

(No Model.)

4 Sheets—Sheet 1.

H. HACK & F. LEY.

APPARATUS FOR RECEIVING AND CONVEYING AWAY COKE DRAWN
FROM GAS RETORTS.

No. 323,323.

Patented July 28, 1885.

Fig. 1.

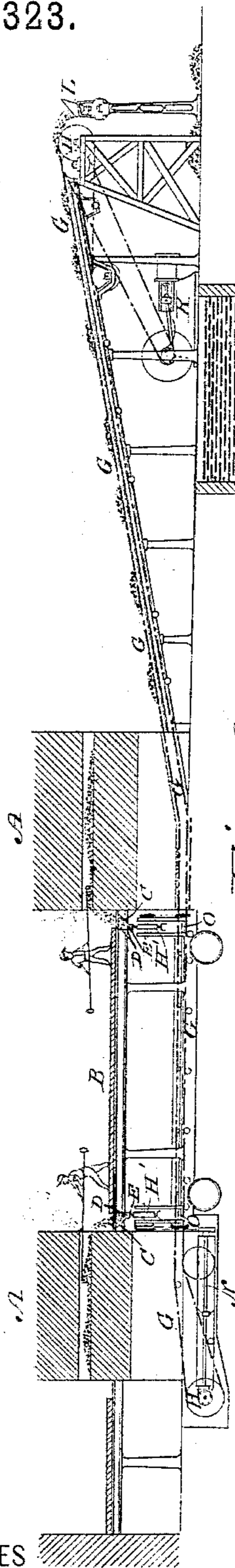
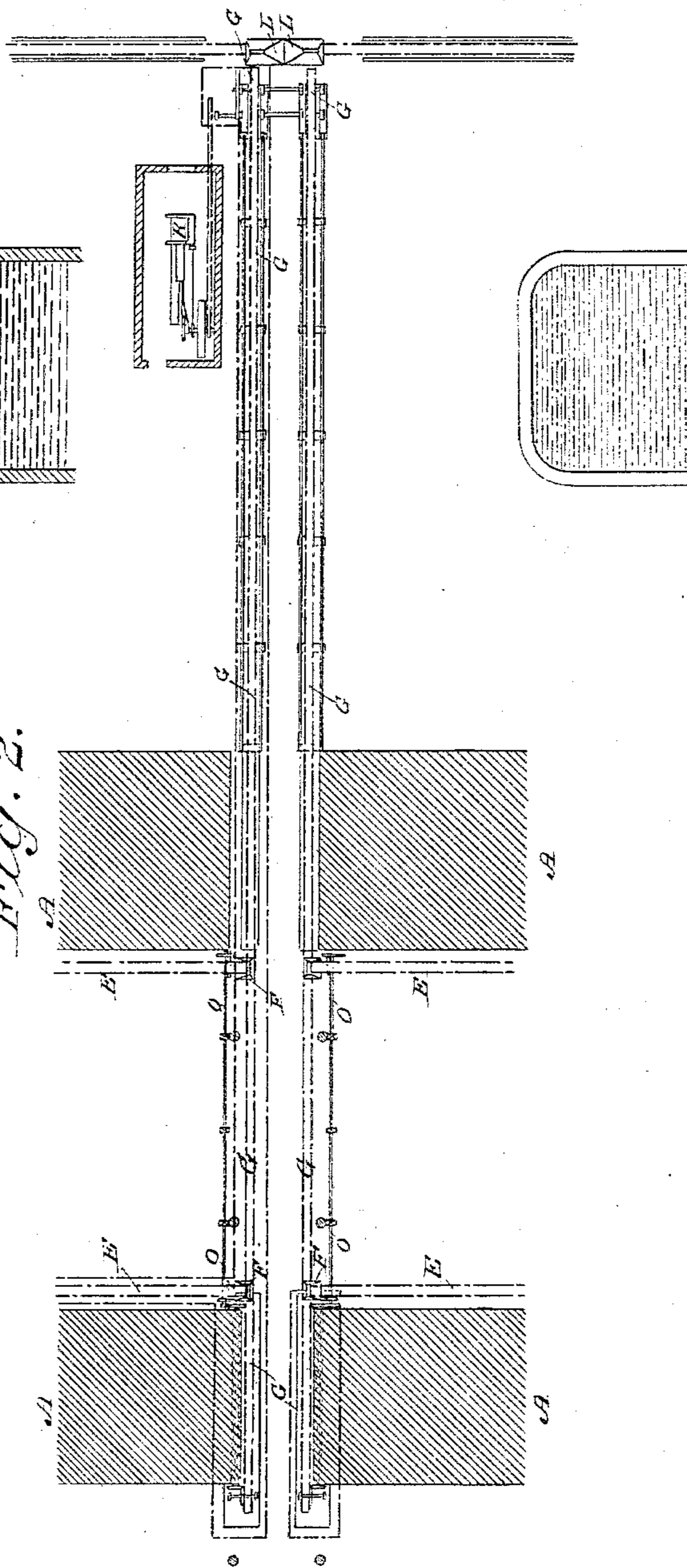


