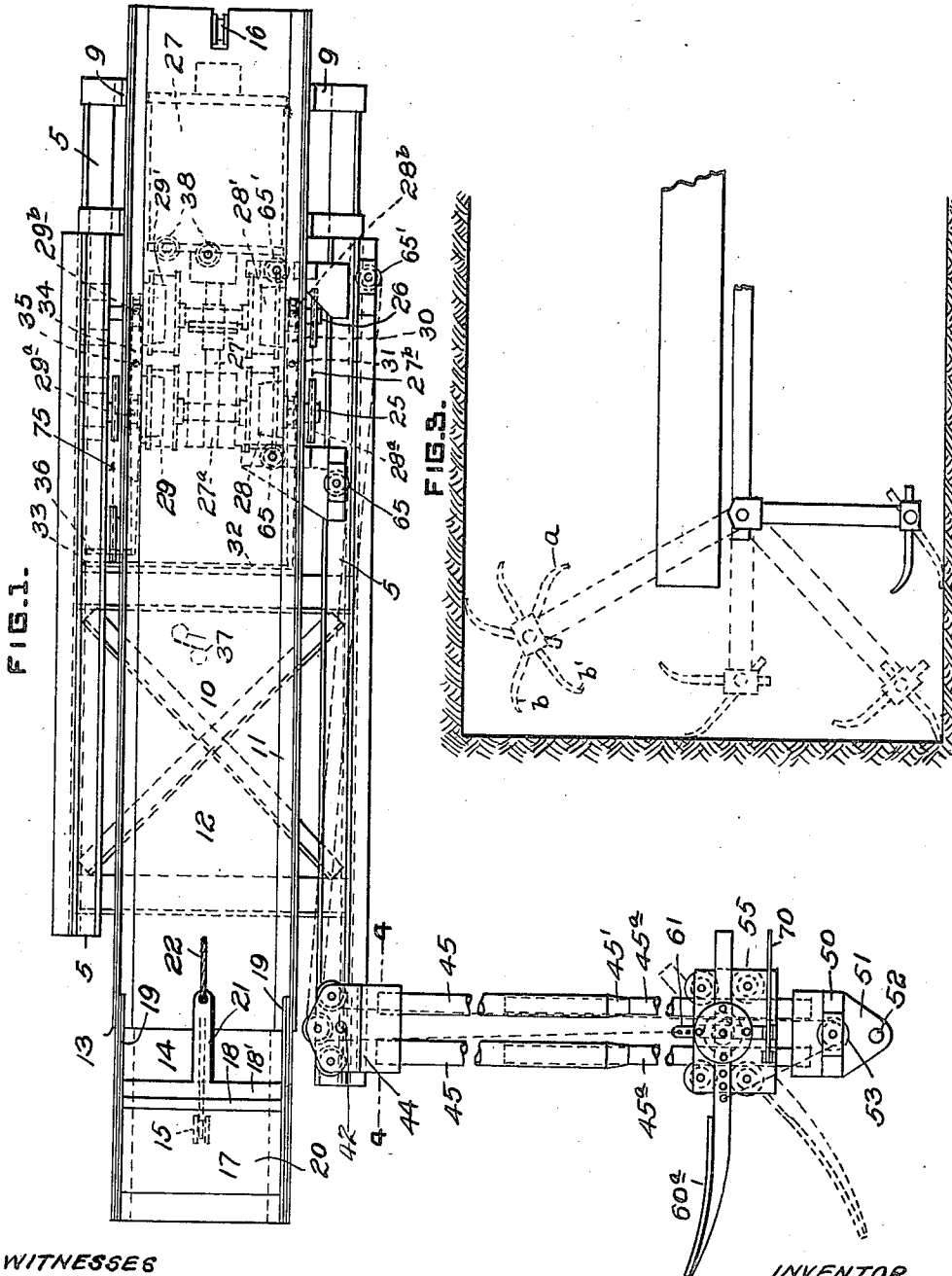


Feb. 13, 1923.

