

No. 804,670.

PATENTED NOV. 14, 1905.

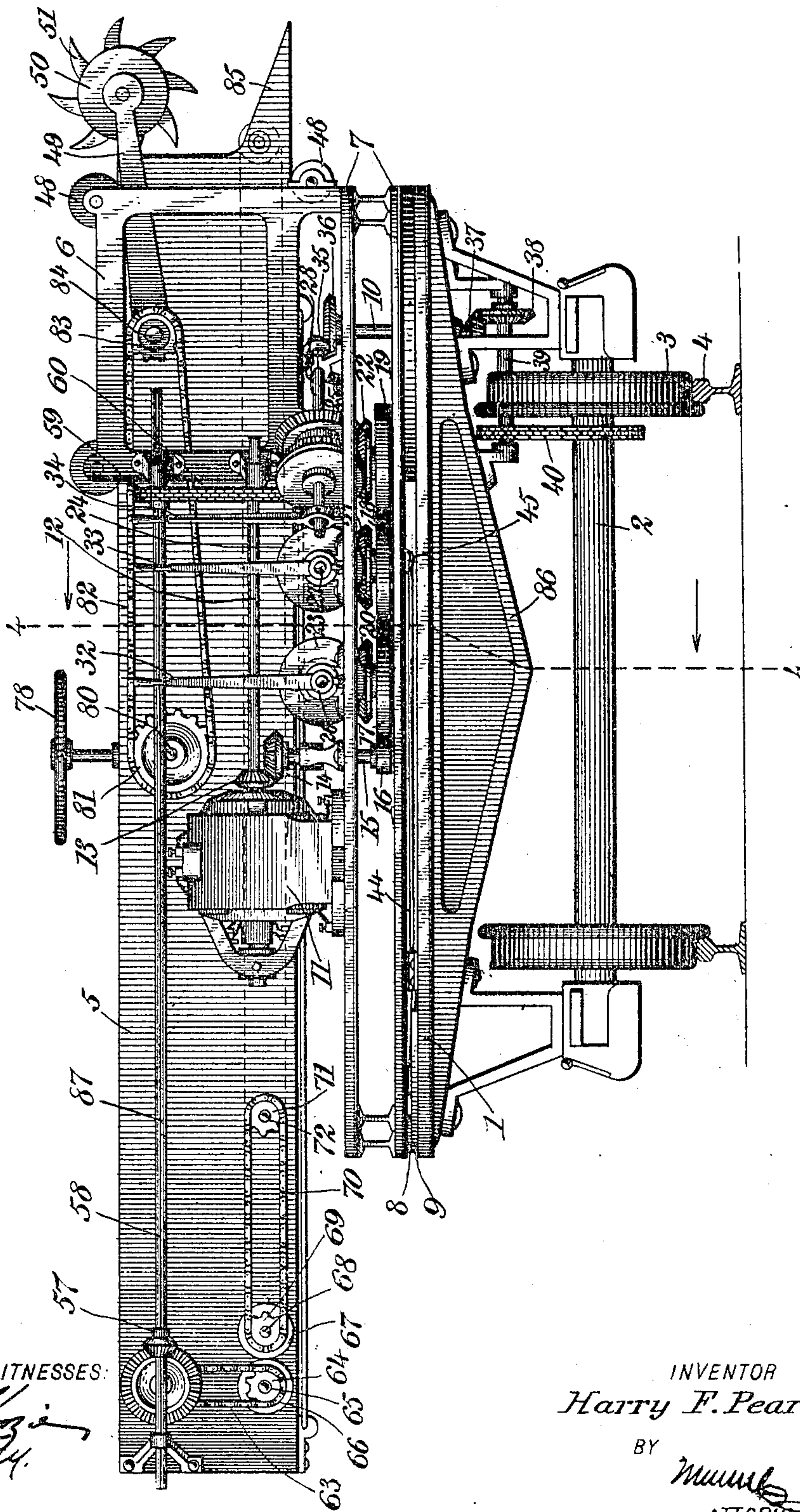
H. F. PEARSON.