Fig. 2.



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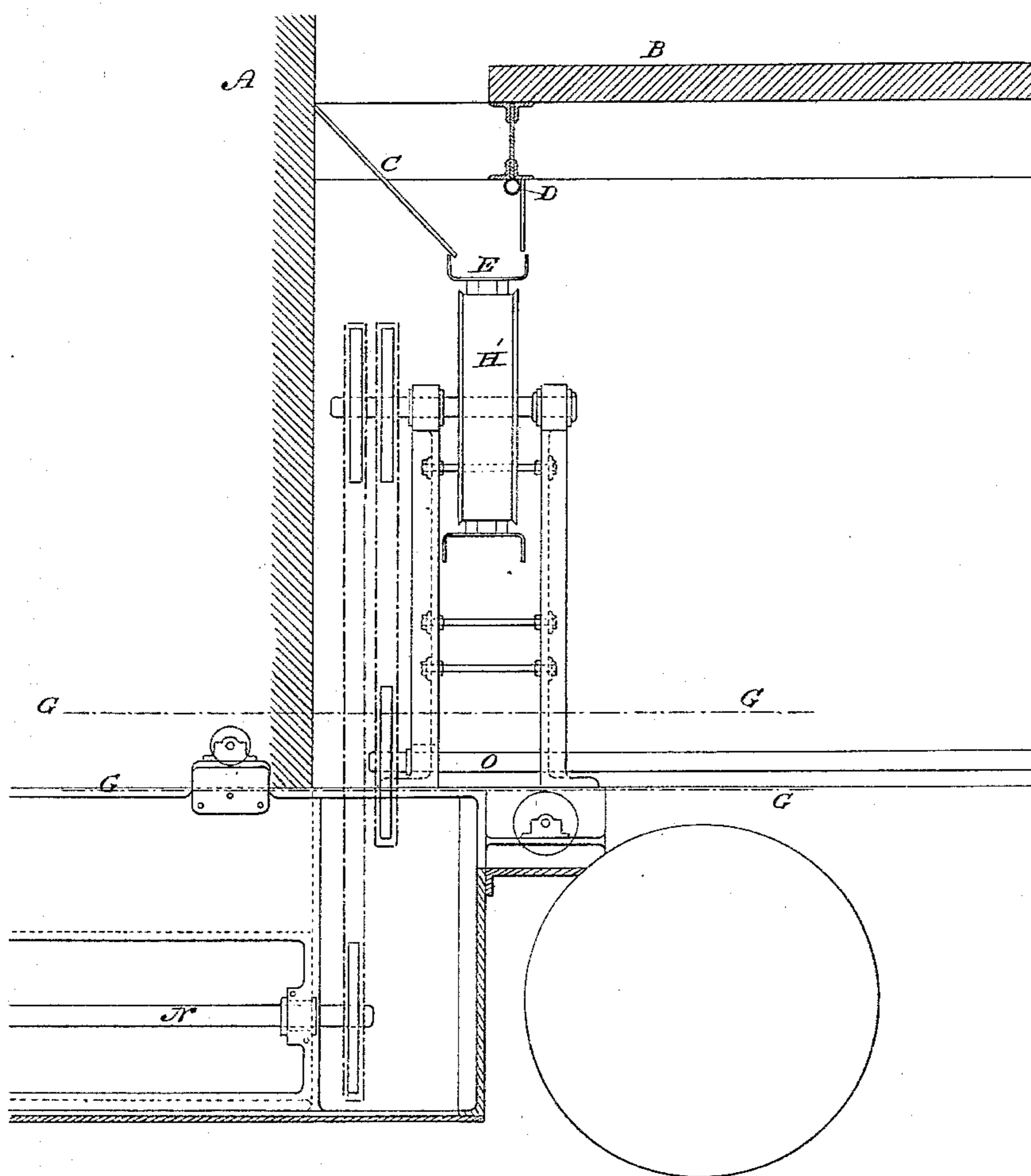
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FROM GAS RETORTS.