J. M. LONDON.
LOADING MACHINE.
FILED MAR. 2, 1921.

1,445,332.

2 SHEETS—SHEET 1.



WITNESSES

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Leo Vernerman

INVENTOR

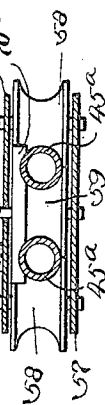
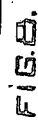
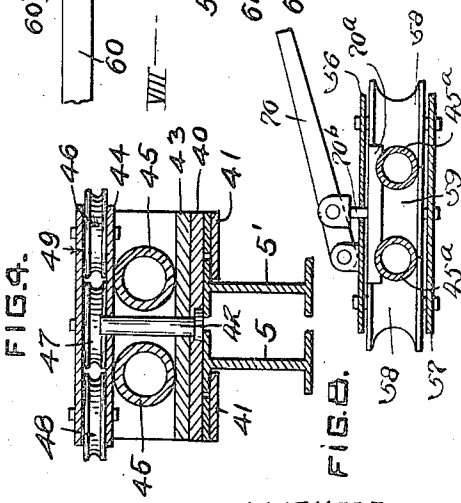
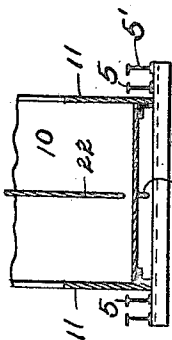
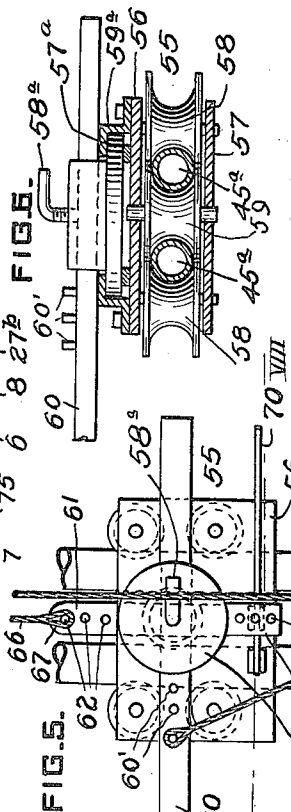
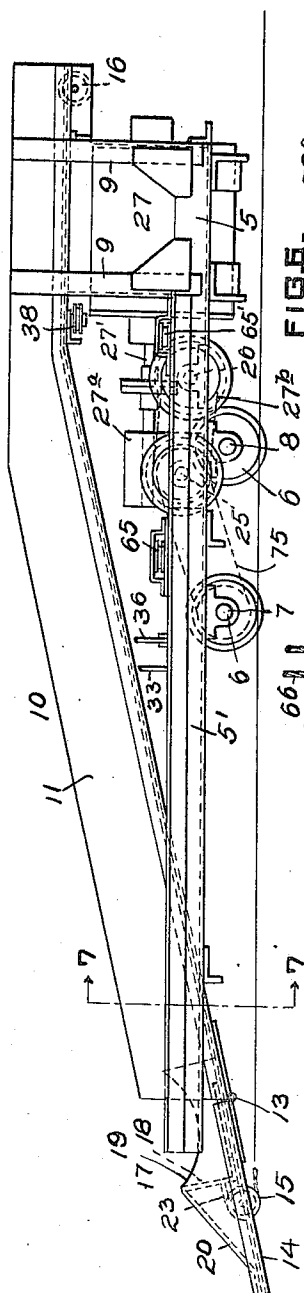
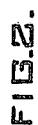
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2 SHEETS—SHEET 2.



WITNESSES
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UNITED STATES PATENT OFFICE.

JACOB M. LONDON, OF BUTLER, PENNSYLVANIA, ASSIGNOR OF ONE-HALF TO GEORGE M. CRAWFORD, OF PITTSBURGH, PENNSYLVANIA.

LOADING MACHINE.

Application filed March 2, 1921. Serial No. 449,165.