COKE PULLER.

APPLICATION FILED FEB. 26, 1904.

4 SHEETS—SHEET 1.

Fig. 1.



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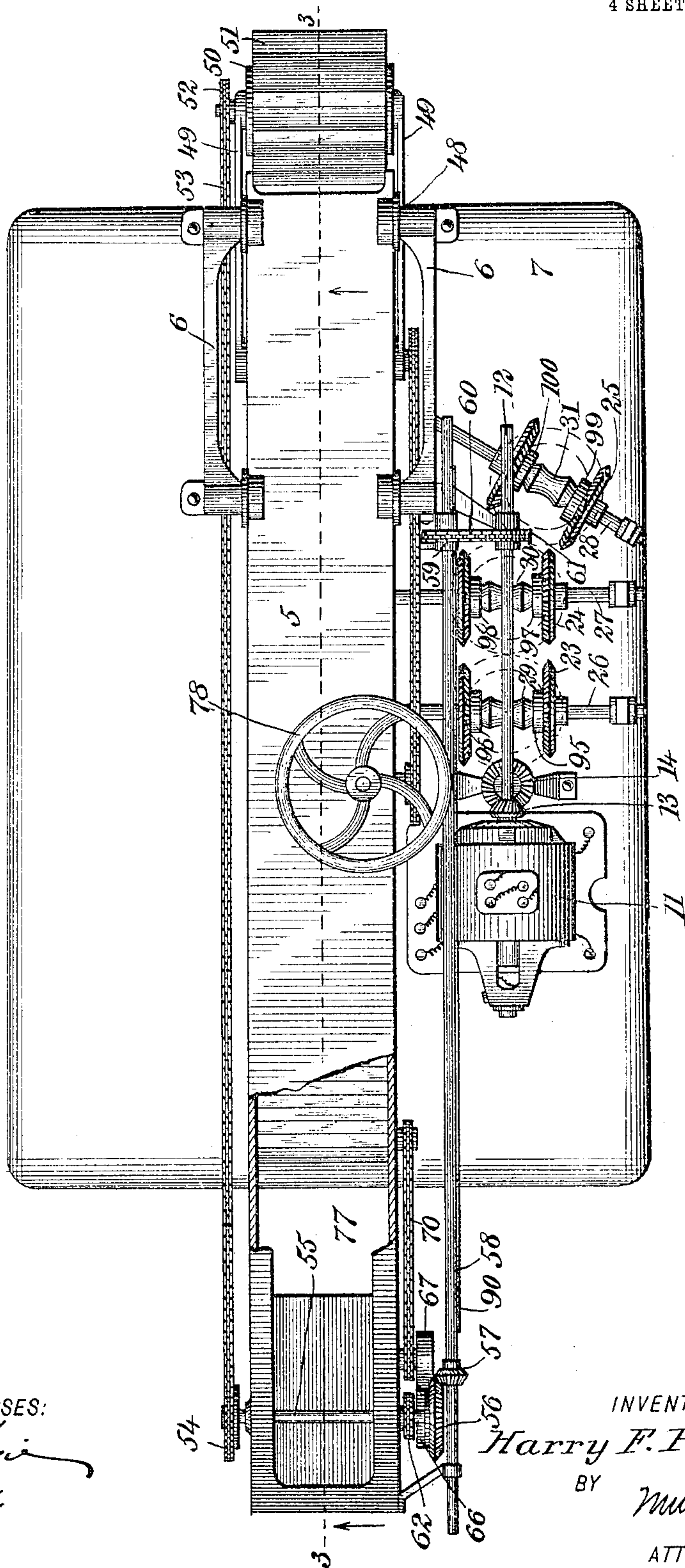
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4 SHEETS—SHEET 2.

