

(No Model.)

5 Sheets—Sheet 1.

J. C. SHARP & A. U. CALKINS.

GRUB AND STUMP EXTRACTOR.

No. 365,545.

Patented June 28, 1887.

Fig. 1.

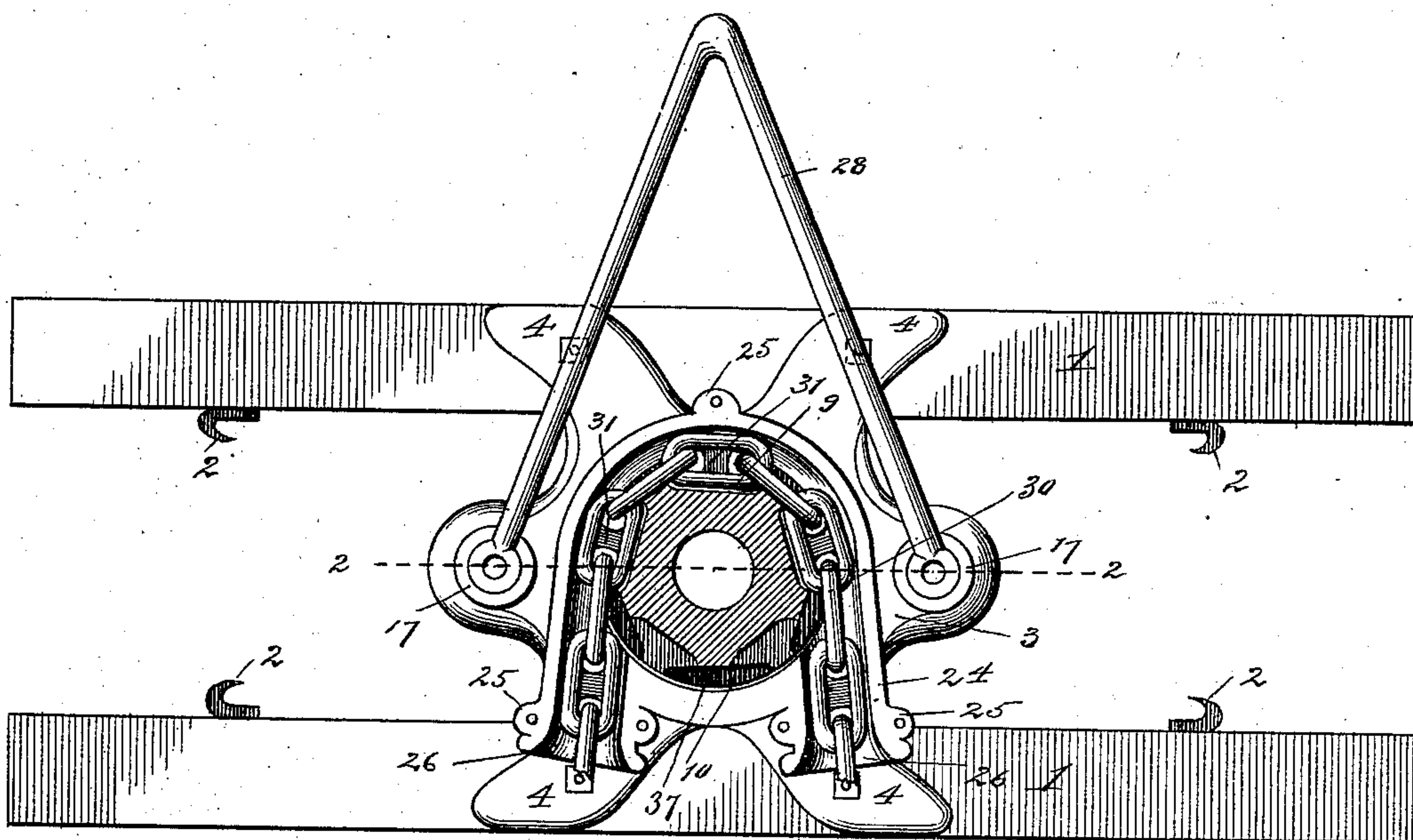


Fig. 2.

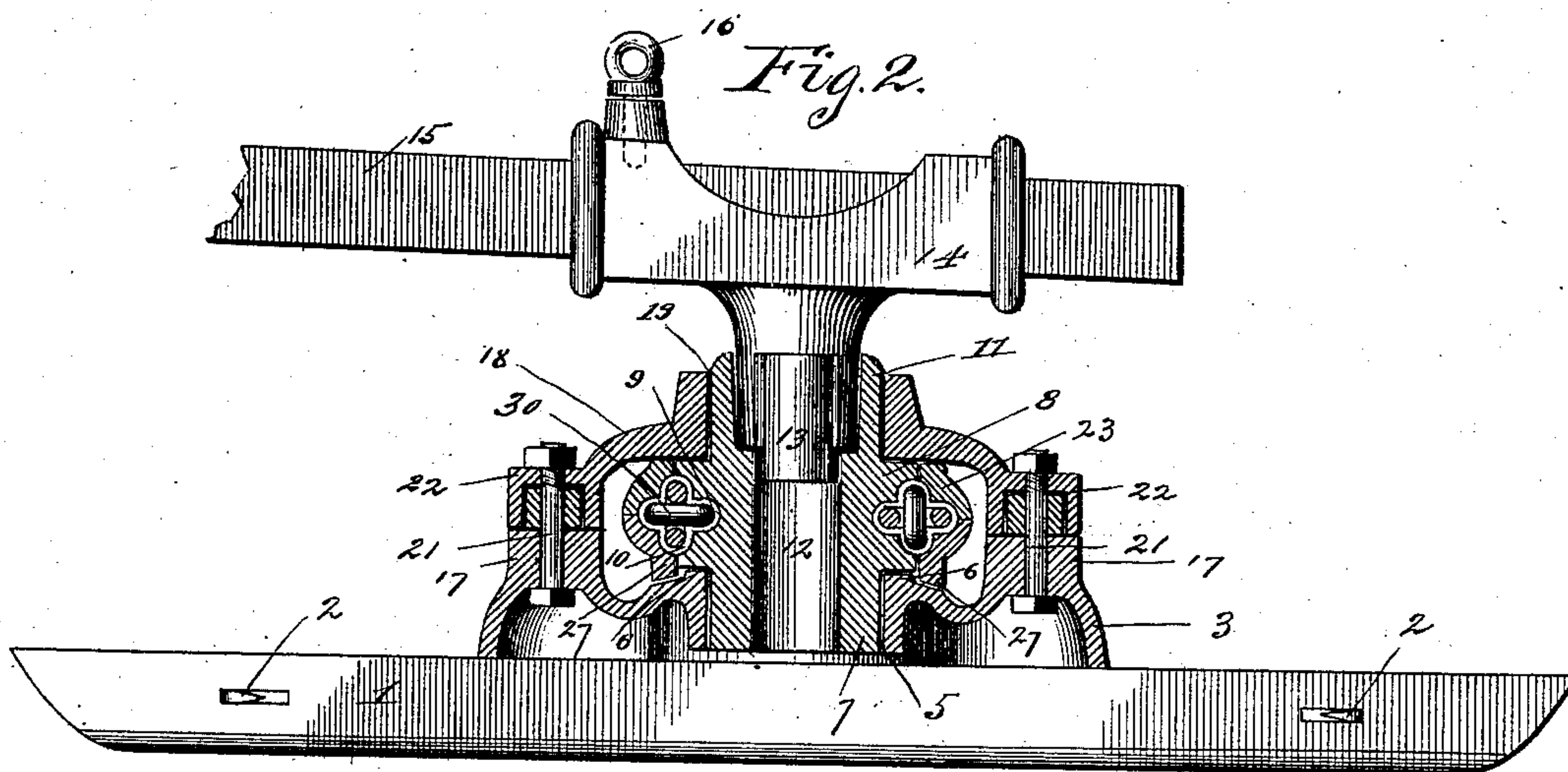
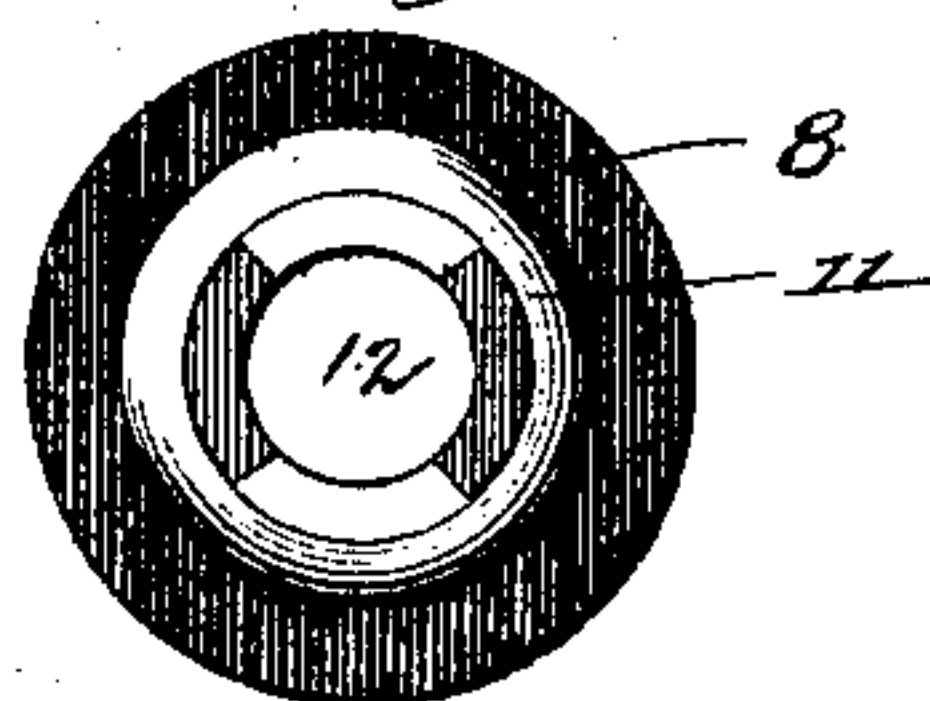


Fig. 3.

