

No. 659,779.

Patented Oct. 16, 1900.

P. WISDOM.

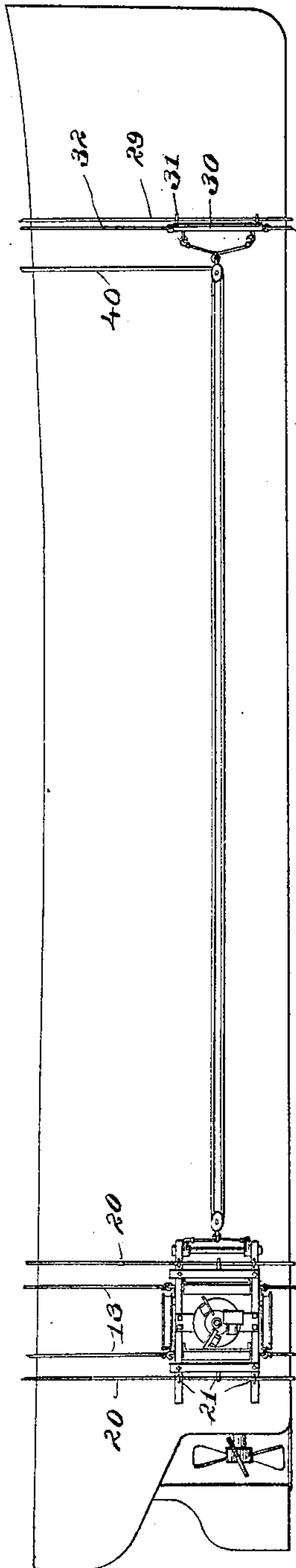
MEANS FOR SCRAPING HULLS OF VESSELS.

(Application filed Nov. 23, 1899.)

(No Model.)

3 Sheets—Sheet 1.

Fig. 1.

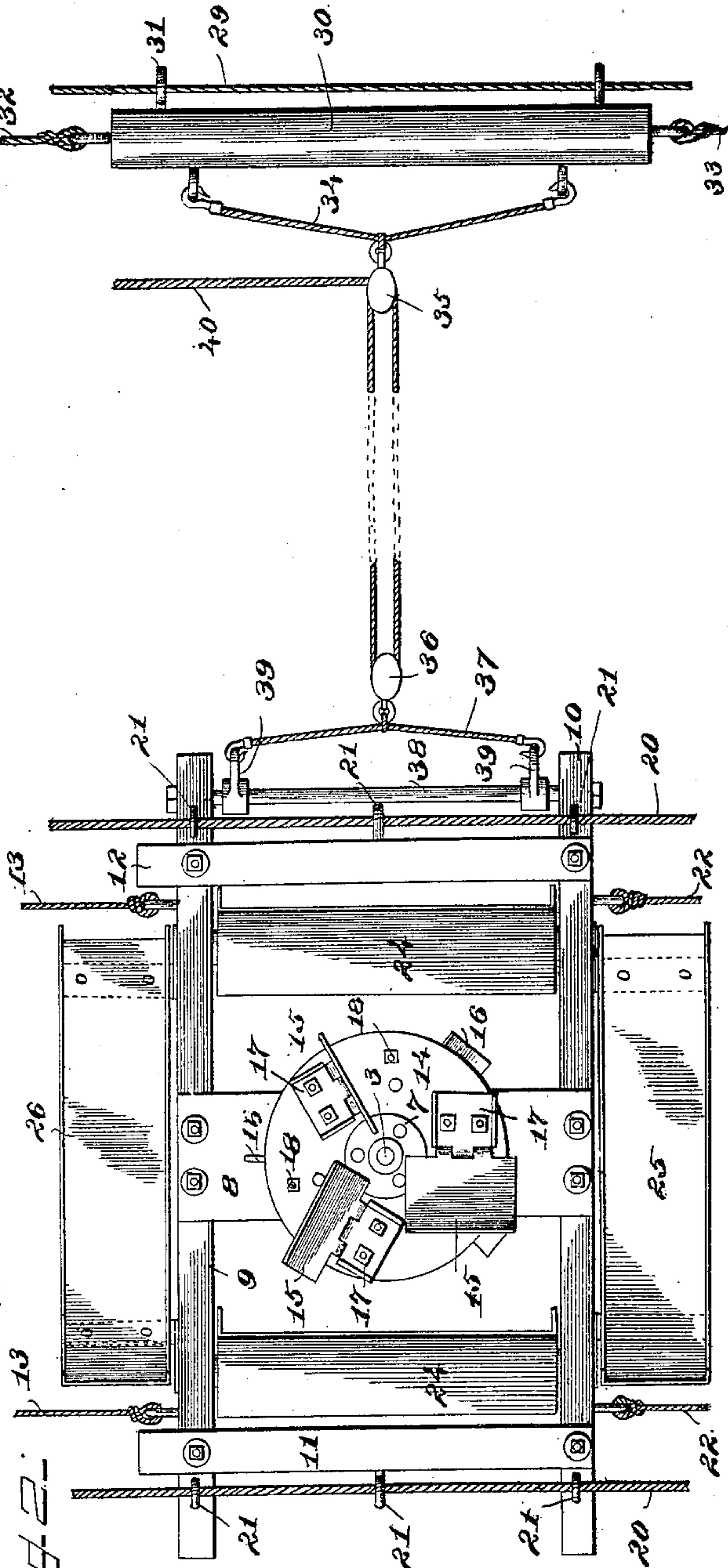


Witnesses—

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Fig. 2.



