

(No Model.)

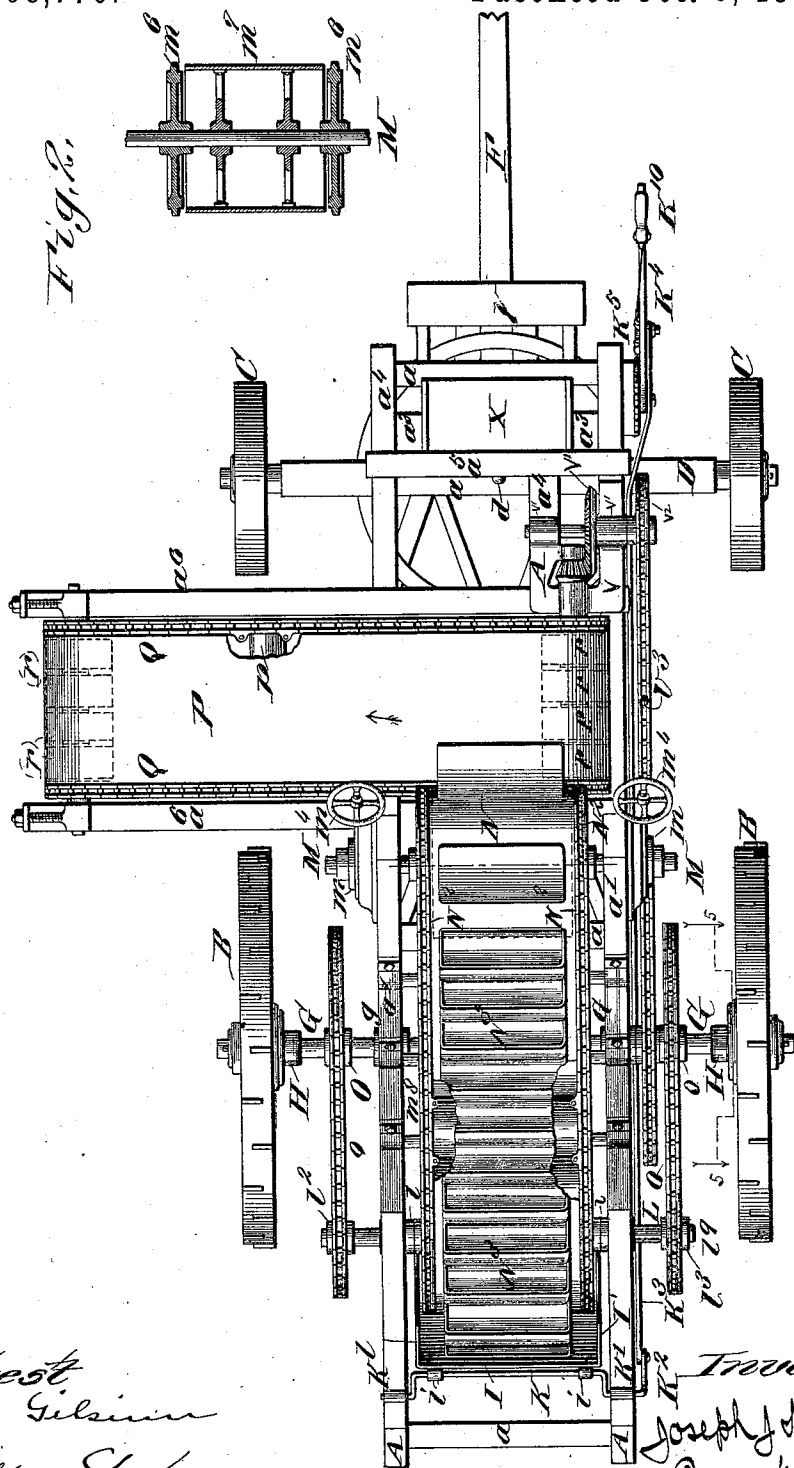
4 Sheets—Sheet 1.

J. J. KULAGE.
GATHERING AND LOADING APPARATUS.

No. 568,770.

Patented Oct. 6, 1896.

Fig. 1.