Fig. 4.

Witnesses
L. J. Mann,
S. A. Utter



Inventors,
John C. Sharp
Abram U. Calkins

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Fig. 5.

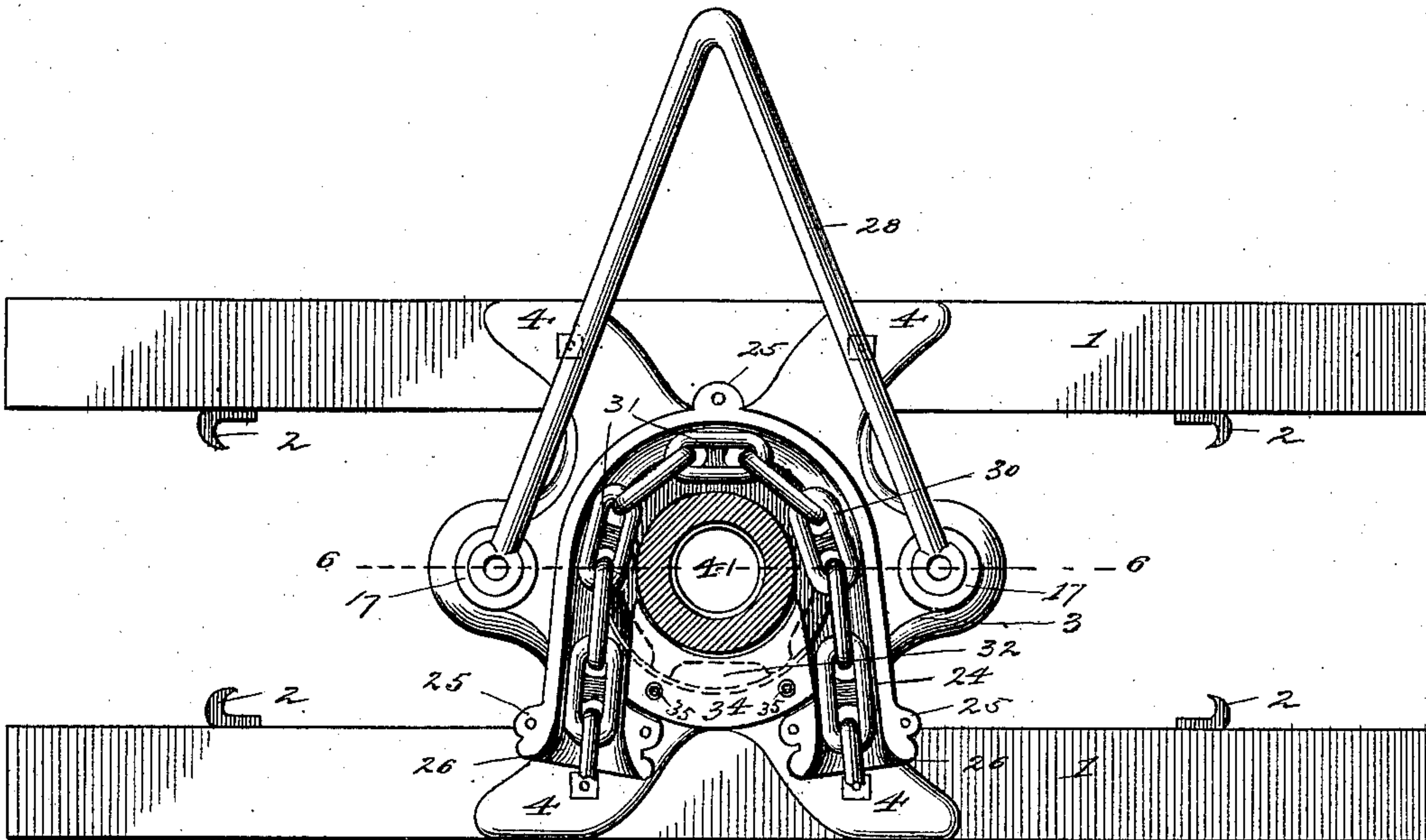


Fig. 6.

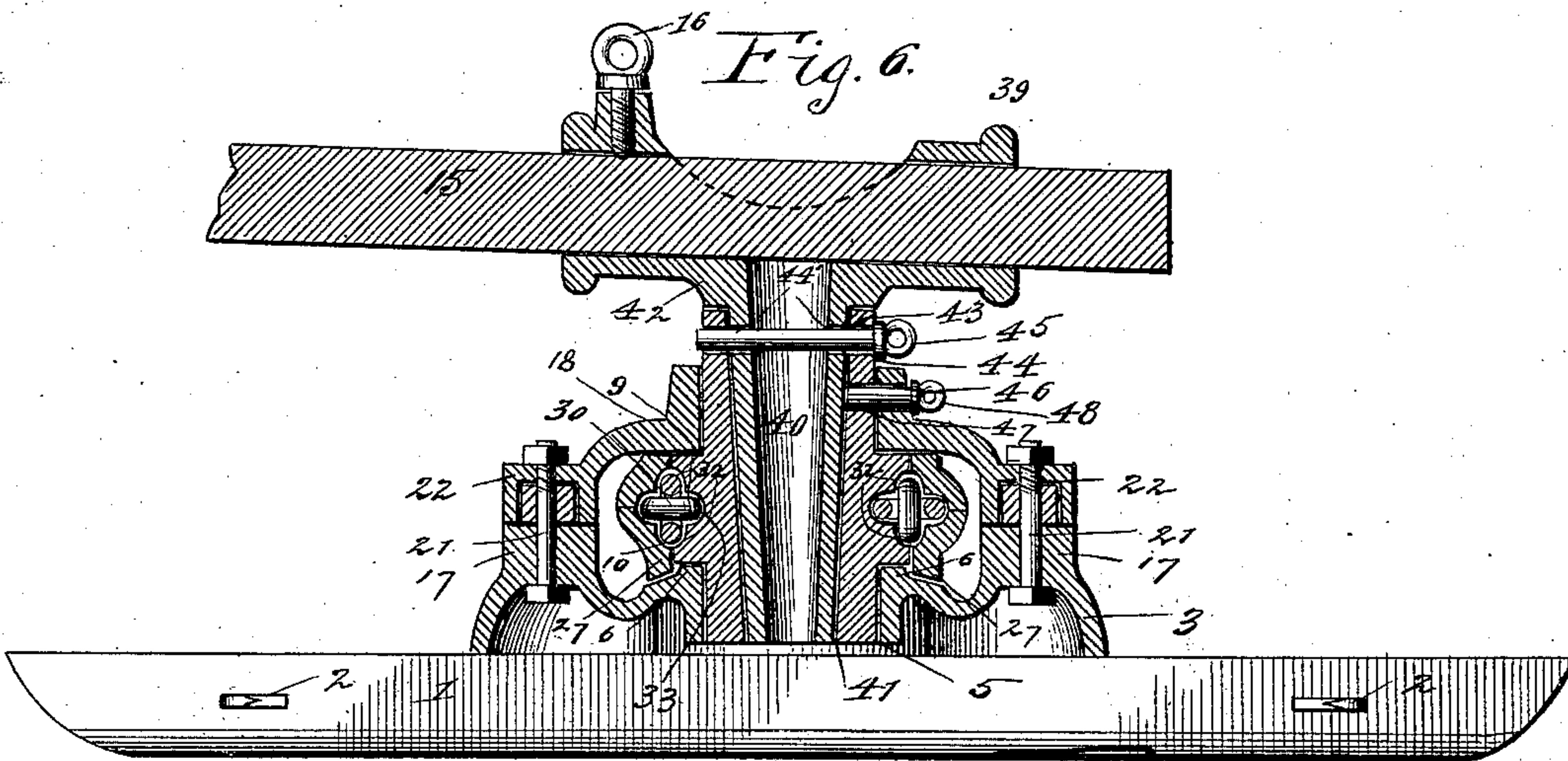
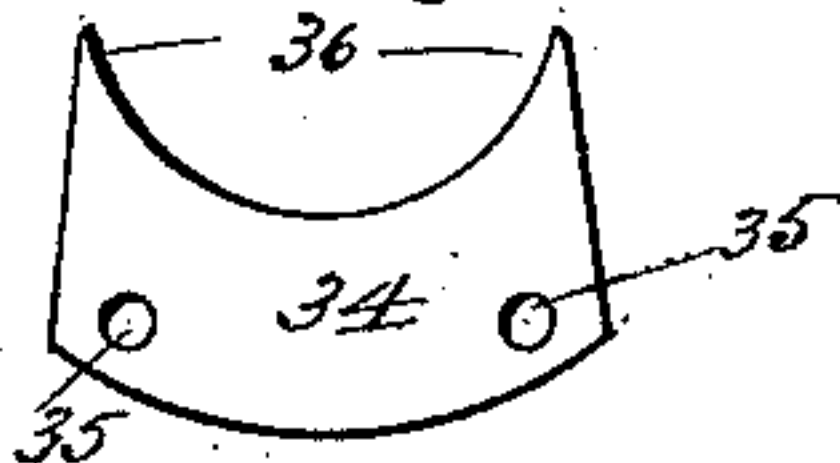


Fig. 7.



