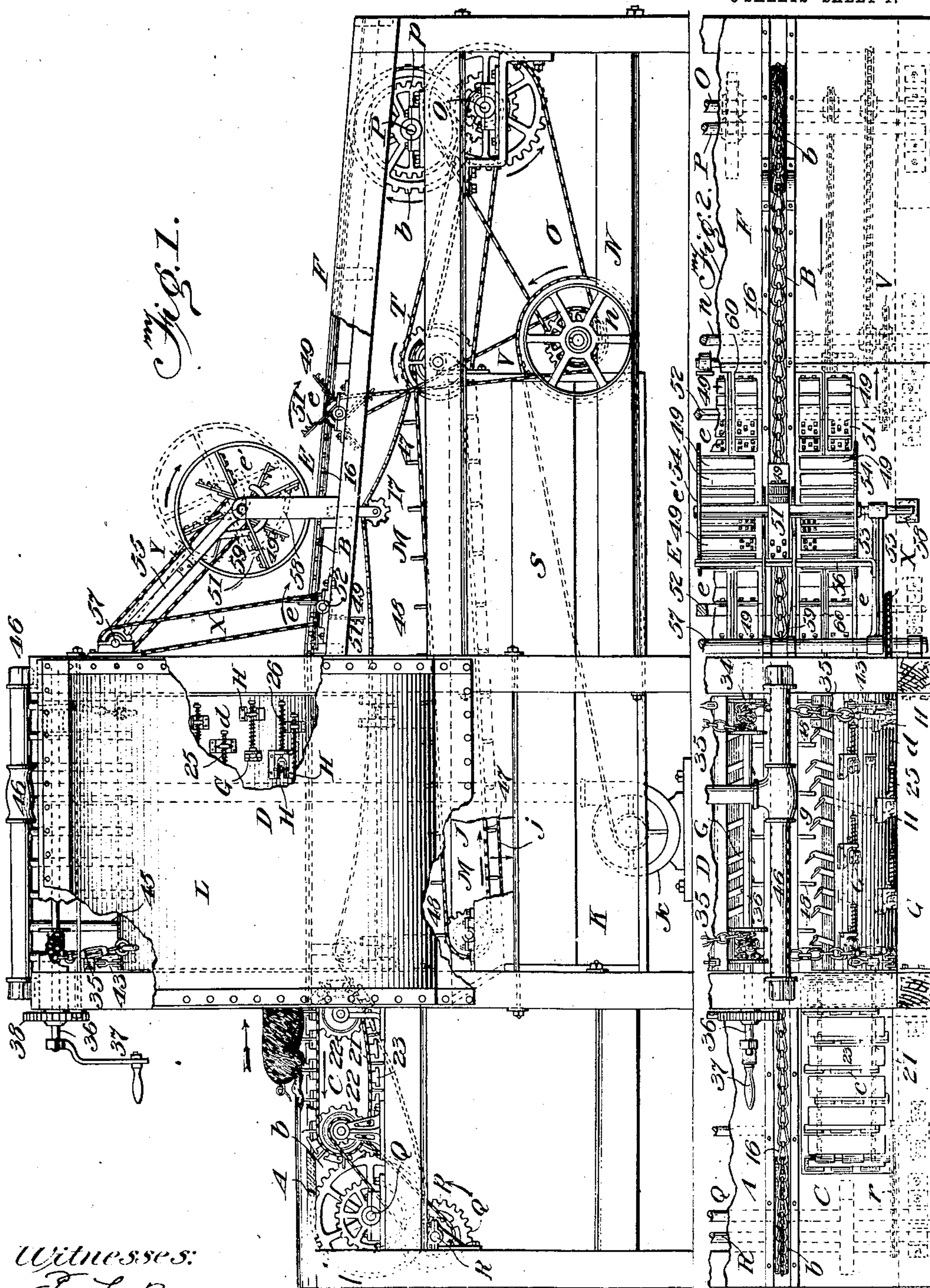


HOG SCRAPER.

**938,594.**

3 SHEETS—SHEET 1.



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HOG SCRAPER.  
APPLICATION FILED SEPT. 7, 1907.

938,594.

Patented Nov. 2, 1909.  
3 SHEETS—SHEET 2.

Fig. 6.

