

No. 681,064.

Patented Aug. 20, 1901.

R. D. MARTIN.

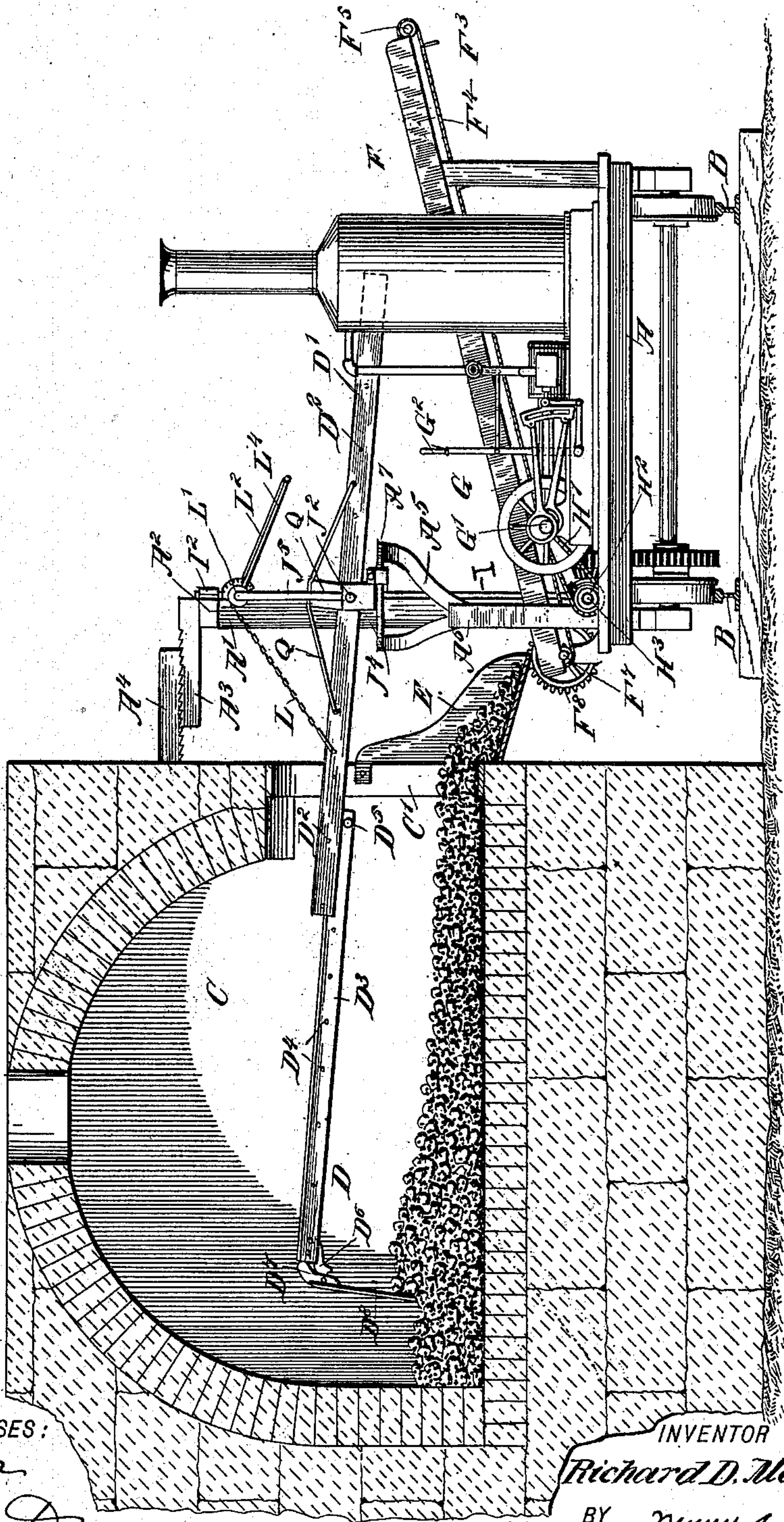
DRAWING MACHINE FOR COKE OVENS.

(Application filed Sept. 27, 1900.)

(No Model.)

5 Sheets—Sheet 1.

FIG. 1



WITNESSES:

H. Walker

Rev. J. H. Hester

INVENTOR

Richard D. Martin.

BY

Mum

ATTORNEYS

No. 681,064.

Patented Aug. 20, 1901.

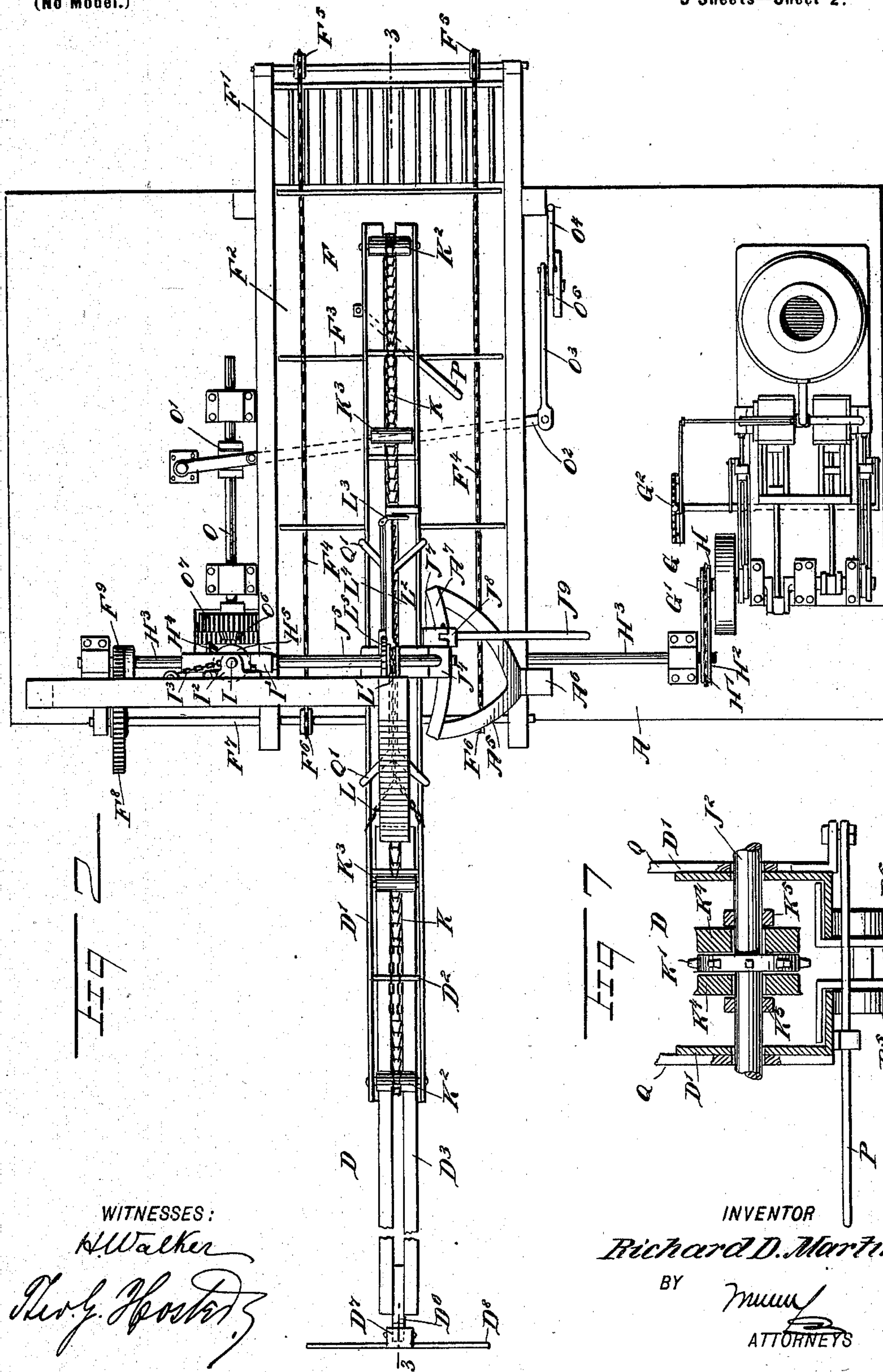
R. D. MARTIN.

DRAWING MACHINE FOR COKE OVENS.

(Application filed Sept. 27, 1900.)

(No Model.)

5 Sheets—Sheet 2.



No. 681,064.

Patented Aug. 20, 1901.