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Fig. 3.



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4 Sheets—Sheet 3.

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APPARATUS FOR RECEIVING AND CONVEYING AWAY COKE DRAWN
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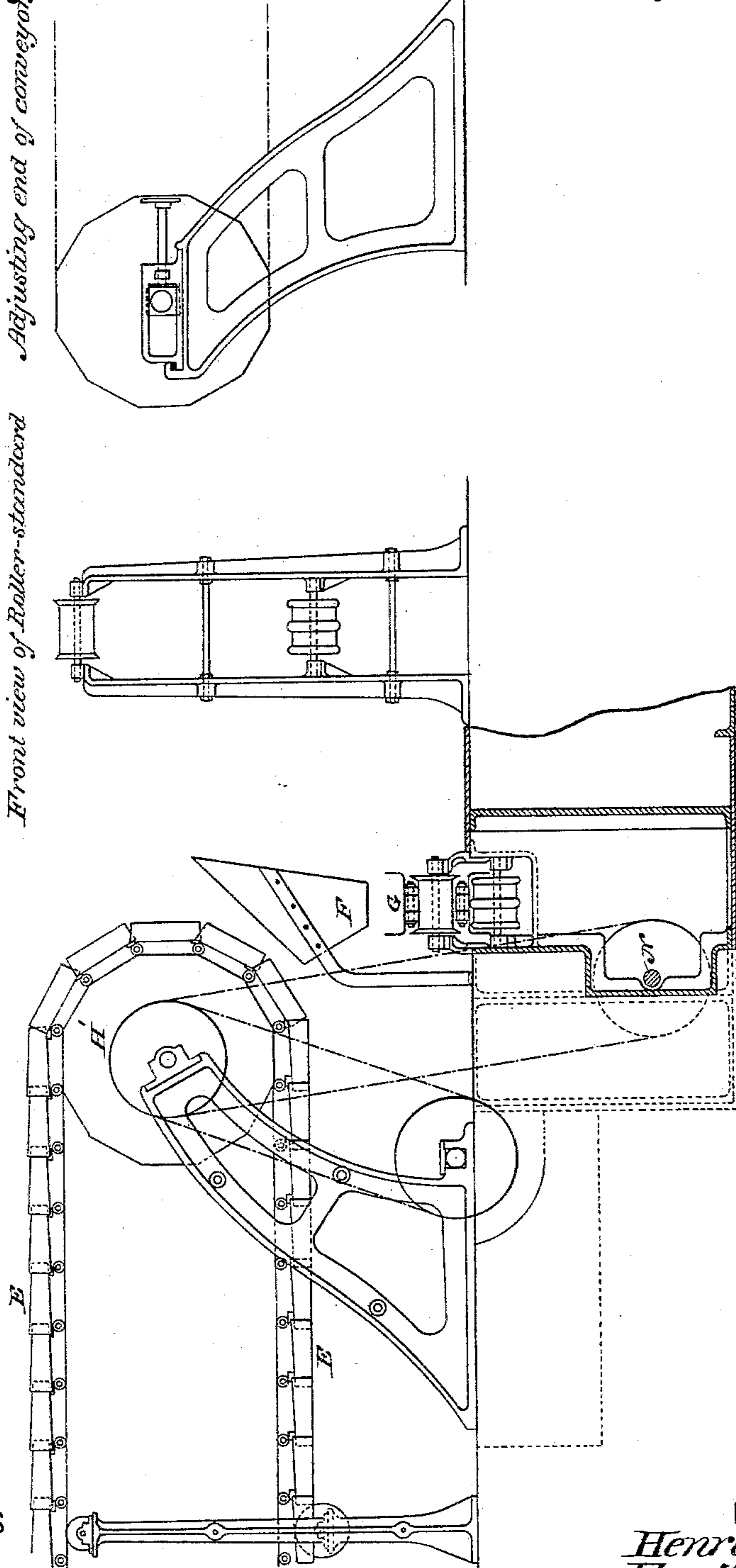
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Fig. 4.