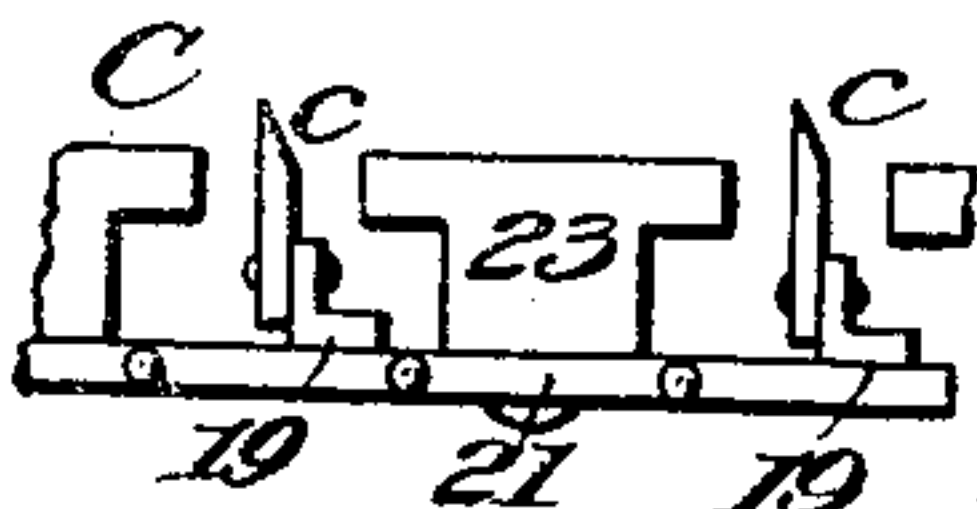
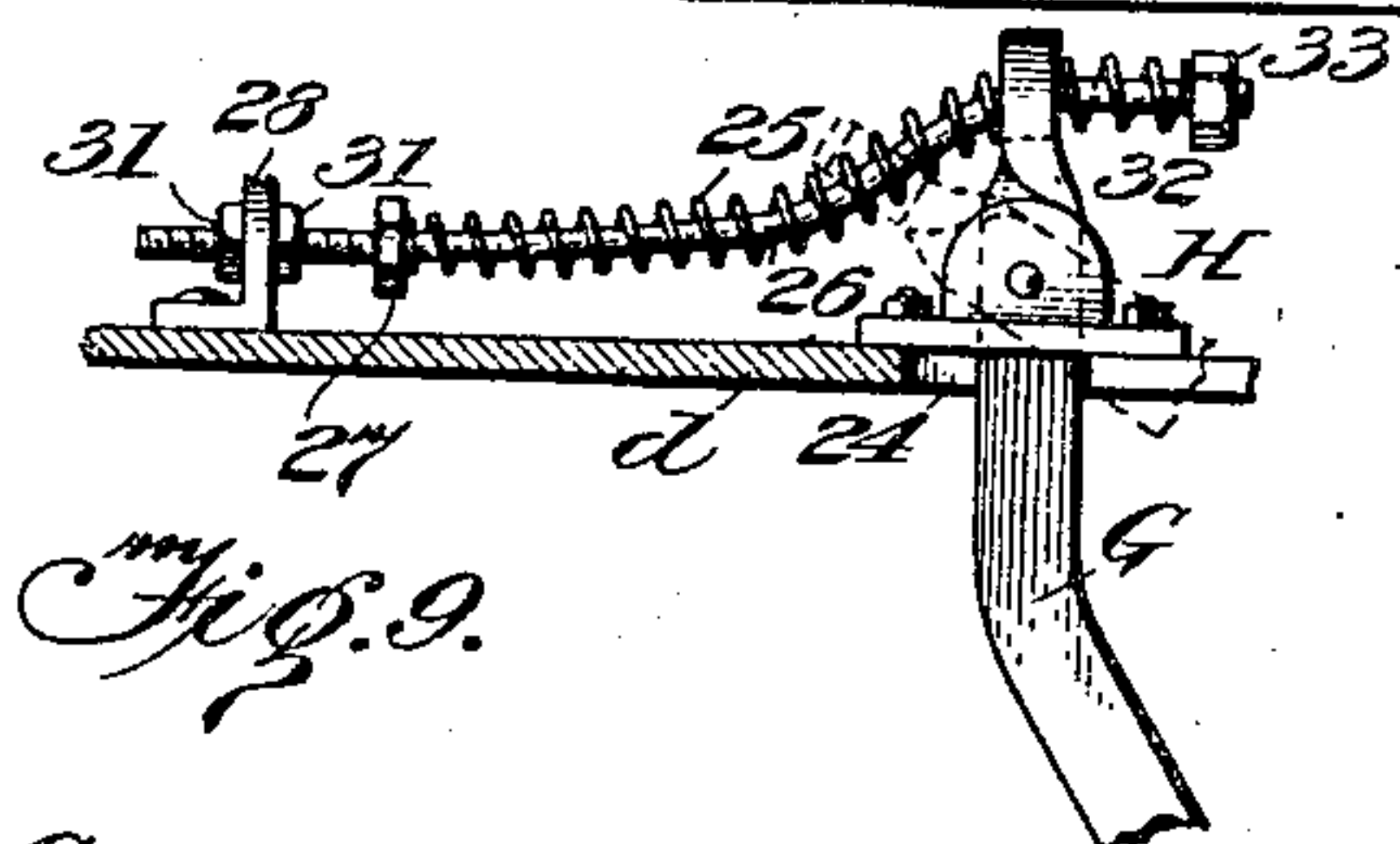
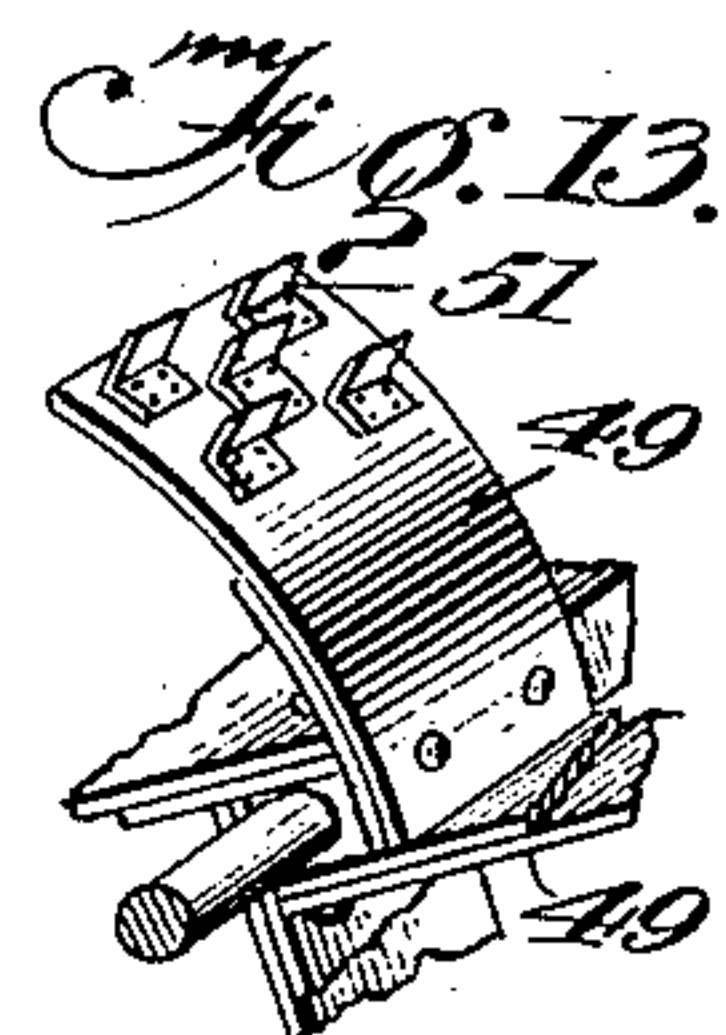
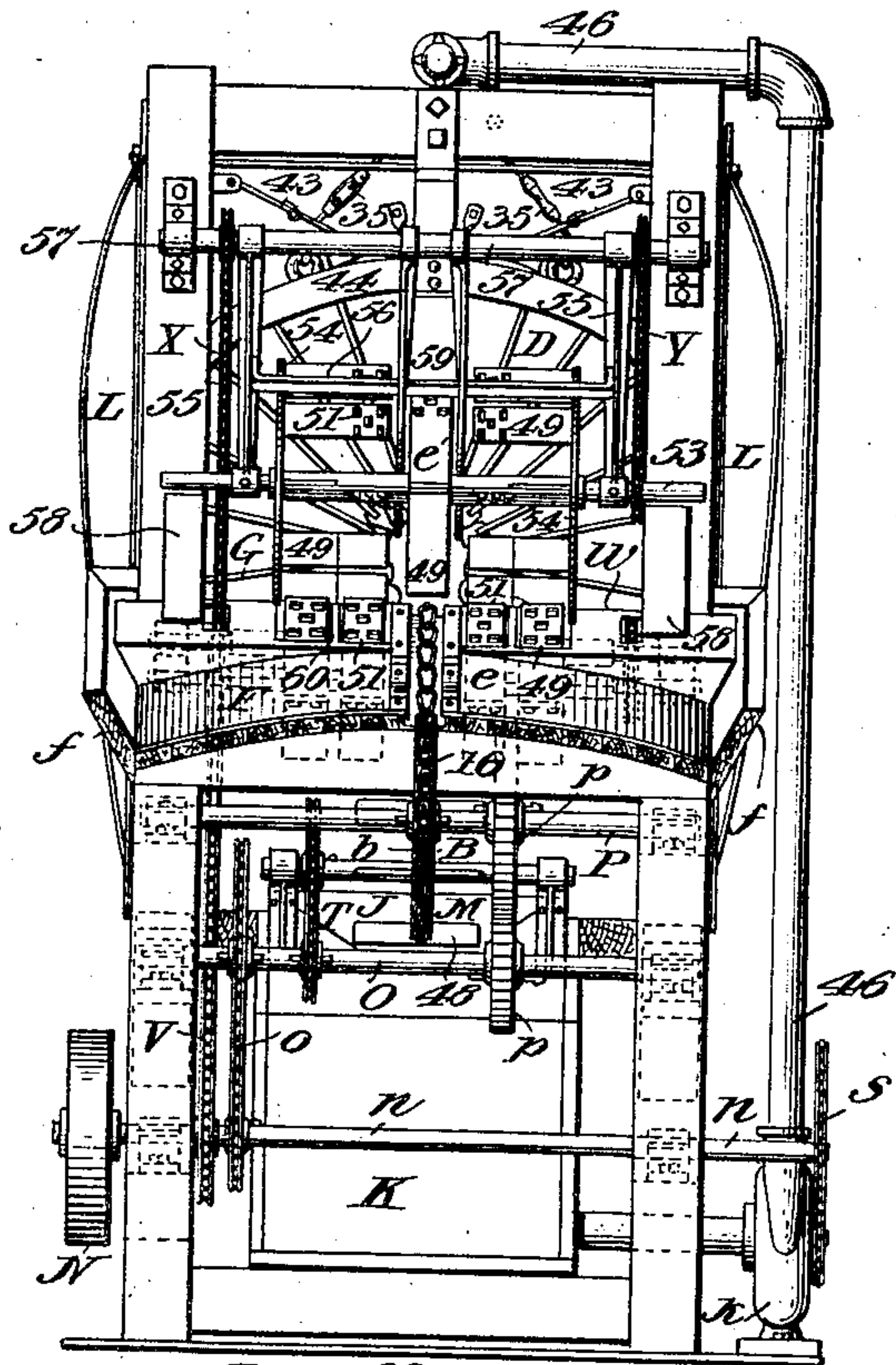