Fig. 2.



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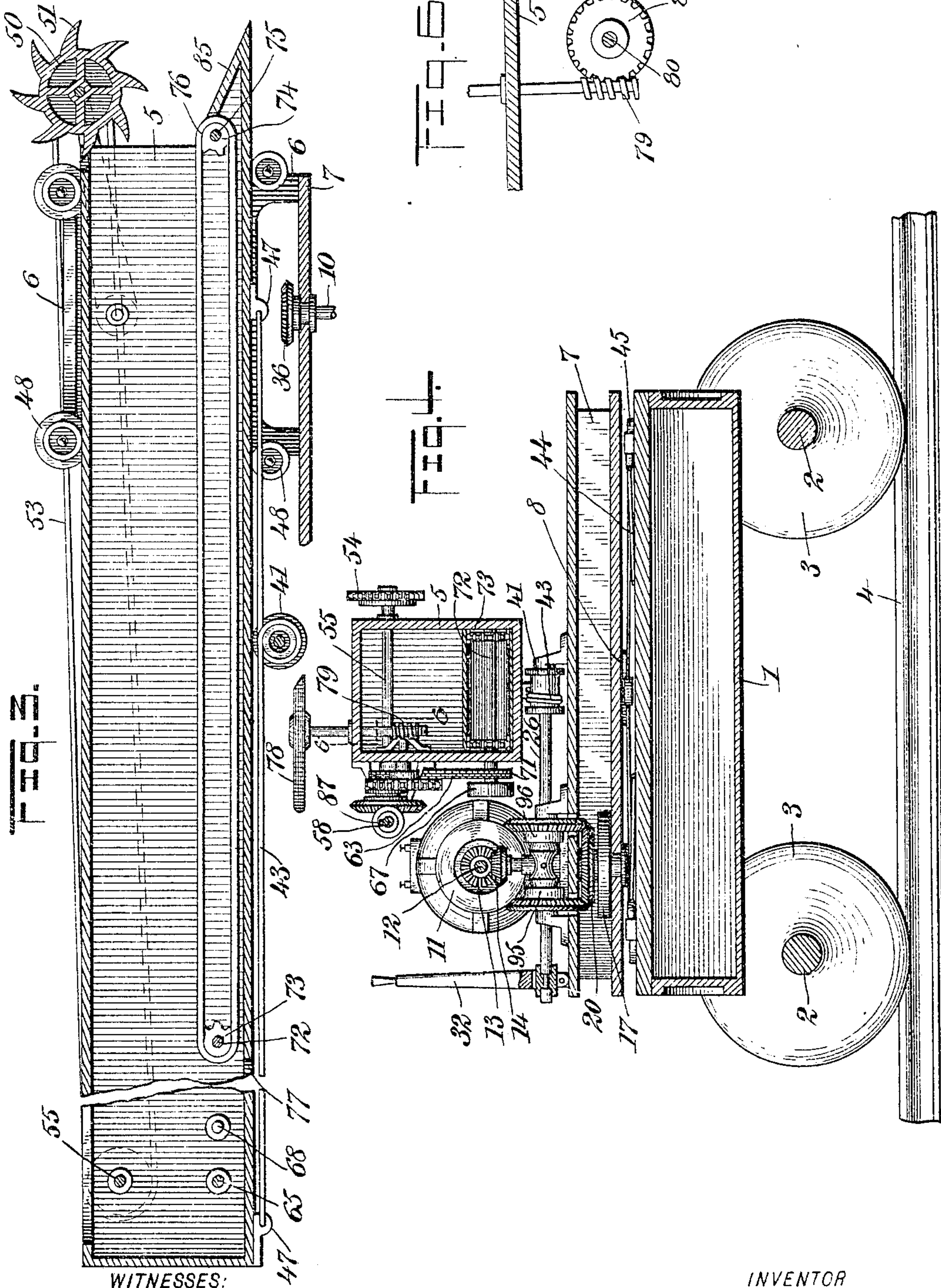
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APPLICATION FILED FEB. 25, 1904.

