No. 812,364. PATENTED FEB. 13, 1906.

D. A. RAMAGE.

COKE DRAWING MACHINE.

APPLICATION FILED NOV. 1, 1905.

3 SHEETS—SHEET 1.

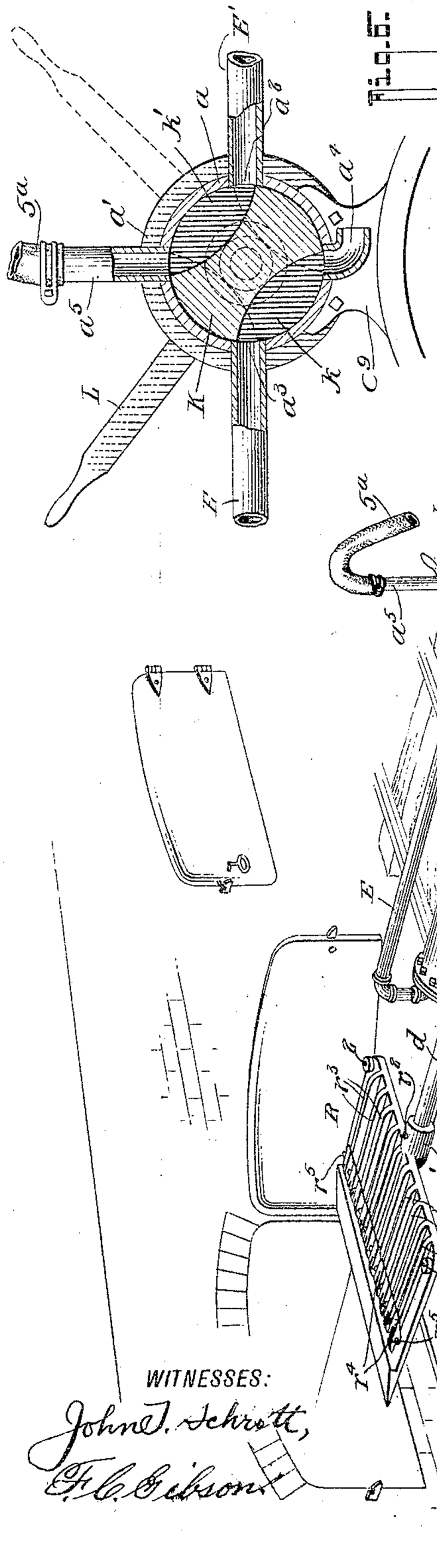

Fig. 2.

Fig. 1.

