

No. 736,385.

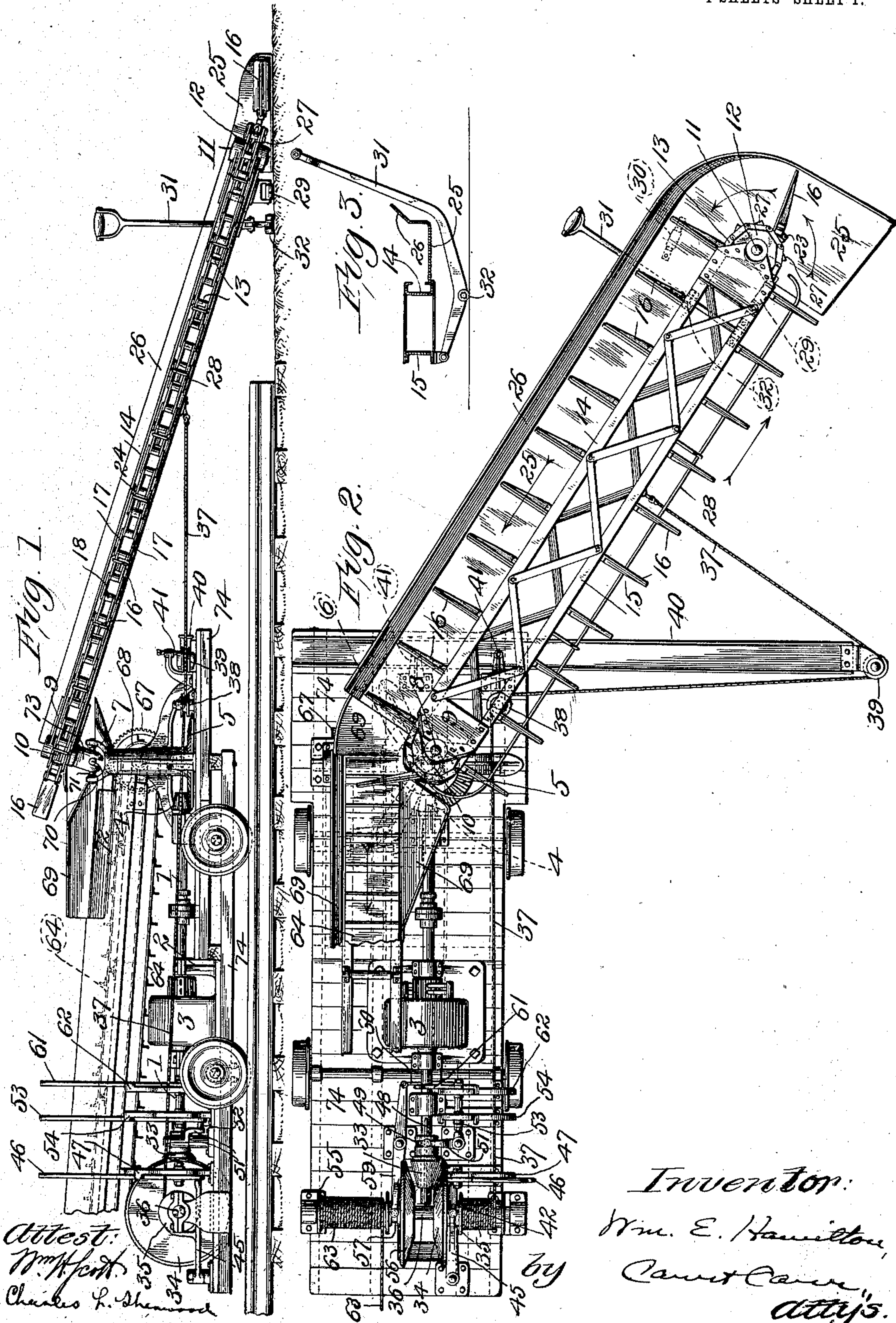
PATENTED AUG. 18, 1903.

W. E. HAMILTON.
LOADING DEVICE.

APPLICATION FILED JAN. 20, 1902.

NO MODEL.

4 SHEETS—SHEET 1.



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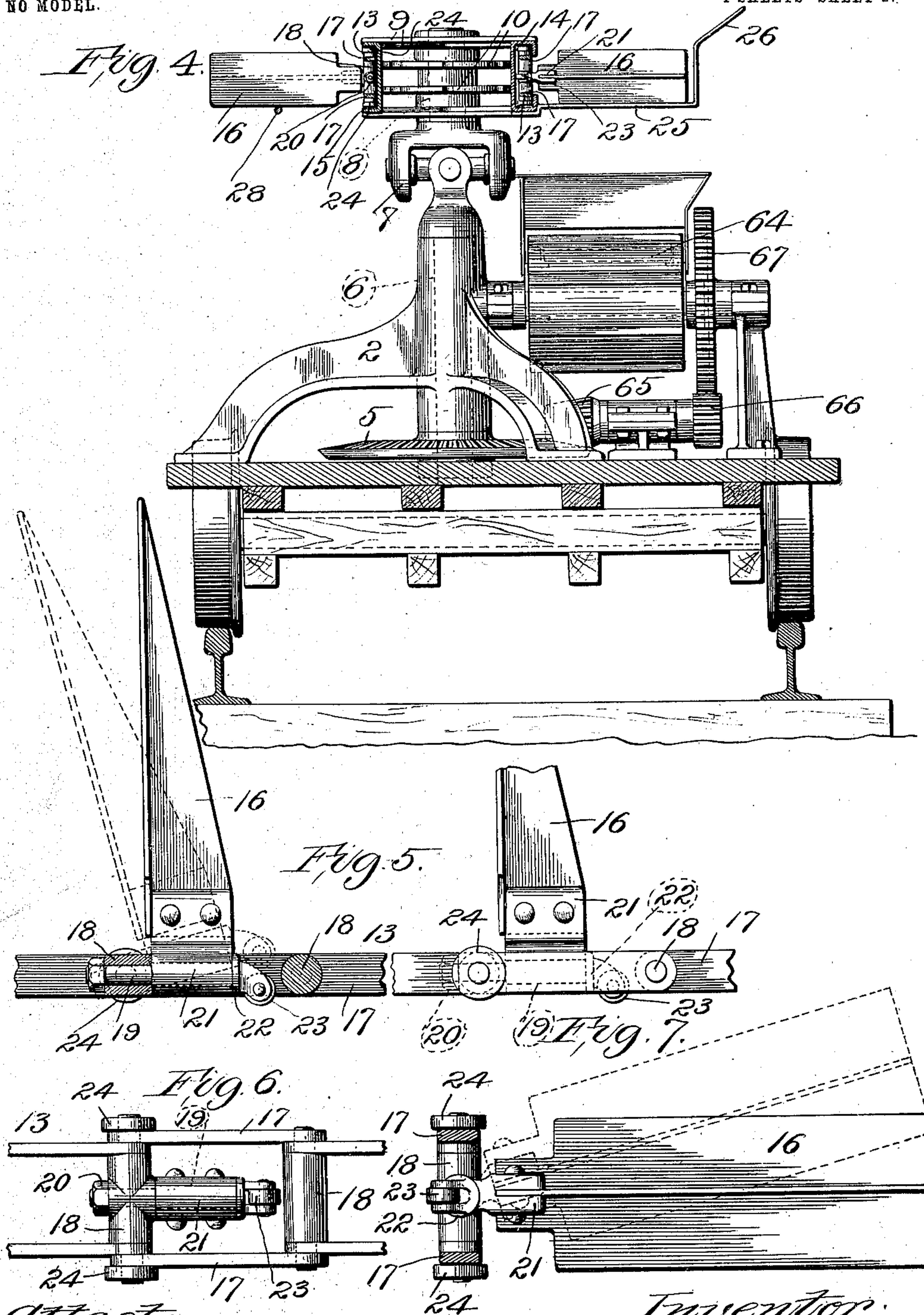
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4 SHEETS—SHEET 2.