To all whom it may concern:

Be it known that I, JACOB M. LONDON, a citizen of the United States, residing at Butler, in the county of Butler, State of Pennsylvania, have invented certain new and useful Improvements in Loading Machines, of which the following is a specification.

This invention is for a coal loading machine for use in mines, and relates particularly to a loading machine for gathering coal where a "straight wall cutter" has been employed to loosen the coal, but which may be used where the coal is loosened in any way.

In machines for gathering and loading coal difficulty has been encountered in devising machines capable of getting the coal out of corners and from along the side of a straight wall. It is the primary object of the present invention to provide a loader which can be used to gather the coal on any point of the mine floor, including corners and along straight walls or faces.

A further important object is to provide a simple scoop actuating means for allowing the scoop to move past the coal when traveling in one direction and for extending itself to gather the coal when moved in the opposite direction.

Further objects are to provide an extensible scoop carrying member which may be swung to various angles and to provide an improved conveyor for receiving the coal from the scoop and delivering it to a car or other suitable receptacle.

These and other objects are attained by my invention as illustrated in the accompanying drawings, in which:

Fig. 1 is a plan view of a machine constructed in accordance with my invention;

Fig. 2 is a side elevation thereof, but with the scoop and scoop supporting frame removed;

Fig. 3 is a diagrammatic view indicating a horizontal section through a mine, showing some of the various operating positions of the machine;

Fig. 4 is a section on a larger scale on line 4—4 of Fig. 1, but with the scoop arm swung at right angles to the position shown in Fig. 1;

Fig. 5 is a plan view on a larger scale of the scoop manipulating mechanism;

Fig. 6 is a transverse section across the scoop manipulating carriage; and

Fig. 7 is a transverse section on line 7—7 of Fig. 2.

Fig. 8 is a transverse section on line VIII—VIII of Fig. 5.

Referring to the drawings, 5 indicates longitudinal frame members, such as I-beams, supported on wheels 6 on axles 7 and 8. At the rear of the frame members are vertical supports 9. Having its rear end secured to the top of the vertical supports 9 and having its front portion supported by the frame members 5, is an inclined chute indicated generally by numeral 10. The chute comprises relatively high side plates 11 and a flat bottom plate 12.

Hinged to the front lower end of the chute at 13 is a swinging plate 14, having suitable angle bar braces therefor, and adapted to have its free end engage the floor of the mine. By reason of the hinges, it can adjust itself to the rough places or inequalities in the floor, and can be raised when the machine is being moved along the ground. In the hinged plate is a slot in which is a sheave 15, while a second sheave 16 is located at the other end of the trough.

Slidably guided in the chute 10 is a pusher or conveyor member 17, comprising a pushing face or plate 18, a bottom flange 18' thereon, cut-away sides 19, and an inclined bracing and gathering portion 20. On the middle of flange 18' is a forwardly extending tongue 21 to which an operating cable 22 is secured, which cable passes over sheave 16. A second operating cable 23 is connected with the pusher and passes around sheave 15.

Supported in the rear portion of the frame are two parallel shafts 25 and 26. Shaft 25 is driven by a motor 27 supported in the frame through shaft 27' and suitable worm gearing in housing 27^a. Obviously, however, other arrangements for the driving mechanism could be easily provided. Shaft 26 is driven by shaft 25 through a chain 27^b passing over sprockets near one end of the shafts, the arrangement being

such that the shafts are rotated at equal speeds. Loose on shaft 25 are two winding drums 28 and 29, one being at each side of the frame.

5 Similarly mounted on shaft 26 are corresponding drums 28' and 29'. The drums are adapted to be rotatably connected with the shafts by means of cone clutches, as indicated. The purpose of the drums will be hereinafter more fully described, but in this
10 invention, it is desired that when drum 28 or 29 is being driven, corresponding drum 28' or 29' will be disconnected from driving relation from the shaft 26, and vice versa.
15 In order to so operate the clutches of drums 28 and 28' I provide a lever 30, pivoted at 31, having suitable feathers thereon for shifting the clutches, the clutch and feather for drum 28 being indicated at 28^a, and for
20 drum 28' at 28^b.