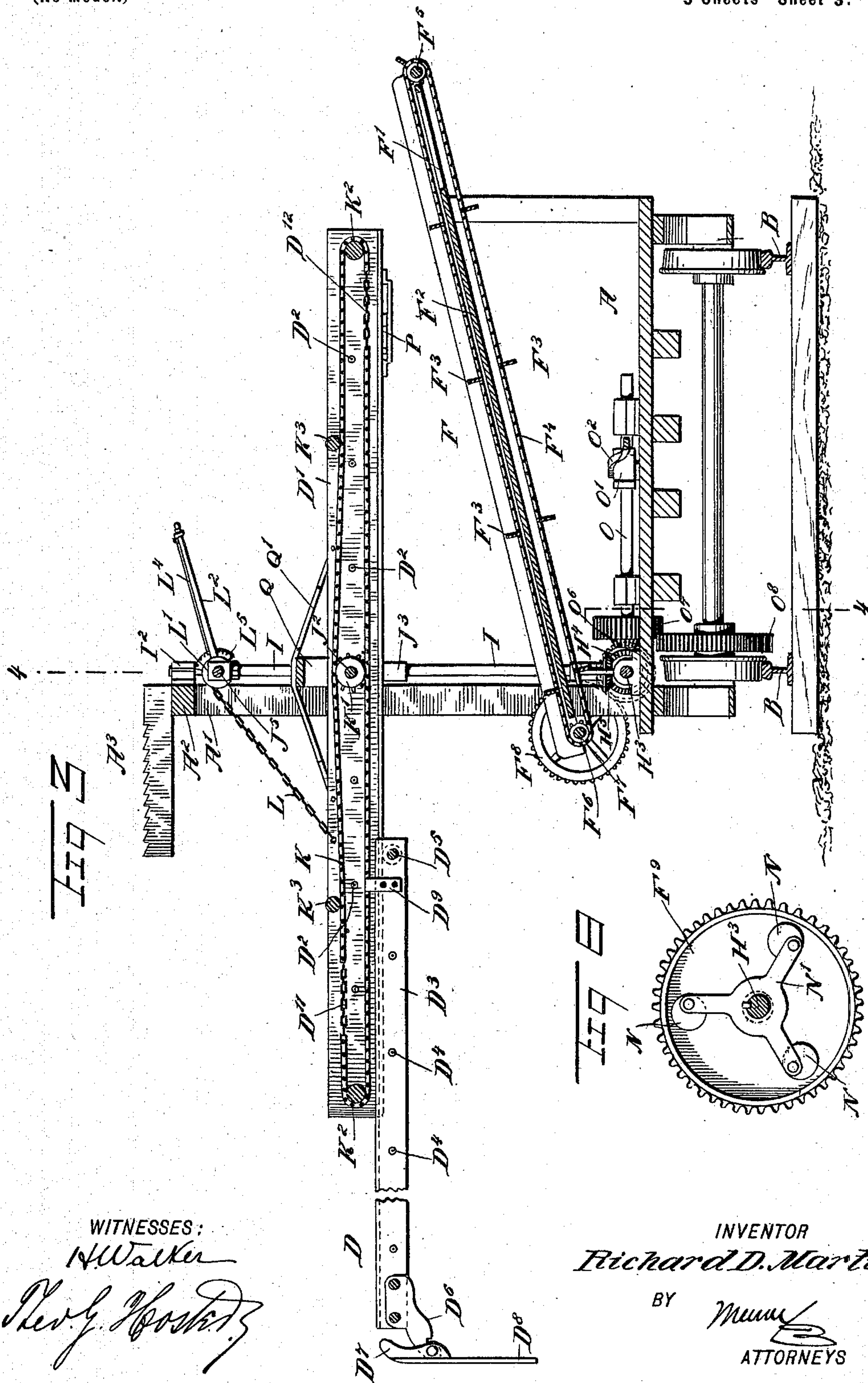
R. D. MARTIN.

DRAWING MACHINE FOR COKE OVENS.

(Application filed Sept. 27, 1900.)

(No Model.)

5 Sheets—Sheet 3.



No. 681,064.

Patented Aug. 20, 1901.

R. D. MARTIN.
DRAWING MACHINE FOR COKE OVENS.

(Application filed Sept. 27, 1900.)

(No Model.)

5 Sheets—Sheet 4.

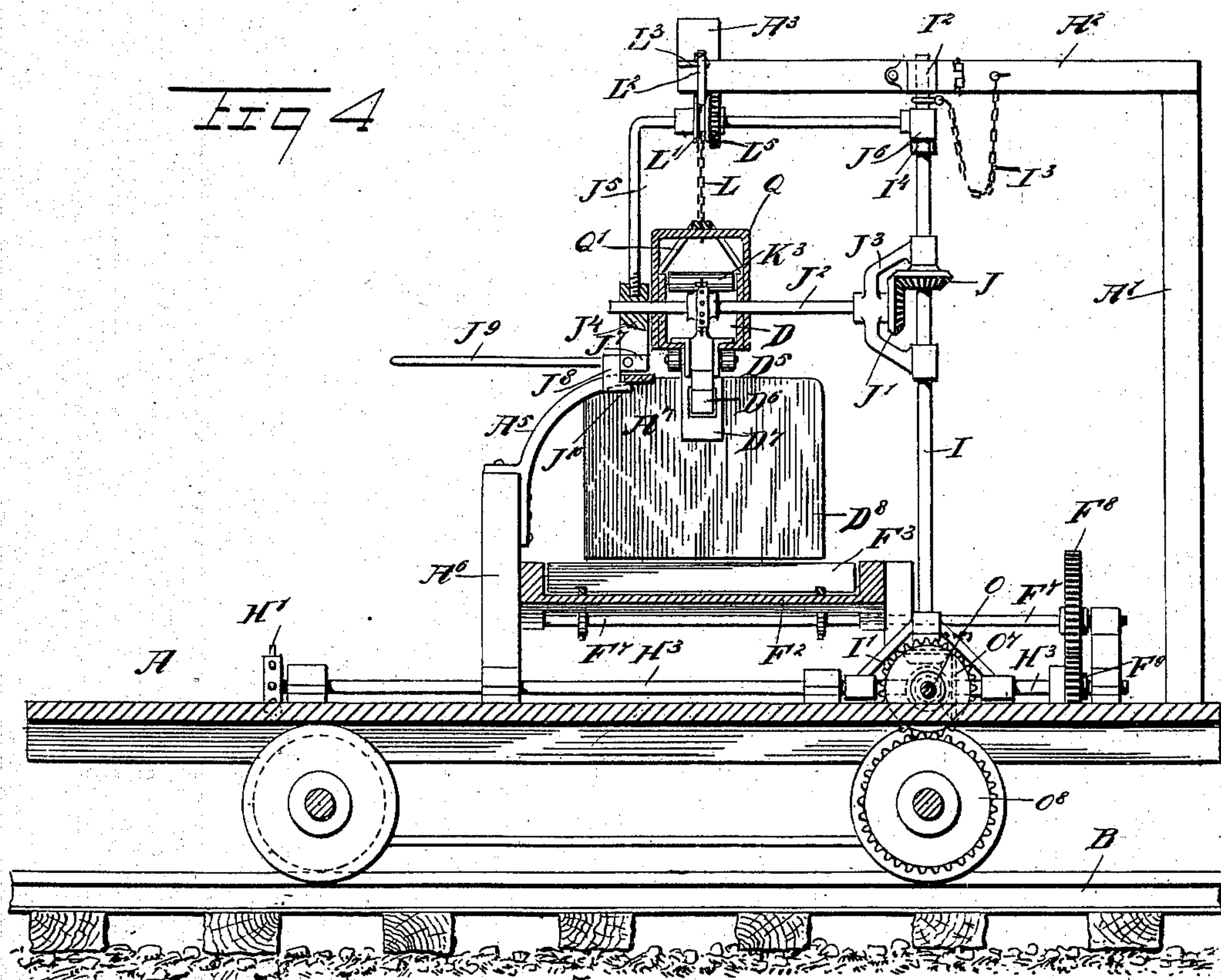
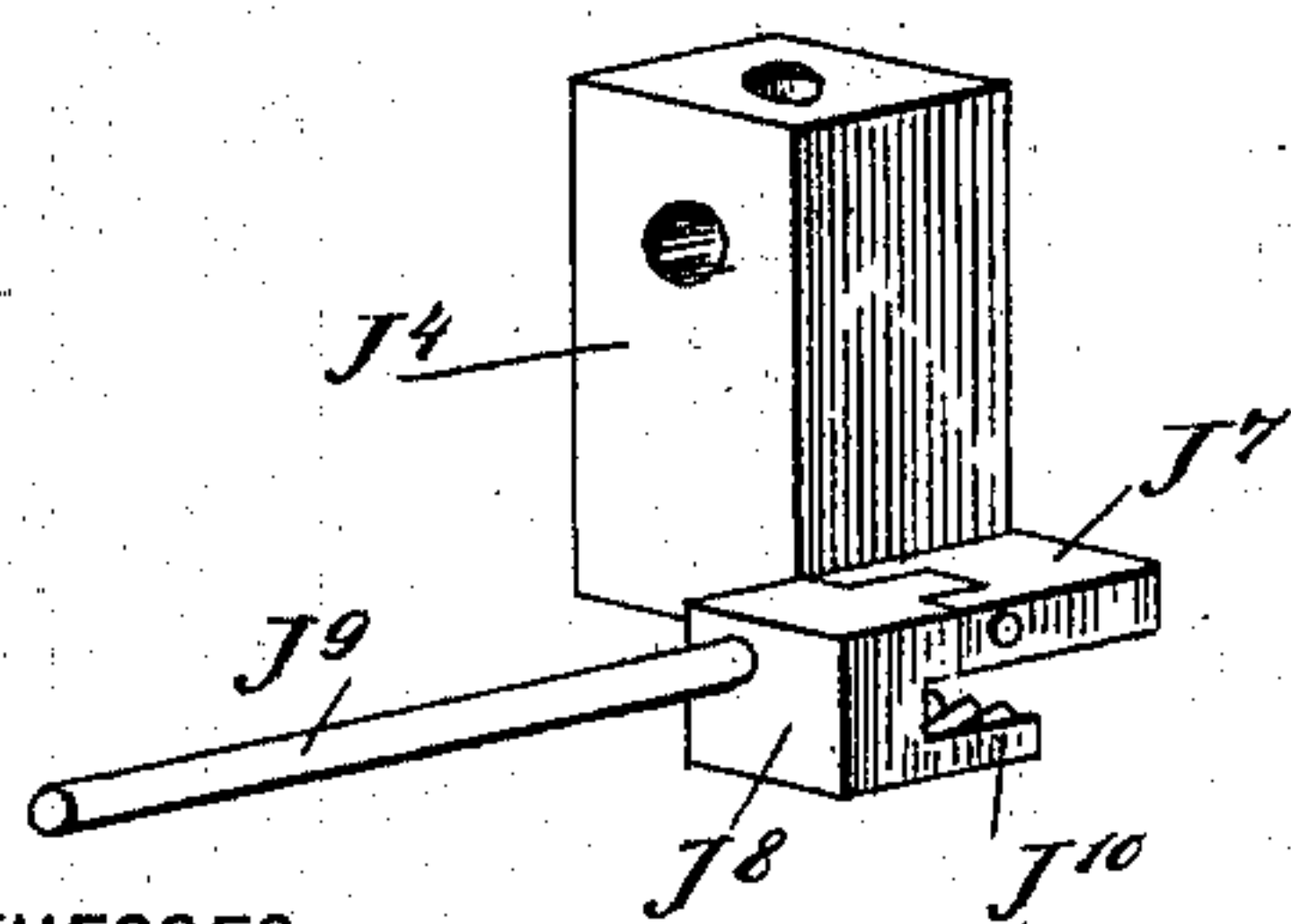