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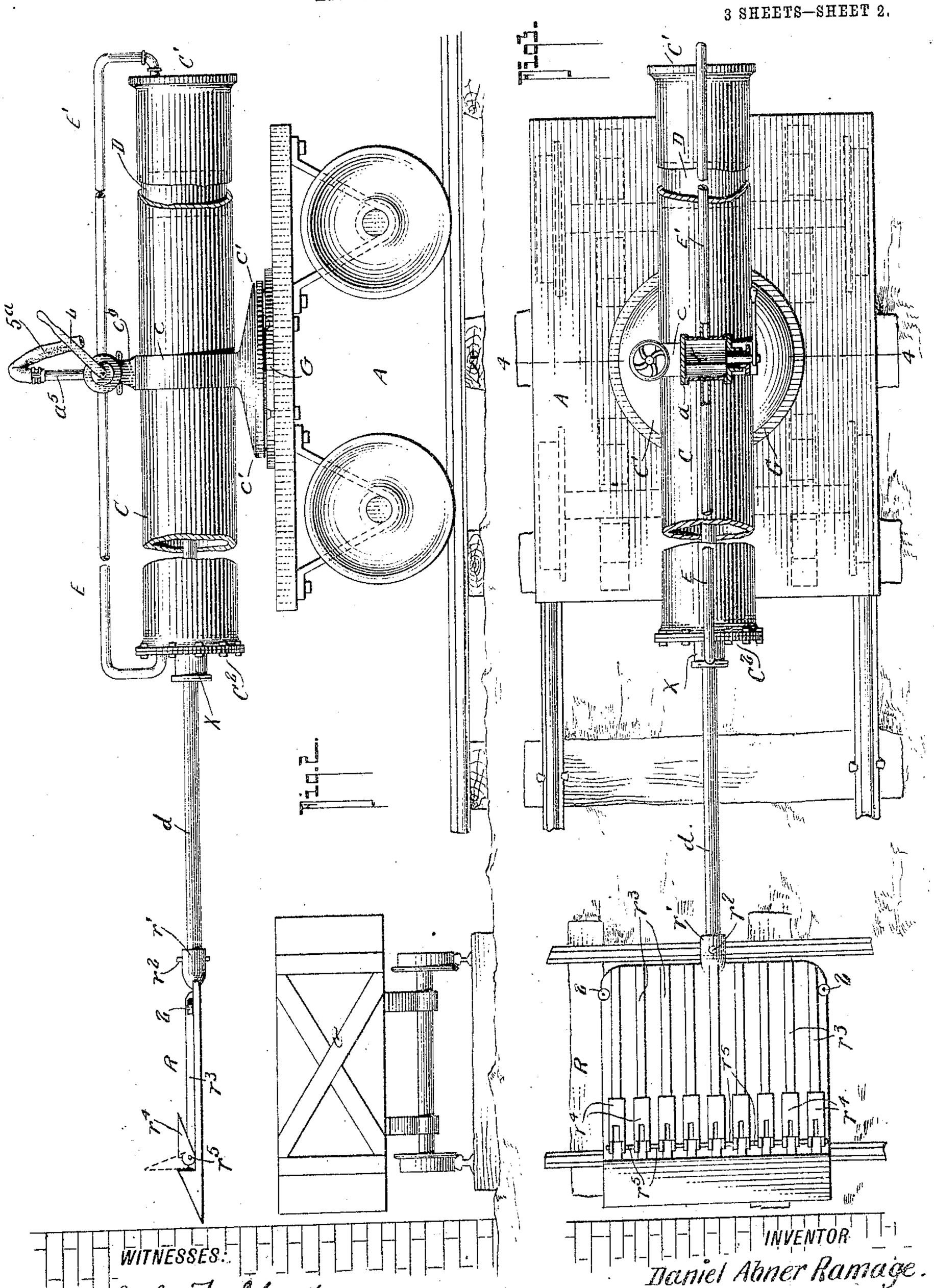

Fig. 2.

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3 SHEETS—SHEET 3.