Connected to one end of lever 30 is a transversely extending link 32 which is connected at its other end to a substantially vertical pivoted operating handle 33. When handle
25 33 is rocked, lever 30 will also be rocked about pivot 31. This causes the feathers and clutches 28^a and 28^b to be moved in opposite directions, moving one into engagement with its respective drum while the
30 other moves out of engagement, a neutral position, however, being provided. Drums 29 and 29' are similarly controlled by lever 34, pivoted at 35, and connected with operating lever 36 adjacent the operating lever 33.
35 The feather and clutches for drums 29 and 29' are indicated at 29^a and 29^b respectively.

Cable 23, passing around sheave 15, extends under the chute around suitable sheaves 37, and is secured to drum 29. Cable
40 22, passing around sheaves 16, is guided around other suitable sheaves 38 and is secured to drum 29'. With the pusher or conveyor in the position shown in Figs. 1 and 2, operating handle 36 would be
45 moved to shift feather and clutch 29^b into driving relation with the shaft 26, at the same time, disconnecting drum 29 from driving relation with shaft 25. With the motor
50 27 in operation, this causes cable 22 to be wound onto the drum 29' while cable 23 is unwound from drum 29. This causes the conveyor or pusher to move up the chute to discharge any coal that has been gathered into the chute at the end thereof. By reverse
55 operation of the operating handle 36, the bucket or pusher may be returned to the position shown, and the lever then moved to neutral position.

A reciprocating conveyor operated in the
60 manner described requires a minimum height and materially reduces the height of the frame, so that the machine may be built and used for loading very low coal. This cannot be readily done where endless
65 conveyors are used, because several inches

of height are necessary for the rollers to support such a conveyor.

For gathering loose coal or material into the lower end of the chute, I provide a scooping mechanism which will now be described. Extending along beside the body frame
70 member 5 is an additional I-beam 5'. Slidable on the two I-beams 5 and 5', as shown in Fig. 4, is a plate 40 having guide members 41 on the under side thereof, by means
75 of which the plate is guided on the I-beams. Mounted on the plate 40 is a vertically projecting pin or king bolt 42 which passes through plate 43 resting on plate 40. It
80 also passes through plate 44 between which and plate 43 are clamped two parallel sections of tube 45 or other suitable frame members, which extend outward horizontally, this arrangement permitting the tubes, together with plates 43 and 44, to pivot about
85 the king bolt 42. On the top of plate 44 are three sheaves 46, 47 and 48, with a cover plate 49 therefor.

Telescoping within tube sections 45, the ends of which are bevelled at 45', are other
90 parallel tubes 45^a, the outer ends of which are clamped or otherwise secured in an end member 50. The end member 50 has a laterally extending ground plate 51 in which is a socket 52 for the reception of a base of
95 a post or jack (not shown), the top of the post being wedged against the top or walls, in a manner well understood, to secure the ground plate against movement. Mounted in the end member 50 is a sheave 53.
100

Reciprocable along the supporting frame provided by tubes or frame members 45 and 45^a is a carriage, indicated generally by 55, which preferably comprises upper and lower
105 plates 56 and 57, having side guide rollers 58 mounted therebetween, and having a single central guide roller 59. The rollers are so arranged that the carriage may ride over the beveled ends of tubes 45. Mounted on the upper face of plate 56 is a turn-table
110 57 having an upwardly projecting portion thereon in which is adjustably secured a bar or scoop carrying arm 60, a lock bolt 58^a or other suitable clamping means preferably being employed. An annular flanged member 59^a is secured to plate 53. The flange serves as a bearing for the scoop arm 60 to rest on and to prevent any tendency of the turn-table to rock. Projecting from the turn-table at right angles to the scoop arm
120 60, are arms 61 and 61' having pins 62 thereon. The arm 60 has pins 60' thereon, and a curved scoop 60^a at one end.