Fig. 12.

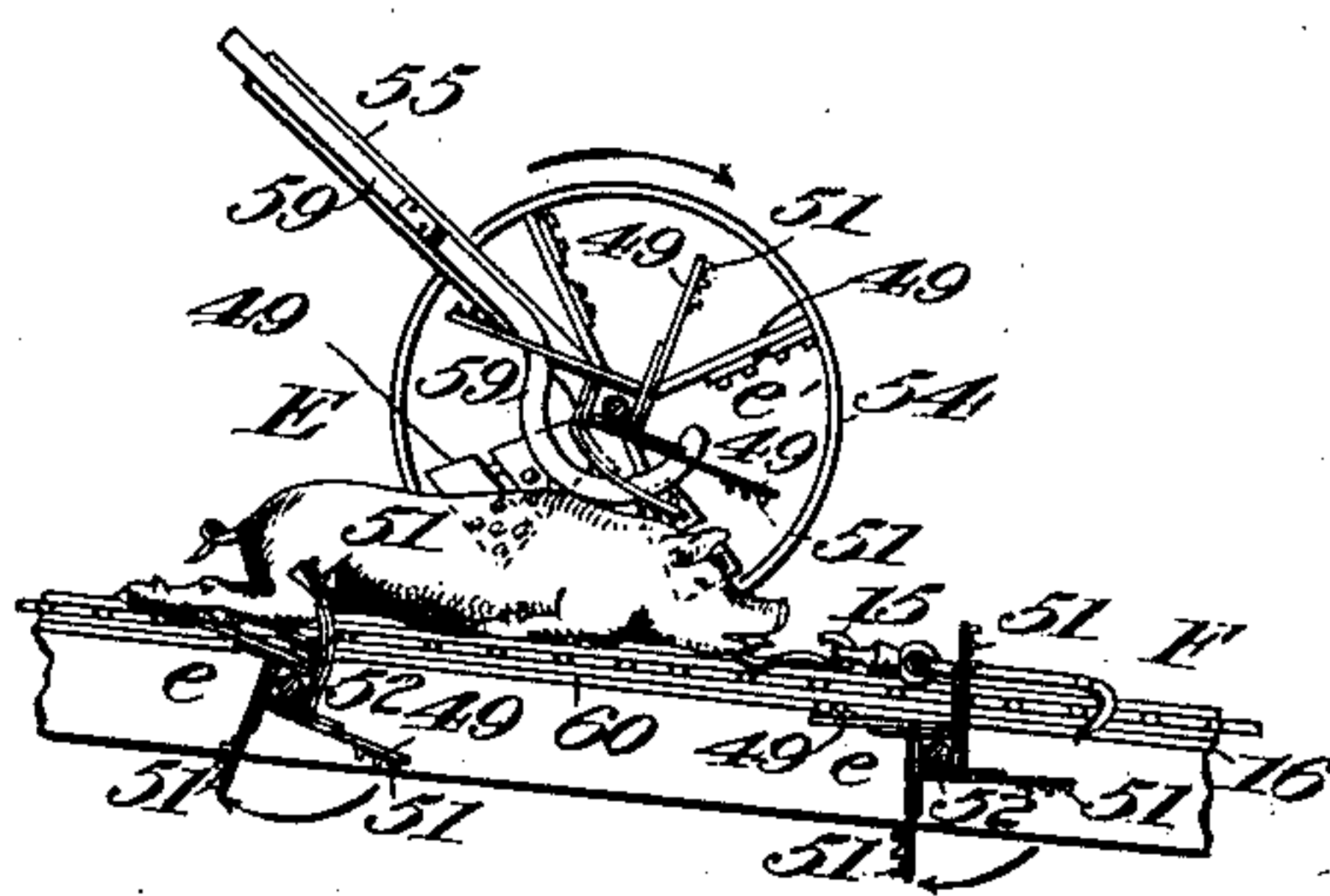


Fig. 3.