Witnesses,
J. J. Mann,
G. A. Utter

Inventors,
John C. Sharp
Abram U. Calkins

(No Model.)

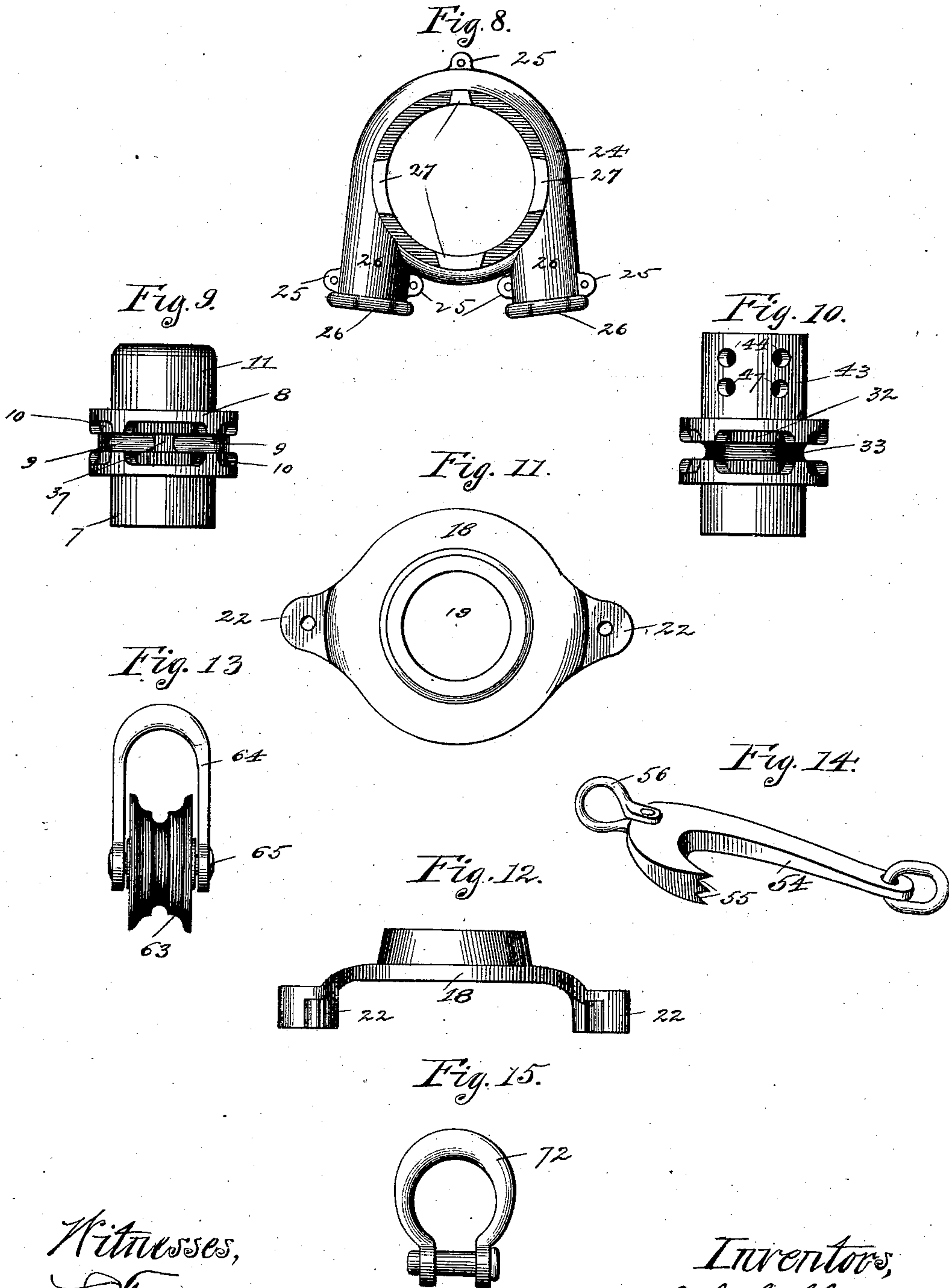
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J. C. SHARP & A. U. CALKINS.

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Witnesses,
S. A. Mann,
G. A. Utter

Inventors,
John C. Sharp
Abram U. Calkins

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Fig. 16.

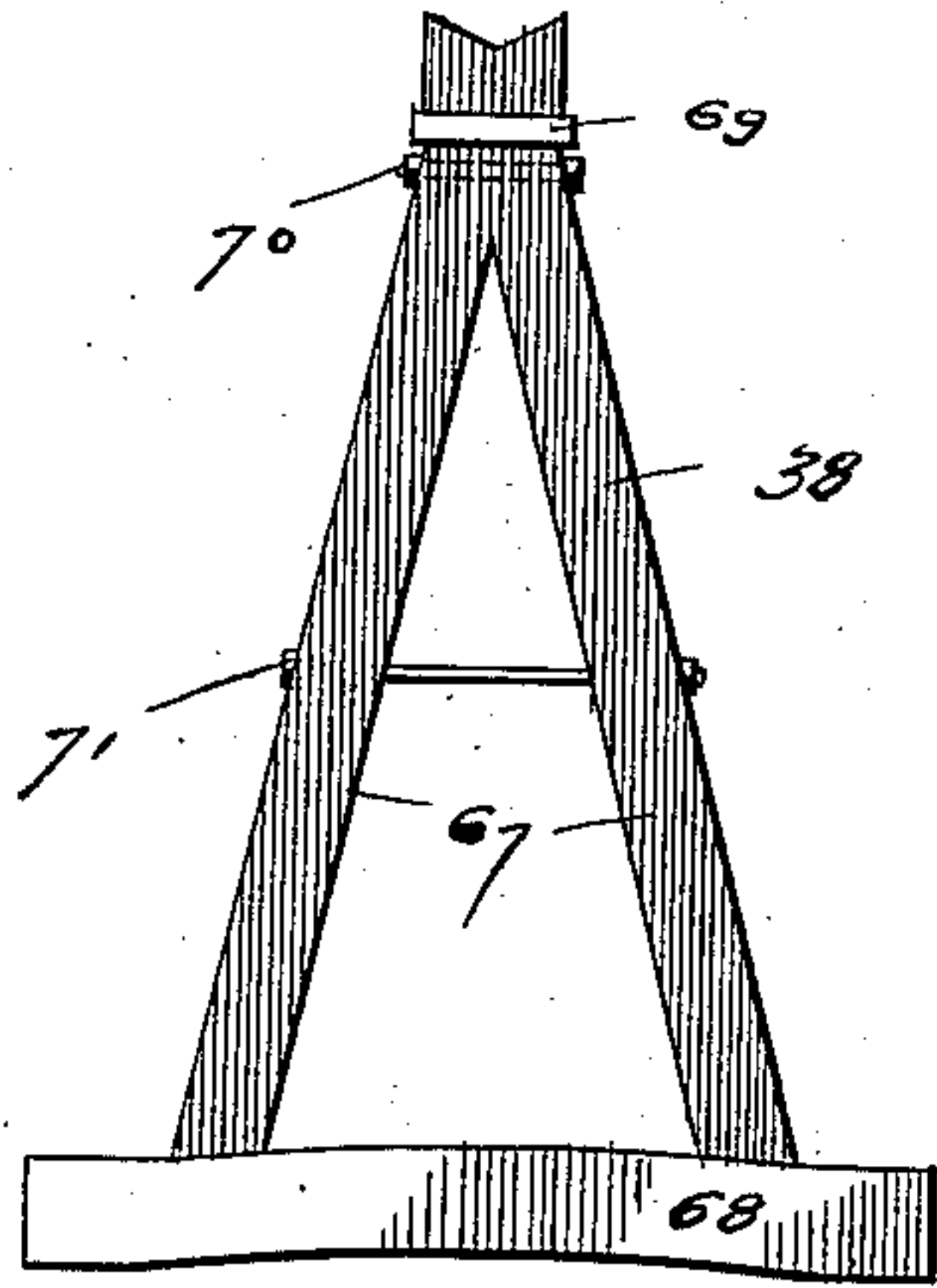


Fig. 17.