Fig. 4

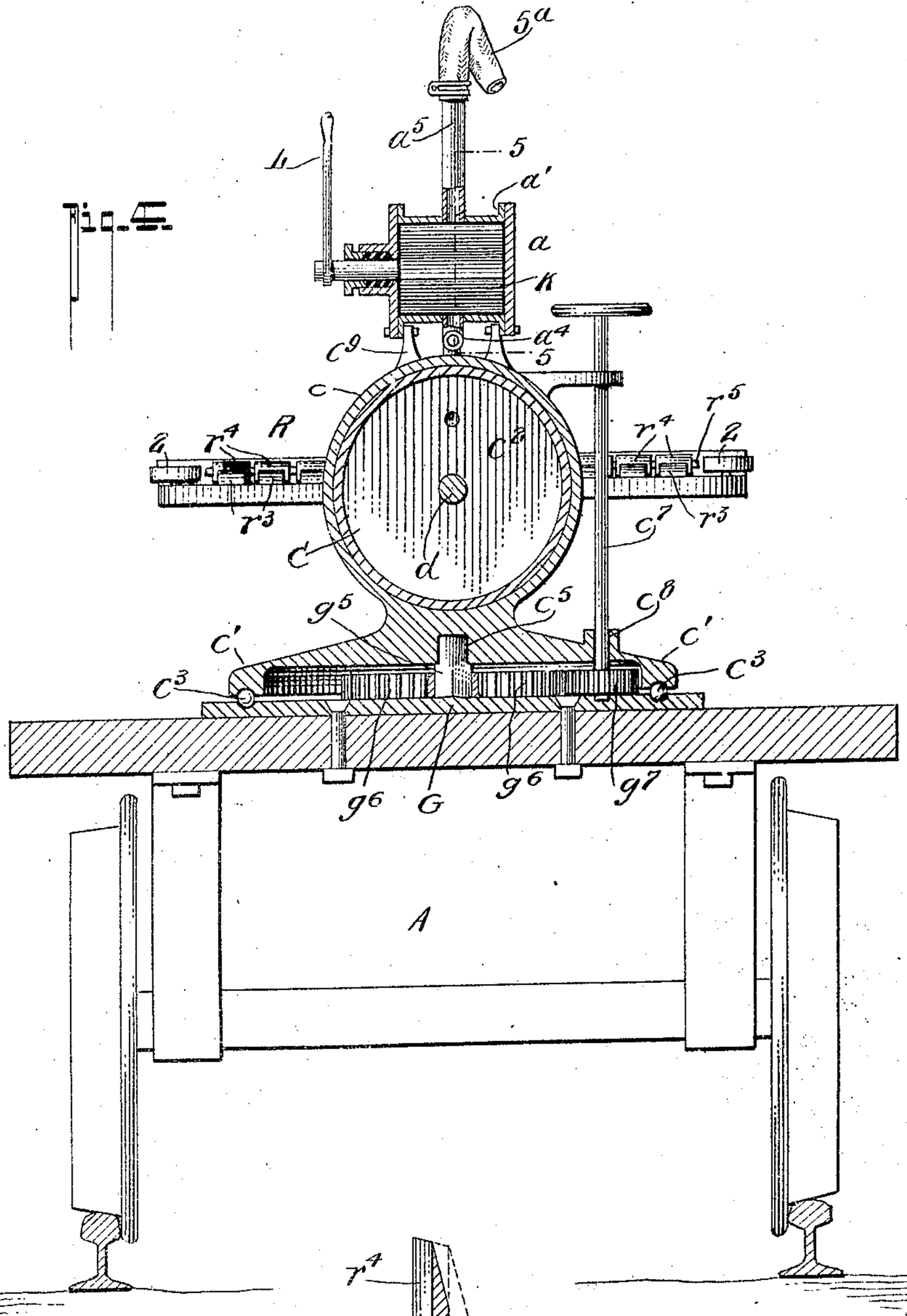
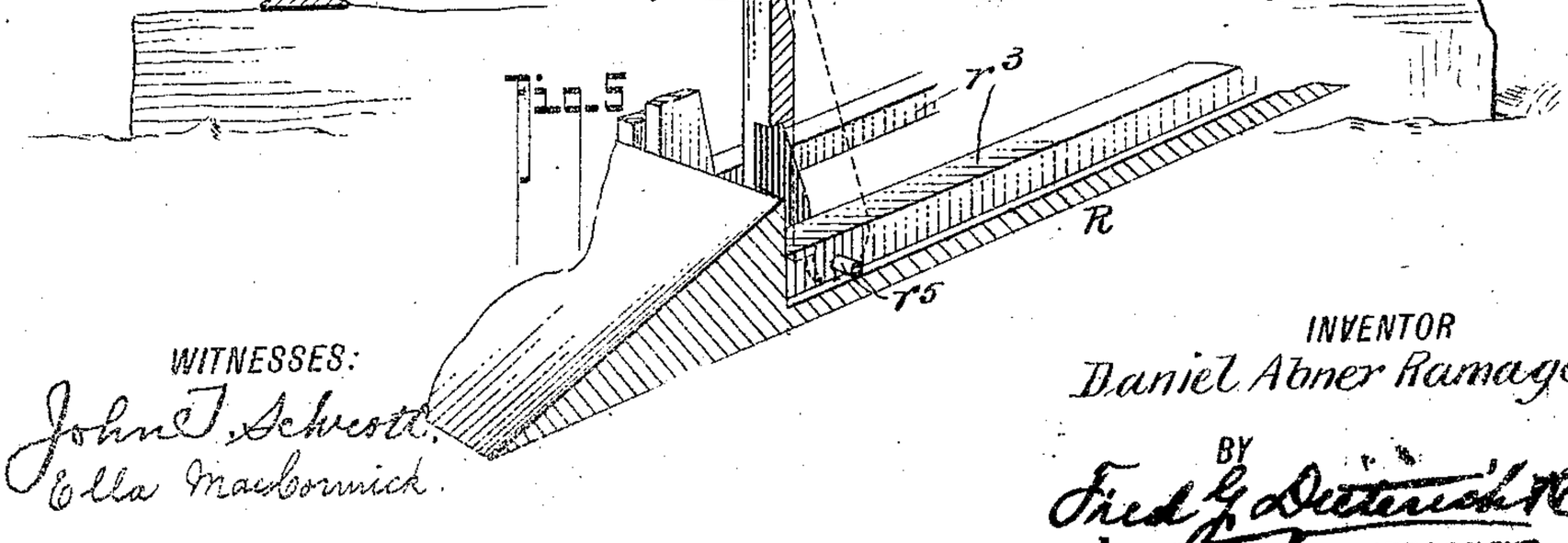