Fig 5

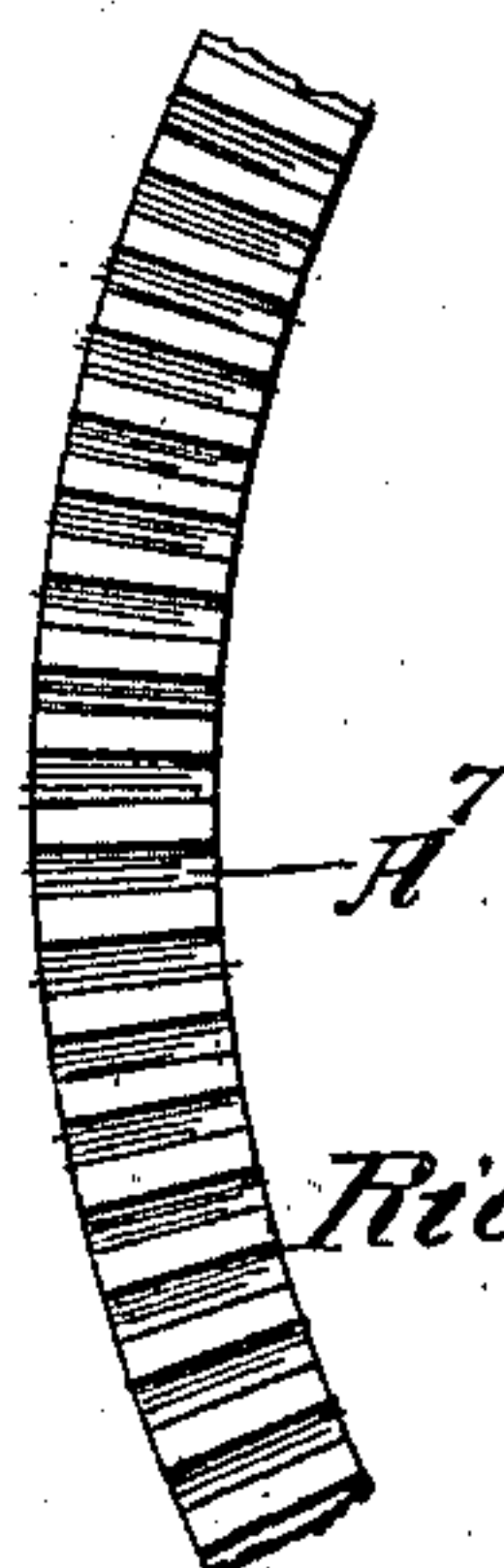


WITNESSES:

N. Walker

Rev. J. H. H. H.

Fig 6



INVENTOR

Richard D. Martin.

BY

Mumford
ATTORNEYS

No. 681,064.

Patented Aug. 20, 1901.

R. D. MARTIN.
DRAWING MACHINE FOR COKE OVENS.

(Application filed Sept. 27, 1900.)

(No Model.)