4 SHEETS—SHEET 3.



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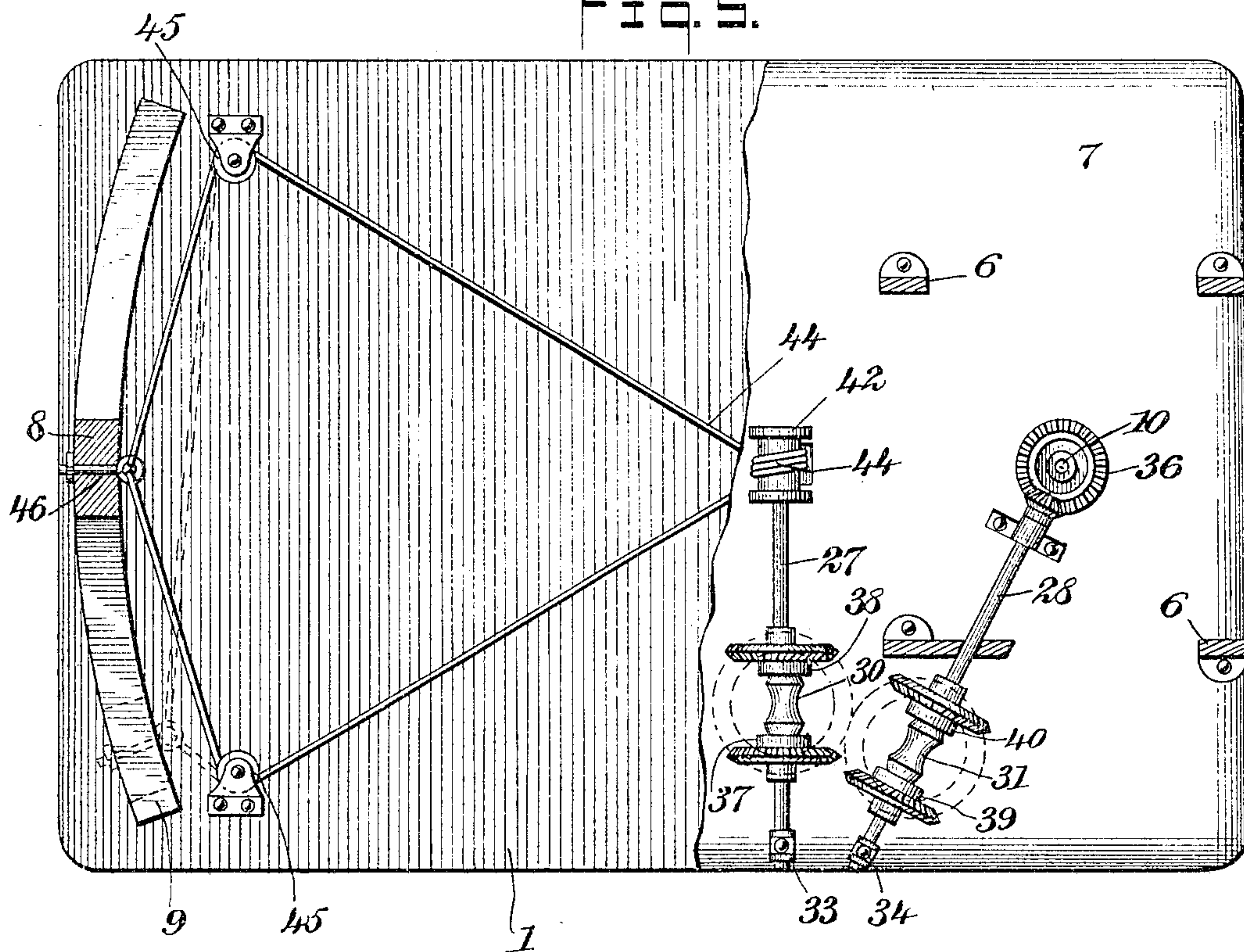
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APPLICATION FILED FEB. 25, 1904.