Attest:
Wm. E. Hamilton
Charles L. Sheppard

Inventor:
Wm. E. Hamilton,
by *Carroll Carr*
Attys.

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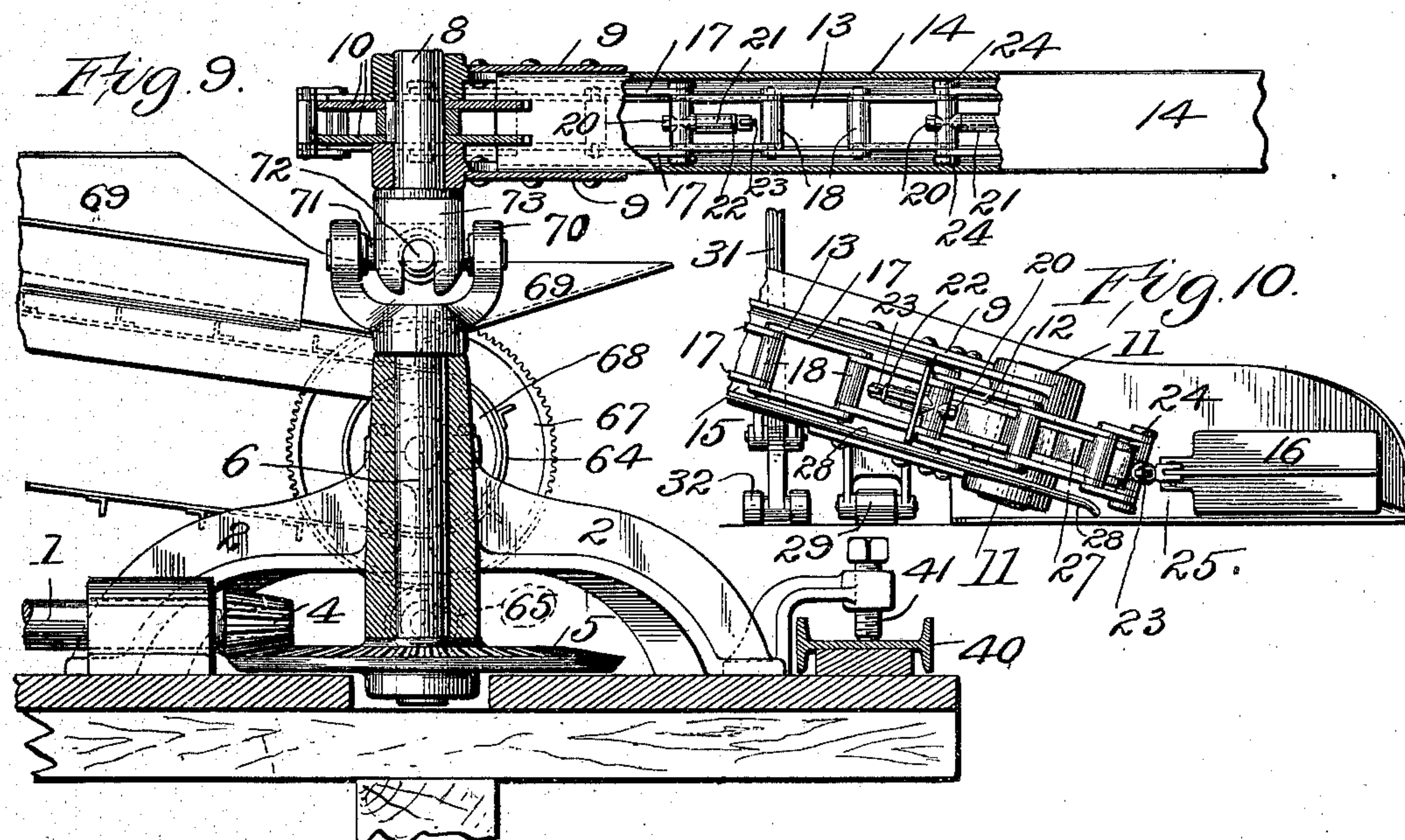
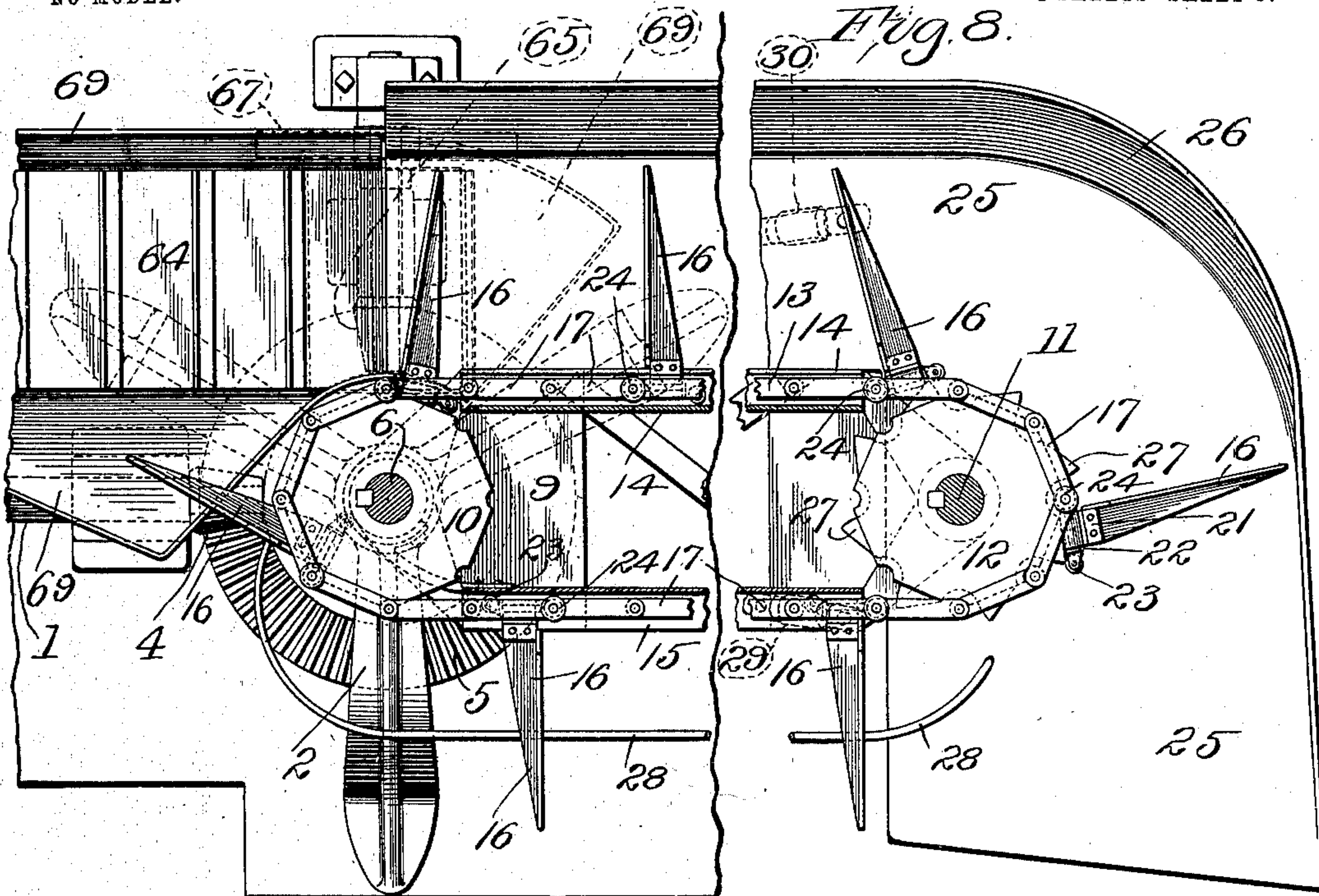
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4 SHEETS—SHEET 3.