Attest
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Per: S. Rex
his Attorney

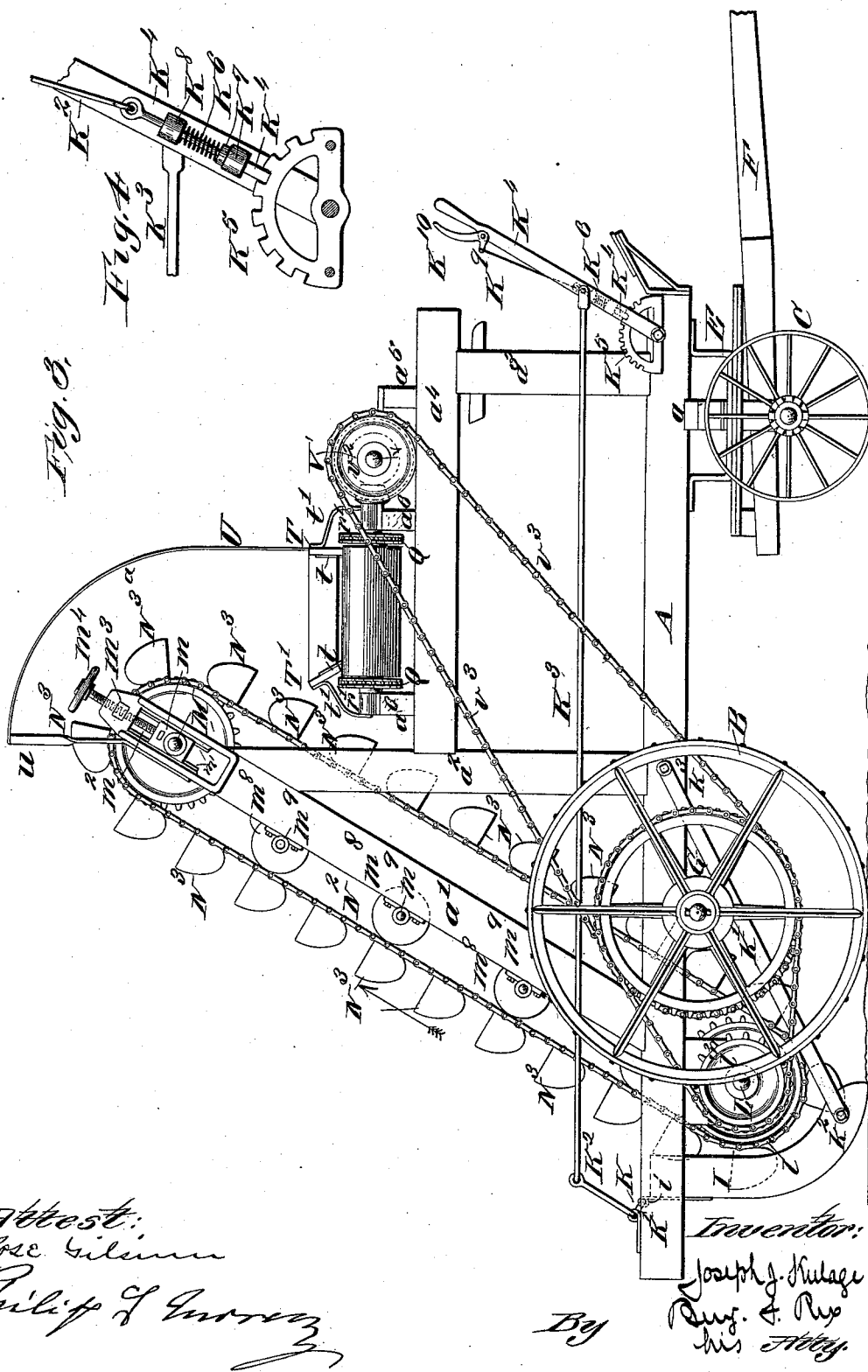
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J. J. KULAGE.
GATHERING AND LOADING APPARATUS.

No. 568,770.

Patented Oct. 6, 1896.