5 Sheets—Sheet 5.

Fig 9

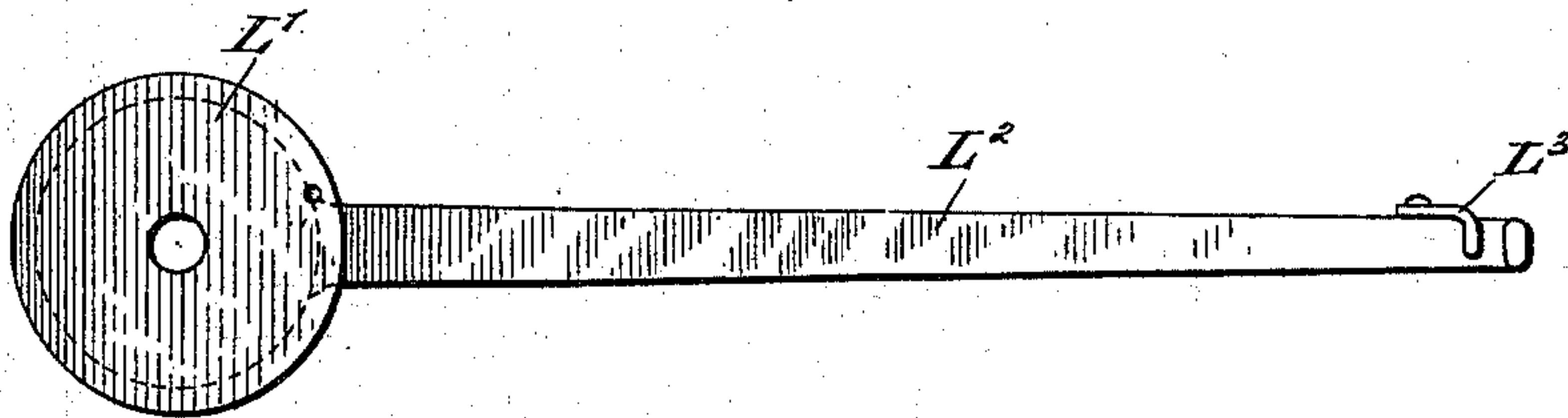


Fig 10

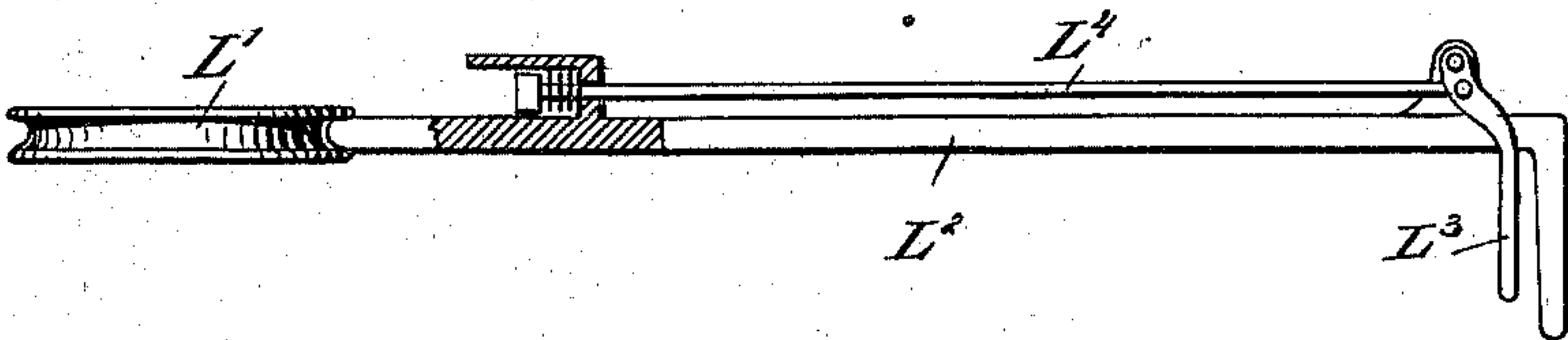


Fig 11

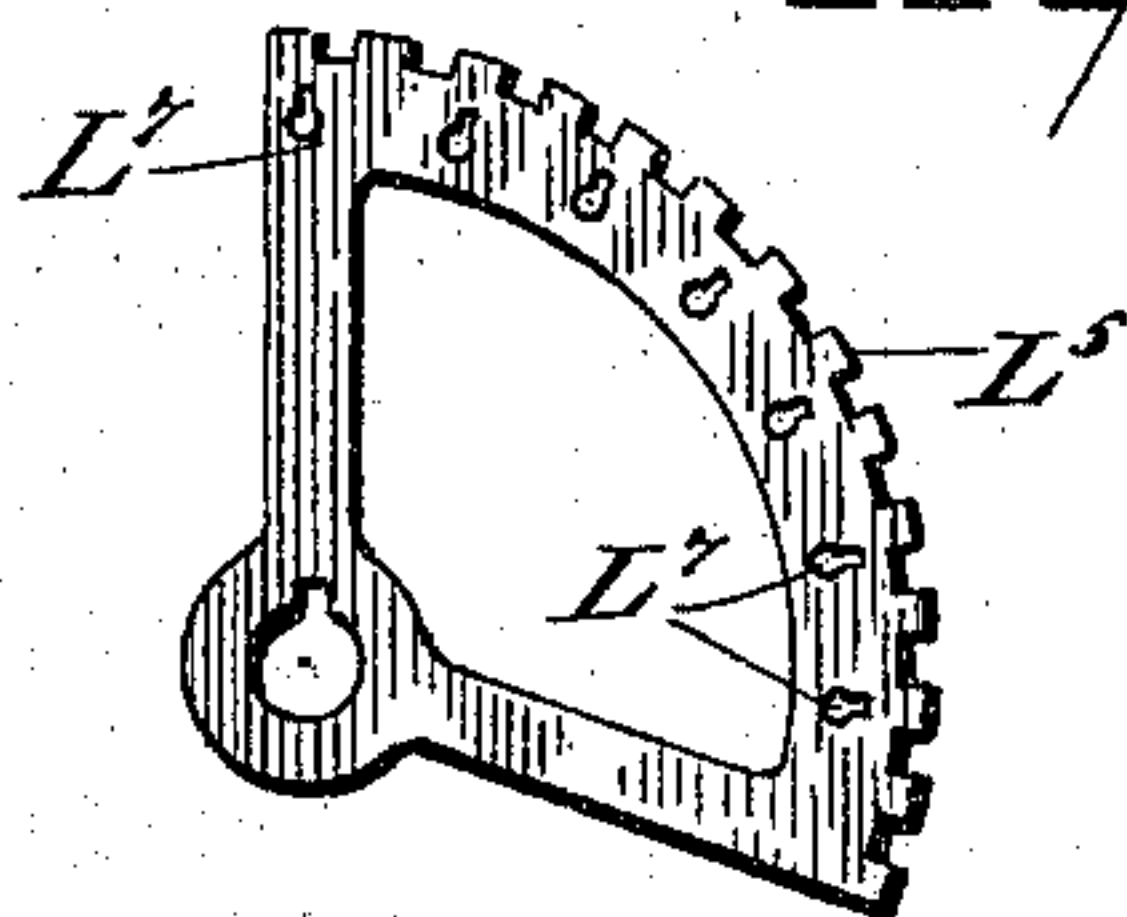


Fig 12

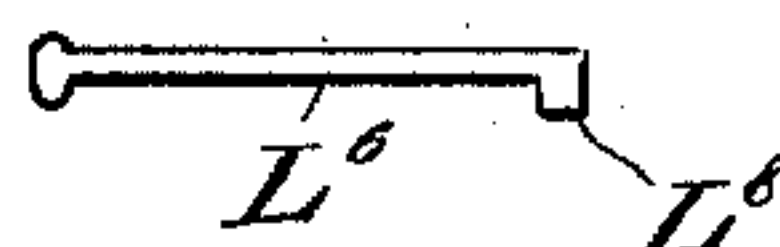


Fig 13

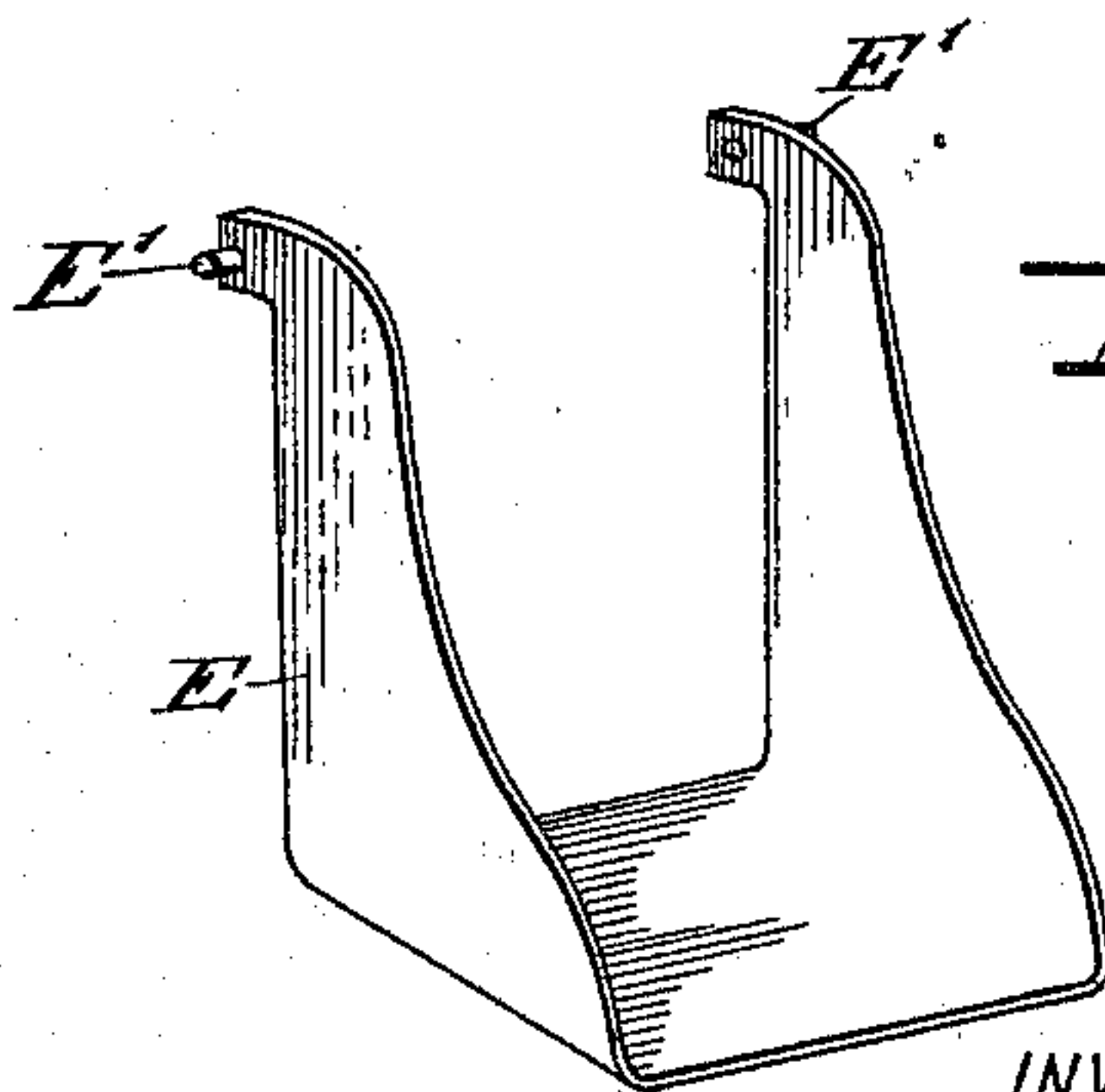
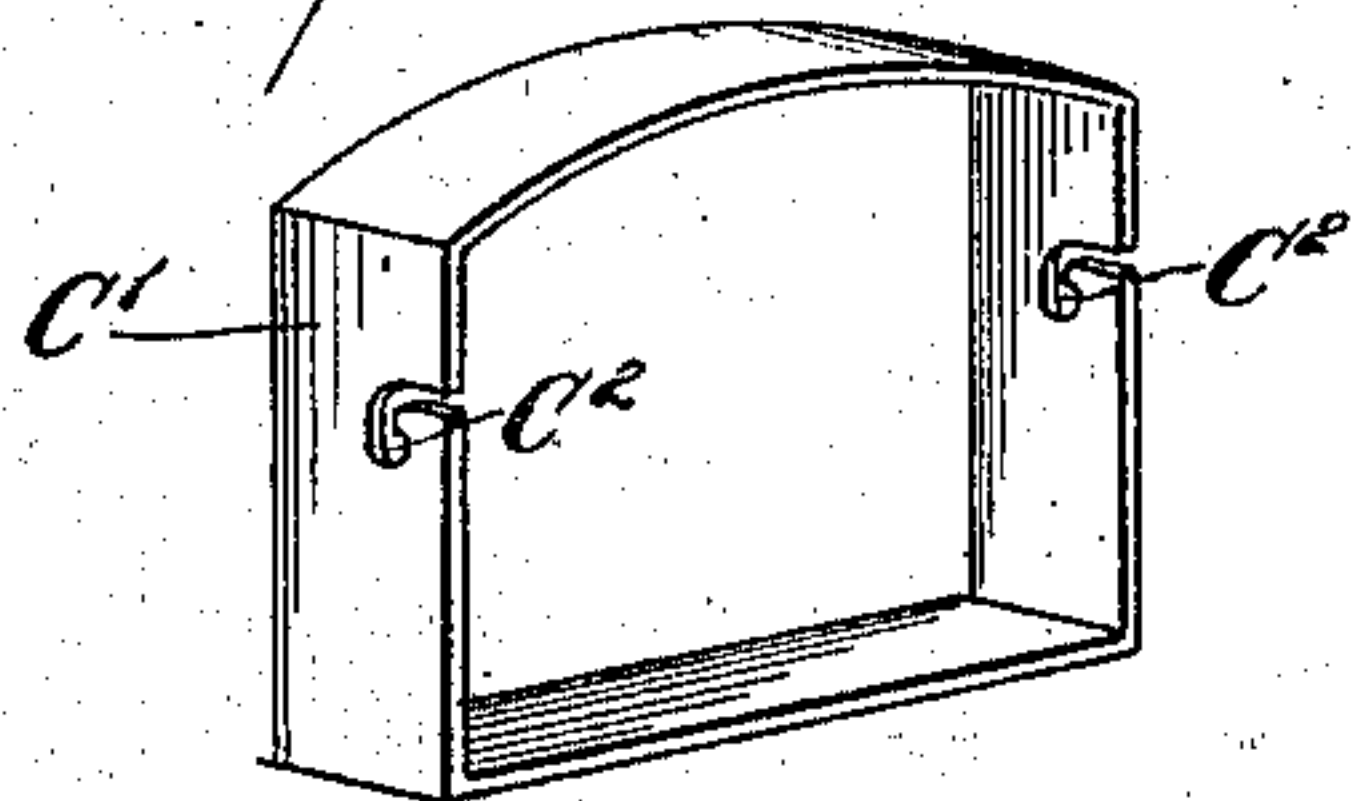


Fig 14

WITNESSES:

H. Walker

Wm. G. Foster

INVENTOR

Richard D. Martin.

BY

Mum
ATTORNEYS

UNITED STATES PATENT OFFICE.

RICHARD DANIEL MARTIN, OF ALDERSON, INDIAN TERRITORY.

DRAWING-MACHINE FOR COKE-OVENS.

SPECIFICATION forming part of Letters Patent No. 681,064, dated August 20, 1901.

Application filed September 27, 1900. Serial No. 31,299. (No model.)

To all whom it may concern:

Be it known that I, RICHARD DANIEL MARTIN, a citizen of the United States, and a resident of Alderson, Choctaw Nation, Indian Territory, have invented a new and Improved Drawing-Machine for Coke-Ovens, of which the following is a full, clear, and exact description.

The invention relates to coke-ovens; and its objects are to provide a new and improved drawing-machine arranged to readily remove the products from the coke-oven, to separate the ashes from the coke, and to deliver the same in separate heaps at one side of the machine.

The invention consists of novel features and parts and combinations of the same, as will be fully described hereinafter and then pointed out in the claims.

A practical embodiment of the invention is represented in the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the views.

Figure 1 is an end elevation of the machine as applied to a coke-oven, shown in section. Fig. 2 is an enlarged plan view of the improvement. Fig. 3 is a transverse section of the same on the line 3 3 in Fig. 2. Fig. 4 is a sectional side elevation of the same on the line 4 4 in Fig. 3. Fig. 5 is a perspective view of the device for moving the scraper sidewise. Fig. 6 is a plan view of the notched segment for locking the said device in position. Fig. 7 is an enlarged transverse section of the scraper and adjacent parts. Fig. 8 is an enlarged face view of the centrifugal clutch. Fig. 9 is a side elevation of the device for swinging the scraper into a normal position. Fig. 10 is a plan view of the same with part