(No Model.) 3 Sheets—Sheet 1.

L. J. McNUTT.

HYDROCARBON GAS BLACK MACHINE.

No. 481,240. Patented Aug. 23, 1892.

Fig. 1.

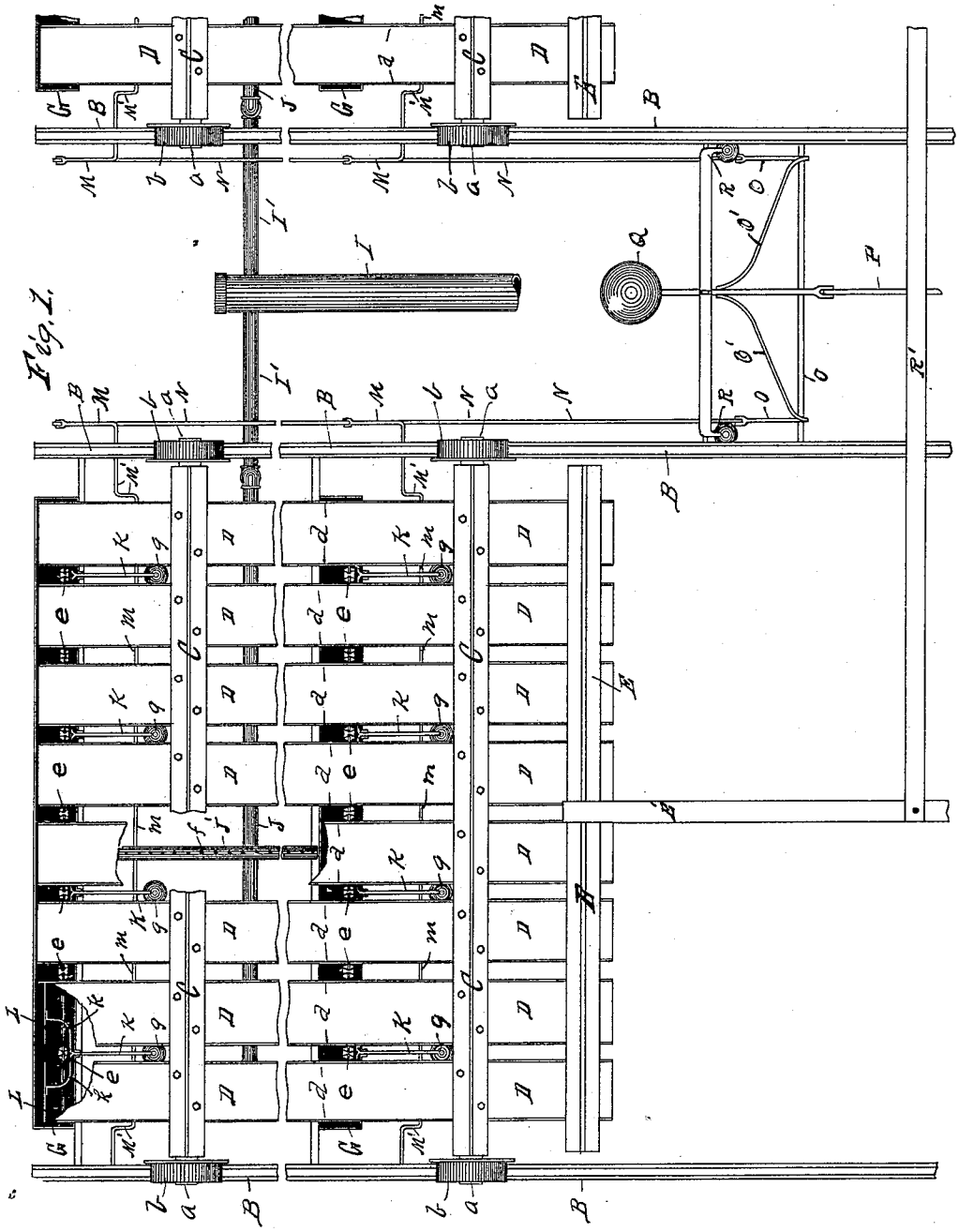

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Fig. 2.