Passing from drum 28 around suitable sheaves 63 and sheave 47 is a rope or cable
125 66 having a suitable loop or other fastening means 67 at its free end, as shown in Fig. 5, which loop is passed over one of the pins 62. Having one end secured to drum 28' and passing around sheaves 65' and sheaves 130

46 and 53 is a cable 68 having its other end provided with a loop or other suitable fastening means passed over one of the pins 60' on the scoop arm. Thus it will be seen
5 that the cables are eccentrically connected with the turn-table relatively to the center of rotation.

In operation, assuming the parts to be in position shown in Fig. 1, with the scoop in the dotted line position, the arm 61 will be
10 turned at an angle to the tubes 45 instead of being parallel therewith, as shown in full line position, by reason of the fact that the turn-table, on which arm 61 is carried, rotates with the scoop arm. Operating lever
15 33 is moved to drive drum 28 and release drum 28' in the manner described. Cable 66 then begins to wind about the drum. This first tends to pull arm 61 around to a
20 position parallel with pipes 45, swinging the scoop in an arc. As the cable continues to wind, the carriage 55 travels toward the end of the chute, and scoops the coal or material into the chute. To prevent the carriage from moving without first swinging
25 the scoop to the full line position when the resistance offered by the coal is great, a brake engaging one of the tubes and an operating lever 70 is provided. The brake may be constructed as shown in Fig. 8 and may comprise
30 a suitable shoe 70^a arranged to be raised and lowered by lever 70 through a suitable connection 70^b. The attendant, upon seeing the carriage move first, may operate the brake to
35 prevent such movement until the scoop has been turned to a position at right angles to the tubes 45.

When the carriage has reached the limit of travel and scooped the coal into the lower end
40 of the chute, the lever 33 is shifted to drive drum 28' to thereby wind up cable 68. The eccentric pull on the scoop bar 60 first tends to swing it to a diagonal position corresponding to the dotted line position in Fig.
45 1. After having been so swung, the carriage 55 travels to its outermost position, the scoop being turned so that it will not collect the coal. Thus, with every reciprocation of the carriage in opposite directions, the scoop is
50 partially rotated in opposite directions.

By changing the end of cable 66 to the pins 60' on the scoop and connecting the loop on cable 68 to one of the pins on arm 61', the scoop may be made to
55 turn at an angle that is just the opposite to that shown in the dotted line position in Fig. 1, which is the position indicated at *a* in Fig. 3. In this position, the scoop "drags" past the coal on its outward movement.

By referring to Fig. 3, it will be seen how the device can gather coal along the sides of a straight wall and rake it into the lower portion of the chute. By reason of the telescoping connection between tubes 45 and 45^a,

the scoop can be projected into corners, and
65 by reason of the swinging movement of the carriage carrying frame, relatively to the body, it can be operated at various angles to the front and sides of the body. When working on the side of the machine opposite to
70 that on which the slidable frame supporting means is located, the lock bolt 58^a may be loosened, the scoop arm removed, the scoop inverted, and the scoop arm inserted in the turn-table from the opposite direction,
75 whereby the scoop will project from the opposite side of the carriage supporting frame, as indicated at *b* and *b'* in Fig. 3, without reversing the operation of the machine.

When sufficient coal has been gathered into
80 the lower end of the chute, the conveyor or pusher is operated in the manner hereinbefore described to push the coal along the chute to the upper end thereof, where it is pushed out and into a suitable car, not
85 shown. Obviously, other forms of conveyors might be used.

It will be noted that sheave 48 does not, as shown in the drawings, guide any cable. This sheave, however, is used when the sliding frame is transferred to the other side
90 of the machine, as it may be, and pulley 46 would not then be used. By having the scoop carrying frame slidable on the loader frame members 5 and 5', the scoop frame
95 can be drawn up alongside the truck when the machine is being moved and will not project to the front.