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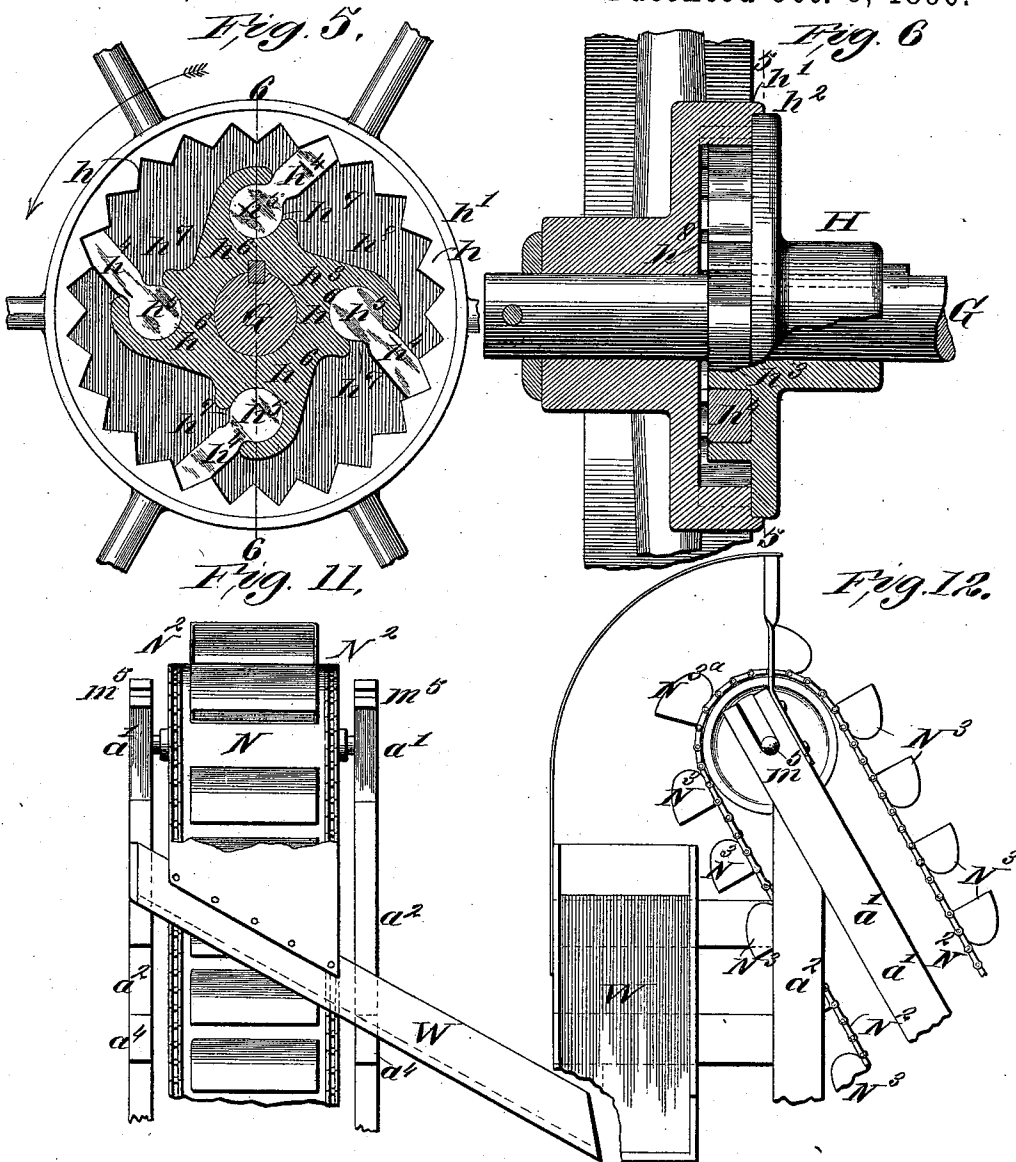
(No Model.)