4 SHEETS—SHEET 4.

FIG. 5.



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# UNITED STATES PATENT OFFICE.

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## COKE-PULLER.

No. 804,670.

Specification of Letters Patent.

Patented Nov. 14, 1905.

Application filed February 25, 1904. Serial No. 195,179.

*To all whom it may concern:*

Be it known that I, HARRY FRANCIS PEARSON, a citizen of the United States, and a resident of Redstone, in the county of Pitkin and State of Colorado, have invented a new and Improved Coke-Puller, of which the following is a full, clear, and exact description.

My invention relates to apparatus for breaking and removing frangible material from any position and for loading it thereafter; and it is especially adapted for use in pulling coke from the ovens and loading it upon wharves or cars.

The objects of my invention are to improve the construction of devices of the aforesaid character, to render them universally adjustable, so that the material may be reached at all points and from all directions, to make them easily operable by a single attendant, and to make them efficient and certain in operation, and other objects, which will appear in the course of the subjoined description.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the figures.

Figure 1 is a side elevation of a preferred form of my invention. Fig. 2 is a plan view thereof with the parts broken away to show the interior construction. Fig. 3 is a longitudinal section of the upper part of the apparatus on the line 3 3 of Fig. 2. Fig. 4 is a transverse section taken on the line 4 4 of Fig. 1. Fig. 5 is a plan view of the lower part of the apparatus with the body portion removed and parts broken away to show certain features of construction, and Fig. 6 is a sectional view on the line 6 6 of Fig. 4.

The drawings illustrate the principle of my invention and one specific manner in which I contemplate employing it; but it will be obvious that various changes may be made in the details without departing from the scope of my invention as specified in the claims.

In the drawings the numeral 1 indicates a car-platform provided with shafts 2, carrying wheels 3, adapted to run on tracks 4, and bearing above it the body 5, mounted in the frame 6, and which directly rests upon a turret composed of a double platform 7. Upon the under side of the lower part of this platform 7 is placed a bearing 8, resting upon a circular track 9, attached to the main car-platform 1. A shaft 10 forms a center on which the turret is adapted to swing, as will be hereinafter described. Upon the turret is placed a motor

11 of ordinary construction, having a shaft 12, which carries a bevel-pinion 13 or other proper power-transmitting device, meshing with a bevel-gear 14 upon a shaft 15, journaled in bearings mounted upon said turret and carrying a friction-wheel 16, adapted to rotate in contact with a friction-wheel 17 and to rotate the same. This friction-wheel 17 in like manner rotates a friction-wheel 18, which in turn rotates a friction-wheel 19. These three friction-wheels are of similar character and are mounted at the lower part of the double platform on shafts carrying bevel-gears 20, 21, and 22, respectively, which are adapted to transmit power to three shafts 26, 27, and 28 by means of friction-clutches 23, 24, and 25, respectively. These friction-clutches may be of any ordinary construction; but I have shown a device comprising double cones 29, 30, and 31 upon the shafts 26, 27, and 28, respectively, and adapted to be forced in either direction by operating-levers 32, 33, and 34 to force cones into their respective seats and cause the rotation of the shafts 26, 27, 28 in either direction, as desired.

It will be understood that the motor-shaft 12 is designed to operate continuously in the same direction so long as the power is applied to the motor and is stopped and started in any ordinary way, but is not reversed.