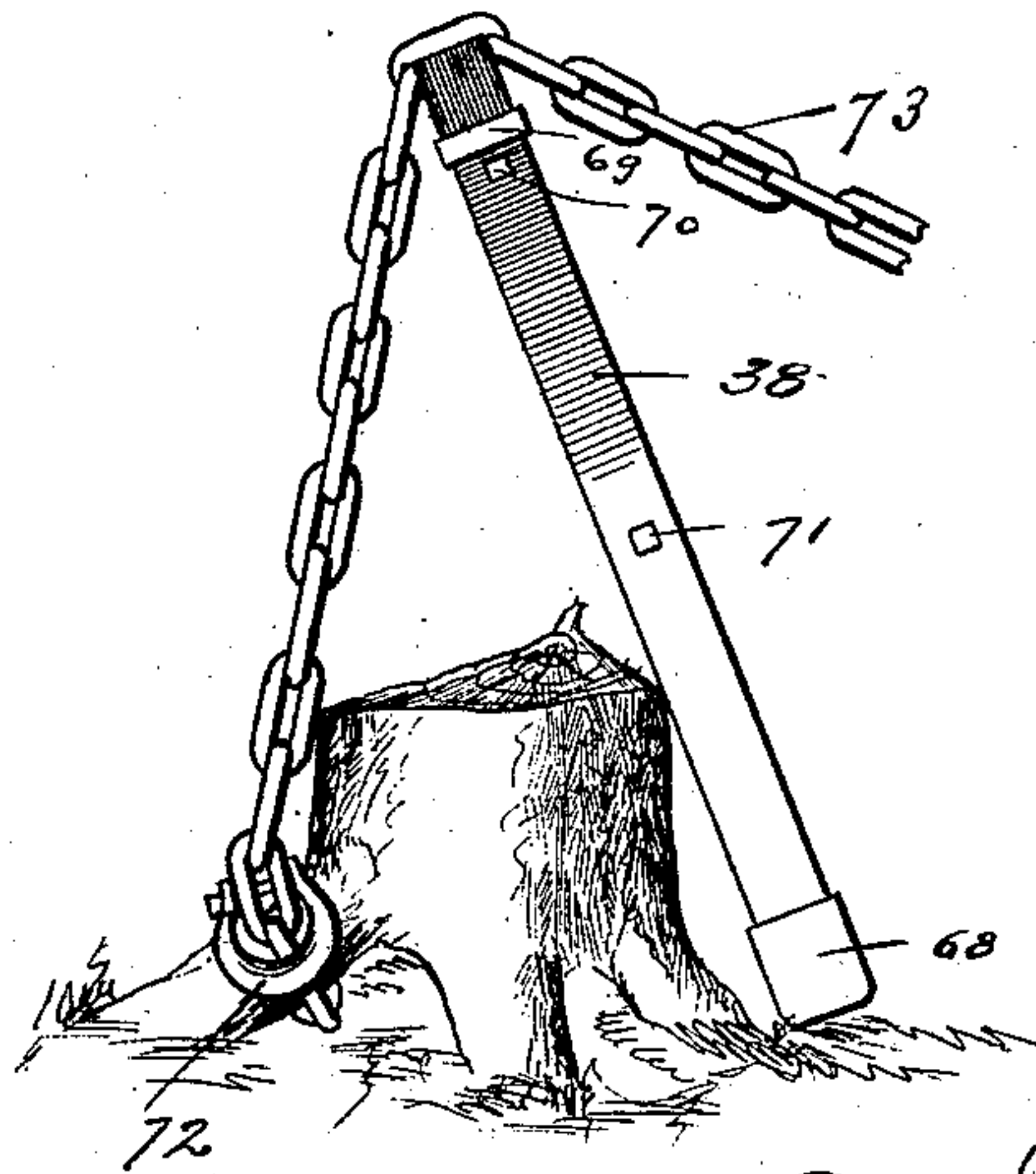


Fig. 20.

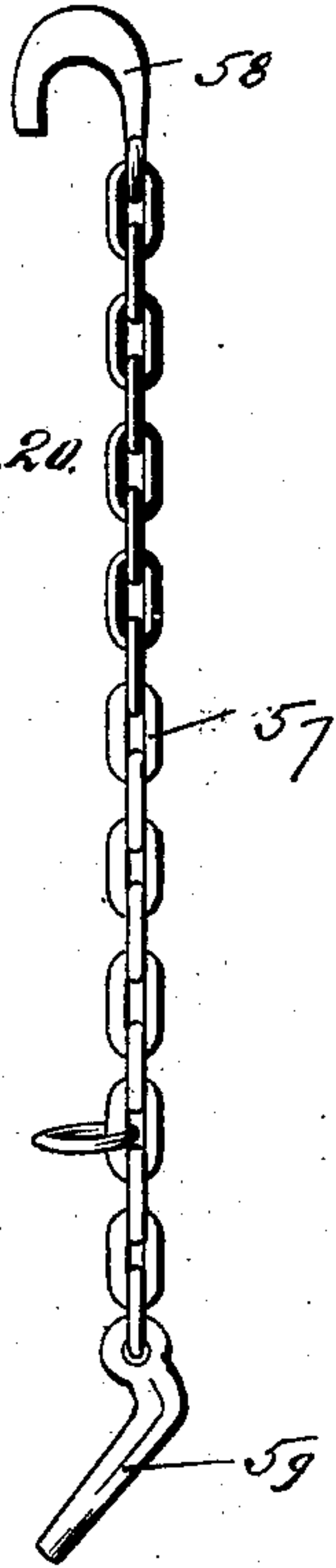


Fig. 18.

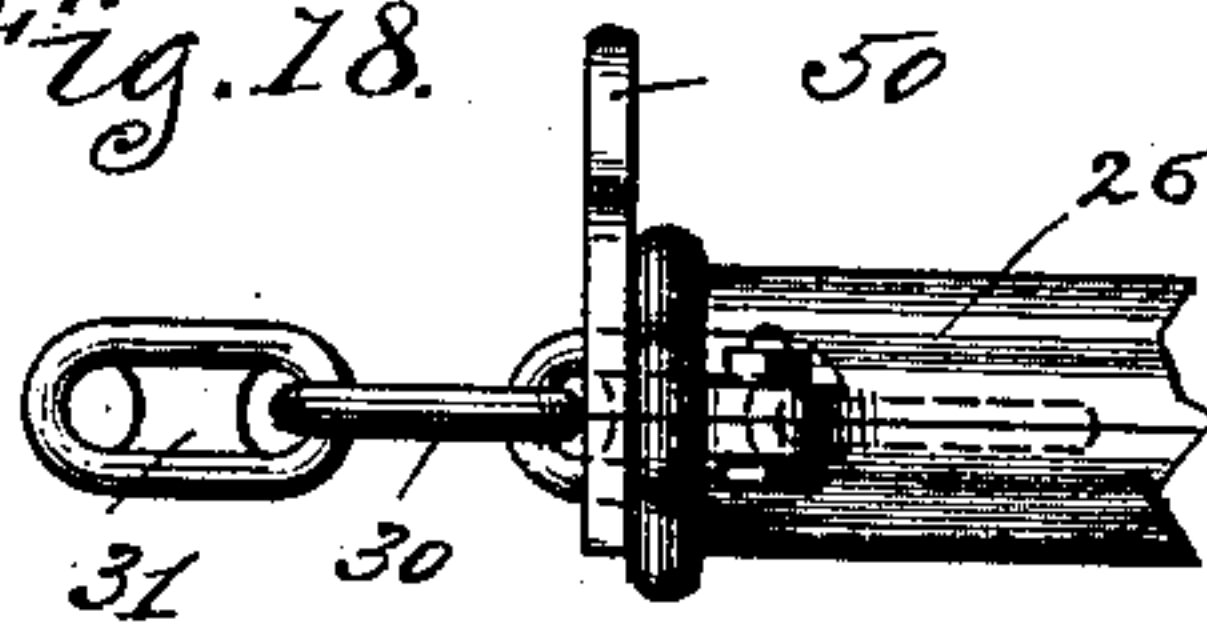


Fig. 19.

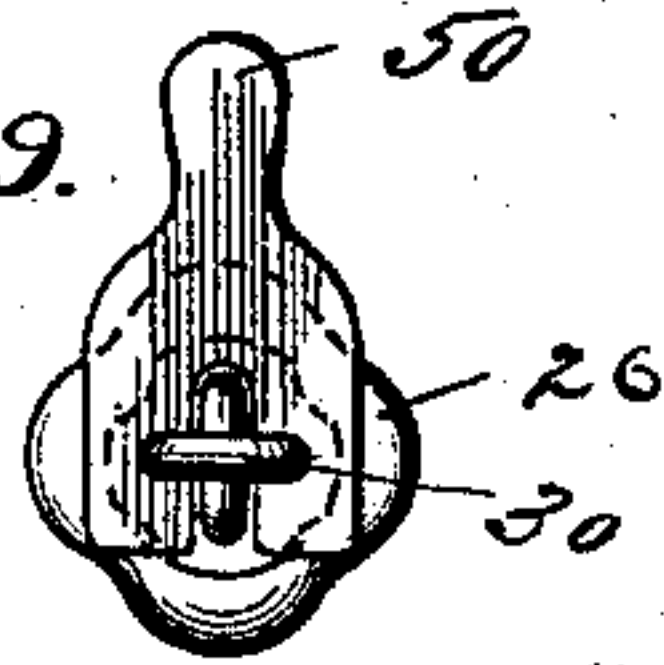


Fig. 21.