Attest:
Wm. H. Scott
Charles L. Sherrwood

Inventor:
Wm. E. Hamilton,
by *Carver & Carver*
Attys.

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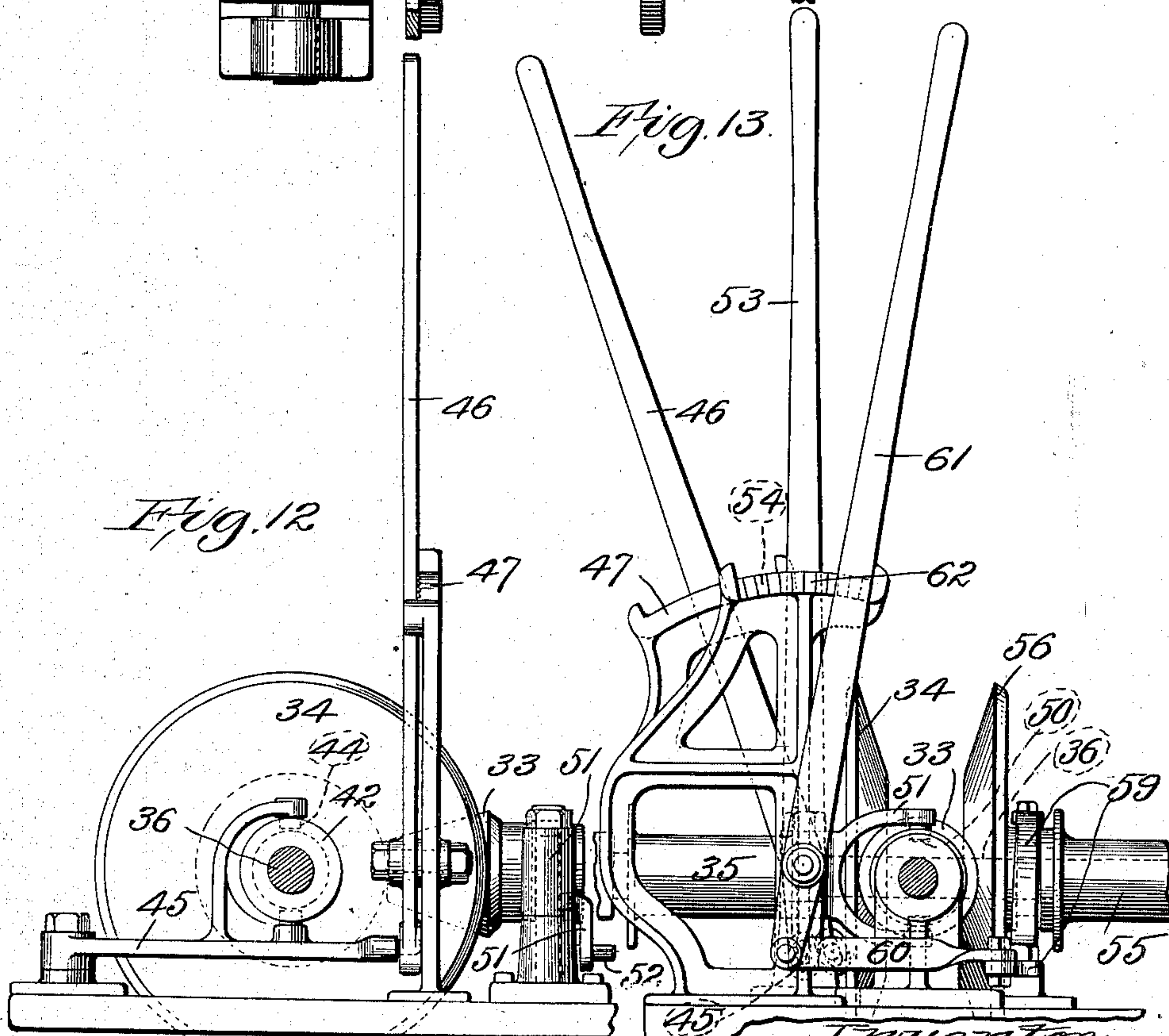
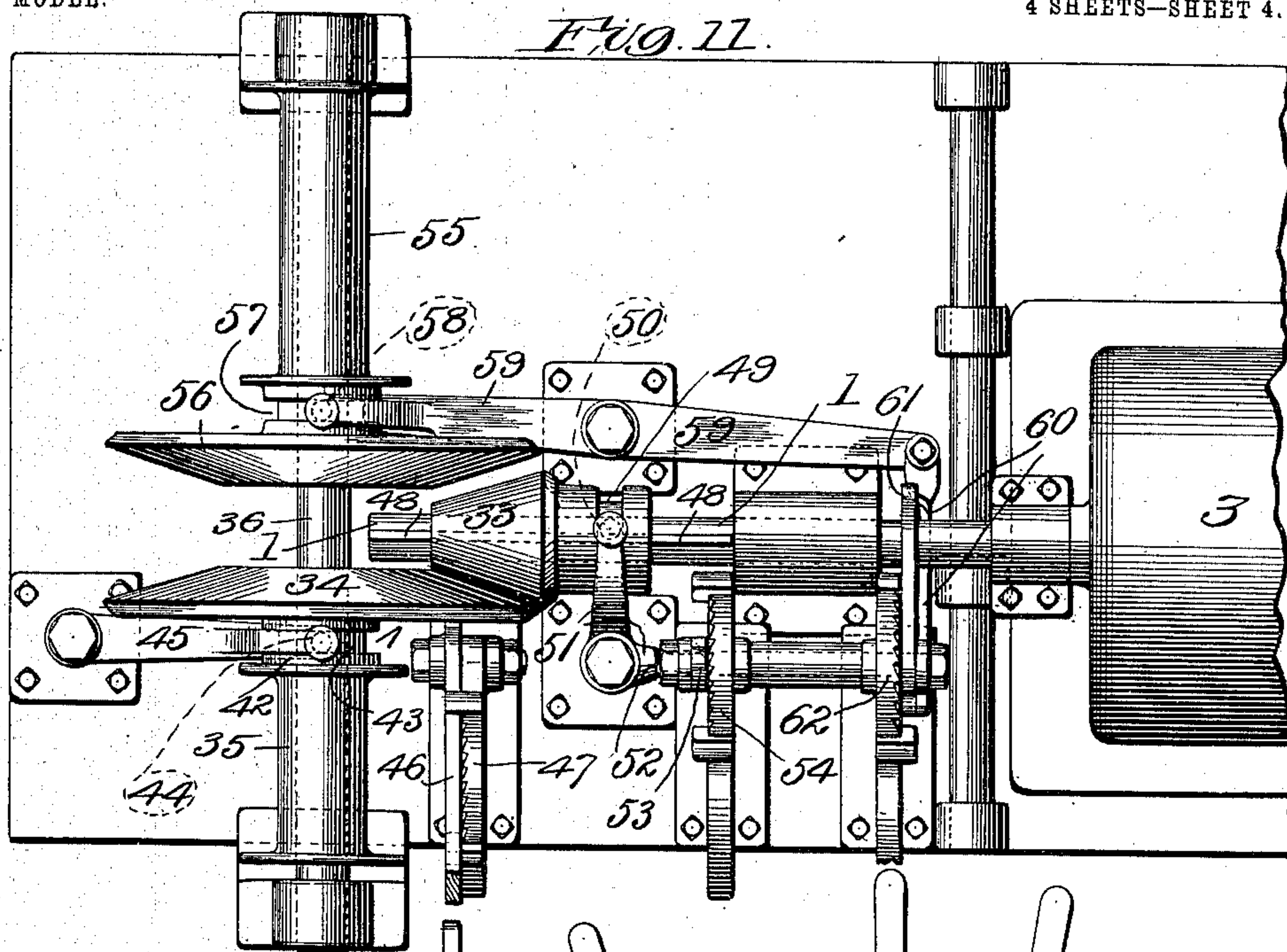
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NO MODEL.

4 SHEETS—SHEET 4.



Attest:
Wm. E. Hamilton
Charles L. Sherrill

Inventor:
Wm. E. Hamilton,
by *Carver & Carver* Attys.

UNITED STATES PATENT OFFICE.

WILLIAM E. HAMILTON, OF ZANESVILLE, OHIO.

LOADING DEVICE.

SPECIFICATION forming part of Letters Patent No. 736,385, dated August 18, 1903.

Application filed January 20, 1902. Serial No. 90,551. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM E. HAMILTON, a citizen of the United States, and a resident of Zanesville, county of Muskingum, and State of Ohio, have invented certain new and useful Improvements in Loading Devices, of which the following is a specification.

My invention relates to a machine for loading coal and other articles, and has for its principal object to economize time and labor in the handling of coal and other articles, and particularly to provide a machine for gathering coal in mines and other chambers of limited height.

My invention consists principally in a mechanism adapted to gather coal or other articles and deliver the same, as hereinafter described and claimed.

It also consists in mounting the gathering mechanism so as to have one end free and capable of movement in all directions.

It also consists in mounting the flights of the gathering mechanism so as to have free movement relative to their actuating-chain.

It also consists in a device for lifting the free end of the gathering mechanism to clear obstructions.

It also consists in the parts and in the arrangements and combinations of parts hereinafter described and claimed.