Adjusting end of conveyor

Front view of Roller-standard



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APPARATUS FOR RECEIVING AND CONVEYING AWAY COKE DRAWN
FROM GAS RETORTS.

No. 323,323.

Patented July 28, 1885.

Fig. 6.

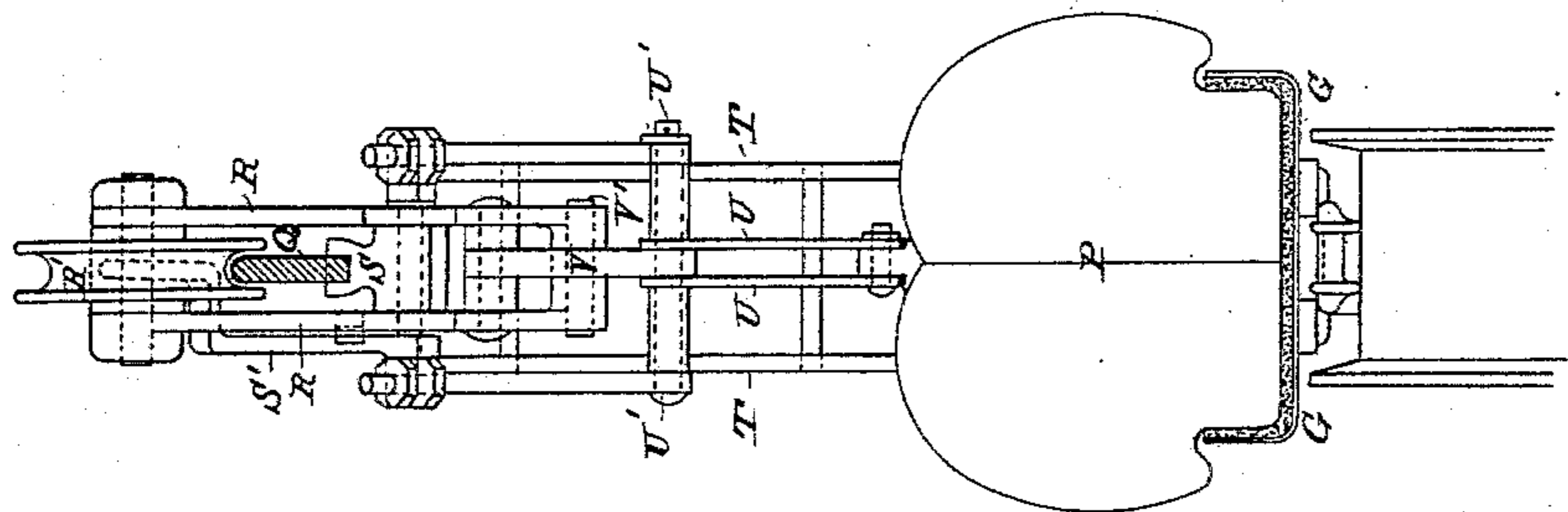


Fig. 5.

