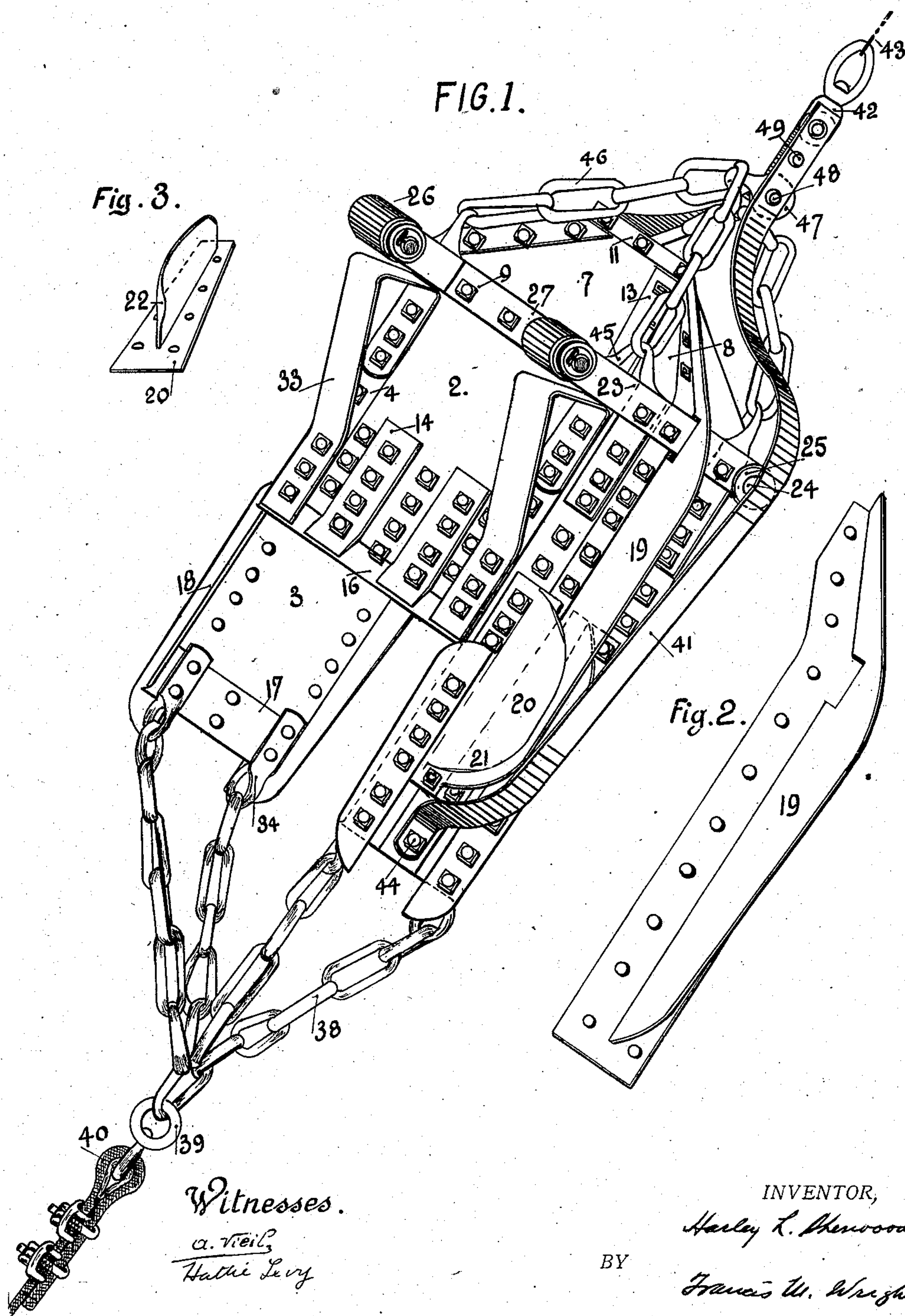


No. 866,971.

PATENTED SEPT. 24, 1907.