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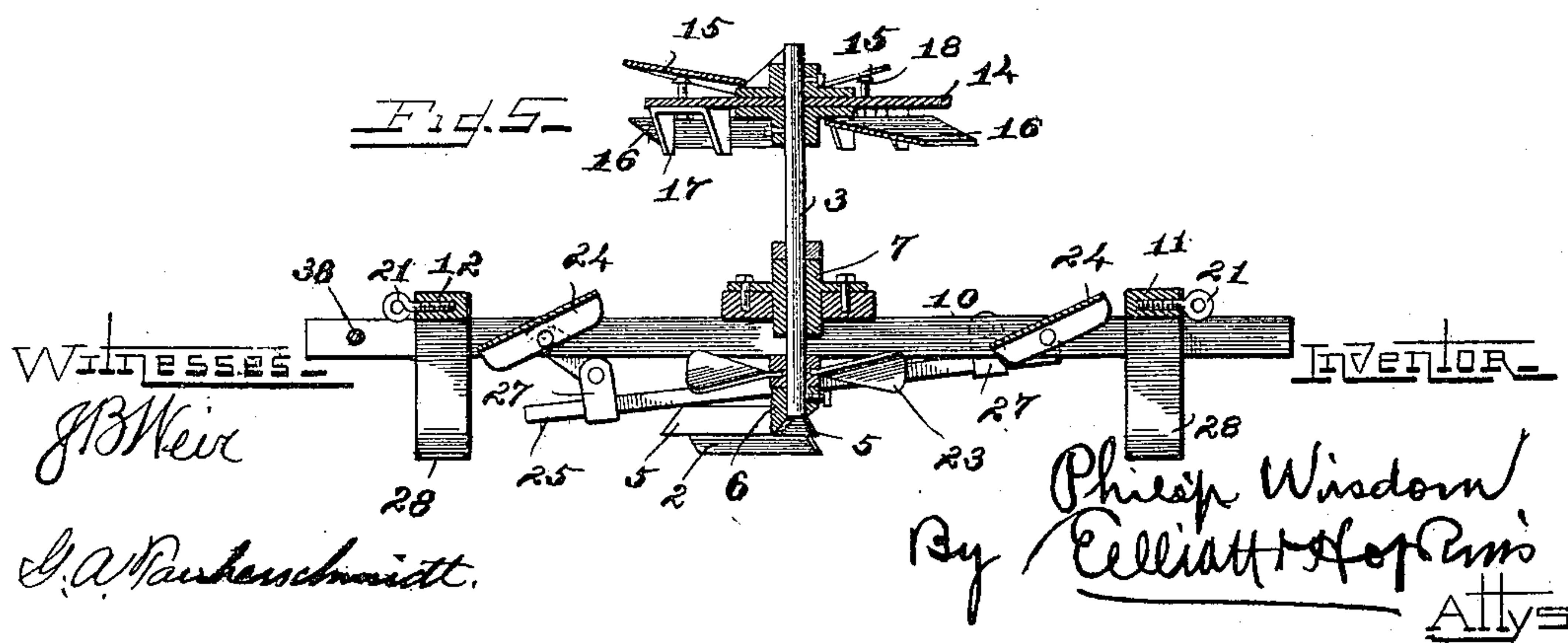
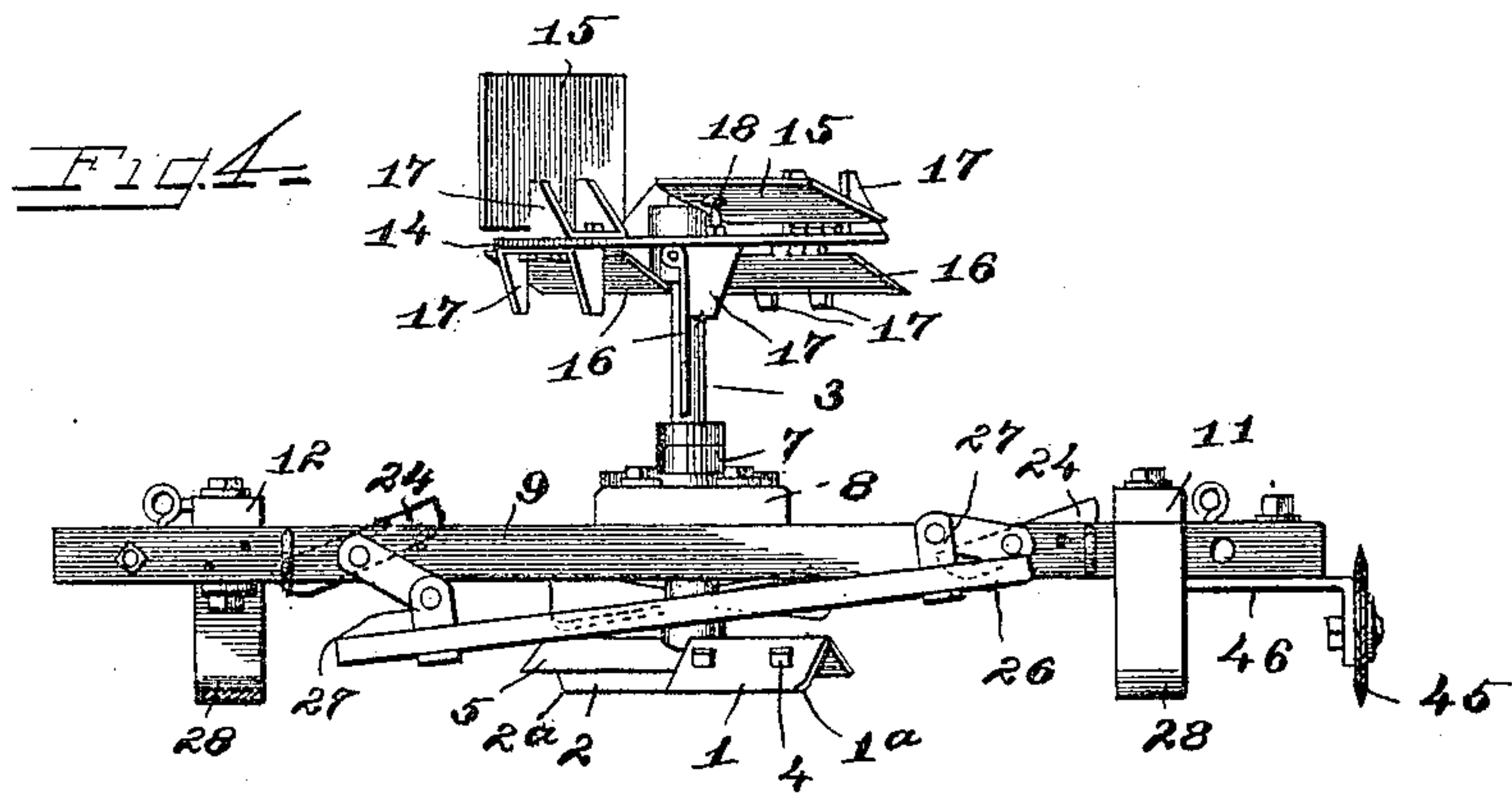
