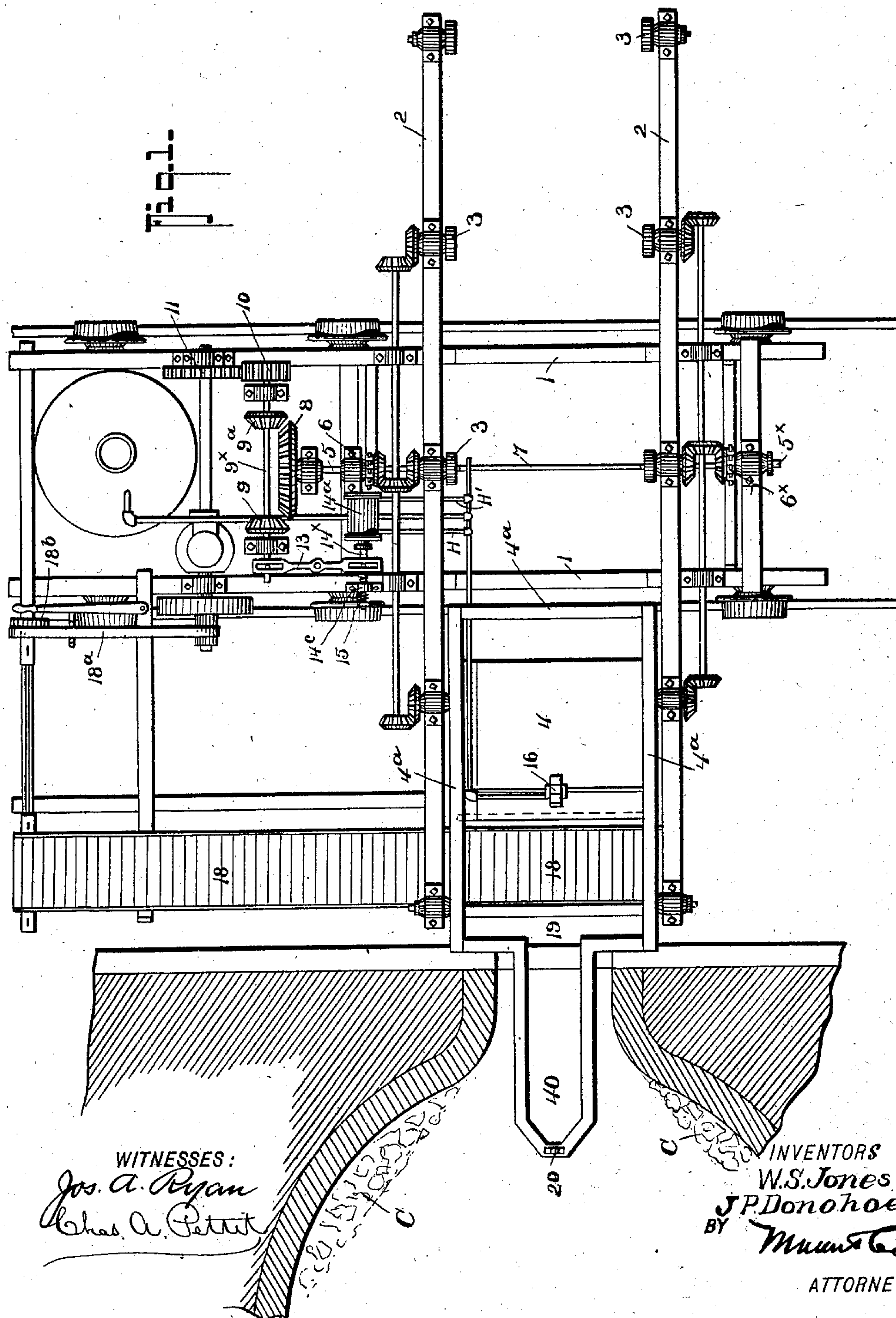
W. S. JONES & J. P. DONOHUE.

COKE DRAWER.

APPLICATION FILED JULY 18, 1902.

NO MODEL.