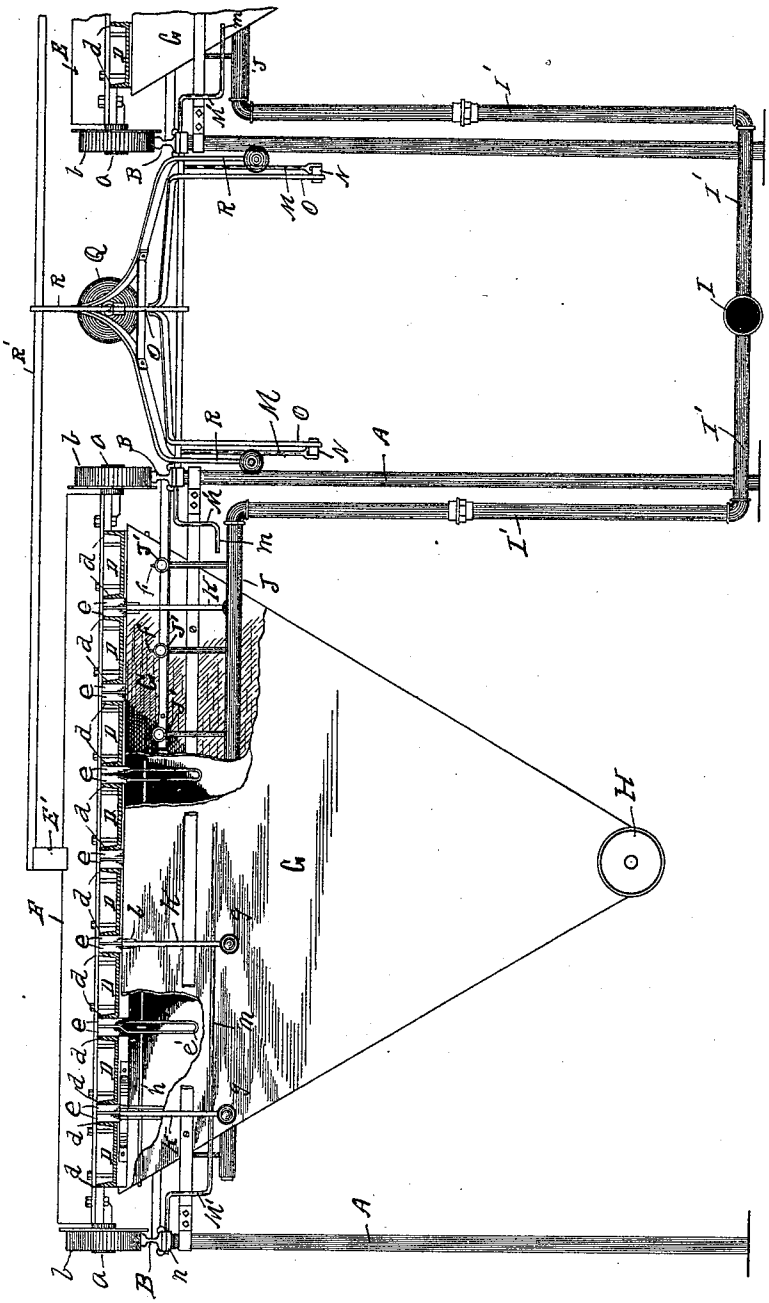

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Fig. 3.