H. L. SHERWOOD.
SECTIONAL DREDGER BUCKET.
APPLICATION FILED NOV. 5, 1906.

4 SHEETS—SHEET 1.



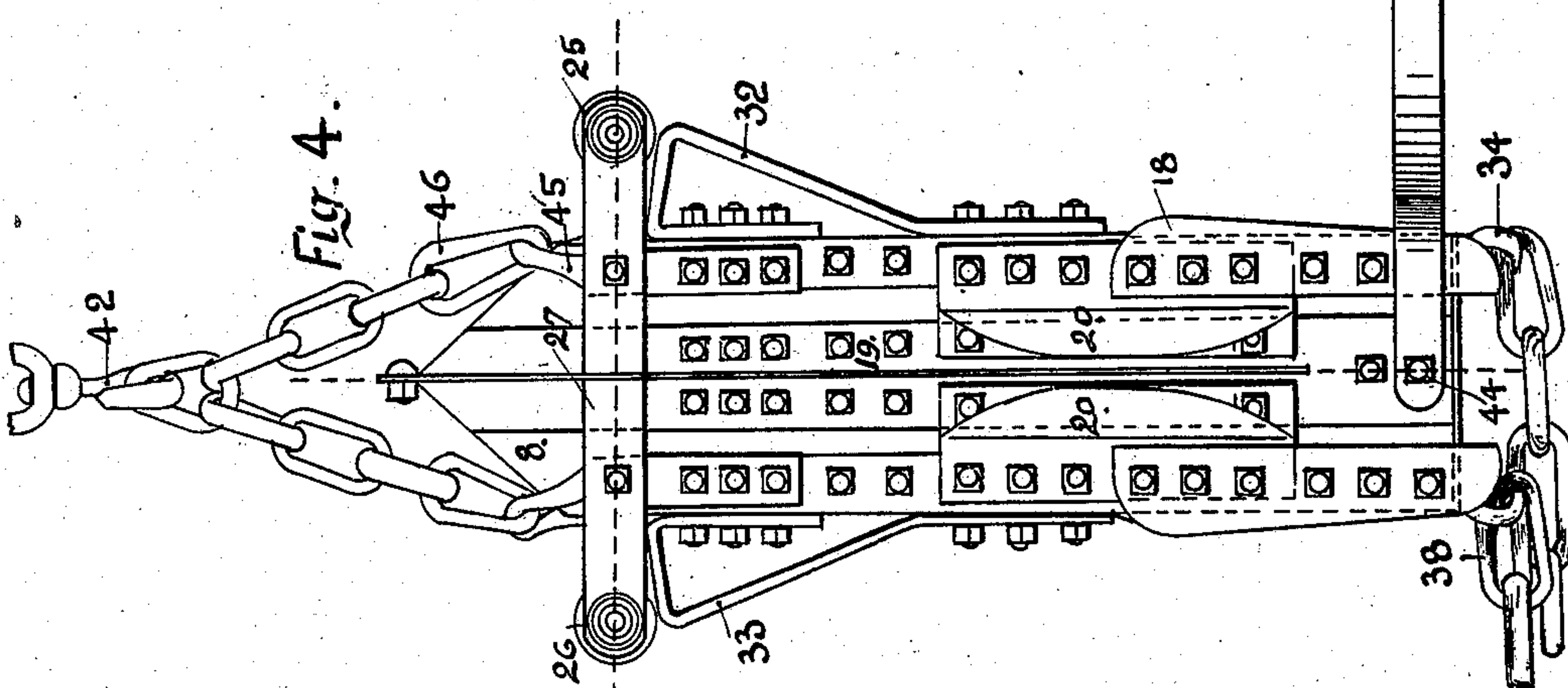
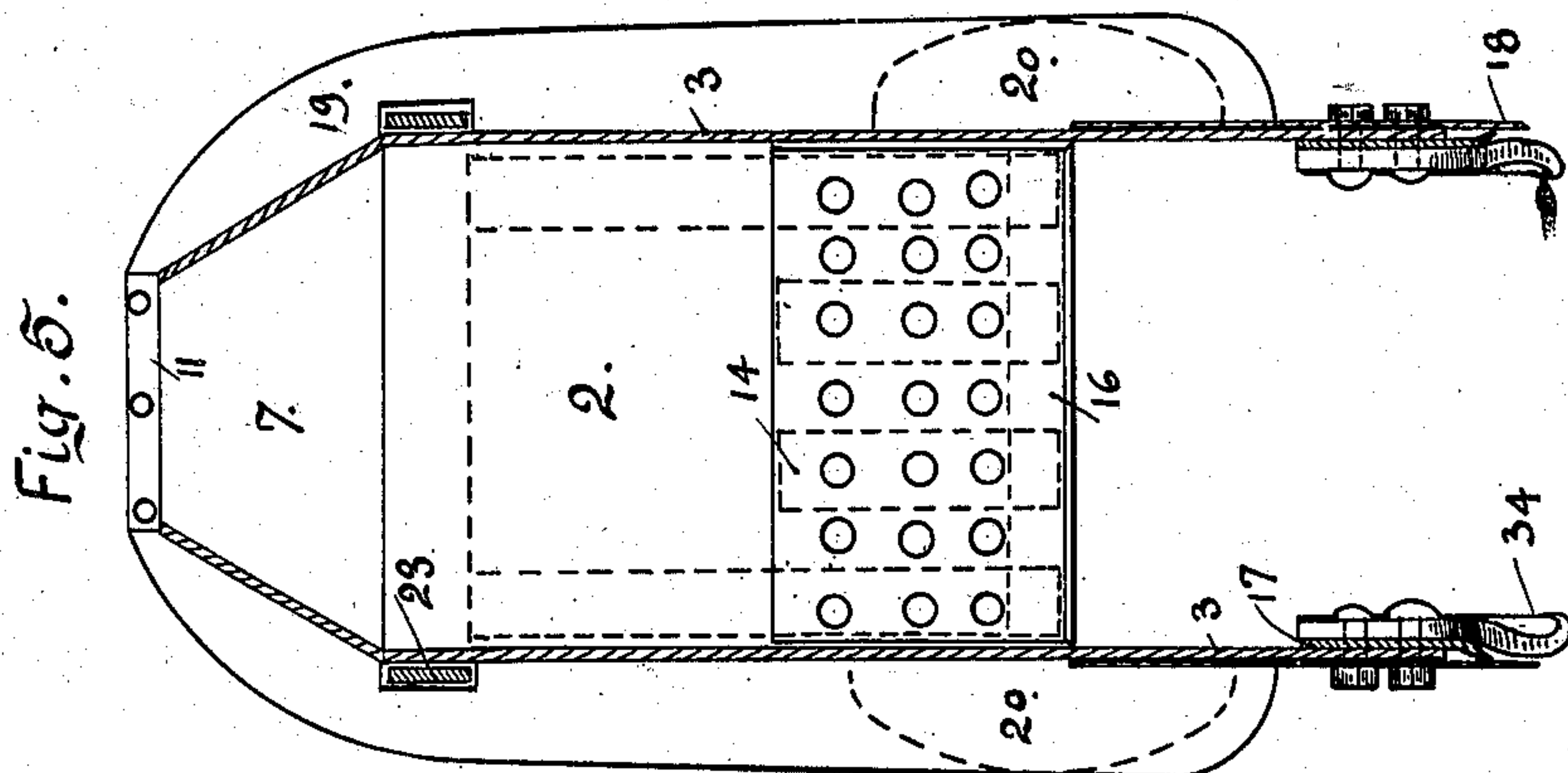
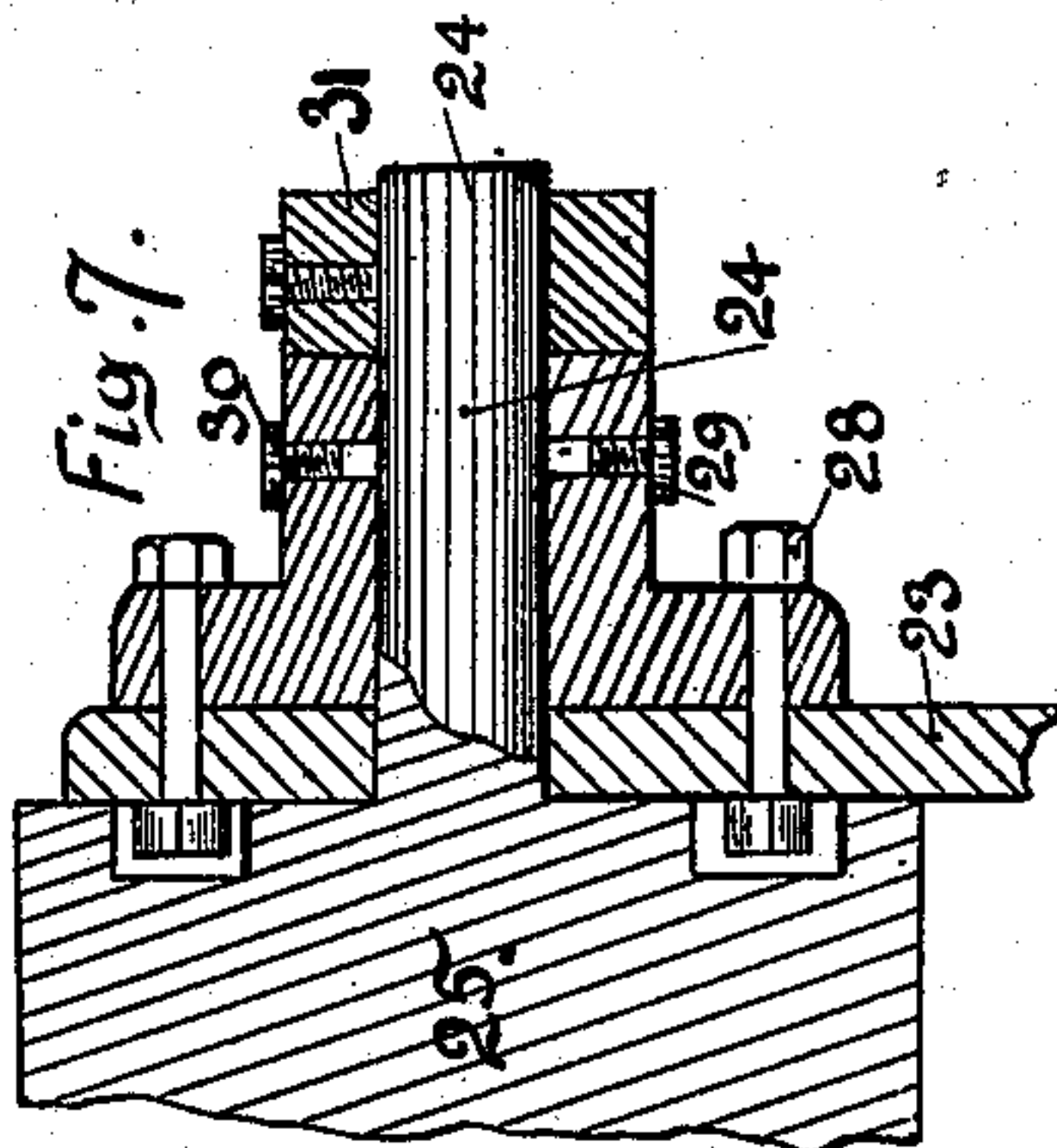