4 SHEETS—SHEET 1.



WITNESSES:

Jas. A. Ryan
Chas. A. Pettit

INVENTORS
W.S. Jones
J.P. Donohue
BY Munn & Co.
ATTORNEYS.

No. 721,519.

PATENTED FEB. 24, 1903.

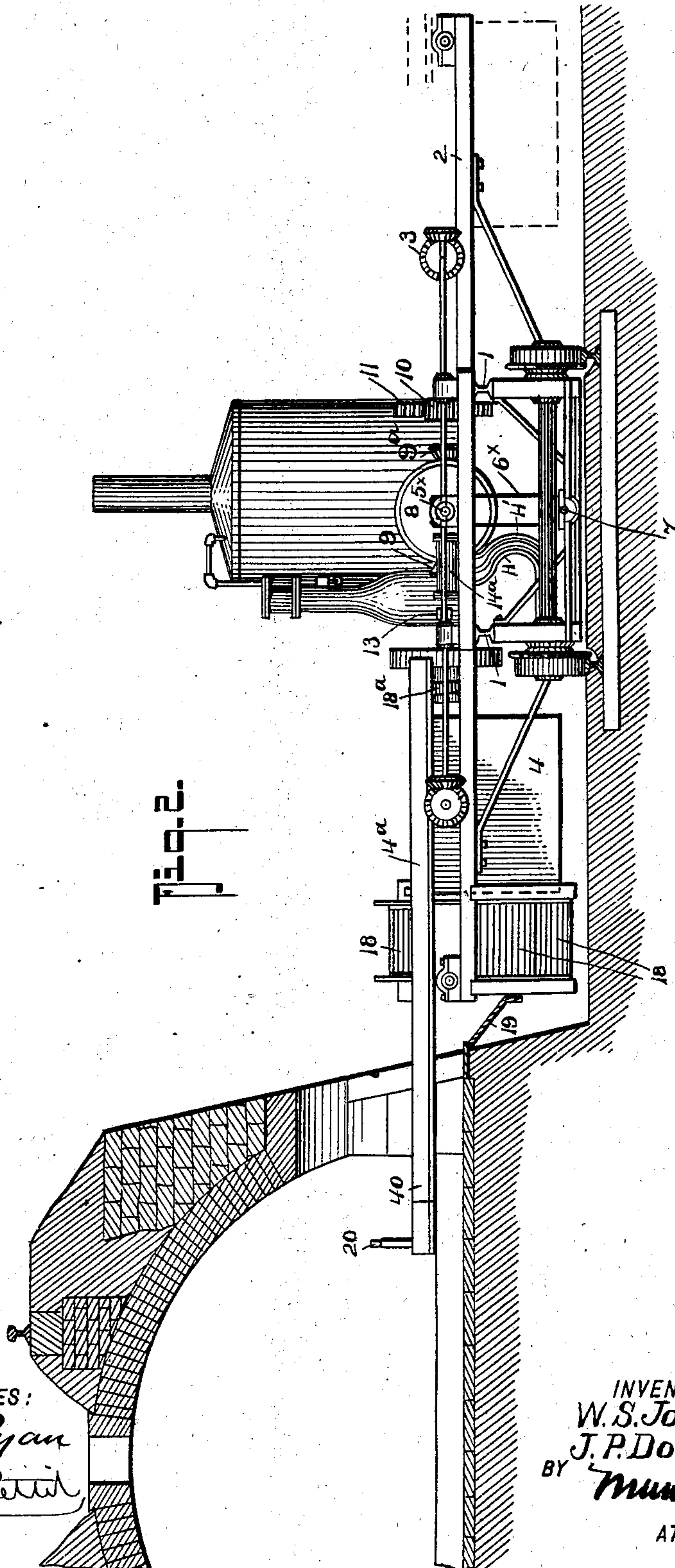
W. S. JONES & J. P. DONOHUE.

COKE DRAWER.

APPLICATION FILED JULY 18, 1902.

NO MODEL.