In the accompanying drawings, which form part of this specification, and wherein like symbols refer to like parts wherever they occur, Figure 1 is a side elevation of my machine. Fig. 2 is a plan view thereof. Fig. 3 is a detail of the lifting-jack for elevating the free end of the gathering mechanism. Fig. 4 is a vertical view of the front end of the machine with the gathering mechanism raised into a horizontal position and shown in section and with the parts at the rear of the machine omitted. Figs. 5, 6, and 7 are detail views of the flights, showing their connection to the chain and their movement relative thereto. Fig. 8 is a broken plan view, partly sectional, of the gathering mechanism. Fig. 9 is a vertical detail showing the means for transmitting motion from the driving-shaft to the conveyer and to the gathering mechanism, said gathering mechanism being in a horizontal position. Fig. 10 is a detail of the forward end of the gathering mechanism in

operative position showing also the lifting-jack therefor. Fig. 11 is a plan view showing the means for transmitting motion from the main driving-shaft to the winding-drums. Figs. 12 and 13 are side and end views, respectively, of the devices for controlling the winding-drum connections.

My invention comprises a main shaft 1, mounted horizontally in the main frame 2 and driven by any suitable motor 3, preferably electric. Upon this shaft is fixed a bevel gear-wheel 4, which meshes with another bevel gear-wheel 5, fixed upon a shaft 6, journaled vertically in said frame. This vertical shaft is connected by a universal joint or shaft coupling 7 to a shaft 8. This last-mentioned shaft 8 is journaled in one end of an elongated arm 9 and has fixed thereon a pair of sprocket-wheels 10. Said arm has no other connection with the main frame of the machine except through said shaft 8, and hence is movable freely in all directions. At the free end of said arm is journaled a second shaft 11, having a pair of sprocket-wheels 12 fixed thereto. A sprocket-chain 13 is mounted to cooperate with the sprocket-wheels 10 on the power-transmitting shaft 8 and with the sprocket-wheels 12 at the free end of the arm. This arm or auxiliary frame is preferably made in the form of a trussed frame whose side bars 14 and 15 cooperate, as hereinafter described.

The sprocket-chain 13 is made up of a series of parallel links 17, pivotally jointed together by means of pins 18. The ends of the pins 18 are reduced to pass through the links, and the shoulders thus formed on the pins constitute abutments, serving to keep the links separated the proper distance. At intervals along the chain the link-pins are provided with studs 19 at right angles thereto. A convenient means for mounting the stud upon the link is illustrated in Figs. 5, 6, and 7. As shown in these figures, the link-pin has a hole formed transversely therethrough. The stud 19 has one end reduced and extended through this hole and is secured by means of a nut 20, working on its projecting end, which is screw-threaded to cooperate therewith. Each stud has a flight 16 pivotally fastened thereto. The flight preferably consists of a flat plate having a longitudinal

rib near the middle of its back to give it rigidity. In order that said flight may have a pivotal motion on the stud, it is secured thereto by means of a strap or casting 21, surrounding said stud and riveted or otherwise suitably fastened to the rib of the flight. The outer end of the stud is provided with a shoulder 22, which holds the flight in position, and this same end of the stud has a roller 23 mounted thereon and arranged to bear against the side bars 14 and 15 of the trussed frame. The link-pins to which the flights are connected are provided on their outer ends with rollers 24, which are also adapted to bear against the side bars of the trussed frame. The side bar 14 of the trussed frame 9 is made of a C shape, so that the rollers 24 may bear either upon the main web or upon the overhanging flanges, as the case may be. By the arrangement just described the rollers 23 and 24 take up the friction and a considerable portion of the wear on the chain, and the flights are movable in any direction relative to the chain.

The trussed frame 8 has a slideway 25, mounted along its side in position to be scraped or cleared by the flights in their return movement toward the driving-sprocket. The forward end of the slideway 25 extends around the end of the trussed frame 9 and a short distance to one side thereof to form a gathering-scoop, as hereinafter specified. Along the outer edge of this slideway is a raised side or guard 26, the arrangement being such as to constitute a trough or channel.

Fixed upon the shaft 11 at the free end of the trussed frame and between the sprocket-wheels thereon is a star-wheel 27. The periphery of this wheel is arranged so as not to interfere with the length of the sprocket-chain; but it has bosses or teeth thereon projecting beyond the pitch-line of the sprocket-wheels in position to engage the pivot-studs of the flights and tilt them outwardly so as to give the flights a forward inclination as they are carried around the driven sprocket. In order to keep the flights in proper position during their backward movement, a rod 28 is fixed to the frame in position to guide said flights.

As hereinbefore stated, the free end of the trussed frame is independent of the main frame 2 of the machine, and consequently this free end rests normally upon the ground or floor. In order to prevent unnecessary wear and to facilitate the movement of this free end about the shaft 8 as an axis, it is provided with rollers 29 30, which rest directly upon the floor. In order to elevate the free end of the trussed frame to clear obstructions, it is provided with a lifting-jack 31. As illustrated in Figs. 1, 3, and 10, this lifting-jack consists of a bent lever pivotally connected to the under side of the trussed frame on the side opposite the coal-trough. The lever is provided with rollers 32, adapted to rest upon the ground nearly below the returning side of the sprocket-chain. Then it is bent upwardly to clear the

coal-trough and is provided with a handle for manipulating the same. By pulling down on the hand-lever the trussed frame is tilted on the roller 30, whereby the forward end of the trough is raised to clear obstruction.

As hereinbefore stated, the end of the slideway 25 constitutes a gathering-scoop. In order to be effective for this purpose, the machine is provided with intermediate connecting devices, whereby the power of the engine is applied to the trussed frame to force the scoop into or under the mass of coal. For this purpose the main driving-shaft 1 of the engine or motor carries a conical head or friction-cone 33. This friction-cone 33 co-operates with another friction-cone or bevel friction-wheel 34, mounted upon a sleeve 35, which sleeve is movably mounted on a shaft or axle 36, arranged transversely of the main shaft in the frame of the machine. The sleeve 35 constitutes a winding-drum for a rope 37, which is fastened thereto at one end. This rope passes over an idle pulley 38 near the front end of the platform, and thence over a second pulley 39 on the end of a mast-arm 40, and thence directly to the side of the trussed frame. The mast-arm 40 is mounted at the front end of the platform of the machine and projects laterally therefrom in a substantially horizontal plane. The mast-arm is preferably removable or adjustable transversely of the vehicle-body, and for this purpose the vehicle-body is provided with clamping jaws or screws 41, arranged to engage the base of said mast-arm.