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J. J. KULAGE.
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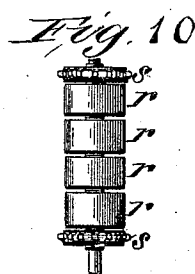
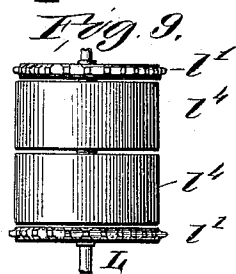
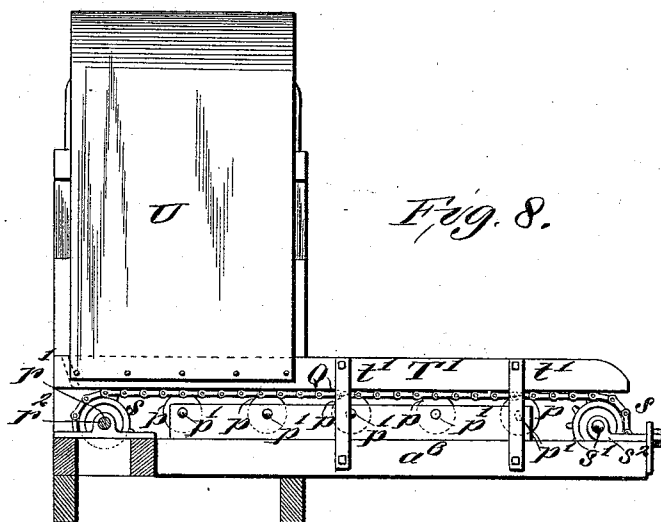
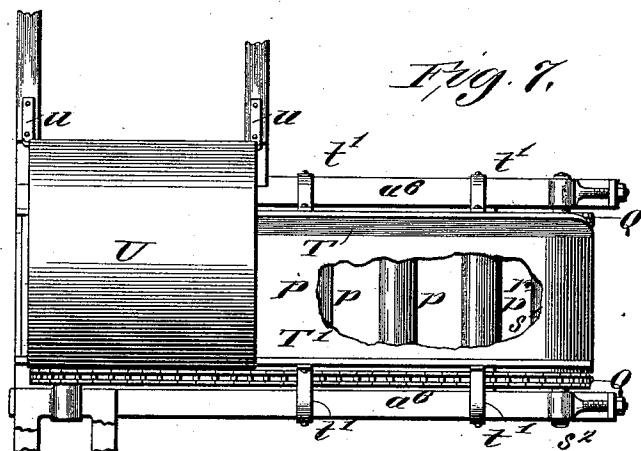
(No Model.)

4 Sheets—Sheet 4.

J. J. KULAGE.
GATHERING AND LOADING APPARATUS.

No. 568,770.

Patented Oct. 6, 1896.



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UNITED STATES PATENT OFFICE.

JOSEPH J. KULAGE, OF ST. LOUIS, MISSOURI.

GATHERING AND LOADING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 568,770, dated October 6, 1896.

Application filed September 9, 1895. Serial No. 561,993. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH J. KULAGE, a citizen of the United States, residing at St. Louis, in the State of Missouri, have invented a new and useful Improvement in Gathering and Loading Apparatus, of which the following is a specification.

My invention relates to improvements in apparatus for gathering and loading upon vehicles clay, sand, gravel, or other similar materials; and my improvements are especially useful in gathering and loading upon wagons or other vehicles clay previously loosened and suitable for use in the manufacture of bricks.

The details of my improvements are hereinafter described and claimed, reference being had to the annexed drawings, making part of this specification, in which—

Figure 1 is a plan view of an excavator embodying my improvements, with hood and side boards omitted for convenience in illustration; Fig. 2, a detailed view showing a vertical longitudinal section of a pulley and a pair of sprocket-wheels arranged on the same shaft; Fig. 3, a side elevation of the apparatus represented by Fig. 1; Fig. 4, a side elevation of a detail on an enlarged scale; Fig. 5, a vertical section on the line 5 5, Figs. 1 and 6; Fig. 6, in part a vertical section on the line 6 6, Fig. 5, and in part a side elevation of parts shown; Fig. 7, a plan view of a laterally-extending carrier and a hood or guard; Fig. 8, a front elevation of the same parts; Fig. 9, a shaft carrying two rollers and a pair of sprocket-wheels; Fig. 10, a shaft carrying four rollers and a pair of sprocket-wheels; Fig. 11, a detailed view of a modification in which the elevated material is dumped into a chute, and Fig. 12 a side elevation of the parts represented in Fig. 11.