4 SHEETS—SHEET 2.



WITNESSES:

Jos. A. Ryan
Chas. A. Pettit

INVENTORS
W. S. Jones
J. P. Donohoe
BY *Munn & Co.*
ATTORNEYS.

No. 721,519.

PATENTED FEB. 24, 1903.

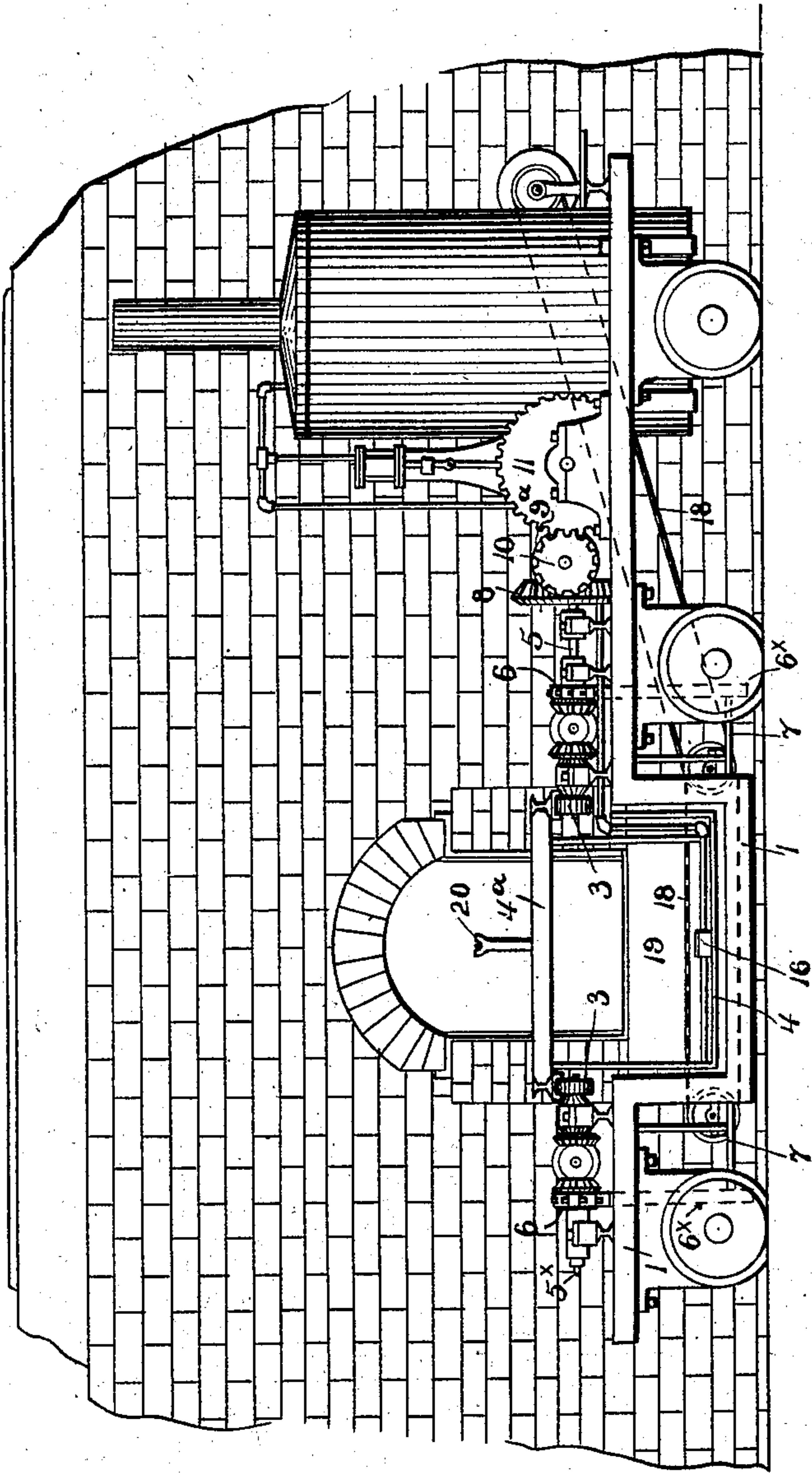
W. S. JONES & J. P. DONOHUE.
COKE DRAWER.