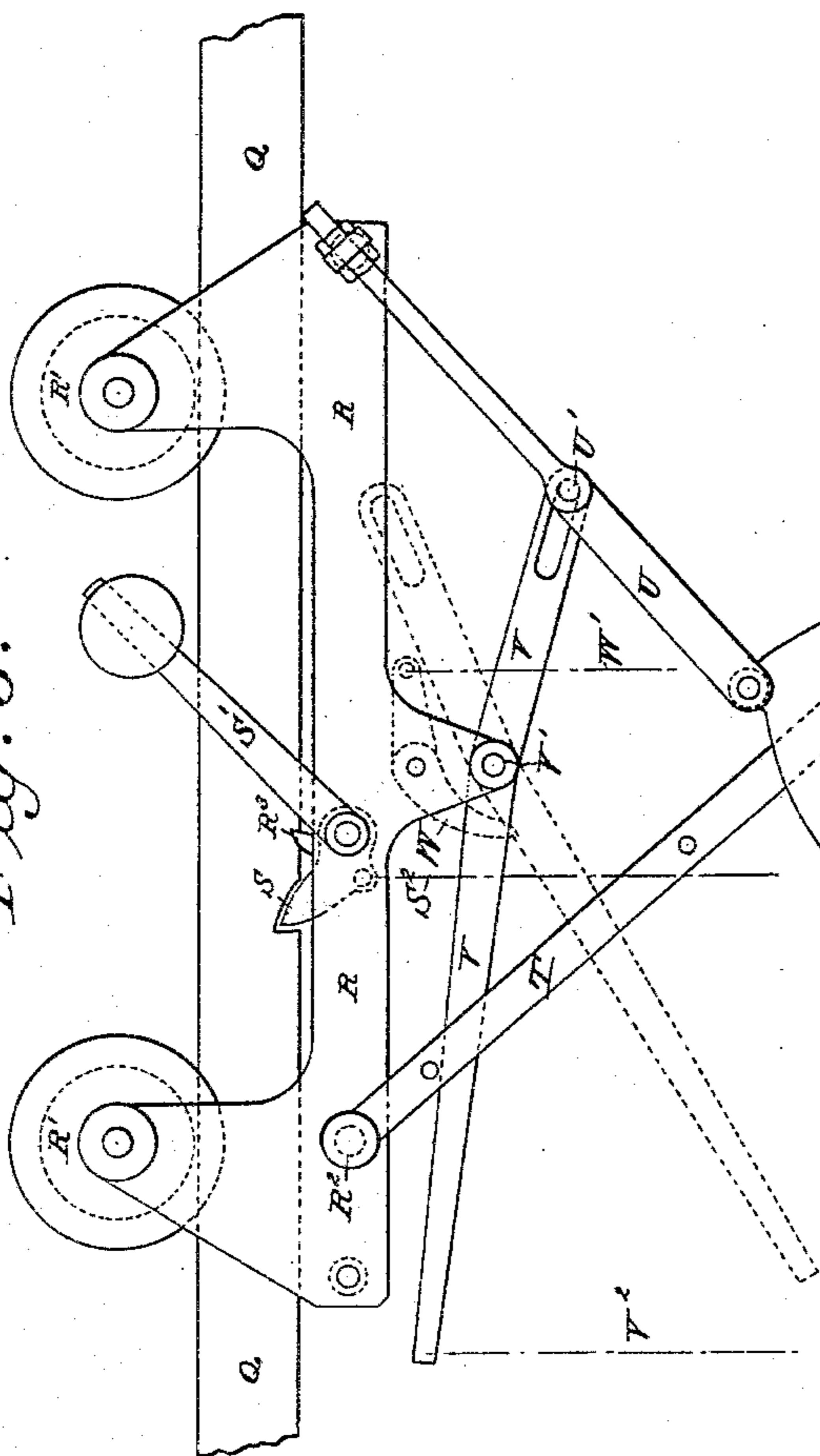
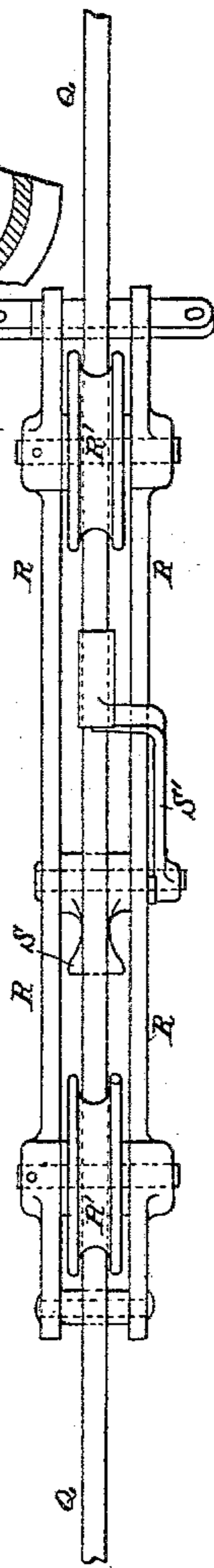