The operation and uses of the shafts 26, 27, and 28 will be described in detail. Upon the shaft 28, which extends in a diagonal direction under the bottom of the body 5, is a bevel-pinion 35, meshing with a bevel-gear 36 upon the shaft 10, which in an obvious manner operates a bevel-pinion 37 on the lower end of the shaft 10 and a bevel-gear 38 upon a horizontal shaft 39, which in turn operates the axle 2 through the instrumentality of sprocket-wheels on the shaft and axle, respectively, and a suitable sprocket-chain 40. It will be obvious that the truck may be easily shifted back and forth upon the tracks 4 by the operation of the handle 34 while the current is on the motor 11 without disturbing the action of the other devices on the truck. Upon the shafts 26 and 27 are placed drums 41 and 42, upon which are wound cables, ropes, wires, or equivalent devices 43 and 44. These cables or the like pass around the drums several times and are attached to a moving part of the device at some point, so that when the drums are turned in either direction they will be wound up on one side and let out on the other, thus moving the movable parts in



either direction, as desired. The cable 44 passes over idlers 45 45 and at both ends is attached at 46 to the under side of the platform 7. It will be observed that the rotation of the shaft 27 in either direction will cause the double platform or turret 7 to be swung in the desired direction about the shaft 10 as a pivot. The ends of the cable 43 are attached to the bottom of the body 5 at the points 47 47, and it is obvious that the rotation of the shaft 26 will cause the body 5 to be advanced or retracted in a straight line through the frame 6 and that this operation is controlled by the hand-lever 32. The body 5 is guided in this motion and supported by rollers 48 on the frame 6, as shown. It will be seen that the body may be easily caused to reciprocate or to swing upon the shaft 10 as a pivot in either direction and the whole car to travel back and forth on the tracks, all these motions being produced by the continuous operation of a single motor in one direction and being controlled by the levers 32, 33, and 34.

Extending from the front end of the body 5 is a pair of arms or walking-beams 49, having journaled in their outer ends a toothed cylinder 50. The ribs or teeth 51 upon this cylinder are preferably curved somewhat, as shown, and are adapted to break up and cut the coke or other material to be operated upon when rotated in contact therewith. Upon the shaft bearing this cylinder is a sprocket-wheel 52, meshing with a chain 53, and this chain also meshes with a sprocket-wheel 54 upon a shaft 55. This shaft 55 also bears a bevel gear-wheel 56, meshing with a pinion 57 upon a shaft 58, mounted upon the side of the body 5 and carried with it. Upon this shaft 58 is a key 90, extending nearly the whole length thereof and engaging with a sprocket-wheel 59, through which the shaft 58 is adapted to pass as the body 5 is reciprocated. Engaging with the sprocket-wheel 59 is a chain 60, which is operated by a sprocket-wheel 61, mounted upon the shaft 12. As has been stated, the motor 11 runs constantly in one direction when the current is on, and therefore the cylinder 50 will be constantly operated in the proper direction to break the coke and pull it into the body 5. The body 5 slides back and forth, as has been stated; but this does not interfere with the operation of the cylinder on account of the sliding connection of the sprocket-wheel 59 with the shaft 58. Upon the shaft 55 is also a sprocket-wheel 62, meshing with a chain 63 and operating a sprocket-wheel 64 upon a shaft 65. A friction-wheel 66 on the shaft 65 operates a second friction-wheel 67 upon a shaft 68. This shaft carries a sprocket-wheel 69, meshing with a chain 70 and operating another sprocket-wheel 71 on a shaft 72, which carries a sprocket-wheel 73. This sprocket-

wheel is adapted to operate the endless belt 76, which passes around a similar sprocket-wheel 74 upon a shaft 75. It will be seen that this endless belt or carrier 76 is always operated in a direction to deliver the material deposited upon it through the body and drop it through the opening 77 in the back of the body.

For adjusting the cylinder 50 up and down a hand-wheel 78 is provided, having a worm 79 meshing with and adapted to turn a gear 80<sup>a</sup> on a shaft 80. This shaft carries a sprocket-wheel 81, meshing with and operating a chain 82, which in turn operates a sprocket-wheel 83, fixed fast to a shaft 84. This shaft 84 is the axis on which the arms 49 are mounted and adapted to swing. The operation of the hand-wheel 78 will obviously cause the arms 49 to swing about the axis 84, and thereby raise or lower the cylinder 50 to bring it into proper position for work.