Fig. 5



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COKE-DRAWING MACHINE.

No. 812,364. Specification of Letters Patent. Patented Feb. 13, 1906.

Application filed November 1, 1905. Serial No. 285,441.

To all whom it may concern:

Be it known that I, DANIEL ABNER RAMAGE, residing at Percy, in the county of Fayette and State of Pennsylvania, have invented a new and Improved Coke-Drawing Machine, of which the following is a specification.

This invention relates to means for drawing or pulling coke from coke-ovens; and it comprehends generally a carriage or frame mounted on truck-wheels, a cylinder axially supported on the frame to turn thereon in a horizontal plane and carrying fluid-pressure feed mechanism adapted to be led into the opposite ends of the cylinder, and a piston within the cylinder whose rod forms a supporting means for detachably receiving the drawing or puller devices that go into the oven and scrape out the coke.

In its more subordinate features my invention consists in certain details of construction and peculiar combination of parts, all of which will be hereinafter fully described, pointed out in the appended claims, and illustrated in the accompanying drawings, in which—

Figure 1 is a perspective view of my invention, illustrating the manner in which it is used. Fig. 2 is a side elevation thereof. Fig. 3 is a plan view thereof, the fluid-controlling valve being shown in horizontal section. Fig. 4 is a transverse section of the same on the line 4 4 of Fig. 3. Fig. 5 is a detail perspective view, partly in section, of a part of the rib portion of the drawing or scaping device. Fig. 6 is an enlarged section of the valve on the line 5 5 of Fig. 4.

In carrying out my invention I provide a wheel-truck frame A, upon which is mounted a longitudinal cylindrical body C, having sufficient length to allow enough piston thrust to admit of a proper movement of the drawing or scraping device, presently described, within the oven.

The cylinder C, which, it will be noticed, has no steam-chest, is provided centrally with a suitable annular seat portion c, the lower end of which is projected laterally, as at c' c', to provide for a firm bearing for engaging the turn-table to properly sustain the cylinder at either of its horizontally-adjusted positions, and to facilitate the adjustments of the cylinder the laterally-projected portions of the bearing member may have and preferably are provided with roller-bearings c^3, that engage the depressed seat or way on the top of the turn-table, and to provide for a simple, economical, and easily-manipulated means for turning the cylinder to the desired positions with respect to the oven-doors the bearing member has a central socket c^5, that engages the shouldered end of a stud-axle g^5, which projects centrally from the table or frame G.