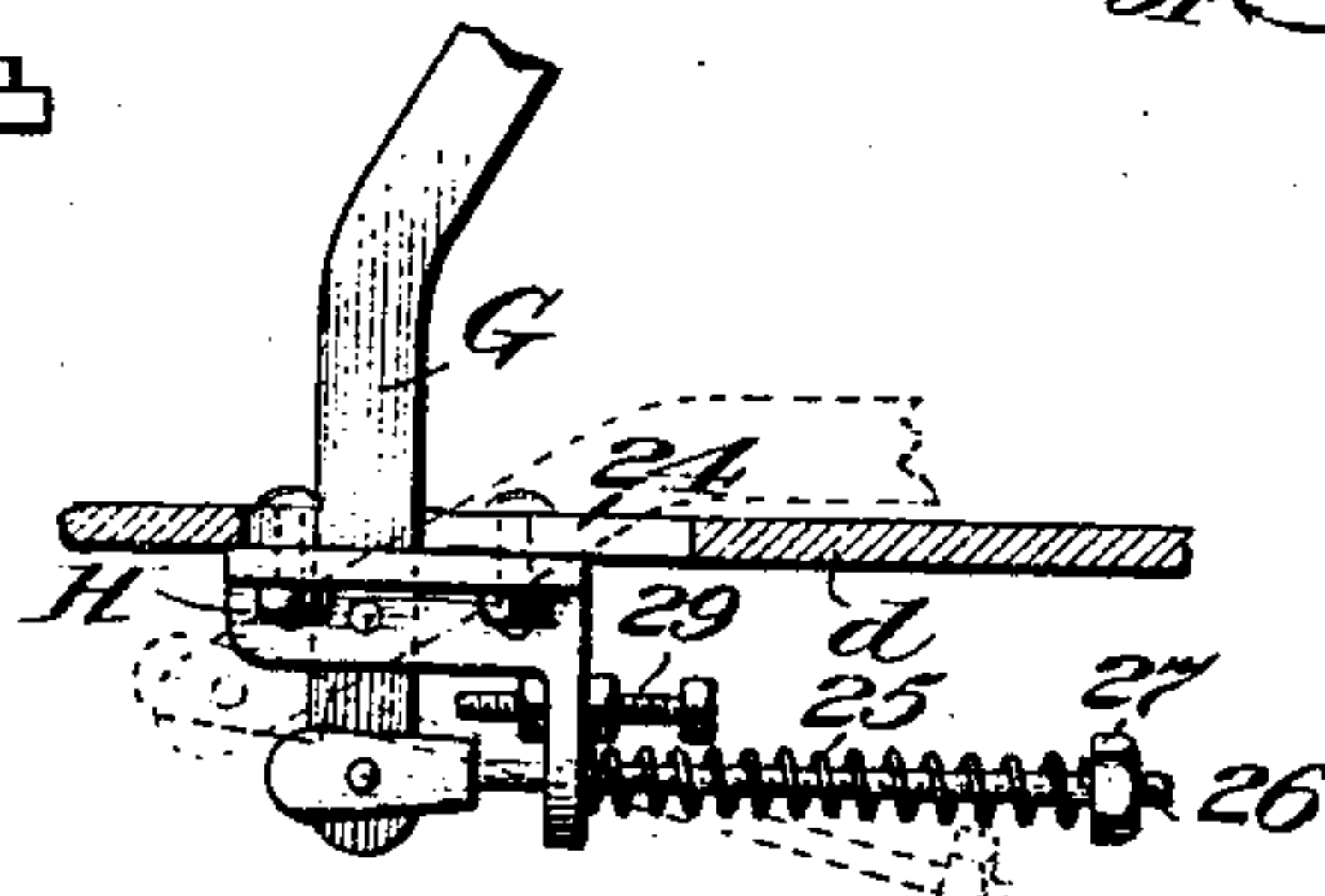


Fig. 8.