Upon the body 5 is a sharp projection 85, designed to enter the coke-oven, slide the coke up from the bottom thereof onto the conveyer, and prevent any loosened material from falling out.

A hopper 86, into which the coke is discharged by the conveyer 76, may have a conveyer or other device (not shown) to carry the coke onto a wharf, car, or any desired place.

It will be obvious from this description that this device is universally adjustable to any position and in all directions, that it is operated by a single motor and is readily controlled in all respects by the three hand-levers and the hand-wheel within easy reach of a single operator, that it will be absolutely certain to operate as desired, and that it will be of high efficiency.

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

1. In a coke-puller, the combination of a movable support, a turret mounted thereabove, a motor upon said turret, a device for swinging said turret upon said support, and means for connecting said device to said motor.

2. In a device for moving frangible material, the combination of a movable support, a turret thereon, a motor on the turret, connections from said motor for moving said support, and connections from said motor for swinging said turret.

3. In a device for moving frangible material, the combination of a movable support, a turret thereon, a motor on the turret, connections from said motor for moving said support, connections from said motor for swinging said turret, and means for reversing the direction of operation of both of said connections.

4. In a device for moving frangible material, the combination of a support, a turret, means on said turret for loading frangible ma-



terial thereon, a curved track, a cable, and means for operating the cable for swinging said turret upon said track.

5. In a device for moving frangible material, the combination of a support, a turret, means on said turret for loading frangible material thereon, a curved track between the support and turret, a cable attached to said turret, and means for moving said cable longitudinally in either direction.

6. In a device for moving frangible material, the combination of a support, a turret, means on said turret for loading frangible material thereon, a curved track between the support and turret, a cable attached to said turret, and means for moving said cable longitudinally in either direction; said means comprising a shaft, a drum, on which said cable is wound, mounted on the shaft, a friction-clutch, and a motor.

7. In a device for moving frangible material, the combination of a movable support, a turret thereon, a motor on the turret, connections from said motor for moving said support, connections from said motor for swinging said turret, and means for operating both of said connections from the motor independently of each other.

8. In a device for moving frangible material, the combination of a support, a turret pivotally mounted thereon, a motor connected with the turret for swinging it, a body upon said turret, and means connecting the body and motor for moving said body longitudinally, said motor being mounted on the turret.

9. In a coke-puller, the combination of a body part, means for swinging it about a pivot, means for giving it a rectilinear motion, and a motor for operating both said means.

10. In a coke-puller, the combination of a body part, means for swinging it about a pivot, means for giving it a rectilinear motion, a motor for operating both of said means, and means for reversing the direction of operation of either of said means independently of the other.

11. In a device for moving frangible materials, the combination of a support, a turret, a body, means for moving said support, means for swinging said turret, means for moving said body longitudinally, a motor on the turret, and means for connecting the motor with each of said other means.

12. In a coke-puller, the combination of an element for detaching the coke, means for rotating said element continuously, means for raising and lowering it, means for moving it in a horizontal plane and means for receiving detached coke and discharging it from the machine.

13. In a coke-puller, the combination of an element for detaching the coke, means for operating said element continuously, means for raising and lowering it, means for moving it in a horizontal plane; said last means being re-

versible and operable independently of either of said other means, and means for receiving detached coke and discharging it from the machine.

14. In a coke-puller, the combination of a body adapted to hold the coke, an element for detaching the coke, means for rotating said element, a conveyer within said body, and means for moving said body in any direction in a horizontal plane; said last-named means being reversible and operable independently of either of said other means.