Similar letters refer to similar parts throughout the several views.

The preferred form of my excavator-frame is represented in the drawings, Figs. 1 and 3, and preferably consists of the following parts, viz: the side pieces A A, the cross-pieces a a a, connecting said side pieces, the diagonal elevator-supports a' a', the uprights a² a² and a³ a³, the side pieces a⁴ a⁴, supported by said uprights and attaching them together, the cross-tie a⁵, connecting the pieces a⁴ a⁴,

and the laterally-extending pieces a⁶ a⁶. As will be obvious, this special form of frame, though well adapted to the purpose, is not essential.

The excavator-frame is preferably supported upon four wheels, two hind wheels B B, preferably of the traction type, and two front wheels C C of ordinary construction. The front wheels C C, as shown, turn on an axle D of ordinary construction, to which the said frame is attached by means of a king-bolt d.

E is a fifth-wheel of ordinary construction, and F a tongue of a form usual in wagons, the apparatus shown being designed to be drawn by animals, though other means of propulsion may be used, as will be obvious.

G is a shaft upon which the rear end of the excavator-frame rests. It turns in bearings g g, Fig. 1.

The wheels B B are each preferably detachably attached to said shaft by means of a clutch H and a linchpin or equivalents. The clutches H H cause the wheels B B and shaft G to turn together when the apparatus is drawn forward, but allow each of said wheels to turn freely upon said shaft when the side on which it is located is moved backward in turning or when the whole apparatus is moved backward. Each of said clutches preferably consists (see Figs. 1 and 6) of an annular rack h and flange h', attached to or formed in the inner side of the wheel in connection with which it operates, a part H', attached to the shaft G and having a flange h² fitting within the flange h', a part h³, adapted to enter the recess surrounded by the annular rack h, and gravity-pawls h⁴ h⁴, &c., pivotally connected to said part h³, so that one or more are in position to engage said rack when the apparatus is moved forward. The preferred method of attaching the pawls in place is represented most clearly in Figs. 5 and 6. Each pawl is shown provided with a rounded head h⁵, adapted to fit into and turn in a socket h⁶ in the part H', having a tangential opening h⁷, through which the pawl extends and between the sides of which it moves. The pawl is so formed that while the part passing through said opening has play therein the head cannot be withdrawn therefrom when the pawl is in place. The outer sides of the heads of

the pawls rest against the face h h of the part attached to or formed on the wheels B when the part II' is in place, and are thus prevented from coming out. Their outer ends h^9 are formed so as to engage the rack h . I prefer to use four pawls, as shown. By using pawls arranged substantially as shown the necessity for using a spring or springs is avoided, as gravity can be relied upon to keep one of the pawls in position to be engaged when the wheel with which the clutch is connected is caused to rotate in the direction indicated by an arrow in Fig. 5. When the wheel is caused to rotate in the opposite direction, the pawls are disengaged and allow the wheel to turn freely upon the shaft G.

I, Figs. 1 and 3, represents a gathering-scraper of ordinary construction, preferably having sides I' I', and which is supported by the excavator-frame, and is preferably located near the rear end of the apparatus. It is preferably pivotally connected with said frame by means of the bent shaft K, which is journaled in bearings k' k' , attached to the frame, and turns in bearings i i , by means of which it is connected with the scraper. The scraper is preferably attached to the excavator-frame by means of bars K' K', which extend forward and upward at an angle, one on each side, from near the nose of the scraper to the excavator-frame, and each of which has its lower end pivotally connected with the scraper and its upper end pivotally connected with the frame. The means of connection shown are bolts k^2 k^2 and k^3 k^3 .

The scraper I may be elevated or lowered by means of the lever K², attached to the shaft K and extending upward therefrom.