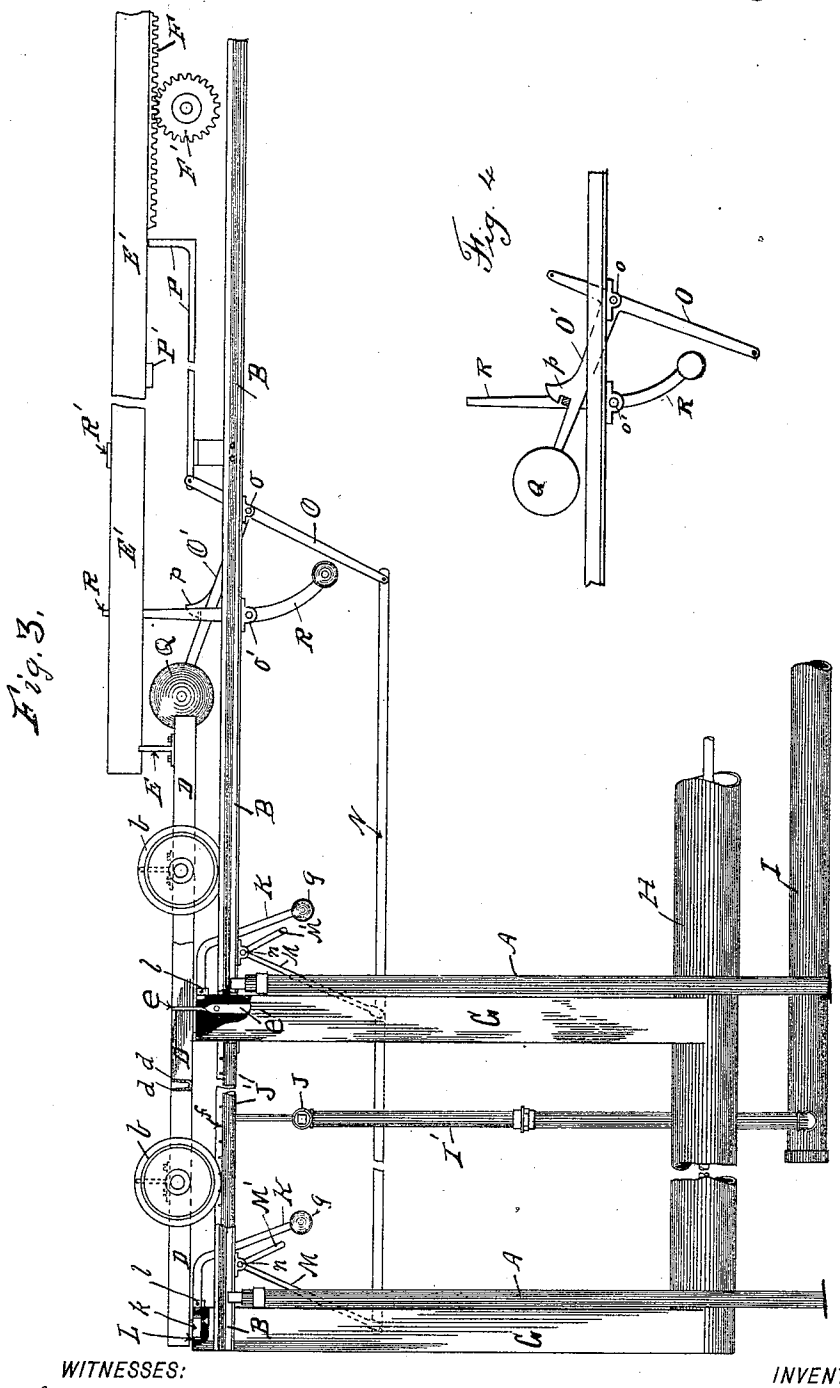

Fig. 4.

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UNITED STATES PATENT OFFICE.

LESTER J. McNUTT, OF WARREN, PENNSYLVANIA.

HYDROCARBON-GAS-BLACK MACHINE.

SPECIFICATION forming part of Letters Patent No. 481,240, dated August 23, 1892.

Application filed May 17, 1892. Serial No. 433,361. (No model.)

To all whom it may concern:

Be it known that I, LESTER J. McNUTT, a citizen of the United States, residing at Warren, in the county of Warren and State of Pennsylvania, have invented certain new and useful Improvements in Hydrocarbon-Gas-Black Machines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, forming part of this specification.

My invention consists in the improvements in hydrocarbon-gas-black machines hereinafter set forth and explained, and illustrated in the accompanying drawings, in which—

Figure 1 is a top or plan view of my improved hydrocarbon-gas-black machine, showing one section thereof with portions broken away and a portion of another section. Fig. 2 is an end elevation of the same. Fig. 3 is a side elevation of the same. Fig. 4 is a detail side view of the levers O′ and R, showing the catch *p*.

Like letters refer to like parts in all of the figures.

In the construction of my improved hydrocarbon-gas-black machine I preferably make it in sections or batteries, two of which are coupled together and operate in unison, as hereinafter described.