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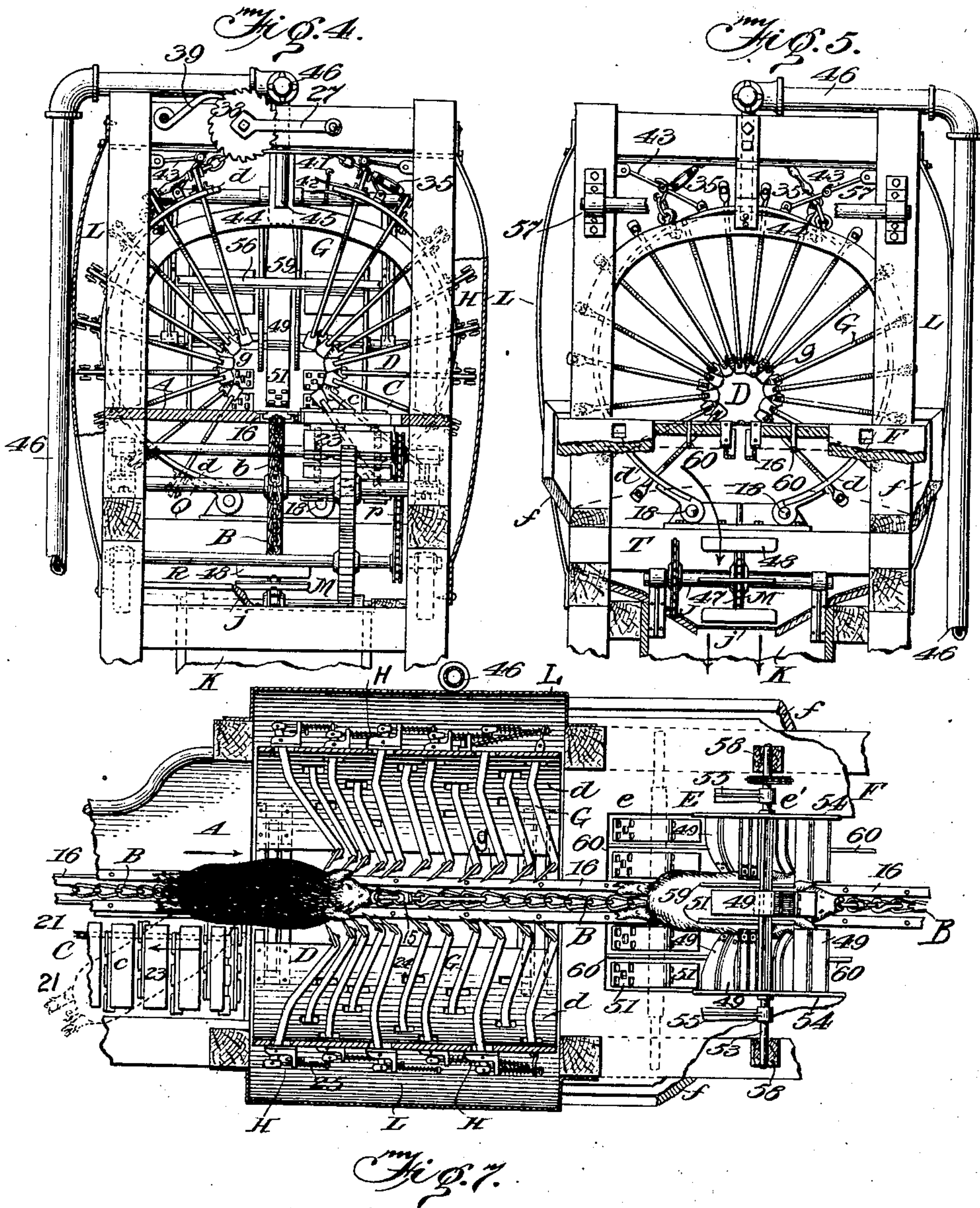
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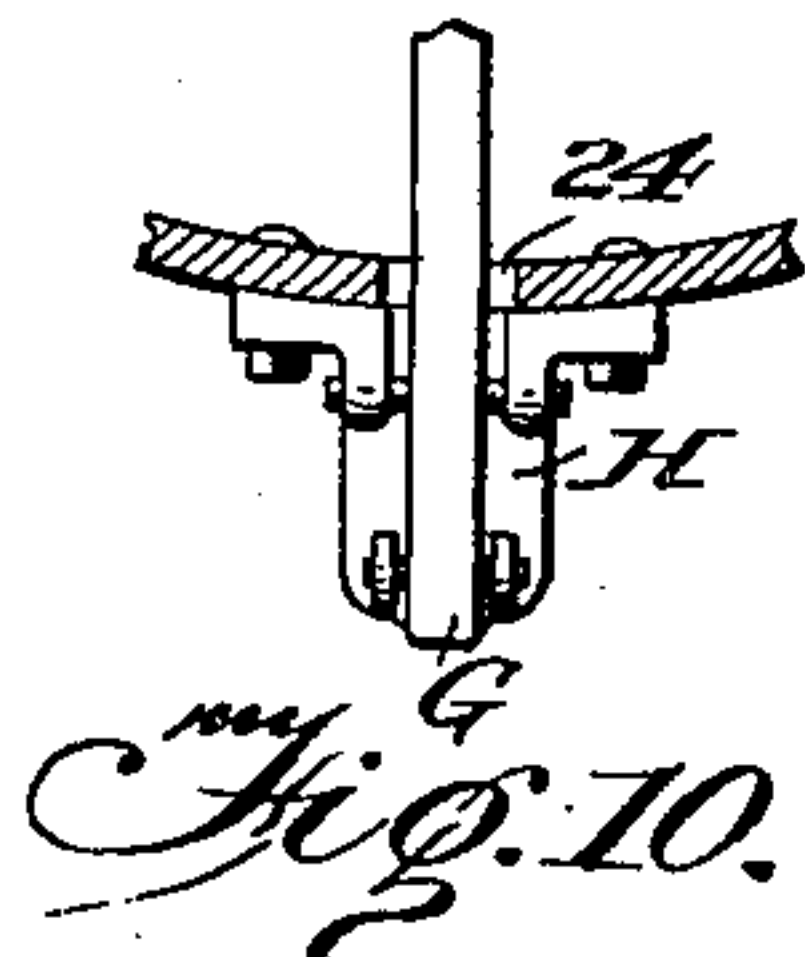
938,594.

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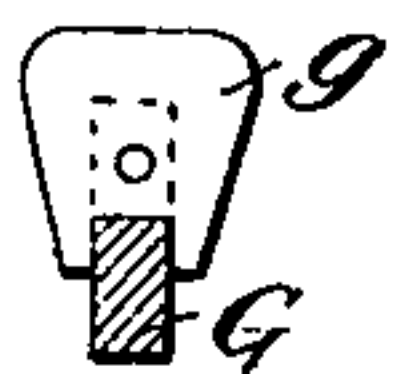
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# UNITED STATES PATENT OFFICE.

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## HOG-SCRAPER.

938,594.

Specification of Letters Patent.

Patented Nov. 2, 1909.

Application filed September 7, 1907. Serial No. 391,783.

To all whom it may concern:

Be it known that I, JAMES F. LAWSON, a citizen of the United States, and residing at Cincinnati, Hamilton county, State of Ohio, have invented certain new and useful Improvements in Hog-Scrapers; and I do declare the following to be a clear, full, and exact description of the invention, attention being called to the accompanying two sheets of drawings, with the reference characters marked thereon, which form also a part of this specification.

This invention relates to certain improvements in hog-scrapers, meaning thereby devices whereby in slaughter-houses the hair is removed from the carcasses of killed hogs. The hogs are usually scalded first to facilitate this operation.

One of the features of the invention is the provision of auxiliary scraping devices, by which the hair is removed from such parts of the hog which ordinarily are not readily accessible to the general scraping-device of the apparatus.

Another feature is the combination and arrangement of all these scraping devices in a general frame so as to produce a compact apparatus of which all parts properly co-act.

Other features relate to the particular construction of certain parts which is such as to obtain efficiency and durability.