Fig. 7.



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UNITED STATES PATENT OFFICE.

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APPARATUS FOR RECEIVING AND CONVEYING AWAY COKE DRAWN FROM GAS-RETORTS.

SPECIFICATION forming part of Letters Patent No. 323,323, dated July 28, 1885.

Application filed March 3, 1885. (No model.) Patented in England February 13, 1884, No. 3,236

To all whom it may concern:

Be it known that we, HENRY HACK, of Saltley, Birmingham, in the county of Warwick, England, gas-engineer, and FRANCIS LEY, of Barrow-on-Trent, in the county of Derby, England, mechanical engineer, subjects of the Queen of Great Britain, have invented certain new and useful apparatus for receiving and conveying away coke drawn from gas-retorts or coke-ovens and for delivering the same into wagons, barges, or elsewhere, (for which we have obtained Letters Patent in Great Britain No. 3,236, dated February 13, 1884,) of which the following is a specification.

This invention has for its object apparatus for receiving and conveying away coke drawn from gas-retorts or coke-ovens, and for delivering the same into wagons, barges, or elsewhere. For these purposes immediately in front of each bench of retorts, and running from end to end of the retort-house, we provide an opening in the floor or working-platform of the house. Beneath these openings we fix guide-plates, forming thereby long hoppers to receive the coke, and into these hoppers the coke falls as it is drawn from the retorts by the gas-stokers. A perforated pipe passes from end to end of each hopper in the upper part thereof, and water issues from this pipe, and, sprinkling the hot coke, rapidly cools it. The coke is conducted by the hopper onto the surface of a conveyer, consisting of an endless chain supported upon rollers and made up of links, which have trough-like receptacles affixed upon their upper surfaces, and these receptacles, locking together, form a continuous traveling trough. The endless conveyer passes around drums at the ends of the retort-house, and these drums being driven the conveyer is kept in continuous motion. This conveyer, which to distinguish it from others may be called the "receiver," carries away the coke delivered upon its surface and discharges it at the end of its course into a hopper, by which it is passed onto the surface of another conveyer running at right angles to the receiver. This latter, which we will call the "main conveyer," may be fed by several receivers passing along in front of as many retort-