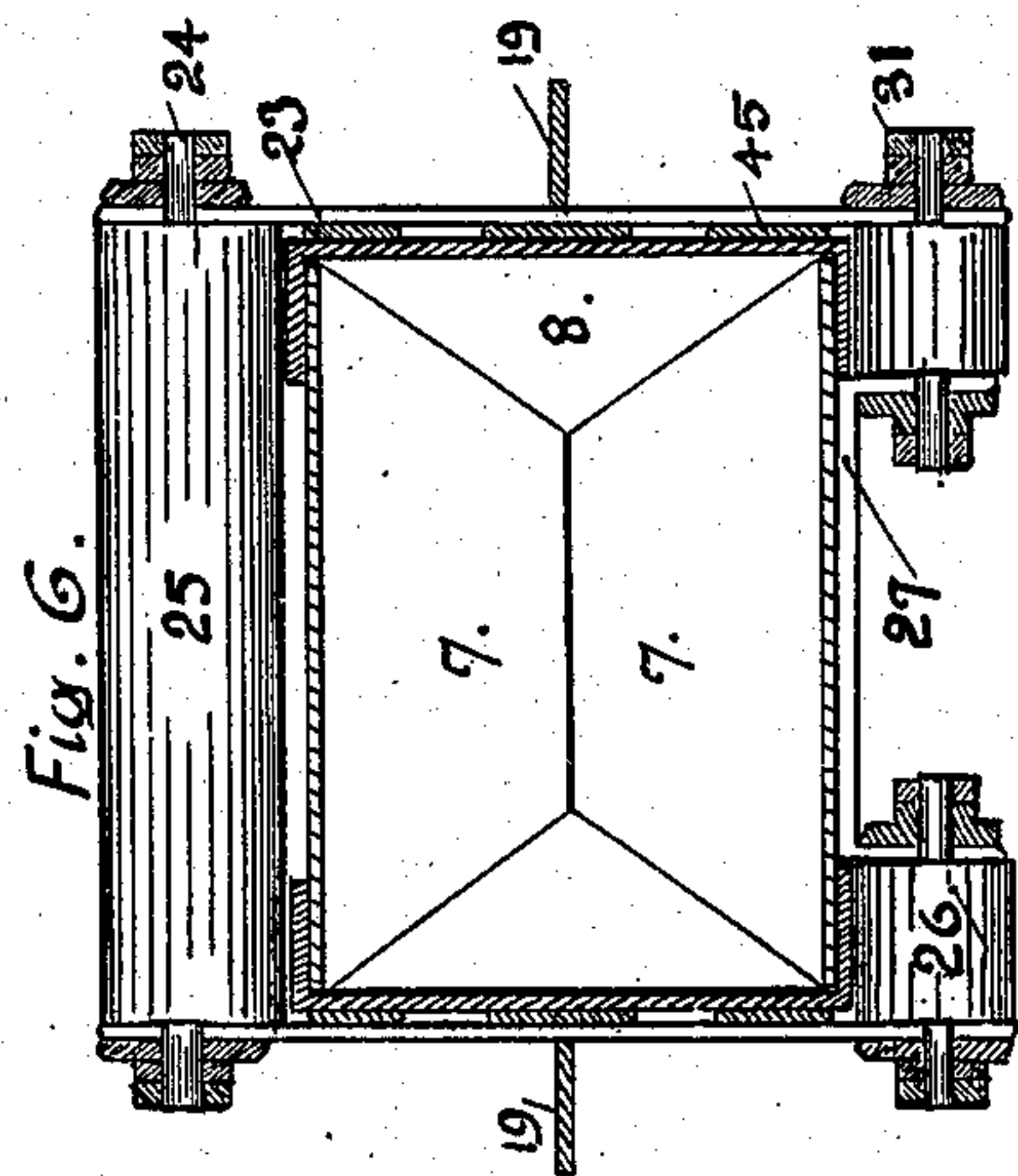
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4 SHEETS—SHEET 2.