APPLICATION FILED JULY 18, 1902.

NO MODEL.

4 SHEETS—SHEET 3.

Fig. 3.



WITNESSES:

Jos. A. Ryan
Chas. A. Pettib

INVENTORS
W. S. Jones.
J. P. Donohoe.
BY *Munn & Co.*
ATTORNEYS.

No. 721,519.

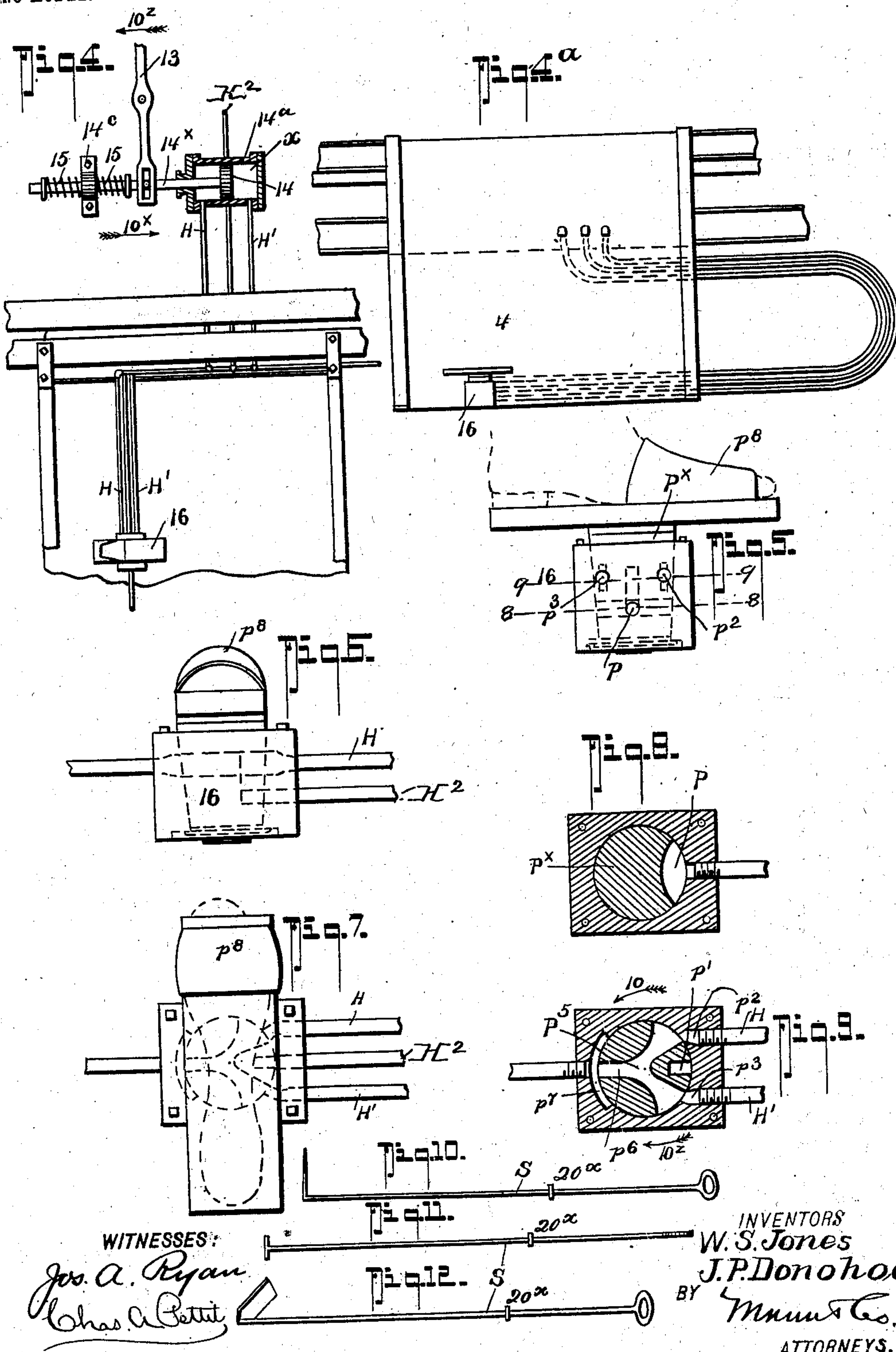
PATENTED FEB. 24, 1903.