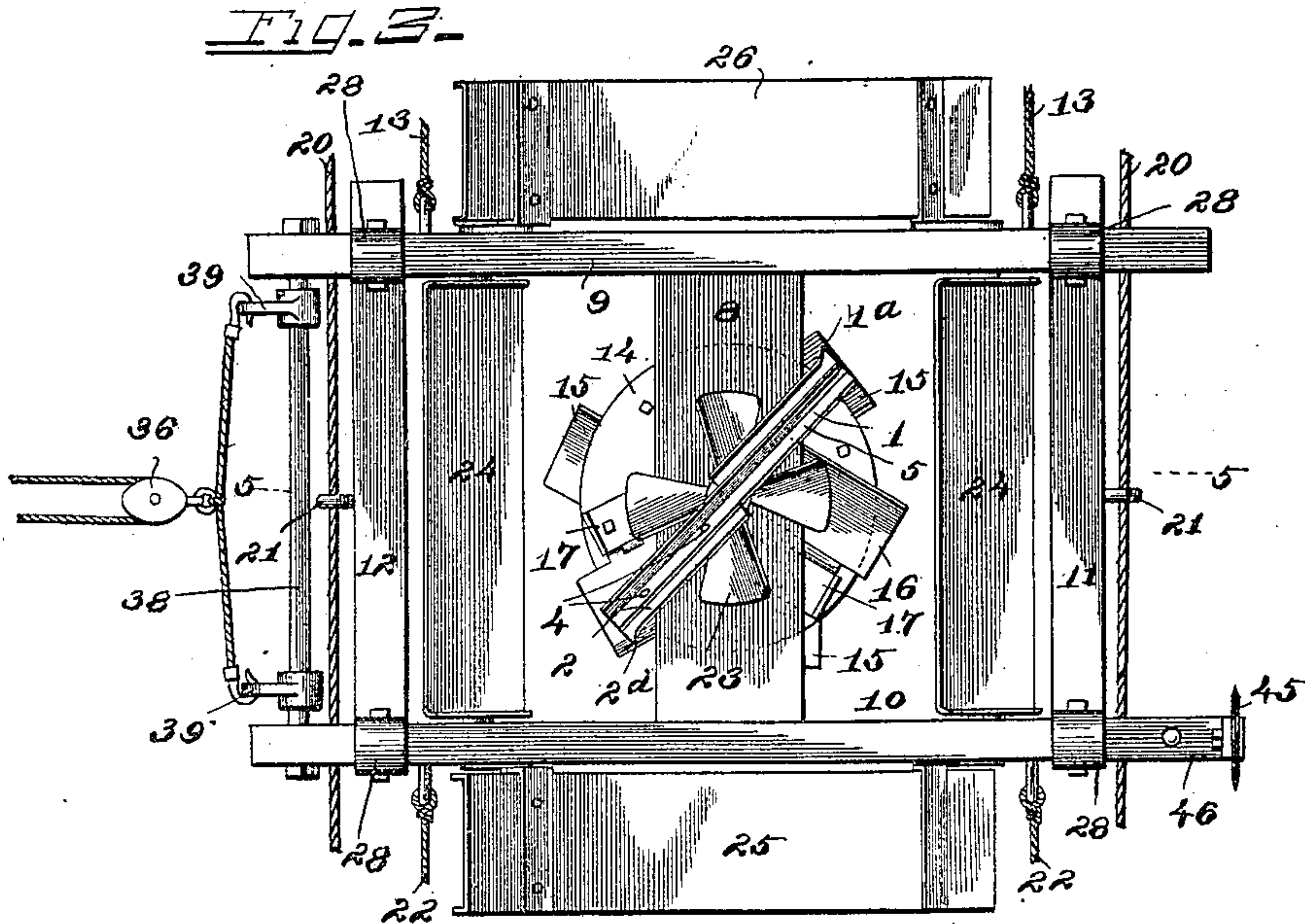
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3 Sheets—Sheet 2.



