

No. 792,250.

PATENTED JUNE 13, 1905.

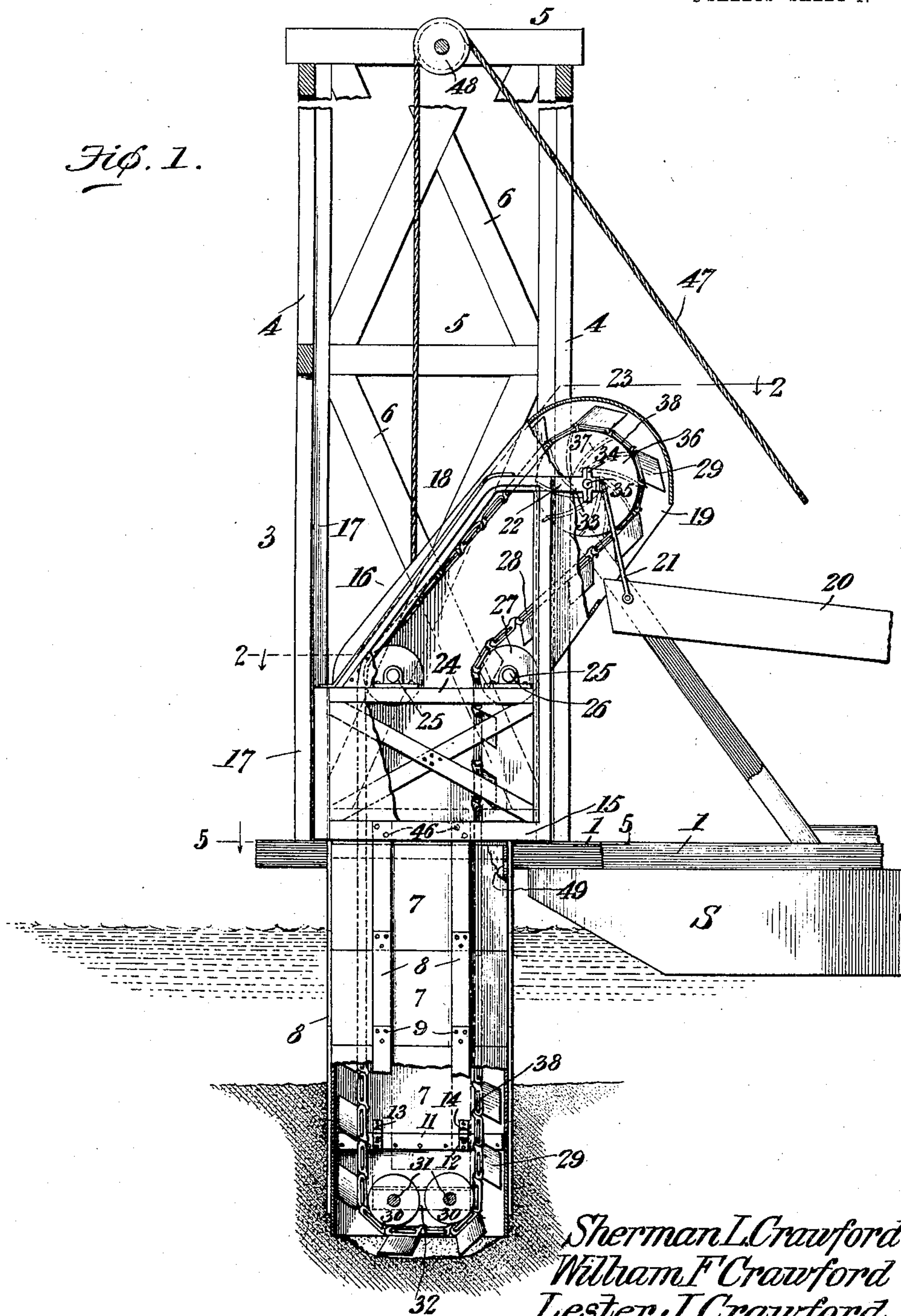
S. L., L. J. & W. F. CRAWFORD.

GOLD DREDGING MACHINE.