W. S. JONES & J. P. DONOHUE.
COKE DRAWER.

APPLICATION FILED JULY 18, 1902.

4 SHEETS—SHEET 4.

NO MODEL.



WITNESSES:

Jos. A. Ryan
Chas. A. Pettit

INVENTORS

W. S. Jones

J. P. Donohoe

BY

Munn & Co.

ATTORNEYS.

UNITED STATES PATENT OFFICE.

WILLIAM S. JONES AND JOHN P. DONOHUE, OF GREENSBURG, PENNSYLVANIA.

COKE-DRAWER.

SPECIFICATION forming part of Letters Patent No. 721,519, dated February 24, 1903.

Application filed July 18, 1902. Serial No. 116,059. (No model.)

To all whom it may concern:

Be it known that we, WILLIAM S. JONES and JOHN P. DONOHUE, residing at Greensburg, in the county of Westmoreland and State of Pennsylvania, have invented a new and Improved Coke-Drawer, of which the following is a specification.

Our invention has for its object to provide a practical means for facilitating the removal of coke from the ordinary beehive ovens and render such operation more expeditious and economical than is possible in the ordinary methods now employed for such purpose.

The present common method of drawing coke out of ovens is by means of a scraper which is inserted through the oven and manipulated by hand. Our invention generally seeks to accomplish the work of drawing the coke as nearly as possible in the same manner as is now manually done—that is, by having a man do the work in the same manner as at present practiced, but in which he is mechanically aided in such manner that the heavy part of the work is mechanically effected, but under the direct supervision of the operator.

Our invention comprehends a carriage held to travel in front of the coke-oven and includes a platform for sustaining the operator reciprocal in the longitudinal plane of the oven and which has a nose or extension adapted to penetrate through the oven-door and provided with means for attaching the scraper and sustaining it in a position to be always under the control of the operator, whereby the said scraper can be set in the coke at the points desired and the same be pulled by the outward movement of the platform to draw the heavy coke bunches out through the oven-door.

In its more complete nature our invention also includes, in connection with the mechanism generally before referred to, an endless conveyer operated by the carriage-propelling motor or engine and adapted to receive the coke as it is drawn out of the oven and to convey the same into a barrow, small car, or other receiver.

In its more subordinate features our invention embodies certain details of construction and peculiar combination of parts, all of

which will hereinafter be fully described, and specifically pointed out in the appended claims, reference being had to the accompanying drawings, in which—

Figure 1 is a plan view of our invention, the same being shown in an operative position, the oven being illustrated in horizontal section. Fig. 2 is an end elevation thereof, the oven being shown in longitudinal section. Fig. 3 is a front elevation thereof in its operative position. Figs. 4 and 4^a are detail views, parts being in section, illustrating the fluid-controlled lever-shifting mechanism for reversing the movement of the platform. Fig. 5 is a side elevation of the foot-controlled valve for governing the fluid-operated mechanism. Fig. 6 is an end elevation thereof. Fig. 7 is a plan view of the same. Figs. 8 and 9 are sections thereof, taken on the lines 8 8 and 9 9 of Fig. 5. Figs. 10, 11, and 12 are detail views illustrating the scraper-bar hereinafter referred to.