WITNESSES

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3 Sheets—Sheet 3.

Fig. 6.

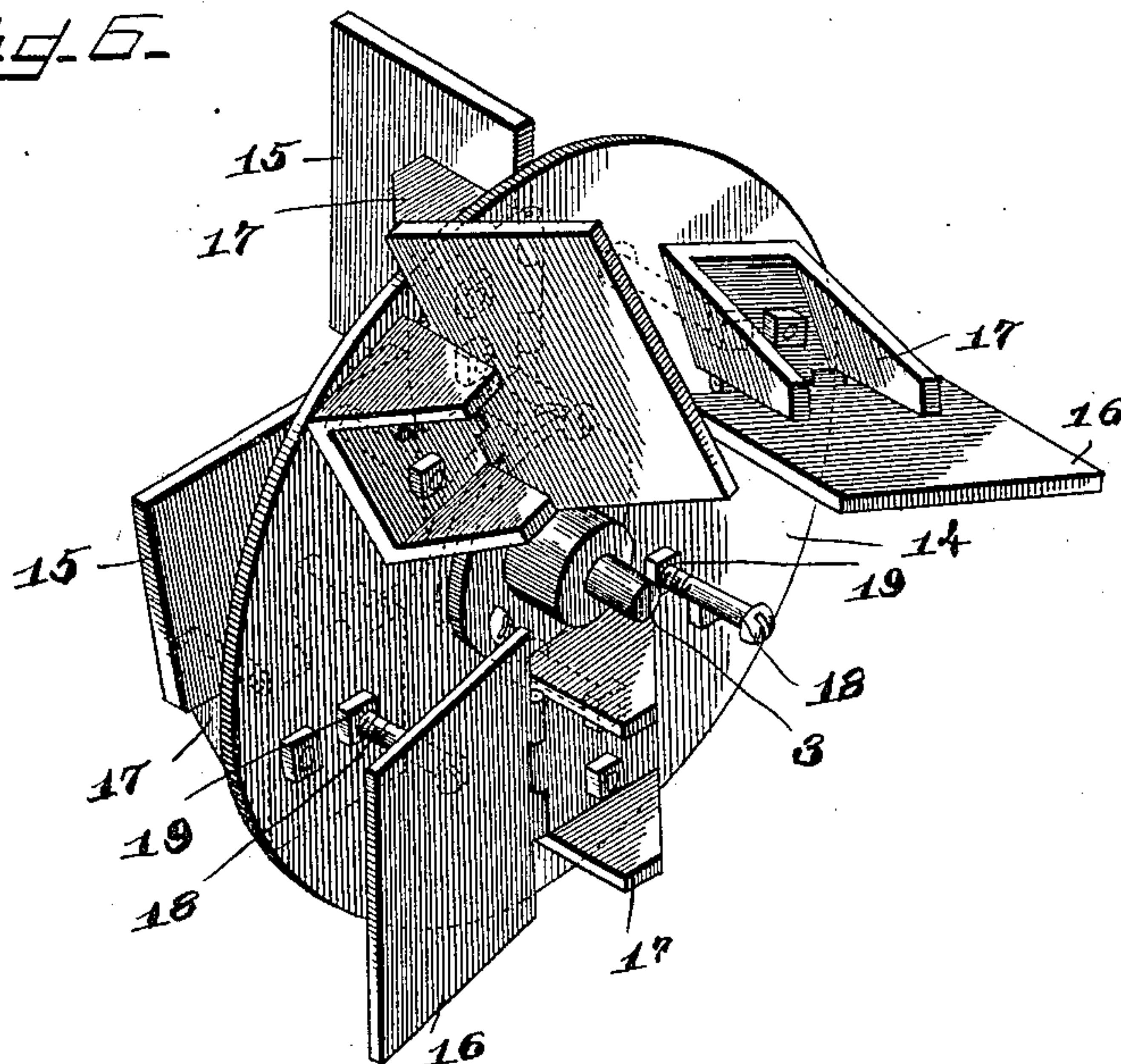


Fig. 8.

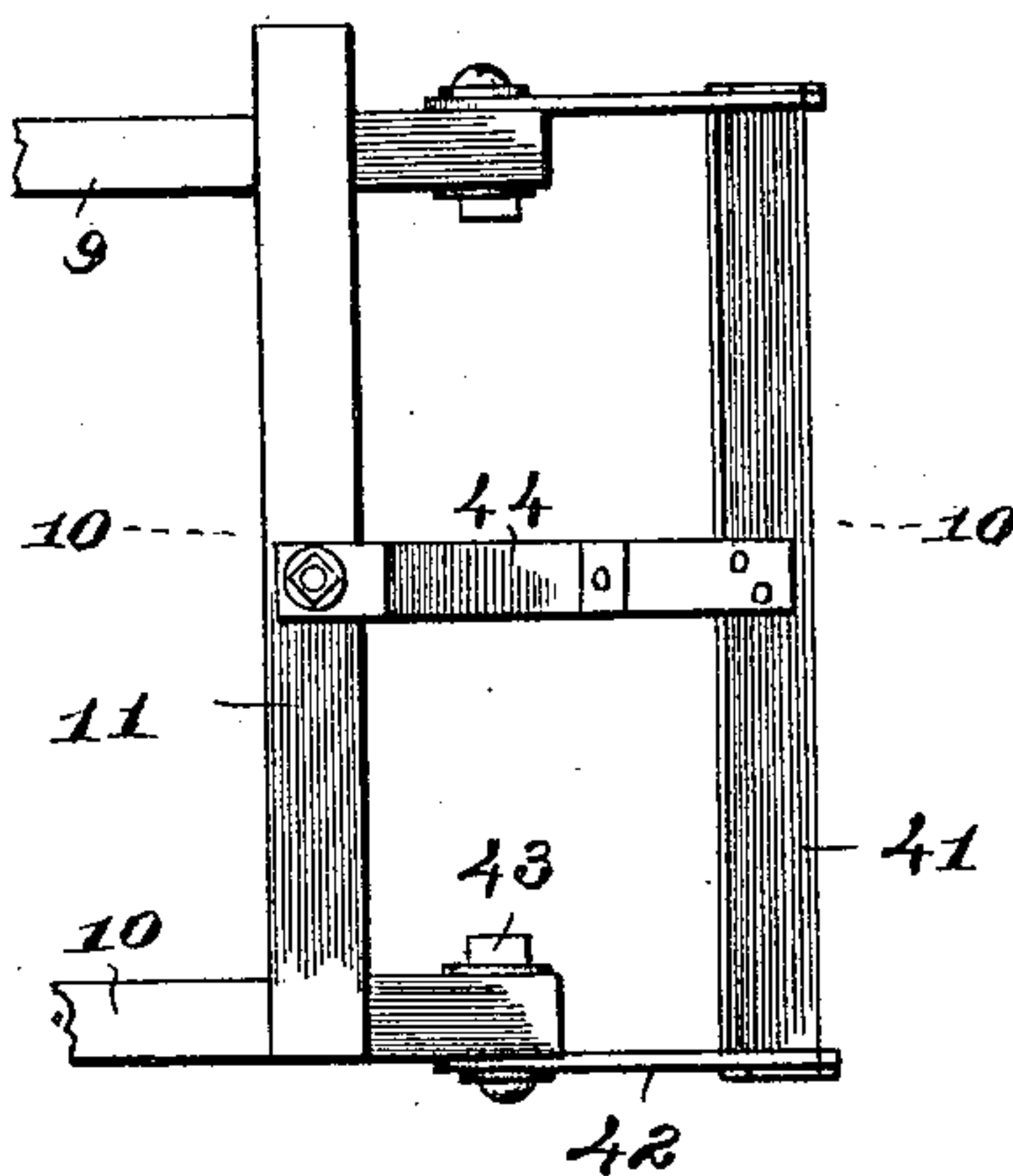


Fig. 7.