In the construction thereof shown in the drawings I make a framework of parts A on a suitable foundation, on the tops of which parts I secure rails B B, forming the frame, and also the track, and upon this track I place a car constructed of cross-beams C C, provided at their ends with journals *a a*, upon which wheels *b b* are placed, which operate on the rails B B. To the under surfaces of these cross-beams C C, I secure narrow plates D a short distance apart and parallel with each other, these plates being preferably made of channel-iron, having wide upwardly-projecting flanges *d* on each edge thereof, so as to prevent their warping from the heat. To the rear ends of these plates D, I secure a beam E, to which is secured a longitudinal beam E′, projecting some distance beyond the plates D and which is provided with rack-gearing F, in which a gear-wheel F′ operates for moving the cars, consisting of the cross-beam C and channel-plates D, reciprocally forward and back, the wheel F′ being provided with a convenient mechanism (not shown) for rotating the wheel F′ first in one direction and then in the opposite direction, so as to produce the ordinary and common reciprocal motion of the car and plates D, which feature, however, I have not shown or described, as it forms no part of this invention. Each of the cars consists of any convenient number of channel-plates *p*. In the drawings I have shown a car having eight of these plates; but the number is not material. Under these plates D, I secure between the posts A A hoppers G at such convenient distance apart as will correspond with the distance of the reciprocal traverse of the plates D, these hoppers G extending downward and opening into an endless screw-conveyer H, of ordinary construction, for conveying the carbon-black away.

From a gas-main I branch pipes I′ extend laterally and upward, connecting with cross-pipes J, to which are coupled longitudinal pipes J′ under the central parts of the plates D, which pipes J′ are provided with small jet-burners *f*, the flame from which impinges against the under faces of the plates D, so as to deposit the hydrocarbon-gas black thereon, the remainder of the products of combustion passing upward between the edges of the plates and depositing the remainder of the black therein on the upwardly-projecting flanges *d*, forming the edges of the channel-plates D, the black thus deposited on the edges of the plates D being of the finest quality produced and has not heretofore been saved for want of suitable facilities therefor. This feature of my construction consists of spring-scrapers *e*, hinged on a transverse rod *h*, secured in each of the hoppers G, the lower ends *e′* of these scrapers contacting with first one side and then the other of the hoppers G as the plates D move forward and back, so as to scrape the carbon-black product off of the flanges *d* of the plates and into the hoppers G at each reciprocal movement of the plates D. The under surfaces of the plates D, I provide with scrapers L, which are constructed and operated, as hereinafter described, to only

scrape the carbon product off of the under surfaces of the plates D during their traverse in one direction. These scrapers L, I construct of weighted levers K, mounted in bearings *l* in the upper edge of one side of the hoppers G, one between each pair of the plates D. On the upper end of each of these levers K, I make laterally-projecting arms *k k*, one under each adjacent plate D, to which arms I secure the scrapers L, so that they extend laterally the full width of the under surface of the plates D. These levers K are pivoted in the bearings *l*, so that the raising of the lower end of the levers K lowers the scrapers L down and out of contact with the under surface of the plates D, which when the levers K hang down freely the weights *g* on the lower ends thereof operate to keep the scrapers L in close contact with the under surfaces of the plates D.

Mounted in bearings on the under side of the track B, forming the upper portion of the frame of my machine, are bell-crank levers M M′, connected by a rod *m*, which connects the arms M′ thereof and passes under the levers K, on which the scrapers L are mounted. To the arms M of these bell-crank levers is coupled a rod N, adapted to move all of the bell-crank levers M M′ in unison.