In the practical construction our invention embodies a truck or carriage adapted to run in front of the oven upon a trackway, which extends the full length of the nest of ovens, and the said truck includes a main frame formed of a pair of longitudinal I-beams 1 1, that support two cross-beams 2 2, disposed at right angles to the beams 1 1, and the said beams 2 2 carry a number of rollers 3 3, upon which the platform or carriage 4 4 runs for the purpose presently explained. The support for the platform 4 includes a rectangular horizontal frame of I-beams 4^a 4^a, and the front end of said horizontal frame is narrowed to form a nose or extension 40, so as to readily enter the oven-door. (See Fig. 1.) At the center the platform-supporting carriage has a base or sheet-iron cage, the bottom of which forms the platform 4 proper and which is disposed near the ground in order that the operator may stand and work as nearly as possible in the same manner as in the present practice of manually drawing the coke. The platform-supporting frame is mounted on the beams 2 2 for reciprocal movement thereon, and it is worked by power, either steam, compressed air, or electrical. In the drawings we have shown a steam-power mechanism for operating the platform and its supporting-

frame therefor, said frame being held to frictionally engage the rollers 3 3, the parallel side beams of said frame having channel-irons for engaging the said rollers, as clearly shown in Fig. 3; but, if desired, racks may be substituted for the channel-irons and the rollers be in the nature of gears for engaging the said racks. A number of the rollers 3 at each side (three being shown) work in unison, and each set of three rollers at each side has a bevel-pin engagement with the shafts 5 5^x, and the said shafts each have a sprocket-gear 6, joined by the chains 6^x with a connecting-shaft 7, that runs under the platform 4, as clearly shown in the drawings, and all of the platform-operating gear devices before referred to are driven by a friction-wheel 8, mounted upon the shaft 5 and held to engage with either one of a pair of shiftable bevel, friction, or toothed gears 9 9^a, mounted upon the shaft 9^x and controlled by a throw-lever 13, the said shaft 9^x being provided with the gear 10, held in mesh with the main drive-gear 11, as clearly shown in Fig. 1. The two bevel-gears 9 9^a work together and run continuously one way, and the shaft that carries said gears 9 9^a is shifted by the lever 13 to bring either one of the gears 9 9^a into engagement with the friction-gear 8 or to be set out of engagement with the said gear when it is desired to hold the cage and platform at rest.

To provide for imparting motion to the cage-platform in reverse directions and for holding it at rest at will, we employ a fluid-controlled reversing mechanism for the lever 13, which consists of a piston 14, mounted in the cylinder 14^a, (see Fig. 4,) with which a steam-pipe from the engine-boiler connects and which passes under the said cylinder 14^a to the valve 16, as shown. The piston 14 has its rod 14^x, movable in a guide 14^c, and upon said rod is mounted two opposing springs 15 15, which work against the opposite side of the guide 14^c and tend to keep the piston in the center of its cylinder and at the same time release the friction members 8 and 9 from each other. For conveniently controlling the movement of the piston 14 a foot-valve (designated generally by 16, see Figs. 6 to 9,) is provided, which is placed on the platform 4. The fluid-pressure is carried from the boiler to the valve and from the valve to the cylinder and from said cylinder back to the valve, through which it exhausts, the said valve being connected with the cylinder 14^x by flexible hose-sections, as clearly shown in Figs. 4 and 4^a. The foot-valve, which is shown in section on two different planes in Figs. 8 and 9, has an inlet p' , which communicates with a channel P in the rotary valve member P^x, which channel extends up in a plane with the outlets p^2 p^3 , (see Figs. 5 and 9,) and the latter join with the flexible hose-sections H H', that connect with the front and rear ends of the cylinder 14^x. (See Fig. 4.) The valve member P^x is also provided with an exhausting-pocket P⁵, having bifurcated branches to communicate