15. In a coke-puller, the combination of a body adapted to hold the coke, an element for detaching the coke, means for rotating said element, a conveyer within said body, and means for continuously operating said conveyer independently of the means for rotating said element.

16. In a device for moving frangible materials, the combination of a support, a turret, a body, means for moving said support, means for swinging said turret, means for moving said body longitudinally, an element supported from said body for detaching the coke, and means for operating said element independently of each of said other elements.

17. In a device for moving frangible materials, the combination of a support, a turret, a body, means for moving said support, means for swinging said turret, means for moving said body longitudinally, an element for detaching coke, a conveyer for the coke, a motor for operating all of said means, said element and said conveyer, and means for connecting each of them with and disconnecting them from the motor independently of each other.

18. In a device for moving frangible materials, the combination of a support, a turret, a body, means for moving said support, means for swinging said turret, means for moving said body longitudinally, an element for detaching coke, a conveyer for the coke, means for continuously operating said element and said conveyer, a motor, and means for connecting each of said means with the motor.

19. A device for removing frangible material, comprising a support, a shaft rotatably mounted thereon, connections from the shaft for propelling the support, a turret, and means for turning said turret about the shaft as a center; said means comprising a motor and a power-transmitting mechanism located on the turret.

20. A device for removing frangible material, comprising a support, a shaft rotatably mounted thereon, connections from the shaft for propelling the support, a turret, and means for turning said turret about the shaft as a center; said means comprising a motor, a power-transmitting mechanism, a drum connected with the latter, a cable connected with the drum, and guides for the cable located on both sides of the center of the turret.



21. A device for removing frangible material, comprising a movable support, a vertical shaft rotatably mounted thereon, connections from the shaft for propelling the support, a  
5 turret mounted on the support and centered by said shaft, power-transmitting mechanism on said turret connected with said shaft, and means on the turret for turning the turret about the shaft as a center; said last-named  
10 means comprising a motor and a power-transmitting mechanism located on the turret.

22. A device for removing frangible material, comprising a movable support, a vertical shaft rotatably mounted thereon, connections  
15 from the shaft for propelling the support, a turret mounted on the support and centered by said shaft, power-transmitting mechanism on said turret connected with said shaft, means on the turret for turning the turret about the  
20 shaft as a center, a body mounted on the turret, and means on the turret for longitudinally moving said body.

23. A device for removing frangible material, comprising a movable support, a vertical  
25 shaft rotatably mounted thereon, connections from the shaft for propelling the support, a turret mounted on the support and centered by said shaft, power-transmitting mechanism on said turret connected with said shaft, means  
30 on the turret for turning the turret about the shaft as a center, a body mounted on the turret, and means on the turret for longitudinally moving said body; said last-named means comprising a shaft, a drum connected there-  
35 with, and a flexible connection passing around the drum and fixed to the body near its opposite ends.

24. A device for removing frangible material, comprising a movable support, a vertical shaft rotatably mounted thereon, connections  
40 from the shaft for propelling the support, a turret mounted on the support and centered by said shaft, power-transmitting mechanism on said turret connected with said shaft, means on the turret for turning the turret about the  
45 shaft as a center, a body mounted on the turret, means on the turret for longitudinally moving said body, a motor on the turret, a motor-shaft connected with the motor, and an independent means for connecting said shaft  
50 with each of said other means.

25. A device for removing frangible material, comprising a movable support, a vertical shaft rotatably mounted thereon, connections  
55 from the shaft for propelling the support, a turret mounted on the support and centered by said shaft, power-transmitting mechanism on said turret connected with said shaft, means on the turret for turning the turret about the  
60 shaft as a center, a body mounted on the turret, means on the turret for longitudinally moving said body, a pivoted frame on the body, a rotatable element on the frame for detaching frangible material, means on the  
65 turret for rotating said element, and means for swinging said frame on its pivots.

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

HARRY FRANCIS PEARSON.

Witnesses:

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L. WAHLMEIER.