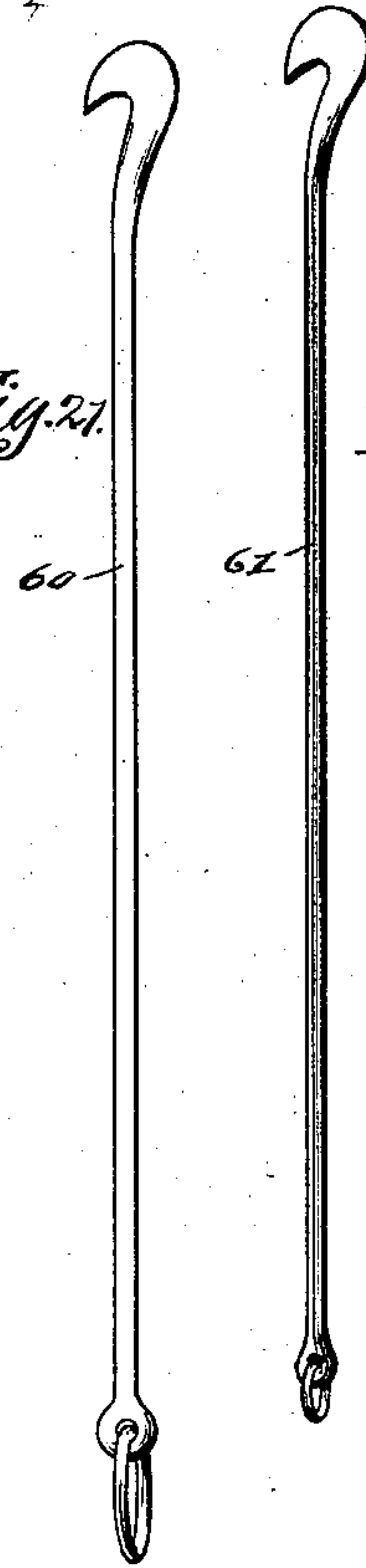


Fig. 22.

Witnesses,
L. M. Mann.
G. A. Utter

Inventors,
John C. Sharp
Abram U. Calkins

(No Model.)

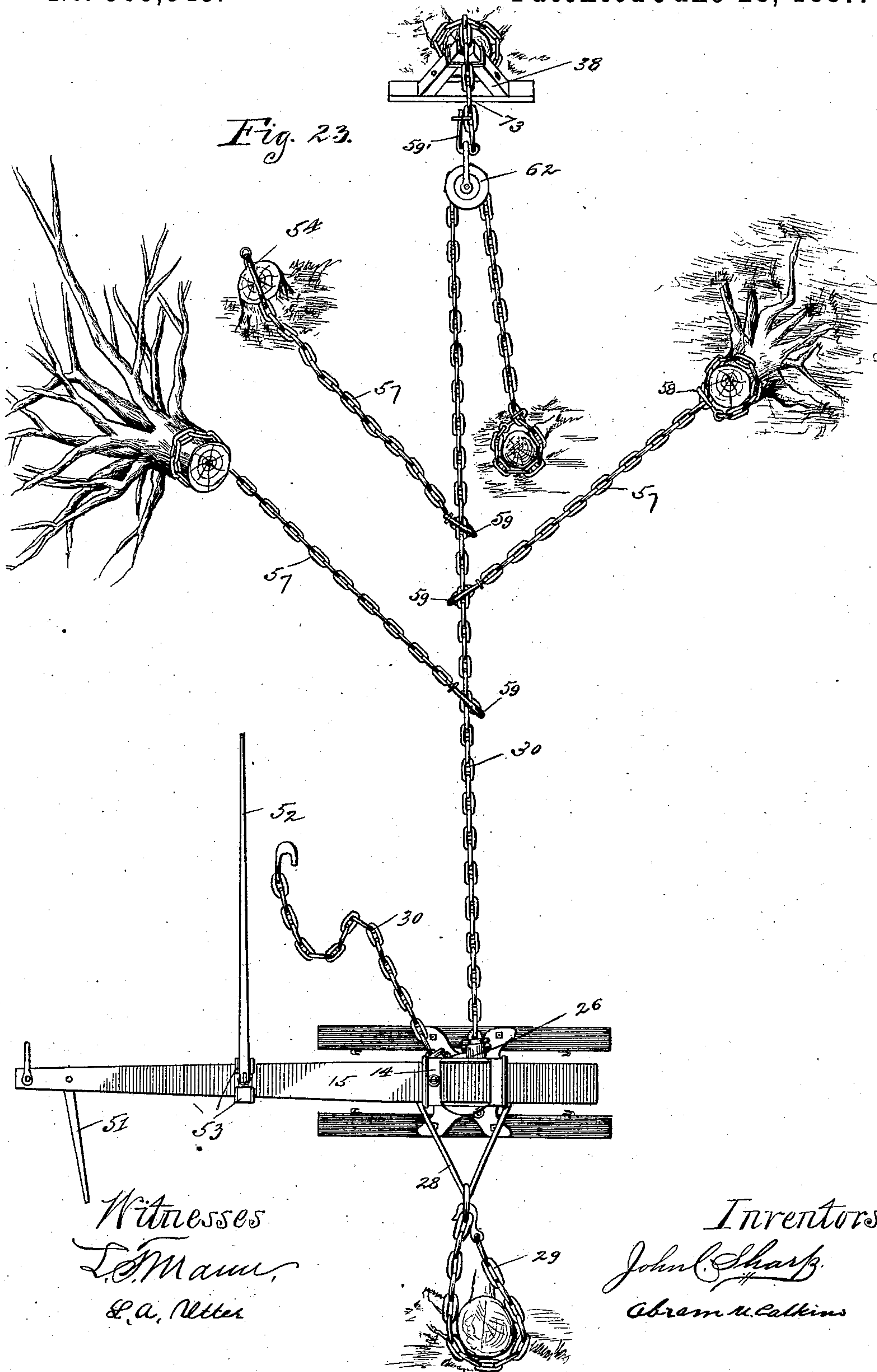
5 Sheets—Sheet 5.

J. C. SHARP & A. U. CALKINS.

GRUB AND STUMP EXTRACTOR.

No. 365,545.

Patented June 28, 1887.



UNITED STATES PATENT OFFICE.

JOHN C. SHARP AND ABRAM U. CALKINS, OF DELAVAN, WISCONSIN; SAID
CALKINS ASSIGNOR TO SAID SHARP.

GRUB AND STUMP EXTRACTOR.

SPECIFICATION forming part of Letters Patent No. 365,545, dated June 28, 1887.

Application filed March 28, 1887. Serial No. 232,730. (No model.)

To all whom it may concern:

Be it known that we, JOHN C. SHARP and ABRAM U. CALKINS, of Delavan, in the county of Walworth and State of Wisconsin, have
5 invented a certain Improvement in Grub and Stump Extractors, of which the following is a specification.

In the accompanying drawings, illustrating our invention, Figure 1 is a plan view of the
10 machine with the upper half of the horizontal chain-guide box and the parts above it removed, and the chain-wheel, with pockets for both the horizontal and vertical links of a cable-
chain, such wheel being in central horizontal
15 section; Fig. 2, a vertical section of machine on line 2 2 in Fig. 1 and showing a section of upper half of the horizontal chain-guide box that in Fig. 1 was removed; Fig. 3, a top view of the chain-wheel, showing the opening in the
20 upper hub thereof to receive the key-shank of the socket of the operating-lever. Fig. 4 is a vertical cross-sectional view of one of the transverse runners, showing its rounded form on the under side; Fig. 5, a plan view of a modification of the machine, the upper half of the
25 horizontal chain-guide box and parts above it removed, with chain-stripper plate in position, and a chain-wheel with pockets for the vertical links and a groove for the inner part of the
30 horizontal links of a cable chain, said chain-wheel being shown in central horizontal section; Fig. 6, a vertical section of the modified machine on line 6 6 in Fig. 5 and showing section of upper half of the horizontal chain-
35 guide box, not shown in Fig. 5, it having been removed in that view. Fig. 6 also shows modified top plate, chain-wheel, and shank of operating-lever socket. Fig. 7 is a top view of the chain-stripper plate removed from the machine;
40 Fig. 8, a view of the lower half of the horizontal chain-guide box in an inverted position to show its supporting-legs; Fig. 9, an elevation of the pattern of chain-wheel shown in Figs. 1 and 2 in horizontal and vertical section, such chain-wheel shown in Fig. 9 removed
45 from the machine; Fig. 10, an elevation of a chain-wheel removed from the machine, shown also in position in the machine in Figs. 5 and 6, but in views of horizontal and vertical
50 section. Fig. 11 is a separate top view of the

top plate which composes a part of the main frame of the machine and the bearing of the upper hub of the chain-wheel; Fig. 12, a separate rear elevation of the top plate shown in Fig. 11. Fig. 13 is a view of the pulley-block; 55 Fig. 14, a view of the low stump-hook; Fig. 15, a clevis to use in connection with a chain in forming a slip-noose hitch around the body of a stump or one of its roots; Fig. 16, a front elevation of the wooden frame that we term a
60 "jack;" Fig. 17, a side elevation of the jack, showing it in position at a stump and also showing in position the clevis that is separately shown in Fig. 15. Fig. 18 is a side view of the locking-plate in position at mouth of
65 one arm of the horizontal chain-guide box, which arm is here shown in vertical cross-section. Fig. 19 is a front view of the aforesaid locking-plate in position at mouth of the horizontal chain-guide-box arm, an end view of
70 the guide-arm being shown in this case; Fig. 20, a view of a side hitch-chain, in which some of its links are composed of square iron or metal with some of the corners set outwardly. Fig. 21 is a view of a square bar with a hook at
75 one end and a link at the other; Fig. 22, a view of a round bar of iron or metal with a hook at one end and a link at the other. Fig. 23 is a plan view of the machine in operation.