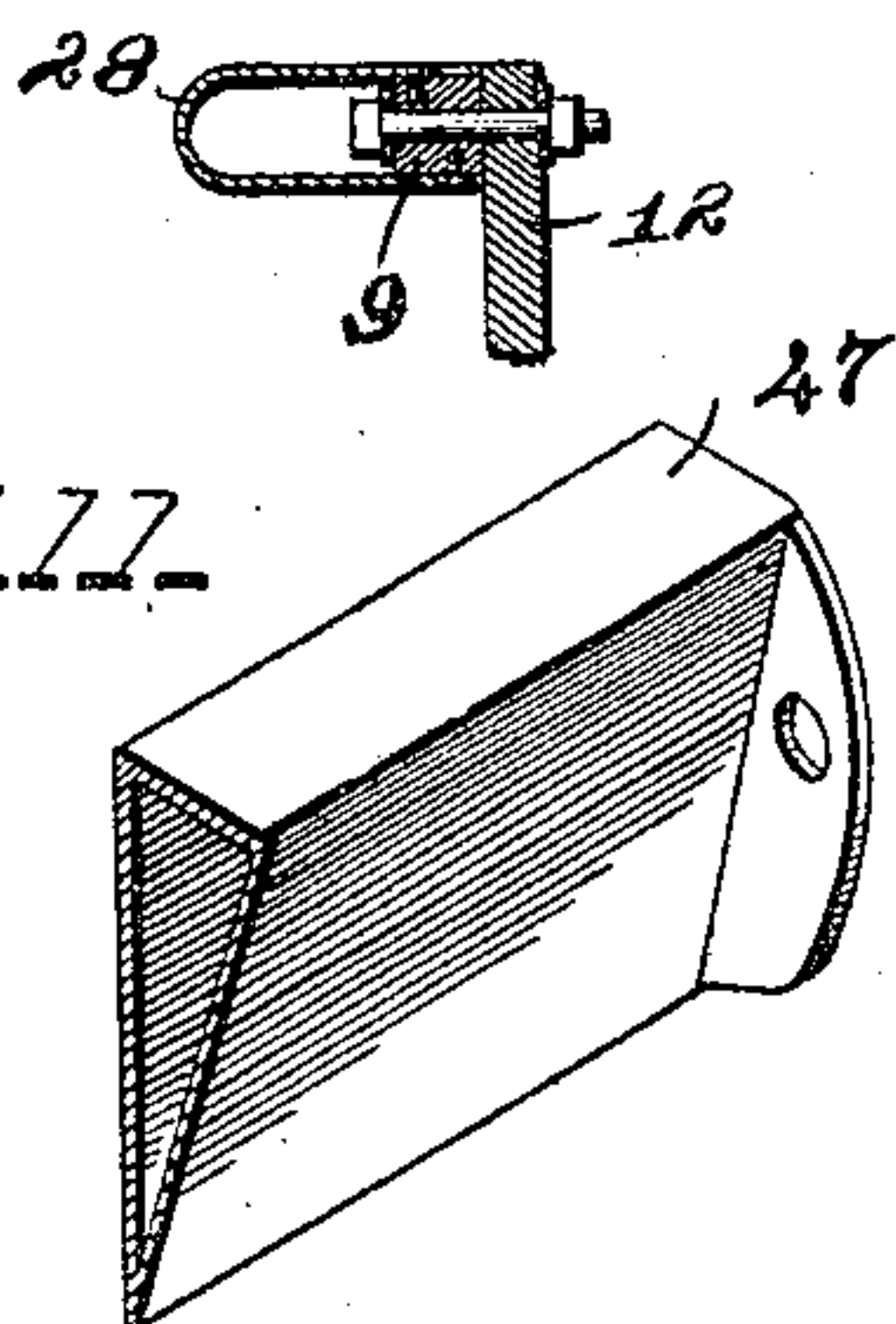


Fig. 11.