The machine may be self-propelled by means of a chain 75 passing over a sprocket
100 on axle 25 and on axle 7, with any suitable clutch, not shown, being provided on the axle. During the operation, the scoop frame is kept from swinging by a suitable post engaging the wall or roof of the mine and
105 ground plate 51. The attendant shifts this post from time to time, as it becomes necessary to swing the scoop frame about. Obviously, other means than posts or jacks for positioning the scoop carrying frame
110 could be provided.

While I have described my invention for use in mines, it may also be advantageously used for gathering loose material of any
115 kind.

It will be obvious that various changes and modifications may be made in this invention within the scope of the appended claims.

I claim:

1. A loading machine comprising a conveyor and a reciprocable scoop for gathering material and delivering it to the conveyor, and means whereby the scoop may be reciprocated at various horizontal angles relatively to the conveyor.

2. A loading machine comprising a conveyor, a power driven reciprocable scooping

means, and means whereby the scooping means may be swung horizontally about a vertical axis around the conveyor.

3. A loading machine comprising a conveyor, a reciprocable scooping means, means for supporting the scooping means, said supporting means being movable longitudinally of the conveyor and pivoted to swing horizontally to said conveyor.

4. A loading machine comprising a conveyor and a reciprocable scoop, a supporting frame for the scoop, and means whereby the scoop may be turned about a vertical axis at various angles to the supporting frame.

5. A loading machine comprising a conveyor, and a reciprocable scoop, a supporting frame for the scoop, means whereby the scoop may be turned at various angles to the supporting frame, and means whereby the supporting frame may be swung horizontally about a vertical axis relatively to the conveyor.

6. A loading machine comprising a conveyor and a reciprocable scoop, a supporting frame for the scoop, means whereby the scoop may be turned at various angles to the supporting frame, and means whereby the supporting frame may be swung horizontally about the conveyor, or moved longitudinally relatively thereto.

7. A loading machine comprising a conveyor and a reciprocable scoop, a supporting frame for the scoop, means whereby the scoop may be turned about a vertical axis at various angles relatively to the supporting frame, means for reciprocating the scoop, and means for turning the scoop.

8. A loading machine comprising a conveyor and a reciprocable scoop, a supporting frame for the scoop, means whereby the scoop may be turned at various angles relatively to the supporting frame, means for reciprocating the scoop, said means being adapted to position the scoop at one angle when the scoop is moved in one direction and at a different angle when the scoop is moved in the opposite direction.

9. A loading machine comprising a body frame, a conveyor mounted on the body frame, a pivotally supported scoop carrying frame, a carriage on said frame, a scoop secured to the carriage, and means for reciprocating the carriage.

10. A loading machine comprising a body, a conveyor on the body, a pivotally supported frame, a carriage on the frame, a scoop rotatably supported on the carriage, and cables eccentrically connected with the rotatable scoop for moving the carriage and effecting a partial rotation of the scoop.

11. A loading machine comprising a conveyor and a reciprocable scoop, an extensible supporting frame for the scoop, and means for reciprocating the scoop along the frame.

12. A loading machine comprising a con-

veyor and a reciprocable scoop, an extensible supporting frame pivotally mounted adjacent the conveyor on which the scoop is reciprocated, and means for turning the scoop at various angles relatively to the supporting frame.

13. A loading machine comprising a body, a conveyor on the body, a pivotally supported frame, a carriage on the frame, a scoop secured to the carriage, cables for moving the carriage, and means on the body for winding the cables to effect a reciprocation of the carriage.

14. A loading machine comprising a body, a conveyor on the body, a pivotally supported frame on the body, a carriage reciprocable on the frame, a scoop rotatably supported on the carriage, cables connected with the scoop eccentrically to the center of rotation of the scoop, and means on the body for winding the cables for reciprocating the scoop and effecting a partial rotation thereof with each reciprocation thereof.

15. A loading machine comprising a body, a conveyor on the body, a pivotally supported frame on the body, a carriage reciprocable on the frame, a turn-table on the carriage, a scoop carrying arm secured to the turn-table, a plurality of means at different angles to each other and eccentric to the center of rotation of the turn-table with which cables may be connected, cables adapted to be connected with the desired ones of said cable attaching means, and means for winding the desired cable to effect the reciprocation of the carriage and a partial rotation of the scoop.