WITNESSES:

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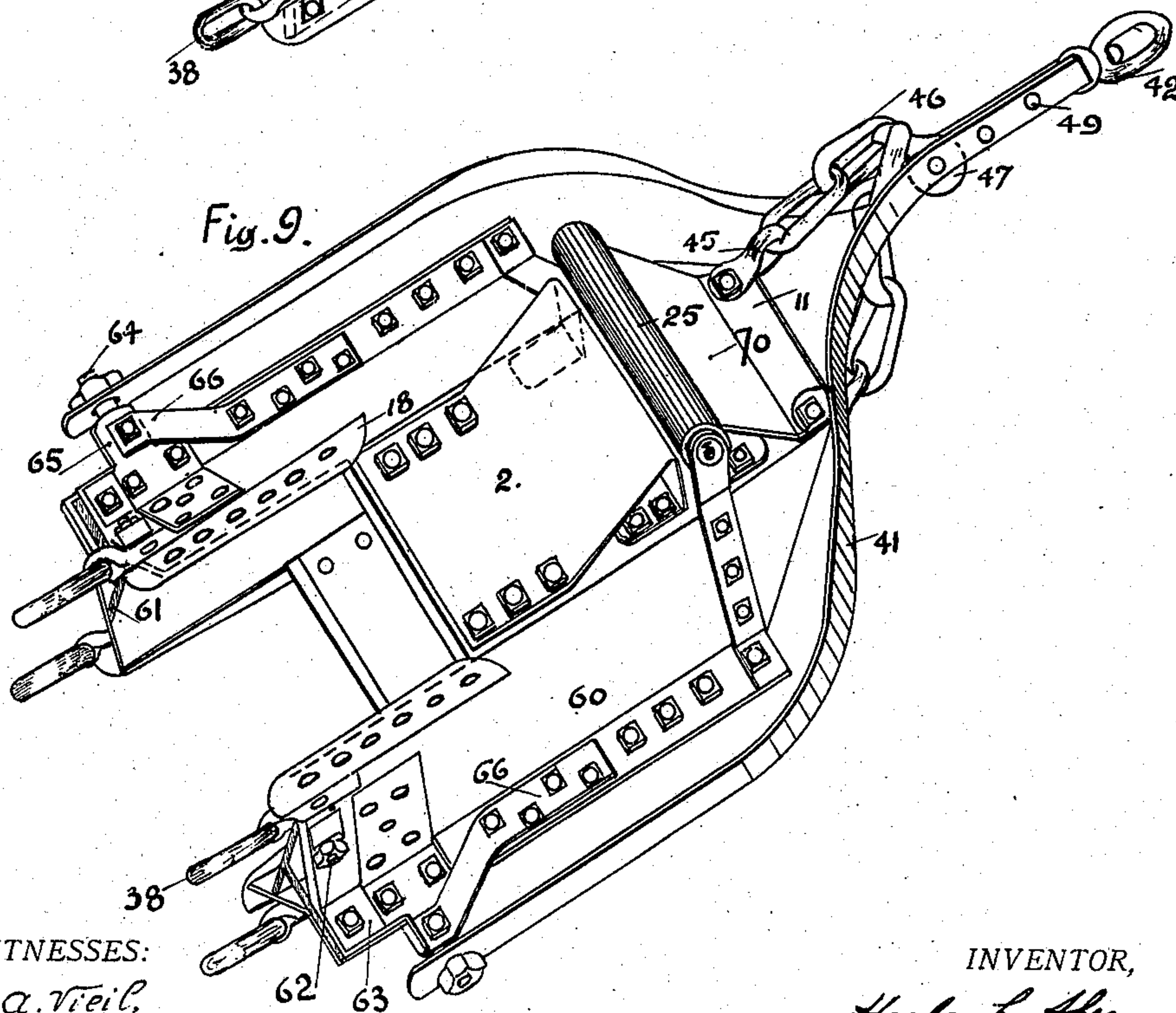
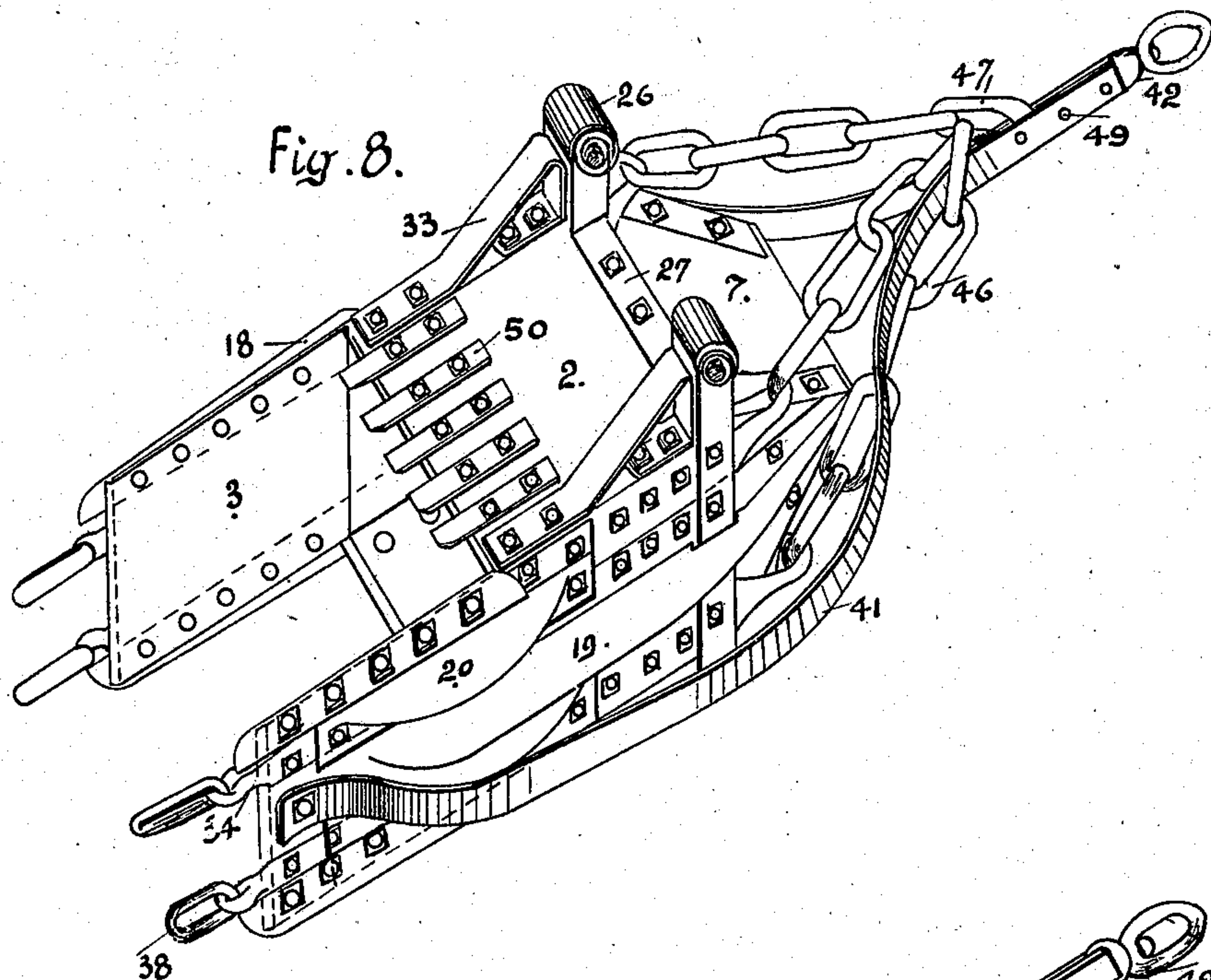
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4 SHEETS—SHEET 3.