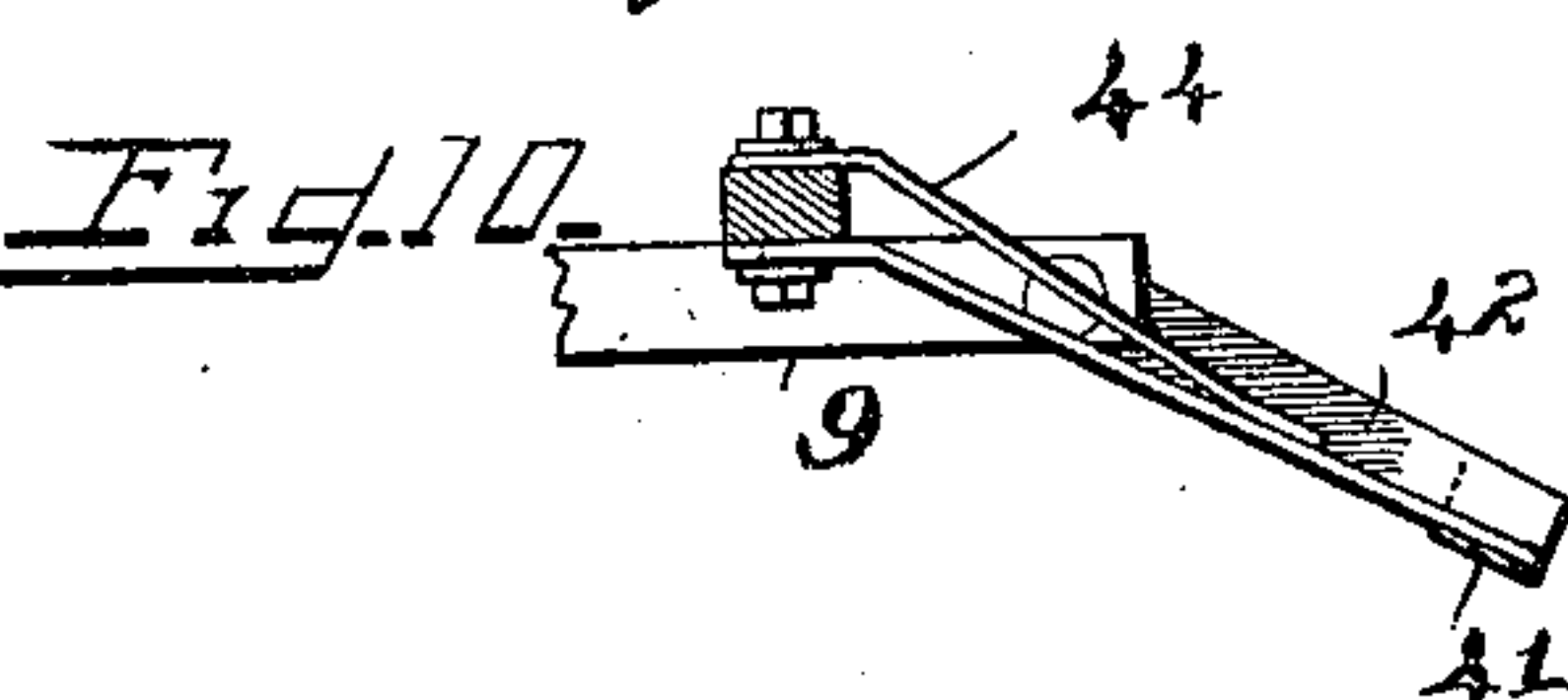


Fig. 10.

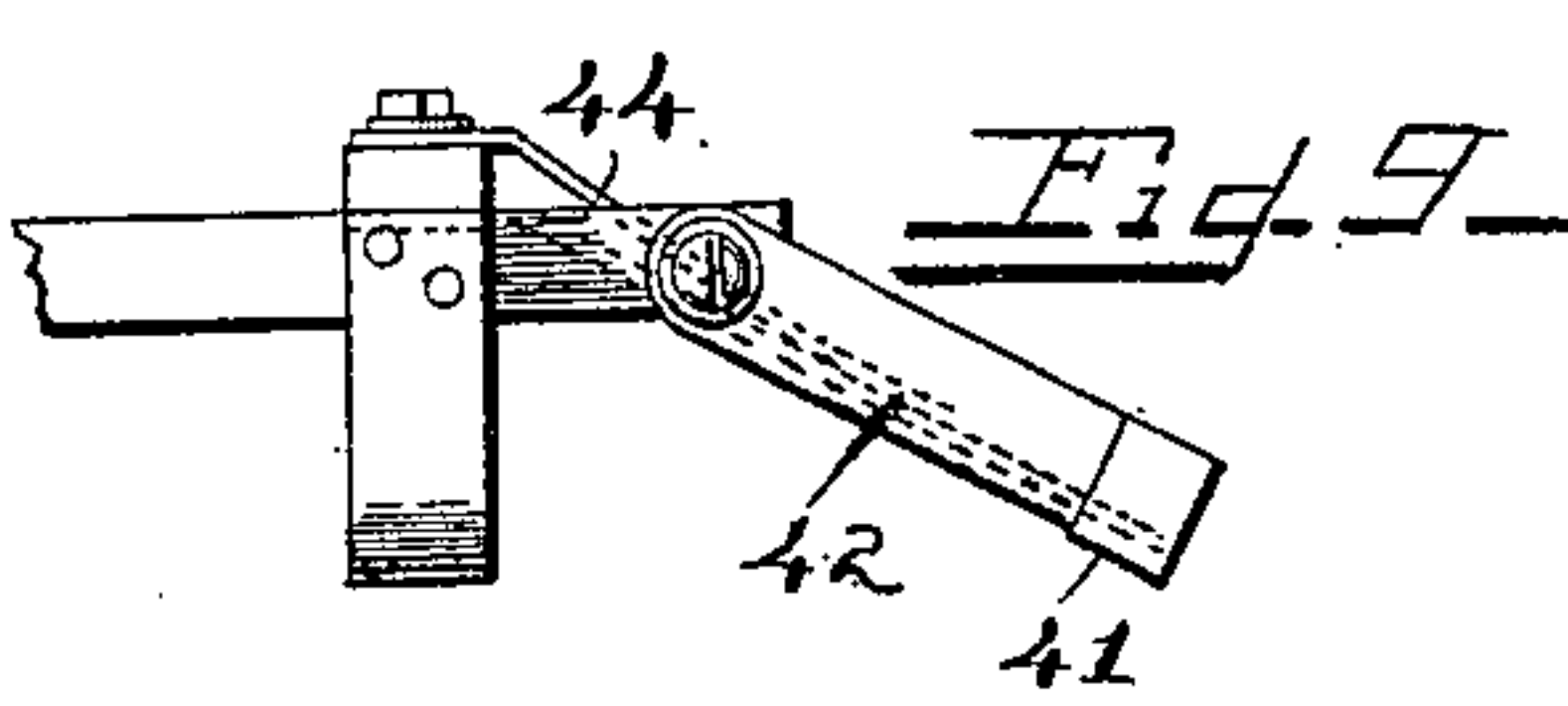


Fig. 9.

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UNITED STATES PATENT OFFICE.

PHILIP WISDOM, OF CHICAGO, ILLINOIS.

MEANS FOR SCRAPING HULLS OF VESSELS.

SPECIFICATION forming part of Letters Patent No. 659,779, dated October 16, 1900.

Application filed November 23, 1899. Serial No. 737,994. (No model.)

To all whom it may concern:

Be it known that I, PHILIP WISDOM, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Means for Scraping the Hulls of Vessels, of which the following is a full, clear, and exact specification.