Like figures of reference denote corresponding parts in all the figures. 80

Our grub and stump extracting machine is mounted preferably upon transverse runners 1 1, which we usually provide with hooks 2 2 2 2, by which the machine can be drawn from
85 place to place. These transverse runners 1 1 are preferably of wood, and we commonly round their ends, as shown, and also their bottoms, which latter are shown in Fig. 4 in a vertical cross-sectional view. The whole frame
90 of the machine, otherwise, we prefer to make of metal, to give the machine strength of parts and sufficient weight, so that when in use it will not be tipped up easily by a long operating-lever. 95

If desired, the machine could be mounted upon rollers instead of the transverse runners shown.

3 is the bed-plate of the machine, made of cast metal and having legs 4 4 4 4, which 100

rest upon the transverse runners 1 1 and are secured thereto. The bed-plate 3 is provided with a central circular opening, 5, and surrounding this opening is a circular platform, 6. (Shown in vertical section in Figs. 2 and 6.) The top of this platform 6 is above the general level of the bed-plate 3. In this opening 5 of the bed-plate 3 turns the extended hub 7 of the chain-wheel 8, the body of such chain-wheel resting upon the circular platform 6 of the bed-plate 3 and projecting slightly beyond the outer line of said circular platform 6. The object of this circular platform and projecting chain-wheel feature is to protect the lower horizontal and vertical bearings of the chain-wheel in the bed-plate 3 from any dirt or sand that may be carried into the machine by the chain; and with this arrangement of the parts it will readily be seen that the dirt or sand would drop on the bed-plate 3 too far below the point at which it must enter to enable it to get into and grind or cause too much wear of the aforesaid bearings.

The chain-wheel 8 has pockets 9 for the inner portion of the horizontal links of the cable chain, and pockets 10 for the vertical links of the chain. The chain-wheel 8 is also constructed with projecting hub 11 on its upper end, and with an opening, 12, down through it, in which opening the key-shank 13 of the operating-lever socket 14 rests removably. The lever-socket 14 receives the inner end of the operating-lever 15, to the outer end of which the horse or team is attached that operates the machine. The sides of the lever-socket 14 are preferably made parallel with each other, and a portion of the operating-lever made with parallel sides also, to enable it to fit the socket and render it capable of being shortened or lengthened, as desired, by pushing it farther through the socket or withdrawing some, the lever being held securely in the socket at the desired point by means of a set-screw, 16, or by a pin passing through the lever-socket casting and projecting into a hole or an opening provided in the lever to receive it; and such holes or openings could be provided at different points in the lever, as desired.

The bed-plate 3 is provided with two upwardly-projecting hollow studs, 17 17, and upon these studs 17 17 rests the top plate, 18, having a central opening, 19, which fits over the upper hub, 11, of the chain-wheel 8 and forms the upper bearing for such chain-wheel. The top plate, 18, is securely held in position by means of the two bolts 21 21 passing upwardly through the studs 17 17 and the side projections, 22 22, of the top plate, 18.

Between the bed-plate 3 and top plate, 18, is situated the horizontal chain-guide box, which is composed of two halves, 23 24, and provided with a sufficient number of lugs 25, by which the halves are bolted together. The parts 23 and 24 form a box, which surrounds the chain-wheel and conforms to the contour of so much of the chain as projects from the wheel, serving to hold the chain in position in

the pockets of the wheel, so the links cannot work out of operative connection therewith or become cramped thereon.

In front of the chain-wheel the chain-guide box has two forwardly-projecting guide arms, 26 26, which entirely inclose the chain, having vertical and horizontal grooves to accommodate the vertical and horizontal links of the draft-chain.

The openings at the outer ends of the guide-arms 26 26 are flared somewhat, so that the links will run smoothly into and out of such guide-arms without catching. These hollow guide-arms 26 26 preferably project obliquely to each other, although we could make them to project parallel with each other. These hollow guide-arms serve to conduct the chain onto and off of the chain-wheel.

The upper and lower halves of the horizontal chain-guide box are exactly alike, except the lower half has supporting-legs 27 27 located around its central opening, such supporting-legs 27 27 27 27 being preferably of the shape shown in Fig. 8. When the lower half of the horizontal chain-guide box is in its proper position on the bed-plate 3 the aforesaid supporting-legs rest thereon. The open spaces between the supporting-legs permit any sand or dirt that may have dropped from the wheel above to work outwardly from it, and when the machine is in operation the lateral movements of the horizontal chain-guide box, when provided with supporting-legs 27 of the shape shown in Fig. 8, serve to push outwardly from the chain-wheel the sand or dirt that may have dropped from above, thus keeping it away from the lower bearings of the chain-wheel, and also the bearings of the supporting-legs 27 on the bed-plate 3.

The chain-guide box is held down in position by the top plate, 18, but is capable of swinging freely from side to side on the bed-plate 3. This swinging movement is limited by the striking of one or the other of the chain-guide arms against one or the other of the studs 17 17. The hollow guide-arms 26 26 also serve to conduct the draft-chain clear of the machine and assure the correct arrangement of the links of the draft-chain before they reach the chain-wheel. The swinging movement of the horizontal chain-guide box allows the guide-arms to adjust themselves to any change in the line of draft of the draft or pull chain with a more gradual movement of the machine and less friction. The anchor-bail 28 is secured by the bolts 21 21, that pass up through the studs 17 17, the eyes of the anchor-bail 28, and the top plate, 18. To this anchor-bail we attach the anchor-chain 29. (Shown in Fig. 23.)

The draft-chain 30 is preferably of what is known as the "stud or brace link" pattern, the links having metal studs or braces 31, extending crosswise inside of the links. We, however, can use the ordinary short-link cable chain, if desired, for a draft-chain.

In some cases we use the pattern of chain-

wheel shown in Figs. 10 and 5, which wheel has pockets 32 for the vertical links of the draft cable chain, and around its center a groove, 33, to receive the inner portion of the horizontal links of such chain. When we employ a wheel of this pattern we use a chain-stripper plate, 34, (shown in Figs. 5 and 7,) to prevent the links of the draft-chain from following the wheel around past the guide-arms and clogging on the delivery side of the chain-wheel. When the chain-stripper plate 34 is used, the horizontal chain-guide box is provided with an opening, as shown in Fig. 5, to receive the chain-stripper plate 34, which is held in position in front of the chain-wheel between the two halves of the horizontal chain-guide box by means of holes 35 and studs on each of the said guide-box halves, which studs project slightly into the holes 35 in the chain-stripper plate 34. This chain-stripper plate 34 projects into the groove 33 of the chain-wheel and conforms thereto, and has two tapering fingers, 36, which follow the groove around to the sides of the chain-wheel. These fingers 36 strip the chain from the wheel and force the horizontal links of the draft-chain outwardly, compelling the links to pass smoothly into the hollow chain-guide arm on the delivery side of the machine without possibility of their becoming cramped or clogging. The chain-stripper plate 34 swings with the chain-guide box and guide-arms, so as to act uniformly therewith.

We sometimes use a chain-stripper plate with the chain-wheel 8; but in such case the chain stripper plate is made of the same shape, but shorter, and does not project into the chain-wheel any farther than the outer ends of the spurs or partitions 37, between the pockets 9 for the horizontal links, will permit, so that the stripper-plate will not interfere with the chain-wheel turning freely. When the chain stripper plate is used, the chain-guide-box halves are provided with the opening to receive it, and the holes and studs, same as hereinbefore described, when the chain-stripper plate is used with the chain-wheel, Fig. 10.

When the operator hitches high on the body of a stump, and when the jack 38 is used, the draft-chain sometimes rises too high to permit the operating horse or team to cross it easily. To meet such difficulty we sometimes use a modified lever-socket, 39, Fig. 6, having a round tapering shaft, 40, which projects downwardly into a central circular opening, 41, in the chain-wheel, adapted to receive and fit it, the horizontal projecting part 42 of the lever-socket 39 resting upon the top of the upper hub, 43, of the chain-wheel, as shown. The hub 43 of the chain-wheel is provided with a number of horizontal holes or openings, 44, entirely through it, and on the same horizontal plane the lever-socket shaft 40 has a number of horizontal holes or openings, 44', to receive the pin 45, which, when in the position as shown, passes horizontally

through the hub of the chain-wheel, and also through the shaft of the lever-socket, which, when the lever or sweep is operated, causes the chain-wheel to turn with it, and when pin 45 is withdrawn the lever can turn without causing the chain-wheel to turn. Through the collar of the top plate, 18, is also provided a horizontal hole or opening, 46; and on the same horizontal plane a number of horizontal holes or openings, 47, are made at different points around the hub of the chain-wheel to receive the pin 48, which passes horizontally through the opening or hole 46 in the collar of the top plate 18, and through one of the holes or openings 47 of the hub of the chain-wheel, but in this case not into or through the lever-socket shaft 40. When the machine is in operation the pin 45 is in position, as shown, and the pin 48 is withdrawn, and if draft-chain on a high hitch rises too high for the horse or team to cross easily, the pin 48 is inserted as soon as one of the holes 47 in the hub comes in line with the hole 46 in the collar of the top plate, 18. Inserting the pin 48 prevents the chain-wheel from turning backward and holds all advantage in the pull that has been gained. The team or horse is now detached from the operating-lever, and after withdrawing the pin 45 the lever is turned beyond the draft-chain and until the holes in the socket-shaft 44' come in line with the holes that match in the hub of the chain-wheel. Then the pin 45 is inserted and the team or horse led around the rear of the machine and again attached to the lever, the pin 48 being withdrawn, so as to permit the chain-wheel to again revolve with the lever.