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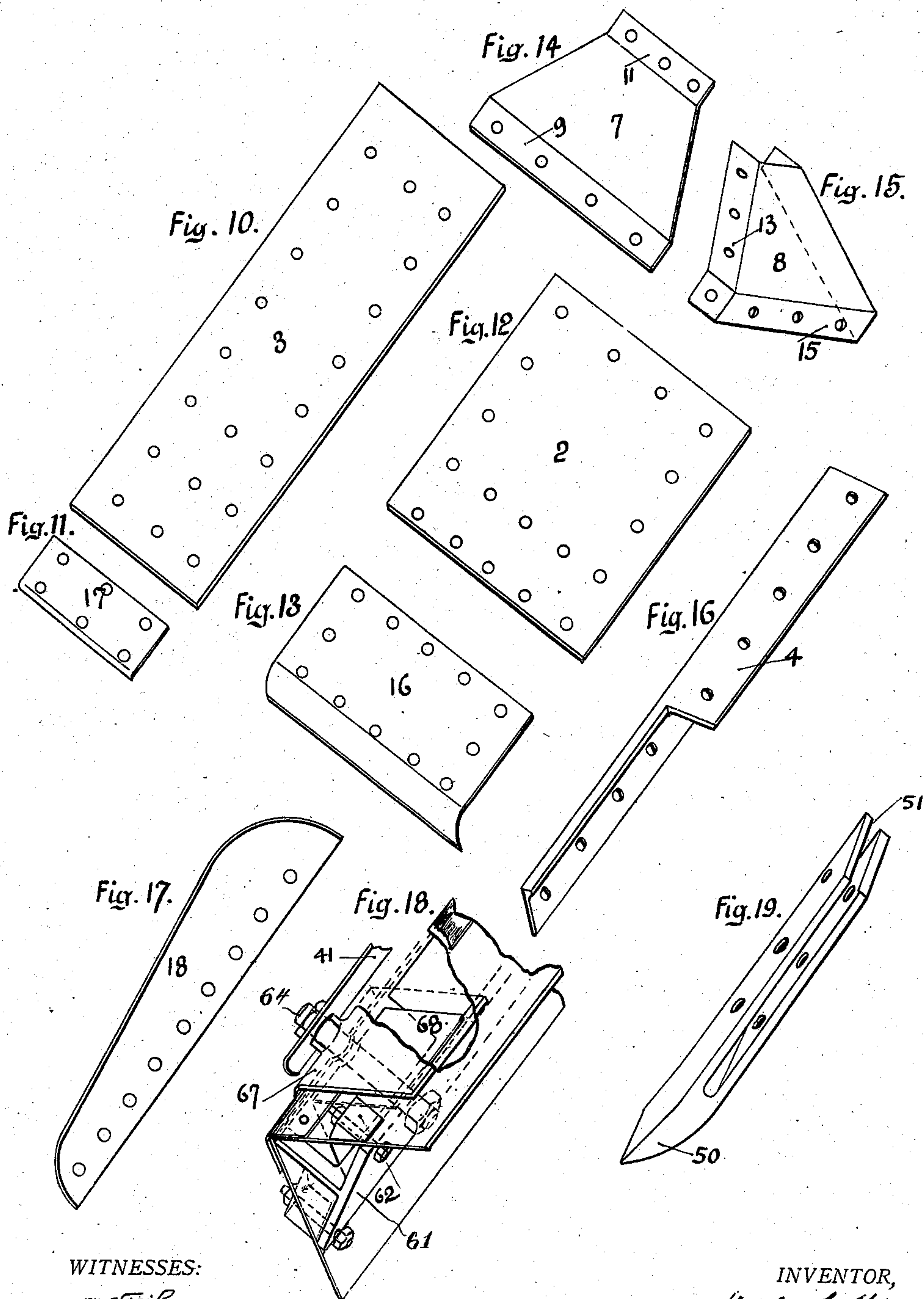
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4 SHEETS—SHEET 4.



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UNITED STATES PATENT OFFICE.

HARLEY L. SHERWOOD, OF OAKLAND, CALIFORNIA.

SECTIONAL DREDGER BUCKET.

No. 866,971.

Specification of Letters Patent.

Patented Sept. 24, 1907.

Application filed November 5, 1906. Serial No. 342,142.

To all whom it may concern:

Be it known that I, HARLEY L. SHERWOOD, a citizen of the United States, residing at Oakland, in the county of Alameda and State of California, have invented 5 new and useful Improvements in Sectional Dredger Buckets, of which the following is a specification.

This invention relates to improvements in dredging buckets for use in removing gravel from ocean beaches, river beds, or other metalliferous deposits, and in 10 scraping the bed rock thereof, the objects of the invention being to provide a bucket of this character which, first, can remove successive superficial layers of such gravel until the bed rock is reached, and can then 15 scrape the bed rock and remove substantially all material lying thereon, and, unless the bed rock is of a slaty or other unusually hard formation, will take off sufficient of the bed rock itself to recover all metalliferous deposits thereon; second, which, however it may 20 be tilted in traveling through gravel mixed with boulders or on an uneven bed rock, will automatically recover the operative position in which it can cut through the gravel; third, which is made in sections so that it can be taken to pieces and readily transported by means of pack animals or on dog sleds, and yet when 25 put together is strong enough to withstand the very rough usage to which it is subjected in being dragged over an uneven river bottom or the like; fourth, which is provided with suitable means for automatically limiting its depth as it moves through the gravel; fifth, 30 which can be used with either cutting side down; also either side can be removed and replaced by one having teeth for working on ground of a rocky uneven character or of cemented formation; sixth, in which the cutting and other parts can be readily removed 35 and renewed when worn out; seventh, in which the cutting parts are advantageously formed and arranged to produce the best results in cutting through the material; eighth, which is provided with means for conveniently dumping the material at the end of the 40 drag; ninth, which is provided with means for adjusting the angle of inclination at which the receptacle for the spoils travels through the gravel; tenth, which is provided with rollers and means whereby, when the bucket is traveling backwards to return to its operative 45 position, and also when ascending a sharp incline to the dumping position, it will run upon said rollers, thus reducing the power necessary to drag it in such cases, and in which said rollers can be adjusted to give the buckets any desired pitch; eleventh, in which 50 the parts are formed and arranged as to be practically indestructible by any ordinary usage or by storms or heavy currents.

In the accompanying drawing, Figure 1 is a perspective view of a bucket constructed in accordance with 55 my invention; Fig. 2 is a similar view of one of the central keels detached; Fig. 3 is a similar view of one

of the auxiliary keels detached; Fig. 4 is a side view of the bucket in dumping position; Fig. 5 is a longitudinal section of the bucket; Fig. 6 is a cross section thereof; Fig. 7 is an enlarged longitudinal section of a 60 bearing for a roller; Fig. 8 is a perspective view showing the bucket supplied with teeth; Fig. 9 is a modified form of bucket; Fig. 10 is a similar view of one of the narrow sides detached; Fig. 11 is a similar view of the cutter plate therefor; Fig. 12 is a similar view of 65 one of the wide sides detached; Fig. 13 is a similar view of the cutter plate therefor; Fig. 14 is a similar view of a wide end piece; Fig. 15 is a similar view of a narrow end piece; Fig. 16 is a similar view of a corner piece; Fig. 17 is a similar view of a cutter blade; Fig. 70 18 is a broken perspective view showing a modification of the construction for attaching the yoke; Fig. 19 is a perspective view of one of the teeth detached.