in section. Fig. 11 is a face view of the quadrant for locking the said scraper-swinging device in position. Fig. 12 is a like view of the locking-key for the quadrant. Fig. 13 is a perspective view of the coke-oven door-casing, and Fig. 14 is a like view of the chute for a dumping attachment to the door-casing to deliver the products of the oven to the elevator.

The improved drawing-machine is mounted on a flat railroad-car A, mounted to travel on rails B, arranged in front of a coke-oven C,

from which the products are removed at the proper time by a scraper D through the coke-oven door-casing C' over a chute E into an inclined elevator F, having its outer upper portion formed with a grate F' for separating the ashes from the coke and causing the ashes and coke to fall in separate heaps at one side of the track B.

In order to give the desired movement to the scraper D and to move the railroad-car A along the rails B from one coke-oven to the other, a reversing-engine G is employed, mounted on the car A and carrying on its driving-shaft G' a sprocket-wheel H, over which passes a sprocket-chain H', also passing over a sprocket-wheel H², secured on one end of a shaft H³, extending longitudinally on the car A and journaled in suitable bearings therein. On the shaft H³ is secured a bevel gear-wheel H⁴ in mesh with a bevel gear-wheel H⁵, secured on the lower end of a shaft I, set at its lower end in a step I', fulcrumed loosely on the shaft H³ to permit the shaft I to swing up or down at a right angle to the shaft H³. The upper end of the shaft I is adapted to be journaled in a bearing I², arranged for convenient opening to disengage the shaft I whenever it is desired to give a swinging motion to the said shaft, as before mentioned. The bearing I² is held on an arm A² of a post A', and said upper end of the shaft I is also engaged by one end of a chain I³, fastened to the arm A², to limit the swinging motion of the shaft I. On the free end of the arm A² is secured a transversely-extending notched beam A³, engaged by a similarly-notched beam A⁴, adapted to abut against the outer face of the coke-oven C, so as to steady the machine during the time the scraper D is in operation, as hereinafter more fully described.