K³, Figs. 1 and 3, is a rod having one end pivotally connected with said lever and extending forward therefrom to another lever K⁴, to which it is also pivotally connected. The lever K⁴ is pivotally connected with the excavator-frame and carries a dog k^4 , which engages a segmental rack k^5 . It is preferably forced into engagement with said rack by means of a coiled spring k^6 , one end of which rests against a shoulder k^7 on said dog and the other end of which bears against a shoulder k^8 on said lever, through which said dog passes.

k^9 is a rod connected at its lower end with said dog and at its upper end with one arm of a bell-crank lever K¹⁰, which is pivotally connected with the lever K⁴, and by means of which the dog k^4 may be retracted and disengaged from said rack k^5 . The lever K⁴ and parts immediately connected therewith are of common forms, and the special forms shown are not essential.

When the lever K⁴ is moved forward, the nose of the scraper I is lowered, and when it is pulled backward the scraper is elevated and may be lifted out of contact with the ground.

The points at which the bars K' and K' and the scraper are connected move when the

scraper is elevated or lowered through the arc of a circle eccentric to the axis of the pulleys 14, around which the series of elevator-buckets turn when loading, as hereinafter described, and which axis may be termed the "lower" axis of the series of buckets. By reason of this fact and the method of supporting the upper end of the scraper I am enabled to adjust the scraper to and from the buckets and increase the distance between it and the buckets, so as to allow them a larger passage when the depth of the cut is increased by lowering the scraper. This increase of the distance between the buckets and the scraper is very important, as it prevents the apparatus from becoming clogged. It is also important when the depth of the cut is small that the scraper should be brought closer to the elevator-buckets than when the cut is deep, as it enables the buckets to gather their loads more perfectly. This adjustment also I secure.

A scraper such as the one shown differs from a plow or similar device in this, that instead of throwing the earth to one side it gathers it up in front of it and thus gets it into a position which enables the buckets hereinafter described to scoop up their loads. Its sides assist in preventing the earth from escaping. It will be obvious that the exact form shown may be varied without departing from the mode of operation of the device shown, and I do not confine my claims to said form of scraper. In brick-making the earth is usually loosened before the gatherer and loader is set to work.

L is a shaft journaled in bearings l l , attached to the frame. It preferably has attached thereto sprocket-wheels l' l' and l^2 and between said sprocket-wheels l' l' two pulleys l^3 , spaced apart, so as to permit material carried onto them by the belt to fall between them. This arrangement of sprocket-wheels and pulleys is shown most clearly in Fig. 9.

The diagonal pieces a' a' of the frame support at their upper ends a shaft M, which preferably turns in bearing-blocks m m , each of which slides between guides m' m' and is movable by means of a screw m^2 , whose lower end engages said block and whose upper end passes through and engages an internally-screw-threaded opening in an end block m^3 and is provided with a wheel m^4 , by means of which it may be turned. This arrangement for adjustably supporting the shaft M, though desirable, for the purpose of tightening the belt, whose upper end is supported by said shaft in the manner hereinafter described, is not essential, and in the modification represented in Figs. 11 and 12 it is not shown, the bearings m^5 there represented being stationary.

The shaft M carries two sprocket-wheels m^6 m^6 and between them a pulley m^7 , which is only shown in dotted lines in Fig. 1, but appears in detail in Fig. 2.

Over the pulleys l^4 and m^7 an endless belt N runs, which has attached to each edge a sprocket-chain N^2 . Each of said sprocket-chains N^2 passes over and is engaged by a sprocket-wheel on the shaft L and a sprocket-wheel m^6 on the shaft M. This arrangement gives the belt a positive motion and supports it more fully than the sprocket-wheels alone could do it. It also prevents lateral movement by the belt on the pulleys. As will be obvious, either the sprocket-wheels alone without the pulleys or the pulleys without the sprocket wheels and chains might be used with good results, though the arrangement described is considered the most perfect and satisfactory. m^8 m^8 , &c., are rollers journaled in bearings m^9 m^9 , &c., preferably attached to the diagonal supports a' a' .

Attached to the belt N and carried by said belt and the chains N^2 N^2 are a series of buckets N^3 N^3 , &c., so arranged that those on the rear portion of the belt have their tops uppermost when the belt is in place and those next the front of the apparatus are carried upside down, substantially as shown in Fig. 3, and, in consequence, when the pulleys and sprocket-wheels are caused to revolve in the direction indicated by arrows in Fig. 3 the buckets N^3 are caused to approach the scraper, moving from front to rear in position to scoop up and load themselves with the material to be elevated, previously heaped up by the action of the scraper I.