The holes or openings 47 in the hub 43 for the pin 48 should be larger than the hole through the collar of the top plate, 18, to enable the operator to more easily withdraw the pin 48 upon starting the team or horse.

The operation described can be repeated as often as a high-draft chain renders it necessary.

In some cases, instead of using the pin 48 for locking or holding the wheel, as hereinbefore described, we use the locking-plate 50, a side view of which is shown in Fig. 18 and a front view in Fig. 19. This locking-plate 50 is preferably made of metal, and has a slot or an opening, so it can be placed on a vertical link of the draft chain at the mouth of the hollow guide-arm 26, Figs. 18 and 19, through which the chain discharges. When thus applied, the locking-plate 50 prevents the draft-chain from passing back through the machine when under heavy strain and with horse or team detached, and also holds the wheel from turning backward while withdrawing the pin 45 and turning the lever beyond the draft-chain, as hereinbefore described.

We could dispense with the pin 48 and the locking-plate 50 also, substituting therefor a ratchet on the hub of the chain-wheel and a pawl located on the top plate, 18, to engage with such ratchet, or the reverse—a ratchet on

the top plate and a pawl on the hub of the wheel; but we deem both the locking-plate and pin devices as preferable to a ratchet and pawl for locking the wheel of our machine.

5 We sometimes provide a follower, 51, Fig. 23, which is attached to the outer end of the lever by means of an eyebolt up through the lever and a spike driven into the upper end of the wooden follower 51, such spike having
10 an eye at its upper end, and said eye welded into the eye of the aforesaid eyebolt, this connection forming a link-joint. By turning the eyebolt in the lever the follower can be easily set to follow the lever in either direction
15 around the circle, and by its lower end pressing into or against the ground a brace is thus formed to hold the lever and relieve the horse or team, when desired, in operating the machine.

20 To cause the horse or team to be led properly around the circle while operating the machine, we usually provide a lead-bar, 52, Fig. 23, to which the team or horse is tied. This lead-bar is connected with the lever by means
25 of an eyebolt passing downwardly through the lever and secured by a nut on the under side thereof, and the lead-bar being provided with a slot or opening at its inner end to receive the eye of such eyebolt, and through the lead-
30 bar and eye of the aforesaid eyebolt we insert a cross-bolt. This connection will enable the operator to cause the lead-bar to project outwardly from either side of the lever to lead the horse or team in the proper direction around
35 the circle. The lead-bar 52 is held in position by cast cups 53 53, with open top to receive it, the cups being bolted to the lever.

As a modification of the horizontal chain-guide box of our machine, any part of the
40 same with which the chain comes in moving contact could be replaced by guide pulleys or wheels mounted in a swinging frame surrounding the chain-wheel.

If we wish to produce a geared machine
45 having greater power and slower movement than the machine described, we mount a large cog-wheel on the shaft of the chain-wheel, and on another shaft back of the chain-wheel we mount a pinion meshing with the large cog-
50 wheel. The draft-lever would be connected with the pinion or its shaft.

The bed-plate and top-plate of the machine would have to be extended back far enough to provide bearings for the extra shaft.

55 Instead of the large cog-wheel we sometimes mount a large chain-wheel on the same shaft and above the chain-wheel that operates the draft-chain, and on the rear shaft, instead of the pinion, we mount a smaller chain-wheel,
60 and with a chain-belt running from the small to the large chain-wheel. The operating-lever connected with the small chain-wheel or its shaft would drive the large chain-wheel, and also cause the chain-wheel below on the same
65 shaft to rotate and operate the draft-chain. The upper and lower bearings of the rear

shaft could be arranged to move backward or forward in slots cut in the top plate and the bed-plate, so as to conveniently tighten or
70 loosen the chain belt to have it of the proper tension. The operating-lever could be connected with the large chain-wheel if less power and more speed be desired.

The chain-wheels hereinafter mentioned in the claims of this application are to be con-
75 strued as meaning those that come in direct contact with the draft-chain and operate said draft-chain, and not to be construed as meaning the belt-chain wheels above described as substitutes for the large cog-wheel and pinion
80 for obtaining the increase of power of the machine.

For pulling stumps that are too low to permit a chain-hitch thereto, or where the tops of the stumps are so much decayed that they would
85 pull off, we use the low stump-hook, 54, made of metal, with a broad point and with notches 55, as shown, and also provided with a ring or clevis, 56. These notches 55 are to pre-
90 vent the hook from cutting too deeply into the wood and to cause it to hold more securely to the stump. The clevis or ring 56 is to hitch a light chain into and around the roots or body of a stump when the hook happens
95 to slip off before the stump is entirely out of the ground and to render it unnecessary to make a second hook-hitch. The clevis or ring 56 affords a convenient hold for the hand when using or setting the hook.

The side hitch-chain, 57, Fig. 20, could be
100 made with links of round iron or metal; but we usually make some of them of square iron or metal, set cornerwise, or so that some of the corners are projecting outwardly, to cut
105 into the wood and hold more securely when a slip-noose hitch is made around the stump by means of the chain and its hook 58. The fly-link 59 on the other end of such chain is used to make the connection with the draft-
110 chain 30, as shown in Fig. 23.

In pulling stumps that are not within reach of the draft-chain and side chains, we sometimes use in connection therewith the hooked
115 bar 60, Fig. 21, or the hooked bar 61, Fig. 22, and in some cases we use wire rope, the hooked bars and wire rope being lighter to handle and cheaper than chain of same length and equal strength, and in some places they answer the purpose fully as well.

For obtaining more power than the direct
120 draft affords, we use the pulley-block 62, as shown in Fig. 23. This pulley-block, also shown in Fig. 13, consists of a metal pulley or sheave 63, secured within the metal bail or clevis 64, by means of the metal shaft 65, which passes
125 through the hub of the pulley and also the two eyes of the bail or clevis 64. The shaft is held in position by riveting the ends, or cross pins could be used through the ends of the shaft just outside of the bail or clevis-
130 eyes, such pins projecting a short distance outwardly from the shaft 65. The jack 38,

Figs. 16 and 17, is preferably of wood, and has side pieces, 67 and 67, Fig. 16, mortised into the sill 68.

To hold the side pieces together at the top, we usually provide a metal band, 69, and in some cases a cross-bolt, 70, and another cross-bolt, 71, to aid in holding the sides together when in use and under heavy endwise strain.

The sill 68 of the jack can be made straight; but we prefer to have it bow upwardly, as shown in Fig. 16, thereby diminishing its liability to breakage when in use if a stone or large root happens to lie beneath its middle or weaker portion. If the jack is properly set and connected with the draft-chain of the machine, greater power and an upward lift is also exerted on the stump, both features being at times desirable in pulling heavy or large stumps. The jack can be used either with or without the pulley-block 62; but when the pulley-block 62 is used in connection with the jack, as shown in Fig. 23, greater power is thereby obtained.

In use, the machine is anchored and the draft-chain 30 is connected with a number of stumps, as shown in Fig. 23, when a horse or team is attached to the draft-lever 15 and the machine operated. After the draft-chain is drawn in upon one side, the other end of the chain is connected with several stumps, and the horse or team pulls the sweep or draft-lever in the opposite direction. The operation is repeated in this manner until all the grubs and stumps within the range of the machine are pulled up, when the machine is drawn to a new anchorage.

The machine is not staked down when in use, but left free to swing laterally on the ground from its anchorage into the line of draft of the stump with which the draft-chain is connected.

In Fig. 17 the jack is shown in proper position for pulling when the chain is connected with the back of the stump; but in some cases we hitch the chain to a front root of the stump, setting the jack a little farther from the stump and at about the same angle as shown in Fig. 17. This front-root hitch tends to tip the stump over backward, and if the stump is a large and difficult one to pull, and the jack rather short, or if obstructions prevent setting the jack close to the stump and hitching to the back thereof, then the front-root hitch above described should be made.

In making root-hitches we use the clevis 72 in preference to a chain with a hook permanently attached to it, because in many cases roots interfere with or render it difficult to get a hole under the root to which the hitch is to be made and such hole large enough to let a hook of the requisite size through the hole, so as to make the slip-noose hitch; but in the other case the clevis is not put on until after the chain has been passed through the hole, which need not be made so large for the chain as would be necessary if a large hook were permanently connected with it. We also at

times use the clevis-hitch around the body of a stump, if a large one.

Aside from stump-pulling, our machine can be used for moving buildings, drawing ditching-machines, and in fact for moving heavy bodies of any kind within its range of power.

For drawing a ditching plow or machine where the ground is too soft to afford a good footing for the horse or team, we provide a platform of sufficient size to enable the horse or team to operate the stump-extractor thereon, the extractor being secured to the center of the platform and the ditching machine or plow attached to the anchor-chain and back of the platform, with the draft-chain of the machine or extractor connected at its outer end with an anchor of sufficient strength. The machine is now operated, and the platform, with the machine and team or horse upon it, and the ditching machine or plow connected, will all be drawn toward the anchor at outer end of the draft or main chain. This platform should be provided with suitable runners, and could be made in sections for greater portability, and when in use the sections properly secured together in any suitable manner.

For convenience in withdrawing or of inserting the pins 45 and 48, Fig. 6, we may connect a lever therewith in any common and suitable manner to accomplish the desired purpose; and in some cases we may use a spring in connection with said pins, or one of them, and such spring adapted in any common and suitable manner to insert or withdraw the pin with which it may be connected.