Referring to the drawings, 1 indicates the bucket proper, which is of a general rectangular form, the 75 closed or rear end thereof, however, having its four sides converging to a ridge or flange. Said bucket is formed of the two wide side pieces 2, forming the top and bottom of the bucket, the two narrow side pieces 3, which extend considerably further forward than said top 80 and bottom, the four corner pieces 4, which are made of angle irons, bolted to the top and bottom and narrow sides, the four end pieces 7, 8, of which the two wider pieces 7 have flanges 9 which extend over the rear ends of the top and bottom pieces 2, and are bolted 85 thereto, and have also flanges 11, which are bolted together to form a terminal ridge, and the narrow pieces 8, having flanges 13 which extend over the edges of the wide end pieces 7 and are bolted thereto, and having also flanges 15 which extend over the ends of the nar- 90 row sides 3 of the bucket and bolted thereto. As already stated, all of these end pieces 7, 8, are bent inwards and converge to said terminal ridge, so as to permit the bucket to travel freely and pass obstructions in returning to its initial operative position. The 95 bucket has also the cutter plates 16, detachably secured to the inner surfaces of the top and bottom at their front edges; the cutter plates 17, detachably secured to the inner surfaces of the narrow sides at their front edges, and the four cutter blades 18, detachably 100 secured to the outer edges of said narrow sides. It will be seen that all of these parts, as well as those hereinafter described, can be readily detached so that the bucket can be transported in comparatively small packages, suited for pack animals or dog sleds. Sup- 105 ports 14 are secured on the outside of the wide sides of the bucket and support and strengthen the horizontal cutter plates 16. The vertical cutter plates 17, cut away material from a bank or the like against which the bucket travels, and the cutter blades 18 cut into 110 the gravel and assist the operation of the lower or active cutting plate 16.

Secured to the narrow sides of the bucket are keels 19, which are made of T-shaped bars, and bolted to said sides at suitable intervals. These bars are bent at the rear to conform to, and lie closely upon, the inwardly converging end pieces 8 of the bucket thus forming terminal ridges, and the central members of the T-bars are rounded off and reduced in depth to form substantial continuations of the terminal ridge. On each side of each of said keels is secured a shield or runner 20 which is also T-shaped in cross section, except that the edge of each runner is bent inwards toward the keel. The central members are rounded at the ends, as shown at 21, and each outer corner thereof is also bent inwards towards the central keel, as shown at 22. These shields or runners prevent the bucket digging itself too deep in the gravel. The runners also serve as additional keels, especially for strengthening the narrow side 3 of the bucket where they project in front of the wide sides 2. It is found that owing to the strain placed upon the front ends of these narrow sides to draw the bucket through the gravel, said sides tend to bend inwards at their front ends, and this deformation increases when once commenced, due to the inward pressure on said extending ends of the material through which the bucket is passing. It is therefore of the greatest importance to prevent the inward bending of said projecting ends, and this is accomplished by means of the long central keels 19 which strengthen the whole of the narrow sides of the bucket, and also by means of the four shields, runners, or auxiliary keels 20. A further advantage of this construction of central keel is that thereby it is rendered impossible for the bucket to travel upon its narrow side, but the bucket is obliged to fall into one or the other of its two cutting positions with a wide side lowermost.

Secured transversely to the narrow sides 3 of the bucket, and adjacent to the converging ends thereof, are bars, 23, which are extended beyond said sides to carry at one end pivotal bearings 24, for the shafts of a roller 25 which extends entirely across the bucket at that side and at the other end bearings for the shafts of two short rollers 26, the other bearings for said latter rollers being carried by a bar 27 secured to the wide side of the bucket and having its ends bent outwards at right angles. In this particular the bucket is differently constructed on its two wide sides, a wide roller being used on one side for traveling over comparatively even gravel, and two narrow rollers on the other side for traveling over rough bed rock or the like. It is, however, to be understood that I may use in any bucket a wide roller on each side, if desired, or two narrow rollers on each side. The rollers 25 located at the juncture of the end with the main portion of the bucket insure that the bucket will travel easily and without friction when moving in either direction.

By selecting bars 23 of suitable lengths, the rollers may be set at any desired distance from the body of the bucket to give the wide cutter plates 16 the proper pitch to cause the weight of the bucket to force their cutting edges to dig.

The bearings 24 for the roller shafts are secured on the ends of the bars 23, 27 by bolts 28, and they have oiling holes 29 stopped by screw plugs 30. Collars 31 are secured on the ends of the roller shafts.

In front of the rollers 25, 26 are secured shoes 32, 33, a wide shoe 32 being provided in front of the wide roller, and two narrow shoes 33, one in front of each narrow roller. These shoes are each formed of a plate suitably bent to form an inclined portion which slopes upwards to near the outer surface of the roller, then a portion bent back at an acute angle to the side of the bucket. Said shoes ride over the bed rock or other surface, so that the rollers strike said surface at a point considerably outside, or below, the axis of the roller thus taking the strain from the roller. This prevents rocks impinging upon the rollers and their supports above their pivotal axis, and thus obstructing the passage of the bucket.

To enable the bucket to be dragged forward, there are provided four heavy loops or clevises 34 formed from bar metal and bolted to the bucket, two to each narrow side thereof, and one to each front corner of the narrow side. These clevises are connected by chains 38 with a swivel 39 to which is attached the cable 40 for drawing the bucket through the gravel.