benches. The course of the main conveyer is not everywhere horizontal. Where it receives the coke it is at some distance beneath the floor of the retort-house; but at its farther end, where the delivery takes place, it is desirable that it should be raised above the surface, and for this purpose it is carried up an incline. The incline will usually commence as soon as the conveyer emerges from the retort-house and will continue until the yard where the coke is delivered is reached. The delivery of the coke, however, does not take place into the trucks or barges directly from the main conveyer, but usually it is first transferred to other conveyers at right angles, which are provided in the delivery-yard. From these latter it can be taken off in any convenient position, and this is effected by means of an apparatus which we term a "plow," and which consists of a double incline. This plow can be lowered into the trough of the conveyer at the point where the delivery is required to take place.

The plow is by preference movable along overhead rails, but it is stationary while in operation; and as the conveyer moves with the coke toward it the plow directs the coke upward and off the surface of the conveyer on either side. The coke then falls into a hopper beneath, which in some cases will deliver it into the wagon or receptacle or onto the ground, and in other cases onto the surface of another conveyer.

The motive power for working the whole arrangement is by preference applied to the elevated end of the main conveyer, the terminal drum of which is driven by means of a steam-engine. The main conveyer transmits the power to other drums over which it passes, and these in turn are geared with the drums over which the receiving and delivering conveyers pass.

In order that our said invention may be most fully understood and readily carried into effect, we will proceed to describe the drawings hereunto annexed.

In the drawings, Figure 1 is a sectional elevation, and Fig. 2 is a plan showing the general arrangement according to our invention of apparatus for receiving and conveying coke.

Fig. 3 shows to a larger scale a transverse vertical section of the receiving arrangements and of the conveyer onto which the coke first falls and which we call the "receiver." The driving-gear by which the receiver obtains movement from the main conveyer is also indicated. Fig. 4 is a side elevation of part of the receiver, and the main conveyer also is here seen in transverse section. Fig. 5 is a side elevation of the plow-like delivering implement and parts connected therewith, and a part of one of the conveyers is seen in section. Fig. 6 is a front elevation of the plow and parts in connection therewith. Fig. 7 is a plan of the overhead rail and parts running thereon.

A A represent benches of gas-retorts from which the coke is being drawn.

B is the delivery-floor. C C are the long trough-like hoppers below the level of the floor which receive the coke as it falls from the retorts.

D D are perforated water-pipes within the hoppers, which by throwing a spray onto the glowing coke rapidly quench it.

E E are the conveyers (called the "receivers") immediately beneath the hoppers C C.

F F are the terminal hoppers, into which the receivers deliver the coke.

G G are the main conveyers, onto which the coke descends from the hoppers F F.

H H are terminal rollers, around which the conveyers are passed.

K is the engine by which the main conveyers are kept in movement. They are driven by gear, represented clearly in the drawings.

L L are the hoppers which receive the coke from the main conveyers and deliver to others as may be required.

These parts are all represented in the general views, Figs. 1 and 2.

In Fig. 3 the receiving-hopper C and receiver E are more fully shown. The receiving-hopper, it will be seen, is a continuous trough, consisting of iron plates fixed below the level of the delivery-floor. It is open at the bottom from end to end, and the coke is prevented from falling through by the traveling-receiver, which is immediately beneath.

The perforated water-pipe D is in connection with a main or elevated cistern, and is provided with a cock by which the amount of water applied to the coke may be regulated, as found necessary.

The receiver consists of an endless chain with interlocking trough-like sections of sheet-iron, one fixed to every link. The conveyer passes around chain-rollers H at its ends.

In Fig. 3 the main conveyer M is indicated by dotted lines. It conveys power from the engine to drive the receiver E, to which motion is imparted by the shaft N. This shaft is driven by miter-wheels, as is clearly seen in Fig. 1, one of the wheels being upon the shaft N and the other upon the chain-roller H, which the main conveyer surrounds. A pitch-chain and chain-wheels connect the shaft N with the axis of the chain-roller H of the receiver E.