On the shaft I is secured a bevel gear-wheel J (see Fig. 4) in mesh with a bevel gear-wheel J', secured on one end of a shaft J², journaled at one end in a bearing J³, mounted to swing loosely on the shaft I, so that the shaft J² can swing at a right angle to the shaft I and in a horizontal plane when the shaft I is in a vertical position—that is, stepped in the step I' and journaled in the bearing I². The shaft J² forms the fulcrum for the scraper-guideway D', Fig. 2, and the outer

end of said shaft is journaled in a block J⁴, supported by an arm J⁵, mounted loosely on the shaft I by means of an eye J⁶, secured on the arm J⁵ and resting on a collar I⁴, fastened on the shaft I, as will be readily understood by reference to Fig. 4. The block J⁴ is provided on its lower end with a flange J⁷, on which is formed a block J⁸, carrying a handle J⁹, adapted to be taken hold of by the operator to impart movement to said block J⁸, and thereby swing the shaft J² around with the shaft I as the fulcrum. The block J⁸ is provided with teeth J¹⁰, adapted to engage a fixed notched segment A⁷ for normally locking the block J⁸ and the block J⁴ in position, said notched segment A⁷ being supported by brackets A⁵, carried on a post A⁶, secured to the platform of the car A. When it is desired to swing the shaft J² around, as previously mentioned, it is necessary for the operator to swing the handle J⁹ upward, so as to disengage the teeth J¹⁰ from the segment A⁷, and by the operator thus pressing the handle J⁹ sidewise a similar movement is given to the block J⁴ to impart a swinging motion to the shaft J² with the shaft I as the fulcrum.

The scraper-guideway D', previously mentioned, is preferably made of two angle-irons (see Fig. 7) suitably spaced apart and rigidly connected with each other by transverse staybolts D², and the scraper-beam D³ is mounted to slide in said scraper-guideway D' and is likewise made of two angle-irons spaced apart and rigidly connected with each other by staybolts D⁴. Friction-rollers D⁵ are journaled at one end of the scraper-beam D³ and travel on the under side of the guideway D' to reduce friction to a minimum, and on the forward end of said scraper-beam D³ is fastened a head D⁶, on which is fulcrumed the head D⁷ of the scraper-blade D⁸, adapted to engage the material in the coke-oven and move the same transversely in the same toward and through the door-casing C' upon and down the chute E. When the scraper-beam D³ moves inward, the scraper-blade D⁸ swings into an inclined position, so as to readily pass over the material in the coke-oven, and when the beam reaches an innermost position and is somewhat elevated then the blade D⁸ swings into its forward vertical position, and when the scraper-beam D³ is moved outward, with the lower end of the scraper-blade in contact with the material in the coke-oven, then the head D⁷ abuts against the head D⁶, so as to hold the scraper-blade D⁸ against rearward swinging movement—that is, in an approximately right-angular position to the scraper-beam D³. (See Fig. 1.) The outer end of the scraper-beam D³ is rigidly connected by a block D⁹ with the lower run of an endless sprocket-chain K in mesh with a sprocket-wheel K', secured on the shaft J², so that when the latter is rotated in one direction and a corresponding traveling motion is given to the sprocket-chain K then the scraper-beam D³ is moved in its guideway D' in an

inward direction, and when the engine G is reversed and the shaft J² is turned in the opposite direction then the sprocket-chain K likewise moves in an opposite direction to move the scraper-beam D³ in an outward direction for moving the material in the coke-oven through the door-casing upon and over the chute E to the elevator F, as above explained. The sprocket-chain K passes loosely at its ends over rollers K², journaled in the guideway D', and friction-rollers K³ engage the top run of said sprocket-chain K to hold said top run in mesh with the sprocket-wheel K'. The sprocket-wheel K' is flanked by loose pulleys K⁴ to carry the side links of the sprocket-chain K and relieve the said sprocket-wheel K' of undue strain from said sprocket-chain K. The scraper-guideway D' is reinforced at its fulcrum—that is, at the shaft J²—by an inverted-U-shaped band Q, Fig. 3, having longitudinally-extending braces Q' reaching from the band lengthwise to the sides of the guideway D'.

The elevator F, into which the coke material is passed from the oven C, as previously explained, is provided with an elevator-frame having a bottom F² and slats F³, moving over the said bottom, to elevate the material as the latter is discharged by the chute E upon the said bottom. The slats F³ are secured on sprocket-chains F⁴, passing at their upper ends over sprocket-wheels F⁵, mounted on a shaft journaled in suitable bearings on the upper outer end of the elevator-frame, and the lower ends of the said sprocket-chains F⁴ pass over sprocket-wheels F⁶, secured on a shaft F⁷, extending longitudinally of the car above the platform thereof. On the shaft F⁷ is secured a spur-wheel F⁸ in mesh with a spur-wheel F⁹, mounted to rotate loosely on the shaft H³ and adapted to be engaged at the inner face of its rim by weights N, in the form of disks, pivoted to the arms of a spider N', fastened on the shaft H³. When the latter is rotated in one direction, the weights N swing outward in frictional contact with the rim of the gear-wheel F⁹ to turn the latter in the direction in which the shaft is rotated; but when the engine is reversed and the shaft H³ turns in the opposite direction then the weights N simply glide over the rim of the gear-wheel F⁹ without turning the same. Thus during the forward running of the engine the shaft F⁷ is at a standstill, and only when the engine is reversed is said shaft F⁷ rotated to give a traveling motion to the slats F³ of the elevator F and move the previously-deposited material from the coke-oven up the bottom F² to separate the coke from the ashes at the grate F' and to discharge the coke at the end of the grate F' at one side of the machine, but in a heap separate from that of the ashes.

In order to move the car A along the track B to bring the scraper to the oven for removing the contents thereof, I provide the following device: The shaft O, extending trans-

versely of the car-platform and journaled in suitable bearings therein, is provided with a shifting collar O', engaged by a shifting fork O², connected by a link O³ with a hand-lever O⁴ under the control of the operator and adapted to be locked on a segment O⁵, carried on the car-platform. On the shaft O is secured a bevel-pinion O⁶ and a spur-wheel O⁷, of which the bevel-pinion O⁶ is adapted to mesh with the bevel gear-wheel H⁴ at the time the shaft O is moved outward by the operator manipulating the lever O⁴ accordingly, so that when the engine G is in motion the rotary motion given to the shafts H³ and I causes a rotary motion of the bevel gear-wheels H⁴ and O⁶, so that the shaft O is rotated, and with it the spur-wheel O⁷. The latter upon the rotation of the shaft O is moved in gear with a gear-wheel O⁸ on one of the axles of the railroad-car, so that a traveling motion is given to the car during the time the bevel gear-wheel O⁶ is in mesh with the bevel gear-wheel H⁴. When the car has reached the desired position in front of an oven, then the operator shifts the lever O⁴ to move the shaft O back to its former normal position—that is, to move the bevel gear-wheel O⁶ out of mesh with the bevel gear-wheel H⁴, so that the rotary motion of the latter does not rotate the shaft O and the gear-wheels O⁷ O⁸. The door-casing C' of the coke-oven is provided in its sides with bayonet-slots C², adapted to be engaged by pins E' on the chute E, so that the latter can be readily attached to or detached from the door-casing for the purpose mentioned.

It is understood that in order to reach the material in any part of the oven it is necessary for the operator to manipulate the handle J⁹ to swing the shaft J², and with it the scraper D, in a horizontal plane, and in order to swing said scraper up or down to bring the scraper-blade D⁸ in proper relation to the material in the oven I provide the following device: A chain L is secured to the scraper-guideway D' at one side of the shaft J², and this chain L is secured to and winds on a pulley L', loosely journaled in the horizontal plane of the rod J⁵. (See Figs. 1, 2, 3, 4, 9, and 10.) On the pulley L' is secured a handle L², adapted to be taken hold of by the operator to turn the pulley L' and wind up or unwind the chain L, according to the desired inclination to be given to the scraper-guideway D' and its beam D³. On the handle L² is pivoted a hand-lever L³, connected with a spring-pressed pawl L⁴, adapted to engage a notched segment L⁵, secured on the horizontal member of the rod J⁵, so as to lock the handle L², and with it the pulley L', in position after the desired inclination is given to the scraper D. In case the pawl L⁴ fails to engage the notched segment L⁵ the scraper is prevented from dropping by an auxiliary locking device in the form of a key L⁶, (see Fig. 12,) adapted to be inserted in one of a series of keyholes L⁷ in the notched segment

L⁵, as is plainly shown in Fig. 11. The bit L⁸ of the key prevents the latter from accidentally disengaging the segment, it being understood that the key is turned after insertion to bring the bit out of register with the keyhole.