In the following specification and particularly pointed out in the claims at the end thereof, will be found a full description of my invention, together with its operation, parts and construction, which latter is also illustrated in the accompanying two sheets of drawings, in which:—

Figure 1, is a side-elevation of the hog-scraper, parts being broken away or shown in section to facilitate illustration. Fig. 2, is a top-view of the device, it being shown completely lengthwise, but transversely only somewhat beyond the longitudinal center-line. Fig. 3, shows a portion of Fig. 1, in longitudinal section, it being more particularly the finishing-scraper. Fig. 4, is an end-view of the scraper, it being more particularly the front or receiving end. Fig. 5, is a vertical cross-section between the ends of the apparatus, it being taken more particu-

larly between the rear-end of the general scraping-device and of the auxiliary scraper thereat. Fig. 6, shows the rear-end of the apparatus complete. Fig. 7, shows a portion of Fig. 2, but complete transversely, it being top-views of the auxiliary scraping-devices and a horizontal section of the main scraping-device between them. Figs. 8 and 9, are enlarged side-views and Fig. 10, is an edge-view of a portion of one of the scraper-arms of the main scraping-device, showing in detail the construction of their pivotal supports, also the means whereby they are yieldingly held in their normal position, the means shown in Fig. 9, being modified as against those shown in Fig. 8. Fig. 11, is a cross-section of a scraper-arm near its free end, showing the scraper-blade thereat. Fig. 12, is an enlarged sectional detail-view of parts of the preliminary scraper. Fig. 13, shows in perspective view a part of the finishing-scraper.

The usual procedure in slaughter-houses where such scrapers are used is substantially as follows: The hogs after being stuck and bled are dropped into a vat containing hot-water in which they are immersed and scalded. Next the carcasses are lifted out and dumped upon a receiving platform, where, by means of a hook, they are attached to a carrier, which is usually a chain, and whereby they are bodily pulled through the scraping-device. During this movement they come in contact with the scraping means which remove the hair. After this, the carcasses arrive upon a rear or discharge platform where they are detached and removed. During this procedure I provide for a preliminary scraping which the carcasses receive before going through the main scraping-device and I further add a finishing-scraper which is applied after the carcasses have been subjected to the action of the main scraping-device. The means whereby these auxiliary actions are applied are located on the receiving and discharge-platforms respectively, with the main scraping-device located between them.

In the drawing, A is the receiving platform upon which the carcasses are delivered from the scalding-vat, which latter, as well



as the means for delivering them thereon, are omitted. A carcass as soon as it arrives, is at once attached by means of a customary hook 15, to one of the links of an endless carrier-chain B, supported on chain-wheels *b-b*. The upper branch of this chain travels in a slotted channel 16, whereby it is supported and guided. The lower branch of the chain is supported on guide-pulleys 17. The carcass while moving into position, see dotted lines in Fig. 7, is at once subjected to the action of the preliminary scraping-device C. From here it is drawn, head-foremost, through the main scraping device D, and thereafter through the finishing-device E, after which it arrives upon the rear or discharge platform F, where it is detached from the chain, usually automatically, and removed.

The main scraper consists of a cylindrical shell, in two sections *d d*, and suitably supported. They may be hinged at one of their edges, preferably their lower ones 18, 18. In the normal position as shown in Fig. 5, the upper edges of these sections come together, forming then substantially a cylinder. From this shell project inwardly toward the center, a number of scraper-arms G, arranged in longitudinal as well as in circumferential rows. At its free end each arm carries a scraper-blade *g*, and the arms are alternately arranged as to location and terminate so that the edges of their blades occupy positions around an imaginary tubular space as best shown in Figs. 5 and 7, so that a carcass, when forced length-wise through this space, is practically surrounded by the edges of scraper-blades. At the same time the size of this space, diametrically considered, is smaller than the smallest carcass, so that this latter, while being pulled through this space has to overcome the resistance of the yieldingly supported scraper-arms with the scraper-blades, which latter are thus caused to bear close against the carcass and, adjusting themselves to the size and contour of this latter, remain in scraping contact with it until the same has passed through the device (see Fig. 7). Excepted from this contact is the under-side of the carcass next to the carrier-chain, where, by reason of the presence of this latter, and its guide-channel, it is impossible to provide scraper-blades. This under side however, it being usually the belly of the hog, is taken care of by blades *c*, of the preliminary scraper C, which do their work before the carcass is in position to move through the scraper D, as best shown in Fig. 7. These blades *c*, are attached to cross-bars 19, see Fig. 12, carried by endless chains 21, supported on chain-wheels 22, and move in a direction opposite to the one in which the carcass travels, see also Fig. 1. These blades are carried on alternate links of the chains and

between them are bars 23, preferably of wood, attached to intermediate links of the chains, which prevent a carcass from sinking in too deep between the scraper-blades, while passing over them. The edges of these latter project above these bars sufficiently for the purpose, and they are arranged alternately transversely, so that all parts of the belly are subject to their action.

Scraper-arms G, of the main scraping device A, are shaped as best shown in Fig. 7, see also Figs. 8, and 9, they being curved rearwardly from their bearings H, in which they are pivotally supported near their outer ends.

The scraper-blades *g*, have square notches whereby they straddle these arms at their free, inner ends, the arms being formed thereat with opposite flat surfaces to fit these notches, thereby holding the blades against wobbling. Shoulders are formed at these ends, and against which the blades rest, as shown in Fig. 11, bolts being used to hold them in position.

Bearings H, which support these arms are secured to the outside of the scraper shell, the arms extending inwardly through closely fitting slots 24, in the shell. The sides of these slots form thus guideways which, in connection with bearings H, which straddle these slots, as best shown in Fig. 10, hold the arms during their operation to a true motion, so that each scraper-blade is held to swing in its intended radial path without interference with any of the others, maintaining also at all times the correct position of its scraping edge with reference to the carcass, so that only the straight part of this edge comes in contact with the same, and to the exclusion of the corners of the blade which would dig into and tear the skin. Observe these positions in Fig. 5. Helical springs 25, are used, sleeved upon rods 26, to maintain these arms in their normal position as shown in Fig. 5, see also Fig. 7. Nuts 27, are provided on these rods against which one end of the springs bear, and by which their resistance may be adjusted. The other ends of the springs, in the form shown in Fig. 8, rest against bearing H, rod 26 passing through an opening in said bearing and with its end is connected to the free end of the scraper-arm.

In the form shown in Fig. 9, rod 26 passes through an opening in the end of the scraper-arm, the spring bearing directly against the arm. In this latter case rod 26 must be held in a fixed position for which purpose a bearing 28, is provided. Since springs change in condition, regulating means are required whereby any such variations may be compensated for, so that each arm returns with its blade always to its proper normal position with reference to the other blades, (see Fig. 5).



In Fig. 8, a regulating screw 29, is used for this purpose, the same being seated in bearing H, and limits with its end, against which the end of the scraper-arm bears, the action of the spring.