The stud-axle g^5 has a stationary horizontally-disposed gear g^6, with which a pinion g^7 on the lower end of a hand-wheel shaft c^7 engages, and the said shaft c^7 is sustained in a vertical bearing portion c^8 on the annular bearing member, as clearly shown in Fig. 4, by reference to which it will be also seen that the said gear and pinion devices are so disposed that by simply manipulating the hand-wheel the cylinder can be turned on the axle-stud to the horizontal positions desired with respect to the position of the truck-frame and the oven-door.

The annular bearing-frame at the top and centrally over the cylinder C detachably receives a four-way valve mechanism which comprises the chest a, having a pendent member a' to detachably engage the flanges c^9 on the annular bearing member, and is formed with a pair of oppositely-disposed ports a^2 a^3, that connect with the long pipes E E′, one of which discharges through the permanent head C′ of the cylinder, while the other discharges through the removable cap-head C² of the cylinder C, which cap-head is provided with a long stuffing-box or gland X, through which the rod d, attached to the piston D, plays, as clearly shown in Fig. 2. The valve-chest a is also provided with an inlet a^5 and outlet a^4, which in practice has a flexible feed-pipe section 5^a, that joins with the source of the actuating fluid, steam, or air, and the direction of feed of said fluid through the valve-chest is regulated by the valve K, provided on diametrically opposite sides with channels or ports k k', adapted when the valve K is adjusted through the medium of the hand-lever L to the position shown in Fig. 6 to open up a direct communication from the feed-pipe to the pipe-section E′, that discharges into the cylinder C, and when adjusted, as shown in dotted lines, to close off the pipe E from the fluid-inlet and bring it in line with the exhaust a^4 and at the same time bring the pipe E into communication with the steam-pipe, and when centrally adjusted it cuts out both of the leads to the cylinder.

Upon the forward end of the shaft is detachably mounted to move in a horizontal plane a scraper or puller device which com-

prises a cross-frame R, having a rear portion formed with a long socket r' to receive the front end of the piston-rod, which is firmly held therein by the lock-pin r^2. The scraper R consists of a solid plate whose rounded end is wedge-shaped and terminates with a shoulder-like portion that merges with a series of space-ribs r^3, and at the rear end on the opposite side of the solid plate are guide-rollers 2, adapted to engage the sides of the oven, and thereby permit of sliding the scraper into and out of the oven. Between the ribs r^3 is pivotally mounted a series of detents or fingers r^4, and the several fingers r^4 are so mounted upon a single cross-rod r^5 that when the said fingers are at their normal position they are dropped back on the solid bottom (see Figs. 1 and 2) in such manner as to not interfere with the movement of the scraper in the coke mass; but when the said scraper-fingers are drawn up to a vertical position (see Fig. 5 and the dotted lines on Fig. 2) they form rake members for drawing the coke out of the oven-door as the scraper is pulled forward.

From the foregoing description, taken in connection with the accompanying drawings, it is believed the complete construction and operation of my invention will be readily understood. By reason of the simple arrangement of the several parts the operator can quickly set the cylinder on the turn-table to suit the particular oven to be drawn, and since the cylinder is sustained in the manner stated the piston strain is evenly distributed therein, and no irregular or tensile strain is applied to the drawing device.