When it is desired to move the machine from one coke-oven to another, the beam D³ is moved outward in the guideway D' to its full extent, and in order to withdraw the forward end of the guideway D' and the blade D³ from the oven it is necessary to swing the shaft I outward, and for this purpose the bearing I² is opened to allow the shaft I to swing forward, and with it the scraper, so as to disengage the same wholly from the coke-oven and allow of moving the car-platform along to the next oven. When the next oven is reached, the shaft I is swung back to its former position, and then the bearing I² is closed and the engine is again started to move the beam D³ outward on the guideway D' to carry the scraper-blade D⁸ into the oven to engage the material and to be then moved outward to scrape the material through the door-casing C' over the chute E upon the elevator F. During this outward movement of the scraper-blade D⁸ the elevator is at a standstill, and when the engine is reversed to move the scraper-beam again inward in the oven the elevator is set in motion by the action of the centrifugal clutch (shown in Fig. 8) to elevate the previously-discharged material and to separate the ashes from the coke and cause the coke to drop off the elevator-frame at one side of the track B.

On the bottom of the scraper-guideway D', near the outer end thereof, is fulcrumed a lever P for manually moving the scraper-beam D³ outward at the time the scraper is to be passed into a coke-oven, it being understood that this lever P extends across the path of the scraper-beam and the latter abuts on the lever at the time the beam is completely telescoped in the guideway. When the scraper-beam is in this position, the sprocket-chain sections D¹¹ and D¹² are on the sprocket-wheel K', and even if the latter were now rotated it would not impart motion to the sprocket-chain and the scraper-beam. Hence the latter is first shifted manually by the lever P, and in doing so the sprocket-chain is caused to travel a distance to bring the non-active links D¹¹ D¹² away from the sprocket-wheel K' and to move the active links of the sprocket-chain in mesh with the teeth of the sprocket-wheel K', so that when the latter is subsequently rotated the scraper-beam is caused to slide by power in its guideway in a forward-and-backward direction, according to the direction in which the engine G is running.

The operation is as follows: When the car A has been moved in position in front of a coke-oven and the shaft I is swung back into a vertical position, then the scraper-blade D⁸, the front end of the scraper-beam D³, and that

of the guideway D' extend through the door-casing C' into the coke-oven, and the operator now moves the lever P and brings the chain K in mesh with the sprocket-wheel K', as above explained. The operator now manipulates the starting and reversing lever G² of the engine G to run the latter forward, so that by the gearing described a traveling motion is given to the chain K and to the scraper-beam D³ to move the scraper-blade D⁸ inward, the latter dragging over the contents of the oven by the blade assuming an inclined position. When the blade D⁸ has moved the desired distance into the oven, the operator reverses the lever G² to cause the engine to run in a reverse direction, and thereby move the scraper-beam D³ and scraper-blade D⁸ outward, it being understood that on the beginning of the return movement the scraper-blade assumes an approximately vertical position to draw the material in front of it toward and through the door-casing and over the chute E upon the elevator F. When the scraper-beam D³ has reached the end of its outward stroke, the operator again manipulates the lever G² to run the engine forward and to return the scraper-blade to an innermost position. The above-described operation is then repeated as often as necessary in the oven, it being understood that the guideway D' is set at such inclination by means of the chain L, the handle L², and the locking device therefor that the lower edge of the scraper-blade can pass to the bottom of the oven. After a passage is formed the operator by manipulating the handle J⁹, as above described, swings the guideway D', and with it the scraper-beam D³ and blade D⁸, to one side, and then the above-described operation is repeated—that is, the scraper-beam is caused to travel alternately inwardly and outwardly to clear the sides of the oven of the coke material. The material discharged into the elevator is elevated during the inward movement of the scraper-beam, as above explained, so that the lower portion of the elevator is free of material on the next outward stroke of the beam and readily receives a new charge to be elevated. When an oven has been cleaned, the scraper-beam D³ is moved completely outward in its guideway, and then the bearing I² is opened to permit of swinging the shaft I, and with it the scraper D, transversely to move the scraper-blade and the ends of the scraper-beam and scraper-guideway out of the oven C. The car is now propelled to move the machine to another oven for cleaning the same of its contents, as above described.

60 Having thus fully described my invention, I claim as new and desire to secure by Letters Patent—

1. A drawing-machine having a scraper, provided with a scraper beam and blade having a reciprocating movement, a shaft on which said scraper is fulcrumed to swing up and down, a second shaft on which the first-

mentioned shaft is mounted to swing in a horizontal plane, a main or driven shaft on which the said second shaft is mounted to swing in a vertical plane, and gearing between the said shafts for the purpose set forth. 70

2. A drawing-machine having a scraper, comprising a scraper-guideway, a scraper-beam mounted to slide thereon, a scraper-blade hung on said beam, a horizontally-arranged shaft on which said guideway is fulcrumed to swing up and down, means for actuating the scraper-beam from said shaft, a vertical shaft on which one end of said horizontal shaft is fulcrumed, whereby the said horizontal shaft and the guideway may be swung laterally, gearing between the said shafts, and a shaft arranged to drive the said vertical shaft and on which the latter is mounted to swing as set forth. 80 85

3. A drawing-machine having a scraper, comprising a scraper-guideway, a scraper-beam mounted to slide thereon, a scraper-blade hung on said beam and having a limited swinging motion, a vertical shaft on which said scraper is mounted to swing laterally, the said shaft being fulcrumed at one end and detachably held at the other end, means for rotating the said shaft, and means for imparting a reciprocating movement to the scraper-beam from said shaft, as set forth. 90 95

4. A drawing-machine, comprising a scraper, a horizontally-arranged shaft on which said scraper is fulcrumed to swing up and down, a vertically-arranged shaft mounted to swing up and down and carrying the said fulcrum-shaft of the scraper, a driving connection between the shafts, and means for driving the said vertically-arranged shaft, as set forth. 100 105

5. A drawing-machine having a scraper, a vertically-arranged shaft on which said scraper is mounted to swing laterally, the said scraper being also mounted to swing up and down and provided with a scraper beam and blade, means for actuating the scraper-beam from said shaft, and a shaft arranged to drive the said vertically-arranged shaft and on which the lower end of the latter is fulcrumed as set forth. 110 115

6. A drawing-machine, having a scraper comprising a scraper-guideway mounted to swing up and down, a scraper-beam mounted to slide on said guideway, a scraper-blade hung on said beam, a vertically-arranged shaft on which said guideway is mounted to swing laterally, means for laterally swinging the guideway on said shaft, means for driving the scraper-beam from said shaft, a shaft geared with the vertically-arranged shaft and on which one end of the latter is fulcrumed, the other end of said vertically-arranged shaft being detachably supported, so that the said shaft can be swung on its fulcrum, as set forth. 120 125 130

7. A drawing-machine having a scraper comprising a scraper-guideway, a scraper-beam mounted to slide thereon, a scraper-

blade hung on said beam, said guideway being mounted to swing up and down, means for adjusting the inclination of the guideway, a shaft on which said guideway is mounted to swing laterally, a shaft gearing with the first-mentioned shaft and on which the lower end of the latter shaft is fulcrumed, the upper end of said shaft being journaled in a bearing arranged to be opened to disengage the shaft, whereby said shaft may be swung on its fulcrum to move the guideway and the scraper-beam bodily, and means for imparting a reciprocating movement to the scraper-beam, as set forth.

8. A drawing-machine comprising a car, an engine thereon, a scraper mounted on the car and adapted to be set in motion from the said engine to draw the material out of the oven, an elevator on said car and upon which passes the material drawn by the scraper out of the oven, and means for actuating the elevator on the return or inward stroke of the scraper, the said means comprising a shaft connected with the elevator to drive the same and provided with a spur-wheel, and a second shaft provided with a spur-wheel mounted to rotate loosely on the shaft and in mesh with the first-mentioned spur-wheel, and means for locking said spur-wheel to the said second shaft when the latter is rotated in one direction, as set forth.