In Fig. 9, nuts 31—31, regulate the position of rod 26, on its bearing 28. In this figure there is also shown a short spring 32, held on extended rod 26, by a nut 33, which however has no operative function and merely serves to cushion arm G, when the same, suddenly released, darts back to its normal position. Such a cushion-spring may also be applied in the form shown in Fig. 8. Either one of these two forms of spring-support shown in Figs. 8 and 9, may be used, but since both forms extend considerably beyond the bearings of arms G, an exception must be made in the case of the arms supported near the ends of the shell, where at one end the other form must be used to prevent the projection of the springs beyond the end of the shell, which is not desirable. A glance at Fig. 7, will render this clear, the form shown in Fig. 8, being used, with the exception of the arms near the rear end of the shell, where the other form is used because in it the springs extend inwardly.

As before stated, the sections of the shell are hingedly attached and may be swung apart as shown in Fig. 4, to permit free access to the interior in case of an accident, to permit removal of a carcass, if necessary, also for repair. Winding-drums 34, connected by chains 35, to each section and mounted on a winding shaft 36, serve to draw the sections together after being opened. A crank 37 is used for this manipulation and a ratchet wheel 38, in connection with a pawl 39, serves to hold the chains wound up. These latter have swivel joints for proper adjustment. The shell may be thrown open instantly by disengaging the pawl and releasing the crank-handle. A locking-pin 41, is used in addition, to hold the sections together. It occupies openings in two tongues 42, projecting from the edge of one section and also an opening in the edge of the other section, which opening registers with the openings in the tongues when said edge is in proper position between them. There are in addition braces 43, connected with one of their ends to the shell-sections and with the other to available parts of the surrounding frame-structure. They have knuckle-joints between their ends and when the shell is to be opened, they are collapsed as shown in Fig. 4. They drop slightly beyond a straight line when the shell is closed and become then rigid braces resisting lateral stress of the shell, as best shown in Fig. 5. There is also an end-brace 44, attached to the frame-structure and against which the larger part of the

rear-edge of the shell bears, thus counter-acting the strain resulting from the pull of carrier-chain B.

While operation in the scraper proceeds, water is constantly discharged into it and over the scraping-blades and onto the passing carcasses, to keep them clear of hair which, together with the water, passes out through the opening in the lower part of the shell and between the hinged edges of the sections thereof. This water discharges from nozzles 45, which extend into the shell through openings at the edges of the sections thereof and is supplied from a pipe 46. The discharge from the shell drops first into an inclined trough J, the perforated bottom of which forms a strainer *j*, which retains the hair, while the water runs into a tank K, from whence, by a pump *k*, it is lifted again and supplied to the discharge-nozzles.

The shell sections presenting extensive, practically solid surfaces, are very useful inasmuch as they serve to confine and concentrate the force of the water so that the interior is subjected to an effective flushing which is particularly desirable as to the scraper-blades and prevents accumulation of hair. To keep the surroundings clear from any water which might possibly splash through slots 24, in the shell, I provide an outer casing L, on each side.

The hair left on strainer *j*, is constantly removed as soon as deposited by a traveling rake M, consisting of a chain 47, to which the rake-arms 48, are attached in a manner to extend transversely across the strainer.

As soon as a carcass emerges from the shell of main-scraper D, it is immediately subjected to the action of another auxiliary scraper E, which removes hair not previously removed. This device consists of revolving scraper-heads supported in any suitable number on both sides of chain B. I show two heads *e e*, which are supported below the carrier-chain and one head *e'*, supported above the chain. They consist substantially of flaps 49, which are studded with scraper-bits 51, (see Fig. 13). Flaps 49, are constructed of a suitable material and connected in a manner by bolts, hinges or otherwise to have an elastic yielding action. The heads are arranged in pairs, each pair mounted on a shaft with a head on each side of the chain. 52, 52, are the shafts of the lower heads and 53, is the shaft of the upper head.

The flaps of the lower heads extend radially from their connected ends and their bits operate from below upwardly against the lower part of the sides of the carcass and catch also the end of the same as best shown in Fig. 3. The flaps of the upper heads extend laterally inwardly from the arms of circular frames 54, mounted on upper shaft 53, and their scraper-bits act principally



against the sides of the carcass as best shown in Fig. 7. There are however additional flaps between these upper heads which act also against the upper side of the carcass.

5 This upper set of scraper-heads is yieldingly supported to accommodate carcasses of various sizes for which purpose the bearings of its shaft 53, are formed in the free ends of links 55, which are hingedly connected to an upper-shaft 57, on which they swing. The set is supported in a normally lowest position, suitable for the smallest carcasses, by posts 58, upon which the ends of its shaft rest.

15 Since it is objectionable to bend the flaps too close to their connected ends, which would occur in case of their contact with a larger carcass, curved fender-bars 59, are provided and connected so as to lift head  $e'$ , before the bending strain on the flaps becomes excessive. They are encountered by the carcass and lift head  $e'$ , corresponding to the size of the former. A preferable construction is to also hinge them to shaft 57, and connect them to links 55, by a cross-bar 56, so that a connected frame is formed, all parts of which move together (including also shaft 53). There are also guards 60, alongside and parallel to chain B, which limit the contact of the carcass with the flaps of the lower heads for the same purpose. After passed through these scraper-heads the operation is finished and the carcass arrives upon the rear platform F, where it is disengaged from chain B, usually automatically and removed. This platform is convex, dropping off toward its edges where curbs  $f, f_1$  are provided which form gutters on each side to catch any water which may still drain from the carcasses.

The operative parts of the apparatus may be actuated by suitable machine elements in various ways, the details not being important. I drive by means of a main pulley N, see Figs. 1, and 6, mounted on a main drive shaft  $n$ . This latter operates a shaft O, by means of a chain  $o$ . Shaft O, drives a shaft P, by means of a gear-train  $p$ , interposed to obtain proper speed relations.

50 Shaft P, operates the carrier-chain B, one of the chain pulleys  $b$  of the same being mounted on this shaft below the outer end of rear platform F. The other chain-pulley  $b$ , is mounted on a shaft Q, under the front end of receiving platform A. This shaft by means of a gear-train  $q$ , operates a shaft R, which by means of a chain  $r$ , actuates auxiliary scraper C. Pump  $k$ , is operated by a chain-connection S, driven direct from shaft  $n$ . Traveling rake M, is driven by a chain connection T, from shaft O.

The finishing scraper is actuated from main shaft  $n$ , by means of a crossed chain V, which drives shaft 52, of the nearest of the

lower scraper-heads, connecting to said shaft near one of its ends. Another chain W, near the opposite end drives shaft 52, of the other one of the lower-heads. From here chain X, drives shaft 57, which latter by means of a chain Y, drives shaft 53, of the upper scraper-head.