Instead of the fly-link 59', Fig. 23, for connecting the chain 73 with the pulley-block 62, we sometimes employ a strong metal clevis having parallel sides provided with holes to receive the cross-pin for closing the open end of such clevis; and we also at times use such clevises to connect one chain with another to reach out long distances when pulling stumps, but do not use such clevises for connecting a side chain elsewhere than at the end of the main or draft chain 30, because a clevis will not connect a side chain to any link of the main chain 30 as a fly-link is capable of doing.

Instead of the chain 73, Fig. 23, being used over the top of the jack, we sometimes use what we term "jack-bars," composed of two bars of metal with two of their ends connected with a short piece of chain. In using the jack-bars, we place the chain part thereof on or over the top of the jack and attach or connect one of the bars with the pulley-block and the end of the other bar with the chain that is connected with the stump. The jack-bars are lighter to handle than a heavy chain.

What we claim as our invention is—

1. In a grub and stump extractor, the combination of a main frame mounted upon the transverse runners 1 and 1, having their ends rounded, as shown, a draft-wheel mounted in said main frame, a draft-chain to move horizontally and in operative connection with said draft-wheel, means for anchoring said main

frame so that in operation the machine can swing laterally and freely upon the ground from its anchorage into line of draft with the variously-located grubs and stumps with which the outer portion of the horizontally-extended draft-chain may be connected, mechanism for locking said draft-wheel to prevent its turning backward, and a horizontally-operating lever pivotally connected with said draft-wheel and in such manner that without lifting said operating-lever from the draft-wheel it can be turned laterally over and beyond the horizontally-extended draft chain when the said draft-wheel is locked, and said operating-lever adapted to engage with and rotate said draft-wheel when said draft-wheel is not locked, all substantially as described, and for the purpose set forth.

2. In a grub and stump extractor, the bed-plate 3, mounted upon transverse runners 1 and 1, and having two studs, 17 and 17, a central circular opening, 5, with the circular platform 6, surrounding said opening, the top plate, 18, secured to the bed-plate 3 by means of the two bolts 21 and 21, a chain-wheel adapted to rotate horizontally between the bed-plate 3 and top plate, 18, said chain-wheel having a horizontal chain-guide box surrounding it, and said horizontal chain-guide box adapted to swing laterally within certain limits independently of the frame of the machine, and said horizontal chain-guide box having the supporting-legs 27 27 27 27, of the shape shown, and mechanism for locking the said chain-wheel, and an operating-lever pivotally connected with said chain-wheel so as to turn independently of the chain-wheel and adapted to engage with and turn the chain-wheel when such result is desired, and means for anchoring said grub and stump extractor, all combined as above recited, substantially as and for the purpose set forth.

3. In a grub and stump extractor, the combination, with the bed-plate 3 and the top plate, 18, secured together, of the horizontal chain-guide box with the hollow guide-arms 26, the anchor-bail 28, the anchor-chain 29, an operating-lever with the lever-socket 39, having a round shaft or shank, 40, having several openings or holes, 44', a chain-wheel with a central circular opening, 41, in its hub, and said chain-wheel having several openings or holes, 44, in its hub, and the pin 45, mechanism for locking said chain-wheel when such result is desired, and a horizontal draft-chain, substantially as shown and described, and for the purpose set forth.

4. In a grub and stump extractor, the combination of the bed-plate 3, mounted upon the transverse runners 1 and 1, and having two studs, 17 and 17, and a central circular opening, 5, the top plate, 18, secured to the bed-plate 3 by means of the two bolts 21 and 21, a chain-wheel adapted to rotate horizontally between the bed-plate 3 and top plate, 18, and surrounding said chain-wheel, a horizontal chain-guide box having hollow guide-arms 26

and 26 projecting from its front portion, and said horizontal chain-guide box having the supporting-legs 27 27 27 27, of the shape shown, an anchor-chain, an operating-lever, a draft-chain, and the locking-plate 50, applied to said draft-chain, substantially as shown and described, and for the purpose set forth.

5. In a grub and stump extractor, the combination, with the bed-plate 3, mounted upon the transverse runners 1 and 1, and having the central circular opening, 5, in the circular platform 6, surrounding said opening, and having the studs 17 and 17 and the top plate, 18, secured to said bed-plate 3 by means of the bolts 21 and 21, of a chain-wheel mounted between said top plate, 18, and bed-plate 3, and a horizontal chain-guide box surrounding said chain-wheel and adapted to swing laterally within certain limits around said chain-wheel and independent of the frame of the machine, and said horizontal chain-guide box having the hollow guide-arms 26 projecting from its front, and having the supporting-legs 27, of the shape shown, a draft-chain, and an anchor-chain, substantially as described and shown, and for the purpose set forth.

6. In a grub and stump extractor, the combination, with the bed-plate 3, mounted upon the transverse runners 1 and 1, and said bed-plate having the studs 17 and 17, and the central circular opening, 5, with the circular platform 6, surrounding said opening, and the top plate, 18, secured to said bed-plate 3 by means of the two bolts 21 and 21, of a chain-wheel mounted to rotate horizontally between said bed-plate and top plate, a horizontal chain-guide box surrounding said chain-wheel and adapted to swing laterally around said chain-wheel within certain limits, and said horizontal chain-guide box having hollow guide-arms 26 projecting from its front portion, a chain-stripper plate mounted in said horizontal chain-guide box, the supporting-legs 27, of the shape shown, a draft-chain, and an anchor-chain, substantially as described and shown, and for the purpose set forth.

7. In a grub and stump extractor, the combination, with the bed-plate 3, mounted upon the transverse runners 1 and 1, and having the two studs 17 and 17 and the central circular opening, 5, in the circular platform 6, surrounding said opening, and the top plate, 18, secured to said bed-plate 3 by means of the two bolts 21 and 21, of a chain-wheel adapted to rotate horizontally between said bed-plate 3 and top plate, 18, the horizontal chain-guide box surrounding said chain-wheel and adapted to swing laterally around said chain-wheel a limited distance independent of the frame of the machine, said horizontal chain-guide box having the supporting-legs 27, of the form shown, the hollow guide-arms 26, projecting from the front of the horizontal chain-guide box, and a chain-stripper plate mounted in said horizontal chain-guide box, the anchor-bail 28, the anchor-chain 29, a draft-chain, an operating-lever, and a side hitch-chain, substantially as

described and shown, and for the purpose set forth.

8. In a grub and stump extractor, the combination, with the bed-plate 3, mounted upon 5 transverse runners 1 and 1, and having the two studs 17 and 17 and the central circular opening, 5, with the circular platform 6, surrounding said opening, the top plate, 18, and the bed-plate 3, secured together by means of the 10 two bolts 21 and 21, of the horizontal chain-guide box surrounding a chain-wheel and adapted to swing laterally a limited distance around said chain-wheel between the bed-plate 3 and top plate, 18, said horizontal chain- 15 guide box having a stripper-plate mounted therein, the hollow guide-arms 26, projecting from the front of said horizontal chain-guide box, and said chain-guide box having the supporting-legs 27, of the form shown, a draft- 20 chain, an operating-lever, the anchor-bail 28, the anchor chain 29, the low stump-hook 54, having a clevis, 56, said low stump-hook connected with the draft-chain, the pulley-block 62, connected with the draft-chain, as shown, 25 and the hitch-chain 73, substantially as shown and described, and for the purpose set forth.

9. In a grub and stump extractor, the combination, with the bed-plate 3, mounted upon 30 the transverse runners 1 and 1, and having the studs 17 and 17, and the central circular opening, 5, in the circular platform 6, surrounding said opening, the top plate, 18, and the bed-plate 3, secured together by means of the two 35 bolts 21 and 21, of a chain-wheel adapted to rotate horizontally between the top plate, 18, and bed-plate 3, the horizontal chain-guide box surrounding said chain-wheel and adapted to swing laterally a limited distance around 40 said chain-wheel independent of the frame of the machine, a chain-stripper plate mounted in said horizontal chain-guide box, the hollow guide-arms 26, projecting from the front of said

horizontal chain-guide box, and said horizontal chain-guide box having the supporting-legs 27, of the form shown, the anchor-bail 28, 45 the anchor-chain 29, the pulley-block 62, connected with the draft-chain, as shown, the hitch-chain 73, the jack 38, connected with the hitch-chain 73, and the clevis 72, connected with said hitch-chain 73, substantially as de- 50 scribed and shown, and for the purpose set forth.

10. In a grub and stump extractor, the combination, with a main frame mounted upon 55 the transverse runners 1 and 1, having their ends rounded, as shown, of a draft-wheel mounted in said main frame, a draft-chain to move horizontally and in operative connection with said draft-wheel, means for anchoring 60 said main frame so that in operation the machine can swing laterally and freely upon the ground from its anchorage into line of draft with the variously-located grubs and stumps with which the outer portion of the horizon- 65 tally-extended draft-chain may be connected, mechanism for locking said draft-wheel to prevent its turning backward, a horizontal operating-lever pivotally connected with said 70 draft-wheel and in such manner that, without lifting the said operating-lever from the draft-wheel, it can be turned laterally over and beyond the horizontally-extended draft-chain when the said draft-wheel is locked, and said 75 operating-lever adapted to engage with and rotate the said draft-wheel when said draft-wheel is not locked, and the jack 38, connected with the draft chain, all substantially as shown and described, and for the purpose set forth.

JOHN C. SHARP.

ABRAM U. CALKINS.

Witnesses:

SILAS W. MENZIE,
L. D. TIDERS.