My invention has for its primary object to provide means for scraping vessel-hulls without putting the vessel in dry-dock or materially interfering with its use during the scraping operation, a further object being to compel the relative movement between the vessel and the water to operate the scraping apparatus.

With these ends in view my invention consists in certain features of novelty in the construction, combination, and arrangement of parts by which the said objects and certain other objects hereinafter appearing are attained, all as fully described with reference to the accompanying drawings and more particularly pointed out in the claims.

In the said drawings, Figure 1 is a side elevation of a vessel-hull, showing my improved scraping apparatus applied thereto. Fig. 2 is an elevation of the scraping apparatus looking from the outer side, showing it on a larger scale. Fig. 3 is a similar view looking from the inner side. Fig. 4 is a plan view thereof. Fig. 5 is a longitudinal sectional view taken on the line 5 5, Fig. 3. Fig. 6 is a perspective view of the water wheel or motor. Fig. 7 is a detail sectional view of one of the limiting stops or guides hereinafter described. Fig. 8 is a side elevation of the scraper employed for scraping the hull lengthwise. Fig. 9 is a plan view thereof. Fig. 10 is a transverse section taken on the line 10 10, Fig. 8; and Fig. 11 is a perspective view of a modified form of rudder or vane hereinafter described, showing one end of the vane cut away.

In carrying out my invention I employ a scraper which is actuated by a motor, and the two are of such construction and so adapted that they may be suspended over the side of the vessel in a position to cause the scraper to impinge the hull and to cause the current induced either by the vessel standing at comparative rest in a running stream or by the vessel moving through the water to actuate

the motor, the device being held against the side of the vessel in any convenient way and, if desired, supplemented by propellers and vanes which are acted on by the water to compel the scraper to adhere to the side of the vessel with sufficient pressure to enable it to dislodge the barnacle and other substance adhering thereto.

The scraper is in the form of two blades 1 2, which are secured to a shaft 3 in any convenient way—for example, by means of bolts 4, which attach the blades to an angle-bar 5, which is in turn secured by a head 6 to the inner end of the shaft 3, the scrapers being revolved by the shaft in a plane at right angles thereto. The shaft 3 is mounted in a suitable journal-box 7, secured by a plate or transverse bar 8 to the upper and lower members 9 10 of a rectangular frame, the end bars of such frame being shown at 11 12. This frame is suspended by ropes or cables 13 over the side of the vessel in such a position that the shaft 3 will be transverse to the vessel with the scrapers 1 2 adjacent to the hull. The outer end of the shaft 3 is provided with a water-motor, preferably consisting of a wheel or disk 14, secured to the shaft in any suitable way and having hinged to its inner and outer faces a number of wings or paddle-wheels 15 16. These paddle-wheels or wings are limited in their movement in one direction by means of abutments 17, while in their opposite movement they are limited only by coming against the face of the disk or wheel 14 or by adjustable stops 18. (Shown in the drawings in the form of screws threaded in the disk or wheel 14 and having lock-nuts 19 for holding them to their adjustment.) These adjustable stops 18 are preferably provided for each of the wings or paddles 15 16 on both sides of the disk 14, and they are for the purpose of causing a more or less endwise thrust on the shaft 3, accordingly as the wings or paddles are held a greater or less distance from the face of the disk 14 as they float backwardly. It will now be understood that when the device is lowered over the side of the vessel and held against relative movement therewith the force of the current of water, whether caused by the vessel moving through the water or by the water passing the vessel, will impart rotation to the shaft 3 by

striking the paddles or wings 15 16, and consequently will impart rotary movement to the scrapers 1 2 on the inner end of the shaft 3.

In order that the apparatus may not be carried rearwardly by the force of the water, I provide it with vertical guides on the side of the vessel, and these guides preferably consist of ropes or cables 20, which may be passed entirely around the vessel and left sufficiently loose to permit the apparatus to slide up and down thereon, the cables 20 being passed through eyes 21 on the frame of the scraping apparatus. By means of the ropes or cables 13, which go up on deck, the apparatus may be raised and lowered, and in order that it may be pulled entirely under the hull and up on the other side I provide the lower side of the frame with ropes or cables 22, which pass under the keel and up on deck on the other side. By this means the scrapers may be held in reasonably firm contact with the hull; but in order to insure perfect contact of the scrapers at all times during the operation of the device and while it is being lowered up and down along the guide-cables 20 I provide the apparatus with means acted on by the water for imparting a positive inward trend or thrust. A portion of this means consists of a propeller 23, secured to the shaft 3 at any convenient point, so that the rotation of the shaft will enable the propeller to cause the apparatus to approach the hull. Another part of this means consists of vanes or rudders 24, pivoted on vertical axes between the upper and lower members 9 10 of the frame and being capable of being set at various angles, so as to gage the inward trend or pressure to a nicety. If desired and for the sake of greater pressure, additional vanes or rudders 25 26 are arranged in a horizontal direction above and below the frame members 9 10, respectively, and pivoted to adjustable links or arms 27, whereby not only the angle of inclination may be changed, but its direction also. It will also be understood that the paddles or wings 15 16 may by means of the adjustable stops 18 be caused to add to the inward pressure on the shaft 3 necessary for keeping the scraper in contact with the hull.

In order that the apparatus may properly position itself against the side of the hull, the four corners are provided with stops or feet 28, secured to the frame in any convenient way and serve to hold the scraper-blades from too severe contact and also preventing the end or corner of the blade from striking the hull in advance of its entire edge. The ends or corners of the scraper-blades are turned up or bent, as shown at 1^a 2^a, in order that these ends may not engage with the laps of the metallic sheeting or other obstructions on the hull, while at the same time being capable of scraping the surface with the same efficiency as the balance of the edge of the scraper.