9. A drawing-machine, comprising a car, an engine thereon, a scraper mounted on the car and adapted to be set in motion from the said engine to draw the material out of the oven, an elevator on said car and upon which passes the material drawn by the scraper out of the oven, a chute leading from the oven-door casing to said elevator, and means for removably connecting the said chute with the oven-door casing as set forth.

10. A drawing-machine having a scraper comprising a scraper-guideway, a scraper-beam mounted to slide thereon, a scraper-blade hung on said beam, an endless chain mounted to travel in a forward and backward direction and arranged in said guideway and directly connected with the scraper-beam, a shaft on which the scraper-guideway is fulcrumed to swing up and down, means for operating the endless chain from said shaft, a second shaft geared with the first-mentioned shaft and on which one end of said first-mentioned shaft is fulcrumed, a main or driven shaft geared with the said second shaft and on which the latter is mounted to swing, and means for moving the scraper-beam manually in an outward direction, for the purpose set forth.

11. A drawing-machine comprising a scraper, a shaft on which the scraper is fulcrumed, means for actuating the scraper from said shaft, a second shaft geared with and standing at an angle to the first-named shaft and on which the latter is mounted to swing as a fulcrum, means for swinging the said first-mentioned shaft and with it the scraper, a

locking device for said means, and a driven shaft geared with the said second shaft and on which the latter is mounted to swing, as set forth.

12. A drawing-machine, comprising a scraper, a shaft on which the scraper is fulcrumed, means for actuating the scraper from the said shaft, a second shaft geared with and standing at an angle to the first-named shaft and on which the latter is mounted to swing as a fulcrum, and a main or driven shaft geared with the said second shaft and on which the latter is mounted to swing as a fulcrum, as set forth.

13. A drawing-machine, comprising a scraper, a shaft on which the scraper is fulcrumed, means for actuating the scraper from the said shaft, a second shaft geared with and standing at an angle to the first-named shaft and on which the latter is mounted to swing as a fulcrum, a main or driven shaft geared with the said second shaft and on which the latter is mounted to swing as a fulcrum, and means for limiting the swinging motion of the said second shaft, as set forth.

14. A drawing-machine, comprising a scraper, a shaft on which the scraper is fulcrumed, means for actuating the scraper from said shaft, a second shaft geared with and standing at an angle to the first-named shaft and on which the latter is mounted to swing as a fulcrum, and means for manually swinging the said second shaft and with it the scraper, as set forth.

15. A drawing-machine, comprising a scraper, a shaft on which the scraper is fulcrumed, means for actuating the scraper from said shaft, a second shaft geared with and standing at an angle to the first-named shaft and on which the latter is mounted to swing as a fulcrum, means for manually swinging the said second shaft and with it the scraper, and a locking device for the said means, as set forth.

16. A drawing-machine, comprising a scraper-beam, a guideway on which said beam is mounted to slide, a shaft on which the scraper-guideway is fulcrumed, means for actuating the scraper-beam from the said shaft, to reciprocate the same, a second shaft geared with and standing at an angle to the first-named shaft and on which the latter is mounted to swing as a fulcrum, to move the said scraper-guideway and scraper in a horizontal plane, means for swinging the first-mentioned shaft on the second shaft and means for rotating the said second shaft in a forward and backward direction, as set forth.

17. A drawing-machine, comprising a scraper proper, a guideway for said scraper, a shaft on which the guideway is fulcrumed, to move up and down, means for actuating the scraper from the said shaft, a second shaft geared with and standing at an angle to the first-mentioned shaft and on which the latter is mounted to swing as a fulcrum, means for swinging the said shaft on said fulcrum,

means for moving the scraper-guideway on its fulcrum to raise and lower the scraper proper, and means for rotating the second shaft in a forward and back direction as set forth.

5 18. A drawing-machine having a scraper, comprising a scraper-guideway, a scraper-beam mounted to slide thereon, a scraper-blade hung on said beam, an endless chain mounted to travel in a forward and backward
10 direction, and arranged in the said guideway and directly connected with the said scraper-beam, means, substantially as described, for imparting a forward and backward traveling motion to the said chain, said chain having
15 non-active sections, and a driven sprocket-wheel for engaging the said chain, as set forth.

19. A drawing-machine having a scraper, comprising a scraper-guideway, a scraper-beam mounted to slide thereon, a scraper-
20 blade hung on said beam, an endless chain mounted to travel in a forward and backward direction, and arranged in the said guideway and directly connected with the said scraper-beam, means, substantially as described, for
25 imparting a forward and backward traveling motion to the said chain, said chain having non-active sections, a driven sprocket-wheel for engaging the said chain, and a lever on the guideway, for moving the said scraper-
30 beam manually, and moving the non-active sections out of mesh with the sprocket-wheel, as set forth.

20. A drawing-machine, comprising a scraper, a shaft on which the scraper is ful-
35 crumed, means for rotating said shaft, means for actuating the scraper from said shaft, a chain connected with the scraper at one side of the shaft, a pulley carrying the said chain, a handle on the said pulley for turning the
40 latter, and a locking device for said handle, as set forth.

21. A drawing-machine having a scraper mounted to swing, a chain connected with the scraper at one side of its fulcrum, a pulley
45 carrying the said chain, a handle on the said pulley, for turning the latter, and a locking device for said handle, said locking device comprising a hand-lever, a pawl and a notched segment, and a key for insertion in the
50 notched segment, to limit the swinging motion of the handle, as set forth.

22. A drawing-machine comprising a scraper, a shaft on which the scraper is ful-
55 crumed, means for actuating the scraper from said shaft, a second shaft geared with and standing at an angle to the first-named shaft and on which one end of said first-named shaft is mounted to swing, a block in which the outer end of said first-named shaft is
60 journaled an arm supporting said block and having a vertical member connected at its lower end to said block and a horizontal member mounted loosely at its end on the said second shaft, means for moving the said block
65 to impart a swinging motion to the said first-

named shaft and the scraper, and a locking device for the said means, as set forth.

23. A drawing-machine comprising a scraper, a shaft on which the scraper is ful-
70 crumed, means for actuating the scraper from said shaft, a second shaft geared with and standing at an angle to the first-named shaft and on which one end of said first-named shaft is mounted to swing, a block in which the other end of said first-named shaft is
75 journaled, an arm supporting said block and having a vertical member connected to the block and a horizontal member mounted loosely at its end on the said second shaft, means for moving the said block to impart a
80 swinging motion to the said first-named shaft and the scraper, a pulley mounted to turn on the horizontal member of the said arm, and a chain connected with the scraper at one side of its fulcrum and carried by the said pulley,
85 as set forth.

24. A drawing-machine, comprising a scraper-guideway, a scraper-beam mounted to slide on said guideway, a horizontally-
90 arranged shaft on which the scraper-guideway is fulcrumed to swing up and down, means for reciprocating the scraper-beam from said shaft, a vertically-arranged shaft to which the first-mentioned shaft is geared and on which it is mounted to swing, a longitudi-
95 nally-extending shaft geared with the said vertically-arranged shaft, and having a step fulcrumed thereon, and in which the said vertically-arranged shaft is set, and means for driving the said longitudinally-extending
100 shaft, as set forth.

25. In a drawing-machine, a car, an engine thereon, a shaft extending longitudinally of the car and journaled in bearings carried thereby, the said shaft being driven from the
105 engine-shaft, a vertically-arranged shaft set at its lower end in a step fulcrumed loosely on the first-mentioned shaft, a bearing in which the upper end of said shaft is removably secured, so that said shaft can be swung
110 up and down on its fulcrum, gearing between the said shafts, a scraper having a guideway and a scraper-beam mounted to slide on said guideway, a shaft on which the scraper-guideway is fulcrumed to swing up and down,
115 the latter shaft being mounted at one end to swing on the vertically-arranged shaft and geared thereto, means for reciprocating the scraper-beam from the shaft on which the guideway is fulcrumed, an elevator on said
120 car, and means for actuating the elevator on the return or inward stroke of the scraper, as set forth.

In testimony whereof I have signed my name to this specification in the presence of
125 two subscribing witnesses.

RICHARD DANIEL MARTIN.

Witnesses:

F. L. WATSON,
GEO. HUDSON.