with the outlets p^2 p^3 and a central branch p^6 , normally held in communication with the exhaust channel p^7 in the valve-casing, as clearly shown in Fig. 9. The upper end of the valve member P^x has a foot-receiving socket p^8 . By providing a foot-controlled valve mechanism constructed as described it will be readily apparent that the operator can control the movement of the platform in either direction or hold it at rest at will and without interfering with the work he has to do with his hands. Thus should the valve P^x be set as shown in Fig. 9 the same will be cut off from the cylinder 14^x and the piston 14 be balanced by the springs 15 and both bevel, friction, or toothed gears 9 and 9^a be held out of mesh with the friction-gear 8. By shifting the valve P^x in the direction of the arrow 10 (see Fig. 9) until the inlet p' registers with the outlet p^2 an exhaust or vacuum will then be created in the piston 14 back of the valve or at that part marked x in Fig. 4, which part will then be in communication with atmosphere through the pipe H', the opening p^3 , and the exhaust through the valve P^x and the exhaust-outlet in the valve-casing. Steam will then enter the cylinder and force the piston 14 in the direction indicated by the arrow 10^x to swing the lever 13 in the direction of the arrow 10^z, and thereby pull the gear 9^a into engagement with the gear 8 and impart motion to the platform-carriage in one direction, it being obvious a shifting of the valves P^x by foot movement in the opposite direction (see the arrow 10^z in Fig. 9) will provide for exhausting from in front of the piston 14^x and for the entrance of live steam back of the piston to shift the piston 14 to bring the gears 9 and 8 into mesh, and by shifting the valve P^x back to the intermediate piston (see Fig. 9) both gears 9 and 9^a will be freed from the gear 8, and the platform 4 will then be held at rest.

An endless conveyer 18 is suspended from the ends of the beams 2 2, and this conveyer is run continuously by a belt 18^a, driven from the engine-shaft, (see Fig. 1,) and said belt engages an idler 18^b, by proper adjustment of which the belt may be stopped when desired. The conveyer 18 removes the coke as fast as it is drawn from the oven and elevates it enough to load it into a wheelbarrow, or preferably a small car, for readily conveying the coke into the shipping-car. The conveyer, which may be of any approved pattern, is preferably constructed of flat iron bars, sufficiently spaced apart to allow the ashes and fine coke-dust to screen out. The conveyer or elevator 18 has sheet-iron sides and includes an apron or incline 19 under the oven-door to lead the coke-droppings onto the endless conveyer.

In operation the operator stands on the platform 4 in front of the oven, and the main truck is blocked by a brake or otherwise from movement on its trackway. The operator places the scraper S (see Figs. 10, 11, and 12)

of the usual construction in the pivoted Y-bearing 20 on the front or nose end of the platform-supporting frame and stands with his foot in the socket of the valve devices 5 16. The scraper is then pushed and caught into the coke within the oven and manipulated in the ordinary manner, the Y-bearing acting as a fulcrum upon which to oscillate the said scraper or fork, which, as will be noticed from the drawings, has a collar 20^x to engage with the outside of the Y-bearing. 10 After inserting the scraper into the coke, as described, the operator by foot movement shifts the valve 16 to effect a reverse or outward movement of the platform-carriage, and thereby produces a strong mechanical pull on the scraper, which drags the coke out through the oven-door onto the conveyer and by again properly manipulating the valve devices 20 causes the platform-carriage to again approach the oven to penetrate the drag or scraper into the coke, and so on. By using a bent scraper (see Fig. 12) the operator can easily reach the coke in the so-called "corners" of the oven (see the fillings marked C in Fig. 1) and bring the same into position to be pulled out by the outward movement of the platform-carriage or, when the remaining coke bulk is small, by hand.

30 From the foregoing, taken in connection with the drawings, it will be readily apparent in the practical application of our invention the operator stands before his oven in a similar way as when drawing coke by hand, uses the same kind of scraper devices, observes 35 where he is working and what he is doing, can place the scraper just where he wants it, and is sensitive to the touch thereof the same as when drawing by hand. He thus avoids catching too much coke and tearing up the 40 oven-bottom and the door-jambs, all of which are very advantageous features in the art of drawing coke. He works the same as when he is drawing the same by hand, except that 45 he is relieved of heavy work, and therefore can do much more work in a given time than by the ordinary method.

While the mechanism disclosed presents a practical and preferred construction of parts, 50 it will be understood that the exact details of construction and arrangement of parts may be modified or varied without departing from our invention or the scope of the appended claims.

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

1. A mechanical means for drawing coke, comprising a main frame, a support for the 60 operator movable on the main frame to and from the oven, a scraper-holder mounted on said support, and adapted to pull the scraper out with it as the support is moved away from the oven, as set forth.