In scraping a vessel with my improved ap-

paratus the scraping operation would of course be started at or near the bow and carried aft either along a continuous horizontal line or up and down along areas equal in width to the swing or diameter of the scraper. In order that the device may be better controlled under either of these methods of operation, I pass around the hull, at or near the bow, a guide-cable 29, vertically upon which runs a guide-log or slide 30, having eyes 31, through which the guide-cable 29 is passed. This log 30 may be raised and lowered or pulled around the keel and up on the other side of the vessel by means of ropes or cables 32 33, attached to its ends, the former passing up on deck and the latter passing under the keel and up on deck on the other side, and to this guide-log 30 is secured by a suitable attachment 34 one member 35 of a block and tackle, whose other member 36 is secured by attachment 37 to the frame 9 10, the frame 9 10 being provided with a rod or bar 38, having eyes 39, to which the attachment 37 is secured, and the cable or rope 40 of this block and tackle is carried up on deck. Thus it will be seen that should it be desired the guide-cables 20, whose office is largely to hold the apparatus from washing aft with the current, may be omitted when the guide-block 30 and block and tackle are employed, because in that event the guide-cable 29 serves the purpose of the guide-cables 20 to the extent at least of holding the apparatus from washing aft; but the guide-cables 20 are nevertheless useful in preventing the apparatus from going too far from the side of the hull and twisting the raising and lowering cables 13 22.

If it should be desired to use the apparatus without the guide-cable 29 and the block and tackle already described, the guide-cables 20 would be passed around the hull at or near the bow and the apparatus raised and lowered by means of the cables 13 22 until the area covered by the swing of the scraper is cleaned. The attachments of the guide-cables 20 will then be loosened and slipped aft a distance equal to the swing of the scraper and the apparatus again raised and lowered, as before described, and this operation would be repeated until the stern is reached, whereupon the apparatus may be elevated and lowered on the other side or else pulled under the keel and up on the other side by means of the cables 22, when it would be slipped forward to the bow and again allowed to work its way aft, as before described. When the block-and-tackle device is employed, the guide-cable 29 is passed around the hull at or near the bow and the guide-log secured thereon, as described, the rope 40 of the block and tackle being taken up to its shortest length, so as to bring the scraping apparatus as close as possible to the bow. The apparatus would then be lowered by means of the cables 13 22, the cable 32 being let out at the same time until it reaches the keel, whereupon it may

either be raised by the cables 13, the rope 40 of the block and tackle paid out a proper extent to bring the scraper over the unscraped area, and the apparatus again lowered, or after reaching the keel the cable 40 may be paid out and the apparatus raised to traverse the unscraped area, and so on until the stern is reached, whereupon the scraping apparatus may be pulled under the keel to the other side of the vessel and the guide-log 30 being also pulled under the vessel, the block and tackle, however, being first unhooked from both the scraping apparatus and the guide-log and again hooked in place on the other side of the vessel.

Should it be desired to scrape the vessel longitudinally or in longitudinal zones, permitting it to traverse the entire length of the vessel without lowering it, the end of the frame 9 10 may be provided with a blade-scraper 41, attached by arms 42 to the ends of the frame members 9 10 by means of bolts 43, the edge of the scraper 41 being held yieldingly against the side of the vessel by means of a spring-arm 44, bolted or secured to the frame member 11. By this means it will be seen that the rope 40 may be paid out and the scraping apparatus allowed to drift aft by the force of the current and as it does so to scrape the hull in longitudinal zones, it being lowered each time it is drawn up to the bow.

In many instances the hull of a vessel becomes coated with long grass or sea-weed, which might have a tendency to entangle the rotary scraper, and in order that this grass may be cut into short lengths in advance of its engagement by the scraper I provide one corner of the frame with a rotary cutter-blade 45, secured to the frame by arm 46 and adapted to cut in a vertical plane as the apparatus is pulled up and down the sides of the vessel, the cutter 45 severing the long grass into short lengths and permitting the free ends to drift toward the stern in advance of the scraper.

If greater buoyancy of the apparatus be desired, one or more of the vanes or rudders 24 25 26 may be composed of an air-chamber 47. (Shown in Fig. 11.)

Having thus described my invention, what I claim as new therein, and desire to secure by Letters Patent, is—

1. In a device for scraping vessel-hulls the combination of a vertical rope or cable on the side of the hull, a log having eyes through which said cable passes, means for raising and lowering said log, a hull-scraping device, a block and tackle having one member con-

nected with said hull-scraping device and the other member connected with the log, substantially as set forth.

2. In a device for scraping vessel-hulls the combination of a revolving scraper adapted to be suspended over the side of the vessel, means for actuating said scraper and raising and lowering it and a rotary cutter bearing against the side of the hull and arranged to cut in a vertical plane in advance of said scraper, substantially as set forth.

3. In a device for scraping vessel-hulls the combination of a scraper, a motor for actuating said scraper adapted to be suspended over the side of the vessel and a buoyant rudder adapted to guide said scraper and motor and serve to buoy them up, substantially as set forth.

4. In a device for scraping vessel-hulls the combination of a scraper, a motor for actuating said scraper consisting of a wheel or disk having hinged wings on both sides thereof adapted to float against said wheel or disk when moving in one direction and to catch the water when moving in the other direction, and adjusting means for limiting the movement of said wings upon their hinges, substantially as set forth.

5. In a device for scraping vessel-hulls the combination of a shaft adapted to be suspended transversely of the vessel over the side thereof, a scraper on the inner end of said shaft adapted to contact with the hull of the vessel and a water-wheel and propeller on the other end of the shaft, substantially as set forth.

6. In a device for scraping vessel-hulls the combination of a motor adapted to be suspended in the water over the side of the vessel, a scraper actuated by said motor, vertical guide-ropes up and down which said motor slides, a second guide-rope fixed to the side of the vessel, a slide running vertically on said second guide-rope, means for raising and lowering said slide and tackle connection between said slide and motor, substantially as set forth.

7. In a device for scraping vessel-hulls the combination of a scraper adapted to be suspended over the side of the vessel, a water-wheel for actuating said scraper having wings hinged on axes radiating from said wheel and on both sides thereof and means for adjusting the angle of said wings, substantially as set forth.

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Witnesses:

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