All parts of the apparatus are supported on a frame suitably constructed to suit the purpose.

Having described my invention, I claim as new:

1. In a hog-scraping apparatus, the combination of a horizontally supported shell open at both ends, platforms, one opposite each of these ends, a general frame-structure whereby all these parts are combined and supported, a carrier-chain adapted to continuously move over these platforms and through the shell, yieldingly supported scraper-blades in this latter and a set of scraper-blades arranged to travel in a plane in alinement with one of the platforms and moving in a direction opposite to the carrier-chain.

2. In a hog-scraping apparatus, the combination of a horizontally supported shell open at both ends, platforms, one opposite each of these ends, a general frame-structure whereby all these parts are combined and supported, a carrier-chain adapted to continuously move over these platforms and through the shell, yieldingly supported scraper-blades in this latter and revolving scraper-heads at one end of the shell supported respectively below and above the platform.

3. In a hog-scraping apparatus, the combination of a horizontally supported shell open at both ends, platforms, one opposite each of these ends, a general frame-structure whereby all these parts are combined and supported, a carrier-chain adapted to continuously move over these platforms and through the shell, yieldingly supported scraper-blades in this latter and revolving scraper-devices at one end of the shell supported respectively below and above the platform, the upper devices being yieldingly supported.

4. In a hog-scraping apparatus, the combination of a horizontally supported shell open at both ends, platforms, one opposite each of these ends, a general frame-structure whereby all these parts are combined and supported, a carrier-chain adapted to move over these platforms and through the shell, yieldingly supported scraper-blades in this latter, a set of scraper-blades at one end of the shell arranged to travel in a plane in alinement with the platform thereat and moving in a direction opposite to the carrier-chain, and revolving scraper-heads at the other end of the shell supported respec-



tively below and above the platform, all these devices being adapted to act upon a carcass while the same is continuously moving from one to the other.

5 5. In a hog-scraping apparatus, the combination of a horizontally supported shell provided with scraping means and arranged in two vertically divided sections which have their lower, opposite edges spaced 10 apart and each hingedly connected, means to manipulate them for opening and closing and means to hold them in closed position.

6. In a hog-scraping apparatus, the combination of a horizontally supported-shell 15 provided with scraping means and arranged in two sections, hinged at their lower edges with a space between them, means to supply water from above to flush the interior of the shell and its contents, a strainer below the 20 space between the hinged edges of the shell-sections which receives the wash-out from the shell directed into it by this latter, a traveling rake to remove the deposit from the strainer and a tank below this latter.

25 7. In a hog-scraping apparatus, the combination of a horizontally supported shell provided with openings in its wall, a slotted channel passing length-wise through the shell, a carrier-chain arranged to move 30 through this channel, scraper-arms all of equal length occupying the openings in the shell and extending outwardly and inwardly therefrom and terminating with their inner ends near the channel in the shell, bearings 35 on the outside of the shell in which these arms are pivotally supported, scraper-blades at their inner ends and springs connected to their outer ends to hold the scraper-blades in a certain normal position.

40 8. In a hog-scraping apparatus, the combination of movable scraping-means adapted to travel in a linear scraping-bath, stationary scraping-means yieldingly supported, revolving scraping-means moving in a 45 rotary scraping-path, a frame-structure on which all these devices are supported and means to continuously move a carcass so as to cause the same to be subjected to the action of all these scraping-means.

50 9. In a hog-scraping apparatus, the combination of a horizontally arranged shell open at both ends, yieldingly supported scraper-blades therein, revolving scraping means at one end of the shell, a frame-structure on which both these devices are supported 55 and means to continuously move a carcass so as to cause the same to be subjected to the action of the scraping-blades and of the revolving scraping means.

30 10. In a hog-scraping apparatus, the combination of a horizontally supported shell open at both ends and in its lower part, scraping devices arranged therein in spaced longitudinal rows, means to move a carcass 5 through between these rows, a water-supply-

pipe parallel to the opening in the lower part of the shell and above the same, discharge nozzles extending therefrom to flush the interior of the shell and means below the opening of this latter to receive the washout therefrom. 70

11. In a hog-scraping apparatus, the combination of yieldingly supported scraper-arms made of rectangular rods and shaped to have shoulders extending at an angle 75 from their free ends, scraper-blades seated against the shoulders and notched to straddle the arms, said notches being rectangular and fitted close to two opposite, parallel surfaces of the arm to prevent the blades from 80 turning thereon and means to hold the blades against this shoulder.

12. In a hog-scraping apparatus, the combination of a scraper-blade having a straight 85 scraping edge with rounded corners, a rectangular notch in the opposite edge, a scraper-arm being shaped to have opposite, parallel surfaces fitted to this notch when the blade is mounted on the arm, there being also 90 a shoulder on the end of this arm against which the latter lies so as to occupy an angular position with reference to the arm, means to hold the blade to this shoulder, and means supporting the arm in a manner to hold it 95 to a yielding movement in a fixed plane at right angles to the scraping-edge so that scraping contact is limited to the straight part of the edge only.

13. In a hog-scraping apparatus, the combination of a carrier-chain adapted to move 100 carcasses, a rotary scraping device supported above the same and yieldingly connected fender-bars also supported above the carrier-chain and extending into the path of a moving carcass, these bars being also operatively 105 connected to the scraping device so that when acted upon by a passing carcass, they automatically adjust the position of the scraping device.

14. In a hog-scraping apparatus, the combination of scraping devices, an inclined 110 platform extending from one end of the apparatus, it being convex between its longitudinal edges and provided with a slot in its highest part between these edges and parallel 115 to them, a carrier-chain adapted to move past the scraping devices and through the slot mentioned and curbs on each of the longitudinal edges of the platform.

15. In a hog-scraping apparatus, the combination of a horizontally supported shell 120 composed of two substantially semitubular sections, each hingedly connected at one of its longitudinal edges, flexible means to draw these sections together when the shell is open 125 and means to hold them in closed position.

16. In a hog-scraping apparatus, the combination of a shell composed of two, substantially semitubular sections, each hingedly 130 connected at one of its longitudinal edges, a



general frame upon which the shell is horizontally supported and jointed braces, each connected at one of its ends to one of the sections of the shell and at its other end to opposite portions of the general frame and adapted, when extended, to hold the shell-sections in closed position.

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

JAMES F. LAWSON.

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