The gathering character of the scraper and the movement of the buckets toward it in scooping up their loads make the successful loading of the buckets easy and certain. The scraper not only gathers the clay or other material up in front of it, but prevents its escaping from the buckets when they are scooping it up.

Motion is preferably communicated to the buckets as follows: Two pulleys O O are attached to the shaft G, and from one a sprocket-chain o runs to and over a sprocket-wheel l^2 on the shaft L, and from the other a sprocket-chain o' runs to and over the sprocket-wheel l^3 . Hence when the wheels B B and shaft G are caused to revolve by the forward movement of the apparatus movement is transmitted, through said sprocket wheels and chains, from the shaft G to the shaft L and, through the sprocket-wheels l' l' and pulley l^4 thereto attached, to the belt N and sprocket-chain N^2 N^2 and the buckets N^3 , carried thereby, which belt N, sprocket-chains N^2 , and buckets N^3 are caused to move in the direction indicated by arrows in Fig. 3.

The dirt or other material elevated and dumped by the buckets N^3 N^3 , &c., is preferably carried to one side and deposited by means of an endless belt P, preferably having attached to each side a sprocket-chain Q. Said belt and chains are preferably supported by means of pulleys r r , &c., and sprocket-wheels r' r' and s s , attached to shafts r^2 and s' , (see Figs. 1, 3, and 10,) journaled in bearings

r^2 and s^2 , attached to the laterally-extending parts a^6 a^6 of the excavator-frame. Each of said shafts preferably carries four or more pulleys spaced apart to permit material to fall between them. Two pulleys gain this advantage to a certain extent, but I prefer more. At each end of each outer pulley a sprocket-wheel is preferably arranged on each of said shafts, as shown most clearly in Fig. 10. Between the pulleys on the shafts r^2 and s' supporting-rollers p p , &c., are arranged and journaled in bearings p' p' , &c., in which they turn, Figs. 7 and 8.

The material dumped upon the belt P is kept from escaping along its side edges by means of side boards T' T', Figs. 3 and 8, each having a flexible lip t and preferably supported by means of brackets t' t' , &c., attached to the parts a^6 a^6 . The board on the rear side is preferably inclined from the bottom edge outward. The material dumped by the buckets is preferably prevented from being thrown too far forward by a guard or hood U, Figs. 3, 7, and 8, whose upper end is preferably supported by means of brackets u u , preferably attached to the tops of the diagonal pieces a' a' , and whose lower end is preferably attached to the side board T', guarding the front side of the belt P.

Motion is communicated to the shaft r^2 and the pulley and sprocket-wheels thereby carried and the belt and chains running over them by means of the following mechanism:

The shaft r^2 , Figs. 1 and 3, carries at one end a bevel-gear V, which meshes with a gear V', attached to a shaft v , which turns in bearings v' v' and carries on its outer end a sprocket-wheel v^2 . From this sprocket-wheel a sprocket-chain v^3 runs to a sprocket-wheel v^4 , attached to the shaft G, from which, when said shaft G revolves, motion is transmitted to the belt P in an obvious manner. The direction in which the belt P travels is indicated by an arrow in Fig. 1.

In the modification shown in Figs. 11 and 12 an inclined chute W takes the place of the belt above described, and when material is dumped upon it it is carried to one side by the force of gravity. The chief advantage of the endless belt over such a chute is that, inasmuch as it can travel horizontally, it is unnecessary to have the point at which the buckets dump the material as high when it is used as it has to be where an inclined chute depositing the dirt at the same level is adopted.

X is a seat for a driver. Y is a foot-rest.