By the arrangement just described the power is transmitted through the friction-cone 33 and bevel-wheel 34 to the winding-drum 35 and thence through the rope 37 to the side of the trussed frame. The power thus transmitted tends to pull the scoop end of the slideway under or into the mass of coal. The pull upon the scoop is thus regulated by the frictional contact between the friction-cone 33 and bevel-wheel 34. Consequently the sidewise movement of the scoop ceases whenever it meets any considerable resistance, but is resumed as soon as the resistance becomes slight, as is the case when the coal-supply is nearly exhausted. This construction thus constitutes a yielding frictional device which operates automatically to swing the scoop of the gathering mechanism into position to work to best advantage, and said device is easily separable from the actuating mechanism.

The hoisting-drum 35 has a collar 42, provided with a circumferential groove 43. In this groove 43 works one or more pins 44, mounted on a lever 45, which is journaled in the framework and engages an elongated slot provided therefor in the end of a hand-lever 46. This hand-lever is preferably made of resilient metal, arranged to normally engage ratchet-teeth provided therefor in a sector 47. By this arrangement the movement of the hand-lever causes the hoisting-drum 35

and the bevel-wheel 34 to move endwise of the shaft 36, and thereby causes the winding-drum 35 to be engaged or disconnected from the driving mechanism.

5 In order to change or vary the contact-surfaces of the friction-cone 33 and bevel-wheel 34, and thereby regulate the power-transmitting capacity of the frictional engagement, the conical head or the friction-cone 33 is movable endwise on the driving-shaft 1. For this purpose the friction-cone 33 is fastened to said shaft by a feather or spline 48 and groove cooperating therewith to allow the endwise movement of said head. Said friction-cone 15 has a collar provided with a circumferential groove 49. In this groove 49 works a pin 50, which is carried on one arm of a horizontal bell-crank lever 51, which has a pin 52 in its other arm. This pin 52 works in an elongated slot in a hand-lever 53, which is preferably resilient and cooperates with a sector 54, provided therefor. By this arrangement the movement of the hand-lever is transmitted through the bell-crank lever to cause the 25 movement of the friction-cone endwise of the driving-shaft.

The machine is also preferably provided with a second winding-drum 55, mounted on the axle or shaft 36 and provided with a bevel-wheel 56, arranged to engage the friction-cone 33 on the driving-shaft. The winding-drum 55 has a collar fixed thereto and provided with a circumferential groove 57, in which works one or more pins 58, mounted 35 on a lever 59, which is connected by a link 60 to a resilient hand-lever 61, arranged to cooperate with a sector 62, provided therefor. This arrangement is similar to that shown for controlling the transmission of power to the scoop and is similar in its operation. The drum 55 is likewise provided with a rope 63 and may be used for any of the usual purposes for which winding-drums are commonly employed—such, for instance, as pulling the 45 machine along or hauling mine-cars.

The delivery end of the slideway terminates near the power-transmitting shaft 8. Below said delivery end is a conveyer, which consists of an endless belt 64 or other similar device actuated by the driving mechanism. A convenient arrangement for this purpose consists in a horizontal shaft having a bevel-gear 65, meshing with the bevel-gear 5 of the power-transmitting mechanism, and having 55 also a gear-wheel 66, meshing with a gear-wheel 67, mounted on a shaft which carries the bell-drums 68. In order to provide for the various movements of the gathering mechanism, guards 69 are mounted alongside of the conveyer and at the end thereof for guiding onto the conveyer the coal dumped off of the end of the slideway. The delivery end of the conveyer mechanism is preferably capable of vertical movement. For this purpose the idle drum is mounted in a frame 65 similar to the trussed frame 9 of the gathering mechanism, and any suitable mechanism

may be used for raising and lowering the delivery end of this frame.

In order to render the machine more easily 70 portable, it is preferable to make the gathering mechanism detachable from the actuating mechanism. For this purpose the universal-shaft coupling is made as shown in Figs. 4 and 9. The power-shaft 6 has a yoke 75 70 fixed thereon and carries a transverse bar 71, which is provided with a cross-pin 72. The shaft 8 and gathering mechanism likewise has a yoke 73 at its end, and each arm of this yoke is bifurcated to form a yoke or 80 saddle adapted to fit over and constitute an operative connection with the ends of the cross-pins 72. By this arrangement the shaft 8 of the gathering mechanism is operatively 85 connected to the shaft 7 of the driving mechanism merely by fitting the saddles of the yoke 73 over the pin 72 of the universal joint. The universal joint not only permits the gathering mechanism to move in all directions with reference to the driving mechanism without affecting the operative relation 90 thereof, but it also renders the gathering mechanism easily detachable from the actuating mechanism.

The operation of the device is as follows: 95 All of the mechanism is preferably mounted upon a portable truck or car-body 47, whereby it may be conveniently moved wherever desired—for instance, to a recently-blasted chamber in the mine. During this transportation the gathering mechanism is disconnected and removed from the driving mechanism, the construction of the universal joint hereinbefore described permitting this action with great facility. The gathering mechanism is mounted in position merely by inserting the slotted yoke or one member of the universal joint over the pin which cooperates therewith. The mast-arm 40 is then adjusted to the desired position, and the winding-rope 110 37 is thence passed around the pulleys 38 39 and connected to the trussed frame 9 of the gathering device. The scoop end of the gathering device rests upon the ground or close thereto. The rollers 29 30 support the free 115 end of the gathering device close to the ground. When the engine is set in motion with the parts in these positions, the power is transmitted through the friction-cone 33 and bevel-wheel 34 to the winding-drum 35 120 and thence through the rope 37 to the trussed frame 9 of the gathering mechanism, causing the scoop end of said frame to be pulled laterally into or under the mass of coal until the resistance overcomes the friction-cone 33 and the bevel-head 34. At this stage the movement of the trussed frame ceases, but is repeated from time to time thereafter as the coal is exhausted from the scoop end of the slideway. The power of the engine is also 130 transmitted through the universal-shaft coupling 7 to the sprocket-shaft 8 and thence to the sprocket-chain 13 and the flights 16 thereon. As the flights pass around the idle