When it is desired to use a larger or smaller scraper drawing mechanism, it is only necessary to move the one in use by disconnecting the same from the front end of the piston-rod, which is done by simply removing the lock pin or bolt before referred to. By forming the front end of the scraper-fingers in the nature of prongs and connecting the latch or rib members in the manner shown it is obvious that the shoulders of the prong ends of the fingers will act as stops to hold the ribs or latches from being swung beyond a vertical plane, and, furthermore, since the shoulders on the fingers are inclined rearwardly and the ribs can never reach the full vertical position it follows that the slightest pressure against them in forcing the fingers into the oven will cause the said latches or ribs to assume a horizontal position and freely ride into the coke mass within the coke-oven.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

1. A coke-drawing mechanism, which comprises a wheel-frame, a cylinder axially mounted on the center thereof to turn in the horizontal plane, a frame surrounding the cylinder and having a seat to engage a stud axially on the wheeled frame, the stud-axle having a horizontally-disposed gear fixedly mounted thereon, a pinion on a shaft mounted on the annular frame on the cylinder adapted to mesh with the gear-wheel on the supporting-frame, a fluid-pressure feed, a piston working within the cylinder, a valve mechanism detachably mounted on the annular frame on the cylinder, the casing of said valve having two feed-ports, an inlet and an exhaust, a valve operating in said casing for alternately moving the opposite one of the inlets in communication with the feed-port and at the same time bringing the other feed-port into communication with the exhaust-leads from the feed-ports, one of which discharges into the rear end of the cylinder, the other one of which discharges into the front end of the cylinder, and a draw or scraping device detachably mounted on the front of the piston-rod, all being arranged substantially as shown and described.

2. A coke-drawing machine, comprising in combination, a truck-frame having a central axial stud, and a horizontal gear fixedly mounted thereon, a cylinder mounted upon the axial stud to turn in a horizontal plane, a pinion and a shaft for the same mounted on the cylinder, said pinion engaging the horizontal gear, a source of fluid-pressure, a regulating-valve mechanism mounted on the cylinder having a feed-pipe connection that discharges into one end of the cylinder, another feed-pipe connection that discharges into the other end of the cylinder, and having a feed-inlet and an exhaust, the piston within the cylinder having its rod extended and a scraper-frame connected to the front end of the piston, as set forth.

3. A coke-drawing means comprising a truck-carriage having a centrally-disposed turn-table, a cylinder mounted on said turn-table, means mounted on the cylinder for actuating the turn-table devices, a pressure-fluid lead-pipe that discharges into one end of the casing, a second pipe that discharges into the other end of the casing, a source of fluid-pressure supply, a controlling-valve mechanism mounted on the cylinder and adapted to have a flexible connection with the fluid-pressure supply, said valve also connecting with the feed-pipes to the cylinder, a lever device for setting the valve to cut out one feed-pipe as it exhausts the other, the piston and its rod, and a scraper device detachably mounted on the end of said rod as set forth.

4. In a coke-drawing mechanism of the character described, the combination with the wheeled frame, the cylinder mounted to turn in a horizontal plane, means for adjusting the cylinder, means for feeding and exhausting the fluid-pressure in the cylinder to actuate the piston, said means being carried by the cylinder, the piston and its rod and a drawing or scraper device, comprising a frame having a series of forwardly-extending bars, a

spear-shaped cross member that joins the front end of the said bars, a rib or latch pivotally secured to each of the said bars, and mounted to normally drop to a horizontal position when the scraper is inserted into the coke and to rise to a vertical position when the scraper is pulled, said scraper having guide-rolls at the rear edges, all being arranged substantially as shown and described.

5. In a coke-drawing mechanism of the character described, the combination with a wheeled frame, the cylinder mounted thereon to turn in a horizontal plane, means for adjusting the cylinder and means for feeding and exhausting a fluid-pressure of the cylinder to actuate the piston, said means being carried by the cylinder, the piston and its rod, and a drawing or scraper device mounted on the outer end of the rod which comprises a frame having a series of forwardly-extending bars, a spear-shaped cross member that joins the front end of said bars, a rib or latch pivotally secured to each of said bars and mounted to normally drop to a horizontal position when the scraper is inserted into the coke and rise to a vertical position when the scraper is pulled out, substantially as shown and described.

DANIEL ABNER RAMAGE.

Witnesses:
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