On the same axis there is another chain-wheel, and this, by a pitch-chain, drives a corresponding wheel on an axis, O, which passes across the retort-house beneath the delivery-floor and actuates the receiver on the other side of the house.

The receivers and the main conveyer are similar in construction, and in each case the endless chain is supported upon rollers arranged a short distance apart. The way in which the chain passes over these rollers is clearly represented in Fig. 4. The main conveyer may be guided up a rising incline, as is represented in Fig. 1. The main conveyer delivers the coke to other conveyers in the same way as it receives it from the receiver, and these other conveyers are arranged according to the circumstances of the case to take the coke to the places where it is required. At these places the coke is removed from the conveyer by the delivery apparatus, which we will proceed to describe.

P is a plow-like instrument of iron, covered at its lower part with leather. It can be lowered down into the trough-conveyer. The leather covering serves to prevent contact of metal with metal, thereby avoiding risk of damage. The implement P is suspended from a carriage, which runs along an overhead rail, Q. R is the frame of this carriage, and R' R' are its wheels.

S is a pawl, which is caused to drop in a notch in the under side of the rail Q when it is desired to fix the implement P in position to cause the delivery of the coke from the conveyer. On the axis of the pawl is a weighted lever, S', which tends to raise the pawl and make it engage with the notch in the under side of the rail. The pawl, however, can be drawn out of the notch by means of a hand-chain S².

R' is a stop upon the carriage, serving to limit the movement of the lever S'.

The implement P is fixed to a frame, T, which is jointed to the carriage at R². The fore part of the implement P is also connected to the carriage R by an arrangement of links U with an intermediate joint at U'. The pin of this joint passes through a slot in the end of the lever V, which has its fulcrum at V' upon the carriage.

When the parts are in the position in which they are represented in Fig. 5, the implement P is in its lowest position, resting within the conveyer. It is raised from this position to put it out of use by means of a hand-chain, V², attached to the lever V, which being pulled downward raises the slotted end of the lever and with it the joint U'. The frame T then turns about its fulcrum upon the carriage. The implement P is lifted out of the conveyer and is held suspended above it. A pawl, W, engages with the lever V to retain the plow in its elevated positions. The pawl is released when required by lifting it by means of a hand-chain, W', attached to it. It will thus be seen that the implement P may be brought

to any position along the line of the conveyer, being carried into position by the carriage R, running along the rail Q, and when in place the carriage can be there locked. This having been done, the implement is ready to be lowered into the conveyer, and then the coke with which the conveyer is loaded, coming in contact with the implement P, rises up its double incline and is delivered out of the conveyer on the two sides. It falls to the ground or into a receptacle—it may be a railway-truck or barge—for taking it away.

We would remark that we do not claim generally the conveyance of coke by endless conveyers; but

We claim—

1. The arrangements for receiving the coke, consisting of guide-plates forming long hoppers into which the coke falls as it is drawn from the retorts or ovens and which deliver it onto the conveyer, such long hopper being provided with sprinkling apparatus for quenching the coke, substantially as described.

2. The system of conveyers, consisting of endless chains supported on rollers and made up of links carrying receptacles locking together to form a continuous traveling trough,

such conveyers being arranged at right angles the one to the other and being all driven through one main conveyer, substantially as described.

3. The means for the delivering of the coke from the conveyer, consisting in placing within the trough of the conveyer a plow-like implement, which, being held stationary while the conveyer continues in movement, directs its contents over the sides of and out of the conveyer, substantially as described.

4. The combination of the endless trough-like conveyers, the overhead rails, and the plow-like delivering instrument, substantially as described.

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Witnesses to the signature of Francis Ley:

GEO. W. REYNOLDS,

J. W. ROWBOTHAM.

Clerks to Messrs. Moody & Woolley, Solicitors and Notaries Public, Derby, England.