To the end of the rod N, I couple the arm O of a bell-crank lever O O′, which lever is also mounted in a bearing *o* on the under side of the track B, the arm O of this lever also extending above said bearing *o*, where it is coupled to a horizontally-sliding bar P, adapted to engage with a stop P′ on the lever E′. The other arm O′ of the bell-crank lever is provided with a weight Q. This arm O′ is also provided with a catch *p*, adapted to engage with a like catch on a curved weighted lever R, mounted in a bearing *o′* on the under side of the track B, so that when the catch *p* on the arm O′ is engaged with the catch on the curved arm R the arm O′ and the weight thereon are supported in a raised position, so as to prevent the rods *m* connecting the bell-crank levers M M′ from contacting with the scraper-levers K. A stop R′ is also provided on the beam E′, adapted to engage with the upper end of the weighted lever R. When the car C D, to which the actuating-beam E′ is secured, moves in one direction, the upper end of the weighted lever R engages at the end of the traverse of the car in that direction with the stop R′ on the beam E′ and disengages the lever from the catch *p* on the arm O′ of the bell-crank lever O O′, allowing the weighted arm O′ to fall, which operates through the rod N, connecting the arm O of said beam with the bell-crank lever M M′, to bring the rods *m*, connecting said levers, into contact with the arms K of the scrapers and raise them, and thereby lower the scrapers away from the under faces of the plates D, in which position they are retained until near the end of the return traverse of the plates D, when the upward projecting end of the sliding bar P engages with the stop P′ on the beam E′ and raises the weighted arm O′ of the bell-crank lever O O′ until the catch *p* engages with the catch on the weighted lever R, which operation actuates the bell-crank lever M M′, so as to move the rod *m* back from the scraper-levers K, allowing the scrapers L to again come into contact with the under surfaces of the plates D. Thus it will be observed the scrapers L only operate on the plates D to remove the carbon product therefrom during their traverse in one direction.

In the drawings and description I have only described one battery of plates, but have shown in the drawings a portion of a second battery. In practice it is usual to couple at least two batteries of plates together, as illustrated in the drawings, the bell-crank levers M M′ and O O′ for relieving the scrapers L on each battery then being coupled together by bringing the arms O′ of the bell-crank lever O O′ together into a single arm O′, supporting the weight Q and catch *p*, as illustrated in Fig. 2, so that two batteries of plates are operated simultaneously.

Having thus fully described my invention, so as to enable others to construct and operate the same, what I claim as new, and desire to secure by Letters Patent of the United States, is—

1. The combination, in a hydrocarbon-gas-black machine, with a series of plates and driving mechanism operating to move the said plates back and forth over a series of gas-jets, of a series of scrapers engaging with the under surfaces of the said plates when the plates are moving in one direction and weight-and-lever mechanism operating to disengage the said scrapers from the plates when the plates are moving in the reverse direction, substantially as and for the purpose set forth.

2. The combination, in a hydrocarbon-gas-black machine, with a series of plates and driving mechanism operating to move the said plates back and forth over a series of gas-jets, of scrapers engaging with the edges of the said plates, substantially as and for the purpose set forth.

3. The combination, in a hydrocarbon-gas-black machine, of a series of narrow parallel longitudinal plates having a reciprocal motion forward and back with scrapers having weighted levers thereon for holding them up into contact with the under surfaces of said plates and bell-crank-lever mechanism for automatically withdrawing the scrapers from the under surfaces of said plates, substantially as and for the purpose set forth.

4. The combination, in a hydrocarbon-gas-black machine, of a series of narrow parallel longitudinal plates having a reciprocal motion forward and back over a series of gas-jets with a series of scrapers engaging with the under surfaces of said plates as they move in one direction and disengaged therefrom when the plates move in the opposite direc-

tion and another series of scrapers engaging with the edges of said plates during their traverse in one or both directions, substantially as and for the purpose set forth.

5. The combination, in a hydrocarbon-gas-black machine, of a series of narrow parallel longitudinal plates having a reciprocal motion forward and back over a series of gas-jets, a series of hoppers located apart from each other and under said plates substantially the distance of the traverse of the plates, and an endless conveyer for removing the accumulated black from the bases of said hoppers, with scrapers located under said plates and over said hoppers, adapted to remove the black from the plates and into said hoppers during the traverse of the plates in one direction and be disengaged from said plates when they move in the opposite direction.

6. The combination, in a hydrocarbon-gas-black machine, of a series of scrapers operating under reciprocating plates with bell-crank levers, stops on the frame, and weights operating said levers to automatically withdraw the scrapers from the plates during their traverse in one direction, and lever-and-catch mechanism and stops on the frame for raising and retaining said weights in a raised position, so as to allow the scrapers to operate during the traverse of the plates in the other direction, substantially as and for the purpose set forth.

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

LESTER J. McNUTT.

Witnesses:
C. O'BRIEN,
J. C. STURGEON.