sprocket 12 at the free end of the trussed frame they come in contact with the coal resting on the scoop end of the slideway and force such coal along the slideway and over the end thereof, causing it to dump onto the conveyer below the upper end of the slideway. When a flight reaches the lower sprocket, the stud 19, upon which it is mounted, is forced outwardly by a boss on the star-wheel 27, so as to give a forward inclination to the flight and rounding the sprocket-wheel, and thereby render its gathering action more effective. When the flight has passed the lower sprocket-wheel, it resumes its position perpendicular to the chain and travels on the antifriction wheels or rollers 23 24. When the flight reaches the upper sprocket-wheel, its stud is forced by the pressure of the coal back between the two sprocket-wheels, the purpose of this action being to prevent the flight knocking off any coal that may be resting on the top of the hopper or side guards of the conveyer. When the flight passes the driving-sprockets, the rollers 24 bear against the side of the trussed frame and throw the flights out of their normal position perpendicular to the chain. The gathering mechanism thus sweeps in a circular arc, scooping up and carrying to the conveyer all the coal within its reach. The gathering mechanism is then pulled back and the machine moved forwardly to resume the operation just described. The coal dumped onto the conveyer is carried by it to the mine-car or other place of delivery.

Obviously the construction hereinbefore described admits of considerable modification without departing from my invention, and I do not wish to be restricted to the specific construction hereinbefore described.

What I claim is—

1. A loading device comprising actuating mechanism, gathering mechanism and a universal shaft-coupling constituting both the support for said gathering mechanism and the means for connecting it to the actuating mechanism, substantially as described.

2. A loading device comprising actuating mechanism, gathering mechanism and a universal shaft-coupling constituting both a support for said gathering mechanism and the means for connecting it to the actuating mechanism, said shaft-coupling comprising a member mounted on a shaft of the actuating mechanism, and a second member mounted on a shaft of the gathering mechanism and having saddles arranged to fit over a part of said first member and to be removable therefrom, substantially as described.

3. A loading device comprising a main frame, an actuating mechanism, a gathering mechanism, and means for transmitting power from the actuating mechanism to the gathering mechanism, said means comprising a yielding connection whose respective members normally engage the actuating mechanism and the gathering mechanism respec-

tively, whereby said gathering mechanism is kept automatically in position to reach fresh material, substantially as described.

4. A loading device comprising a main frame and actuating mechanism, and a gathering mechanism operatively connected to said actuating mechanism to be actuated thereby, and means for swinging said gathering mechanism relatively to said main frame, said means comprising a winding-drum having a yielding connection to actuating mechanism and a rope connected to said drum and to the frame of the gathering mechanism, substantially as described.

5. A loading device comprising a main frame and actuating mechanism, and a gathering mechanism normally connected to said actuating mechanism to be actuated thereby and means for swinging said gathering mechanism relatively to said main frame, said means comprising a winding-drum and a frictional device for connecting it to the actuating mechanism, and a rope connected to said drum and to the frame of the gathering mechanism, whereby said gathering mechanism is moved automatically to its proper working position, substantially as and for the purpose described.

6. A loading device comprising a main frame and actuating mechanism, and a gathering mechanism normally connected to said actuating mechanism to be actuated thereby, and means for swinging said gathering mechanism relatively to said main frame, said means comprising a winding-drum and an adjustable frictional device for connecting it to the actuating mechanism, and a rope connected to said drum and to the frame of the gathering mechanism, all arranged to maintain a continuous horizontal pull on said gathering mechanism, substantially as and for the purpose set forth.

7. A loading device comprising a main frame and actuating mechanism, and a gathering mechanism normally connected to said actuating mechanism to be actuated thereby, and means for swinging said gathering mechanism relatively to said main frame, said means comprising a winding-drum and a separable frictional device for connecting it to the actuating mechanism, and a rope connected to said drum and to the frame of the gathering mechanism, all arranged to maintain a continuous horizontal pull on said gathering mechanism, substantially as and for the purpose set forth.

8. A loading device comprising a main frame and actuating mechanism, and a gathering mechanism operatively connected to said actuating mechanism to be actuated thereby, and means for swinging said gathering mechanism relatively to said main frame, said means comprising a winding-drum, a mast-arm adjustably mounted in the main frame and projecting laterally therefrom and having a pulley thereon and a rope passing over said pulley and connected to said drum

and to the frame of the gathering mechanism, substantially as described.

9. A loading device comprising a main frame and a gathering mechanism mounted thereon to swing laterally, said gathering mechanism comprising an elongated frame, conveyer mechanism thereon and a scoop, and means for transmitting power to the conveyer mechanism, substantially as described.

10. A loading device comprising a main frame, and a gathering mechanism pivotally mounted thereon and comprising an elongated frame, a slideway along the side thereof, sprocket-wheels journaled in the ends of said frame to turn parallel with said slideway, and a conveyer-chain for said wheels arranged to cooperate with said slideway and turn in a plane parallel therewith, and means for transmitting power to said chain, substantially as described.

11. A loading device comprising a main frame and a gathering mechanism pivotally mounted thereon and comprising an elongated frame, a slideway along the side thereof, sprocket-wheels journaled in the ends of said frame to turn parallel with said slideway, a conveyer-chain for said wheels arranged to cooperate with said slideway, and means for transmitting power to said chain, the end of said slideway extending beyond the end of said frame and arranged to form a scoop, substantially as described.

12. A loading device comprising a main frame and a gathering mechanism pivotally mounted thereon, said gathering mechanism comprising a frame, sprocket-wheels journaled therein, a conveyer-chain therefor and mechanism for transmitting power thereto, the frame of the gathering mechanism having a slideway mounted thereon and said conveyer-chain having flights mounted to swing universally thereon and arranged to cooperate with said slideway, substantially as described.

13. A loading device comprising a main frame and actuating mechanism, and a gathering mechanism connected thereto to be actuated thereby, said gathering mechanism comprising a frame, sprocket-wheels journaled therein, a conveyer-chain for said sprocket-wheels and a universal shaft-coupling connecting the shaft of one of said sprocket-wheels to a shaft of the actuating mechanism and constituting a support for the frame of the gathering mechanism, substantially as described.