To withdraw the bucket to its initial operative position there is provided a yoke 41, the members of which are brought together at the rear and attached at their extreme ends to a swivel 42, connected with the rear cable 43, said members at their front ends being pivoted, as shown at 44, to the narrow sides of the bucket. There are also provided at the rear of the bucket, four clevises 45, secured to the body of the bucket beneath the bars 23, 27, and connected by chains 46 with a link 47, through which is passed a heavy bar 48 which is selectively passed through one of a number of pairs of holes 49 in the sides of said yoke 41. The object of this construction is to facilitate the dumping of the bucket. If the rear cable were attached direct to the chains 46, an enormous power would be required to lift the rear end of said bucket against the tension of said cable in order to empty the bucket.

By the present arrangement, the bucket can very readily be emptied. This is accomplished by removing the bar 48 and attaching a block and tackle to the link 47 and thus raising the rear end of the bucket. After dumping, the bucket can readily be replaced in its operative position. Another advantage of this construction is that it enables the depth at which the bucket digs to be regulated by varying the point at which the link 47 is attached to the yoke. If a pair of holes 49 is selected near the swivel 42, the result will be to draw the chains 46 taut and exert a backward pull upon the rear of the bucket, causing the cutting lip or edge of the bucket to rise, so that it does not dig so deep into the gravel. If, however, it is desired to permit the bucket to dig more freely into the gravel, a pair of holes 49 should be selected nearer to the body of the bucket, thereby relieving the tension upon the chains 46 and causing the cutting lip of the bucket to drop.

In addition to the cutting plates 16, there may be provided cutting teeth 50, shown in Figs. 8 and 19. These teeth are made of solid steel in their front portion, which projects beyond the edge of the cutting plate, and in their rear portion they are split as shown at 51, the two parts on each side of the split being passed, one on the outside of the top or bottom of the bucket, and taking the place of the supports 14, and

the other part on the inside of the cutting plate. They are then secured by bolts which pass through both portions of the tooth and also through the cutting plate and the wide side of the bucket and secure them together. These teeth are used in cutting through bed rock of a slaty or other hard formation.

In Fig. 9 is shown a bucket with V-shaped sides, 60, which take the place of the narrow vertical sides 3 in the first form of bucket shown. These sides are reinforced by T-bars 61, either by bolting the central member 62 of the bar between flanges 63 of the side members 60, as shown in Fig. 9, or by bolting the T-bar entirely within the sides, as shown in Fig. 18. In Fig. 9, the yoke is shown as pivoted to pivot pins 64 secured to plates 65 bolted to the flanges 63 and braced by plates 66, and in Fig. 18 the pivot pins are held by outer castings and inner castings 67, 68, bolted to said sides, the T-bar being cut away to receive the inner casting. In this case the narrow sides of the bucket, having an angular form, act as keels to cause the bucket to assume an operative position, however it may be tilted. The V-shaped form of the sides, especially when re-inforced by the T-bars, renders this style of bucket very strong, and well adapted to withstand the strain on the sides and to bear hard usage.

In Fig. 18, a shoe 70 is shown leading to the roller on the rear side thereof similar to that on the front side. It is to be understood that this construction may also be used for both the narrow rollers, and also for either style of bucket.

I claim:—

1. An excavating bucket provided on the outside of each of its narrow sides with a keel to cause the bucket to automatically recover its operative position when tilted, substantially as described.
2. A bucket having short wide sides, long narrow sides extending in front of the wide sides, end pieces secured to the narrow sides, and end pieces secured to the wide sides, the latter converging to meet at their rear edges, substantially as described.
3. A bucket having extending from each of its narrow sides a runner for automatically limiting the depth of the bucket as it travels, substantially as described.
4. A bucket having on each of its narrow sides a central keel and on each side of said keel a runner for limiting the depth of the bucket, substantially as described.
5. A bucket having on each of its narrow sides a central keel and on each side of said keel a runner for limiting the depth of the bucket, said runners converging towards said keel, substantially as described.

6. A bucket having on each side of its narrow sides a central keel and on each side of said keel a runner for limiting the depth of the bucket, said runners converging towards said keel and each having a corner bent inwards toward the keel, substantially as described.

7. A bucket having two wide sides and two narrow sides, a cutter plate secured within the front edge of each wide side and supporting plates secured outside said front edge and extending in front of the same to support the cutter plate, substantially as described.

8. A bucket having two wide sides and two narrow sides, the latter extending in front of the wide sides, and an angular corner piece extending over each juncture of the wide and narrow sides, substantially as described.

9. A bucket having two wide sides and two narrow sides, the latter extending in front of the wide sides, and an angular corner piece extending over each juncture of the wide and narrow sides, said corner piece being cut away in front of the wide side and the front portion being secured to the narrow sides, substantially as described.

10. A bucket having two wide sides and two narrow sides, the latter extending in front of the wide sides, and an angular corner piece extending over each juncture of the wide and narrow sides, and a cutting blade secured to each narrow side in front of the wide side, substantially as described.

11. A bucket, a yoke pivoted to the front end of the bucket and means for connecting the rear end of the yoke with the rear cable, substantially as described.

12. A bucket, a yoke pivoted to the front end of the bucket and means for loosely connecting the rear end of the bucket with said yoke, substantially as described.

13. A bucket, a yoke pivoted to the front end of the bucket and chains attached to the rear end of the bucket, and means for variably securing the rear ends of said chains to the yoke, substantially as described.

14. A bucket having a closed converging end, and a roller on the outside adjacent to the juncture of said end with the main portion of the bucket, substantially as described.

15. A bucket having a closed converging end, and a roller on the outside adjacent to the juncture of said end with the main portion of the bucket and a shoe secured on the outside of the bucket and inclined towards said roller, substantially as described.

16. A bucket having short wide sides and long narrow sides extending in front of the two wide sides and a T-shape bar extending along each narrow side past the front edge of the wide side, substantially as described.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

HARLEY L. SHERWOOD.

Witnesses:

FRANCIS M. WRIGHT,
R. B. TREAT.