The preferred form of my apparatus operates as follows: Upon the apparatus being drawn or driven forward by horses or other means, and the scraper being lowered, the material is gathered by the scraper and tends to accumulate in front of it. At the same time the buckets N^3 N^3 , &c., and the belt P are set in motion, and the buckets, moving toward the scraper in a direction opposite to that in which the apparatus is moving, scoop up the material which has accumulated in

front of the scraper. When the buckets respectively reach the position of the one lettered N^{3a}, they dump their contents upon the belt P, by which it is carried to one side, and if a wagon is driven alongside of the apparatus and into the proper position while the apparatus is at work the elevated material may be deposited in the wagon-bed and the wagon in that way be very quickly loaded. During the loading the wagons move along with the apparatus. After one wagon is loaded the apparatus may be stopped until another has taken the place of the first.

I do not desire to be confined to the special arrangement of parts shown, or the particular forms of mechanism, as any one reading this specification and understanding my improvement will be able to change both without departing from the spirit of my invention.

I claim—

1. The combination of a gathering-scraper; an endless series of elevator-buckets which move from in front toward said scraper in loading; and means by which the scraper is adjusted to scrape to different depths and the space between the lower axis of the series of buckets and the face of the scraper through which the buckets pass is increased when the depth of the scraper's cut is increased and diminished when it is diminished.

2. In a gathering-machine a scraper; a bent shaft K; bearings attached to the frame of the machine, in which said shaft turns; bearings attached to the scraper in which said shaft turns and by which the scraper is suspended from it; bars K', K'; means pivotally connecting them at one end to the scraper at opposite sides, near the scraper's cutting edge; and means pivotally connecting them to the frame of the machine.

3. In a gathering-machine, a scraper; a bent shaft K; the lever K² attached to said shaft; bearings attached to the frame of the machine, in which said shaft turns; bearings attached to the scraper in which said shaft turns and by means of which the scraper is suspended from the shaft; bars K', K'; means pivotally connecting them at one end to the scraper at opposite sides, at points from which they extend upward and forward at an angle; means pivotally connecting their upper ends to the frame of the machine; a rod K³ connected at one end with said lever K²; a lever K⁴, connected to the other end of said rod; and means locking said lever K⁴ in position substantially as described.

4. The combination in a loading apparatus of a scraper; a shaft in front of it; bearings in which said shaft revolves; two or more pulleys spaced apart on said shaft, an upper pulley; a belt passing over said pulleys and a

series of elevator-buckets attached to said belt substantially as described.

5. The combination in a gathering and loading apparatus of a laterally-extending endless conveyer-belt; a pair of shafts each carrying two or more pulleys spaced apart, over which said belt travels; and a pair of side boards each provided with a flexible lip, guarding the sides of said belt substantially as described.

6. The combination in a gathering and loading apparatus, of a pair of wheels which in part support the apparatus; a shaft; bearings within which said shaft turns, means connecting said wheels to said shaft when the apparatus is moved forward, and forcing said shaft and wheels to move together, but permitting said wheels to revolve, on said shaft when moved backward; a gathering-scraper; a shaft rotating in front of said scraper, two or more pulleys on said last-mentioned shaft spaced apart; and two sprocket-wheels, one near the outer end of each outer pulley; a shaft located near the point to which the material is elevated, a pulley and a pair of sprocket-wheels on said shaft; a belt having a sprocket-chain attached to each edge, and said belt running over said pulleys, and said sprocket-chains over said sprocket-wheels; a series of elevator-buckets attached to said belt rising next the rear of the apparatus with tops uppermost and descending next the front of the apparatus with tops down, means transmitting motion from said shaft with which said wheels connect, to said belt and sprocket-chains; and means conveying material dumped from said buckets, to one side of said apparatus substantially as described.

7. The combination in a gathering apparatus of a shaft; a pair of supporting-wheels on said shaft; means which automatically make said wheels fast to said shaft, when the wheels run forward and allow them to run backward loose; a scraper carried by said machine; an endless series of buckets, which move from in front toward said scraper in loading; and means by which the scraper is adjusted to scrape to different depths, and the space between the lower axis of the series of buckets and the face of the scraper through which the buckets pass, is increased when the depth of the scraper's cut is increased, and diminished when it is diminished.

Witness my hand this 6th day of September, 1895.

JOSEPH J. KULAGE.

Witnesses:

THEODOR SCHUMACHER,
OTTO KULAGE.