14. A loading device comprising a main frame and actuating mechanism, and a gathering mechanism connected thereto to be actuated thereby, said gathering mechanism comprising a frame, sprocket-wheels journaled therein, a conveyer-chain for said sprocket-wheels and a universal shaft-coupling connecting the shaft of one of said sprocket-wheels to a shaft of the actuating mechanism and constituting a support for the frame of the gathering mechanism, said shaft-

coupling being detachable, substantially as described.

15. A loading device comprising a main frame and actuating mechanism, and a gathering mechanism connected thereto to be actuated thereby, said gathering mechanism comprising a frame, sprocket-wheels journaled therein, a conveyer-chain for said sprocket-wheels and a universal shaft-coupling connecting the shaft of one of said sprocket-wheels to a shaft of the actuating mechanism and constituting a support for the frame of the gathering mechanism, and separate mechanism connecting said actuating mechanism to the frame of the gathering mechanism for swinging the same, substantially as described.

16. A loading device comprising a main frame and actuating mechanism, and a gathering mechanism connected thereto to be actuated thereby, said gathering mechanism comprising a frame, sprocket-wheels journaled therein, a conveyer-chain for said sprocket-wheels and a universal shaft-coupling connecting the shaft of one of said sprocket-wheels to a shaft of the actuating mechanism and constituting a support for the frame of the gathering mechanism and separate mechanism connected to the frame of the gathering mechanism and having frictional engagements with said actuating mechanism whereby said gathering mechanism is swung on its support, substantially as described.

17. A loading device comprising a main frame and actuating mechanism and a gathering mechanism operatively connected thereto, the connection comprising a part fixed to the gathering mechanism and resting upon and interlocking with a part fixed to the actuating mechanism and said parts being separable from the actuating mechanism merely by lifting the part on the gathering mechanism out of engagement with the other part, substantially as described.

18. A loading device comprising a main frame and a gathering mechanism, said gathering mechanism being pivotally mounted on the main frame and being pivotally mounted to swing on a longitudinal axis, and a lifting-jack for swinging the same on said axis, substantially as described.

19. A loading device comprising a main frame and a gathering mechanism universally connected thereto at one end, and a lifting-jack for the free end of said gathering mechanism, said lifting-jack being mounted on the frame of the gathering mechanism whereby it is arranged to move therewith and work against the floor, substantially as described.

20. A loading device comprising a main frame and a gathering mechanism universally connected thereto at one end, and a lifting-jack for the free end of said gathering mechanism, said lifting-jack comprising a bent hand-lever pivotally connected to the frame of the gathering mechanism and having a

roller adapted to rest on the ground, substantially as described.

21. A loading device comprising a main frame and a gathering mechanism universally connected thereto at one end, and a lifting-jack for the free end of said gathering mechanism, said lifting-jack comprising a handle lever pivotally connected to one side of the frame of the gathering mechanism and having a roller adapted to rest on the ground and being thence bent up past the other side of the frame, substantially as described.

22. A gathering mechanism comprising a frame, sprocket-wheels journaled therein, a sprocket-chain cooperating with said sprocket-wheels, flights pivotally mounted on the sprocket-chain and a star-wheel on the shaft of one of said sprocket-wheels arranged to tilt said flights forwardly as they pass said sprocket-wheel, substantially as described.

23. A gathering mechanism comprising a frame, sprocket-wheels journaled therein, a sprocket-chain cooperating with said sprocket-wheels, flights mounted on the link-pins of the sprocket-chain and a star-wheel on the shaft of one of said sprocket-wheels arranged to tilt said flights forwardly as they pass said sprocket-wheel, substantially as described.

24. A gathering mechanism comprising a frame, sprocket-wheels journaled therein, a sprocket-chain cooperating with said sprocket-wheels, flights pivotally mounted on the link-pins of the sprocket-chain and a star-wheel on the shaft of one of said sprocket-wheels arranged to tilt said flights forwardly as they pass said sprocket-wheel, substantially as described.

25. A conveyer-chain comprising a series of links and flights mounted universally thereon, substantially as described.

26. A conveyer-chain comprising a series of links, pins pivotally connecting said links, studs on said pins and flights pivotally mounted on said studs, substantially as described.

27. A loading device comprising a main frame, an actuating mechanism, a gathering mechanism operatively connected thereto and comprising a frame mounted in the main frame to swing universally, a conveyer-chain and a slideway cooperating therewith and a conveyer mechanism operatively connected to the actuating mechanism and arranged below the delivery end of said slideway, substantially as described.

28. A loading device comprising a main frame, an actuating mechanism, a gathering mechanism operatively connected thereto

and comprising a frame mounted in the main frame to swing universally, a conveyer-chain and a slideway cooperating therewith and a conveyer mechanism operatively connected to the actuating mechanism and arranged below the delivery end of said slideway, said conveyer mechanism having its delivery end vertically adjustable, substantially as described.

29. A loading device comprising a main frame and actuating mechanism, a gathering mechanism operatively connected thereto and comprising a frame mounted to swing horizontally and vertically, a conveyer-chain and a slideway cooperating therewith, and a conveyer mechanism operatively connected to the actuating mechanism and arranged below the delivery end of said slideway, substantially as described.

30. The combination in an ore-loading apparatus, of a wheeled support, a frame pivotally mounted thereon, an endless conveyer having its going and return sections lying in the same horizontal plane, and end wheels over which the conveyer passes, said wheels mounted on axes vertical to the bottom of the channel, in which the conveyer operates.

31. The combination in a loading apparatus, of a wheeled carriage, a frame pivoted thereon, an endless conveyer having outwardly - extending resiliently - supported blades movable over the surface of said frame, and wheels at the ends of the frame over which the conveyer passes, said wheels mounted on axes vertical to the bottom of the channel in which the conveyer operates.

32. The combination in a loading-machine of a wheeled support, a frame pivotally mounted thereon, an endless conveyer having opposite portions of its going and return sections arranged at equal elevations, and end wheels over which the conveyer passes, the axes of said wheels being arranged perpendicular to the plane of the conveyer.

33. The combination in a loading-machine of a wheeled carriage, a frame pivoted thereon, an endless conveyer having freely-swinging blades movable over the surface of said frame, and wheels at the ends of the frame over which the conveyer passes, the axes of said wheels being perpendicular to the plane of the conveyer.

WM. E. HAMILTON.

In presence of—
S. C. ABBOT,
R. L. BELT.