65 2. In a mechanism for drawing coke of the character described, a support for the operator movable to and from the oven, a pull-

bracket at the front end of said support, and a scraper mounted in the said bracket for universal movement relatively thereto, said 70 scraper having means for interlocking with the pull-bracket, whereby to move outward therewith, for the purposes specified.

3. In a mechanism for drawing coke, substantially as described, the combination with 75 a main frame, a support for the operator, mounted on the main frame and movable to and from the oven, a Y-bracket projected upwardly from the front end of said support and rotatably mounted thereon, and a scraper 80 adapted to seat in the Y-bracket, said scraper having a collar for engaging with the said bracket, for the purposes described.

4. A mechanism for drawing coke, comprising a carriage movable across the oven- 85 front, a support for the operator mounted on the carriage transversely thereof, means on the carriage for imparting a reverse movement to the said support to and from the oven, and a foot-operated controlling device 90 for regulating the support-operated means mounted upon the said support, and adapted to be manipulated by the foot of the operator.

5. A mechanism for drawing coke, comprising a carriage including a support, means 95 for moving the latter to and from the oven, and a conveyer mounted on the carriage adapted to run under the oven-door, and means mounted upon the carriage for independently operating the support and the conveyer, as specified. 100

6. In a coke-drawing mechanism as described, the combination with the carriage, and a support for the operator mounted on 105 the carriage, means for moving the latter to and from the oven, and a conveyer also mounted on the carriage, including a portion adapted to project under the discharge end of the oven-door, and an elevated portion for 110 discharging the material, and means mounted on the carriage for operating the support and the elevator independently of each other.

7. A means for drawing coke, comprising a carriage movable transversely of the coke- 115 oven, said carriage including a pair of transversely-disposed rails, friction drive-pulleys mounted on the said rails, a supporting member mounted on the said rails, and including a pendent platform, a drive mechanism 120 mounted on the carriage for imparting motion to the friction-pulleys, a controlling device mounted on the aforesaid platform under the control of the operator, flexible connections joining the said controlling device 125 with the friction-pulley-operating drive mechanism, all being arranged substantially as shown and described.

8. In a means for drawing coke, the combination with the main carriage, said carriage 130 including a pair of transversely-disposed rails, a supporting-body including a pendent platform mounted on the said rails, and adapted to travel to and from the coke-oven

door, a drive mechanism for imparting reverse motion to the said supporting-body, said drive mechanism including clutch devices, a fluid-operated means for shifting said clutch devices, a shifting-valve mounted on the platform-supporting body, adapted to be controlled by the foot of the operator, and flexible connections joining the said foot-operated valve with the fluid-operated mechanism for controlling the clutch-shifting devices, substantially as shown and described.

9. A coke-drawing mechanism, comprising a supporting-body movable to and from the oven-door and in longitudinal alinement with the same, means for effecting such reverse motion of the body, a regulating device on the body under the control of the operator for reversing the movement of the body, and a scraper-support mounted on the body, a scraper, said scraper being adapted to engage said support, said scraper having means for interlocking with the said support, all being arranged substantially as shown and described.

10. In a coke-drawing mechanism as de-

scribed, the combination with the main frame, a supplemental frame, transversely movable on the main frame, driving mechanism on the said frame for effecting a reverse motion of the said supplemental frame, said supplemental frame including a platform for the operator, a fluid-controlled shifting means for adjusting the drive mechanism to operate in reverse directions, a foot-operated valve mounted on the platform of the supplemental frame for setting the said shifting mechanism to its alternate operative positions and to an intermediate or inoperative position, and flexible connections joining the said valve with the shifting mechanism, all being arranged substantially as shown and described.

WILLIAM S. JONES.
JOHN P. DONOHUE.

Witnesses to signature of William S. Jones:
COLVIN NESBETT,
SAMUEL ECKLES.

Witnesses to signature of John P. Donohoe:
EDWD. E. DONOHUE,
J. L. HOUSTON.