16. A loading machine comprising a body, a conveyor on the body, a pivotally supported frame on the body, a carriage reciprocable on the frame, a scoop rotatably supported on the carriage, a pair of cables for reciprocating the carriage, and means on the body comprising a pair of drums, a driving means therefor, and means whereby one drum may be driven to wind the cable while the other is disconnected from driving relation from the driving means.

17. A loading machine comprising a body, a chute on the body, a reciprocable conveyor in the chute, a pair of cables for reciprocating the conveyor, a frame supported on the body, a carriage reciprocable on the frame, a scoop carried by the carriage, a pair of cables connected with the carriage for reciprocating it, a pair of shafts journaled in the body, means for driving the shafts, a pair of drums on each of the shafts, one of the conveyor reciprocating cables being attached to one of the drums on one shaft, the other of the conveyor reciprocating cables being attached to one of the drums on the other shaft, one of the two carriage reciprocating cables being connected with one of the other drums on one

shaft and the other one of the carriage reciprocating cables being attached to the other drum on the other shaft.

18. A loading machine comprising a body, a chute on the body, a reciprocable conveyor in the chute, a pair of cables for reciprocating the conveyor supported on the body, a carriage reciprocable on the frame, a scoop carried by the carriage, a pair of cables connected with the carriage for reciprocating it, a pair of shafts journaled in the body, means for driving the shafts, a pair of drums on each of the shafts, one of the conveyor reciprocating cables being attached to one of the drums on one shaft, the other of the conveyor reciprocating cables being attached to one of the drums on the other shaft, one of the two carriage reciprocating cables being connected with one of the other drums on one shaft and the other one of the carriage reciprocating cables being attached to the other drum on the other shaft, clutches for each of the drums, and means whereby the clutches for the two conveyor operating drums may be simultaneously shifted in opposite directions, and other means whereby the clutches for the carriage reciprocating drums may be simultaneously shifted in opposite directions.

19. A loading machine comprising a body, a conveyor on the body, a pivotally supported frame on the body, a carriage reciprocable on the frame, a scoop rotatably supported on the carriage, cables connected with the scoop eccentrically of the center of rotation thereof, means on the body for winding the cables to reciprocate the carriage and effect a partial rotation of the scoop, and a brake on the carriage for engaging the frame operable for preventing reciprocating movement of the carriage prior to the rotation thereof.

20. A loading machine comprising a body, a chute on the body of substantially the same length as the loading machine body, a reciprocable conveyor in the chute operable

throughout the greater portion of the length of the chute, means for gathering coal into one end of the chute, and means for reciprocating the conveyor to eject the coal from the opposite end of the chute.

21. A loading machine comprising a body, a chute on the body substantially co-extensive with the length of the machine, a reciprocable conveyor in the chute comprising a pushing face and side plates operable throughout the greater portion of the length of the chute, means for scooping coal into the lower end of the chute over the conveyor, and means for operating the conveyor for moving the coal along the chute to the delivery end thereof.

22. A loading machine comprising a body, a chute on the body, a reciprocable conveyor in the chute, means for gathering coal into one end of the chute, and means for reciprocating the conveyor to eject the coal from the opposite end of the chute, said means comprising a pair of drums, a cable connected to the conveyor and to one drum, a second cable connected to the conveyor and other drum, means for driving the drums, and means whereby one drum may be thrown out of driving relation with the driving means when the other is being driven.

23. A loading machine comprising a body, a conveyor on the body, a scoop carrying frame, attaching means at one end of the frame by means of which the frame may be pivotally attached to supporting means on the body, and supporting means at each side of the body onto which the attaching means may be placed, whereby said frame may be pivotally supported at either side of the body.

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

JACOB M. LONDON.

Witnesses:

WM. H. PARMELEE,
SUE B. FRITZ.