APPLICATION FILED OCT. 31, 1904.

2 SHEETS—SHEET 1.

Fig. 1.



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2 SHEETS—SHEET 2.

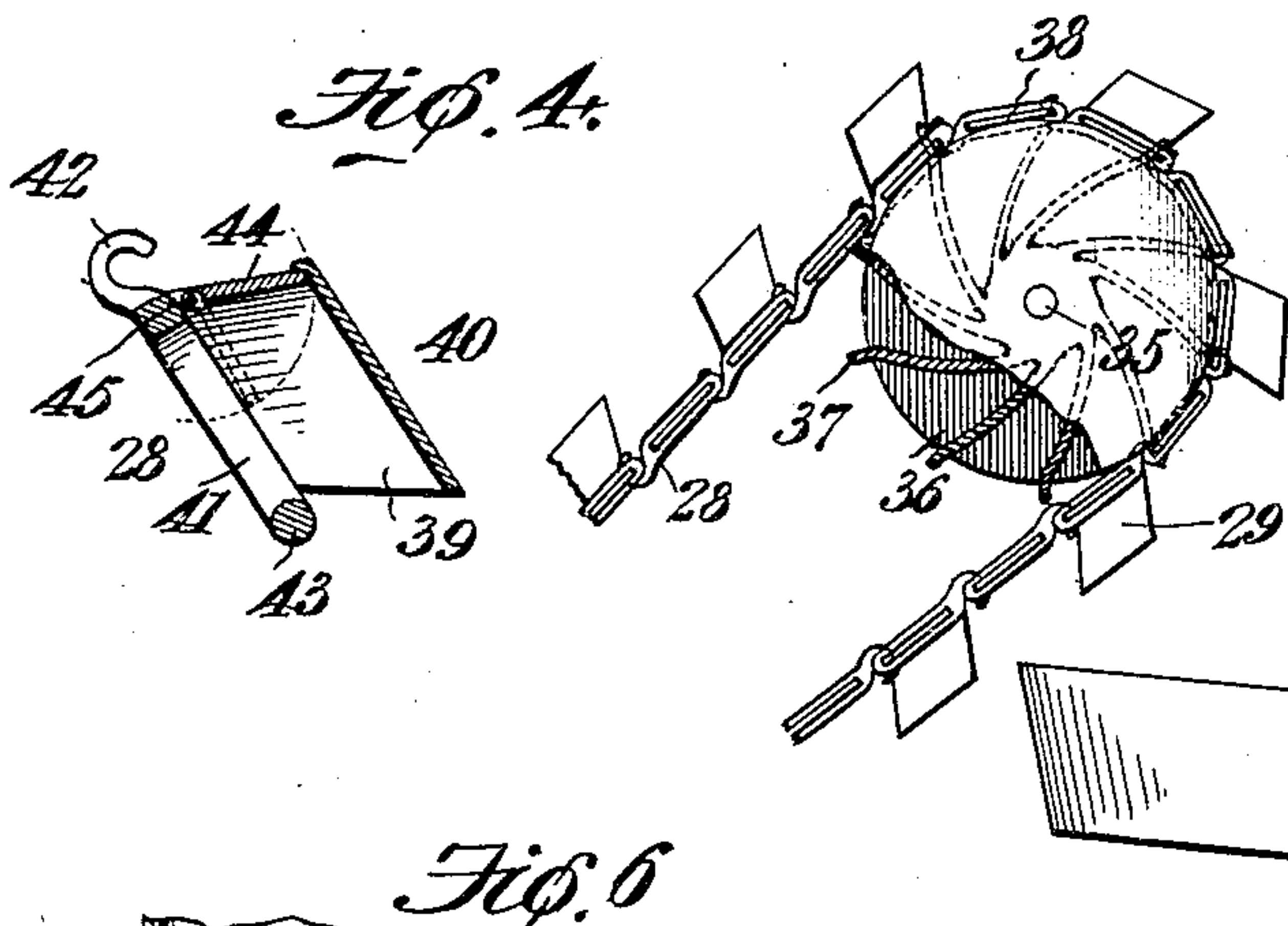
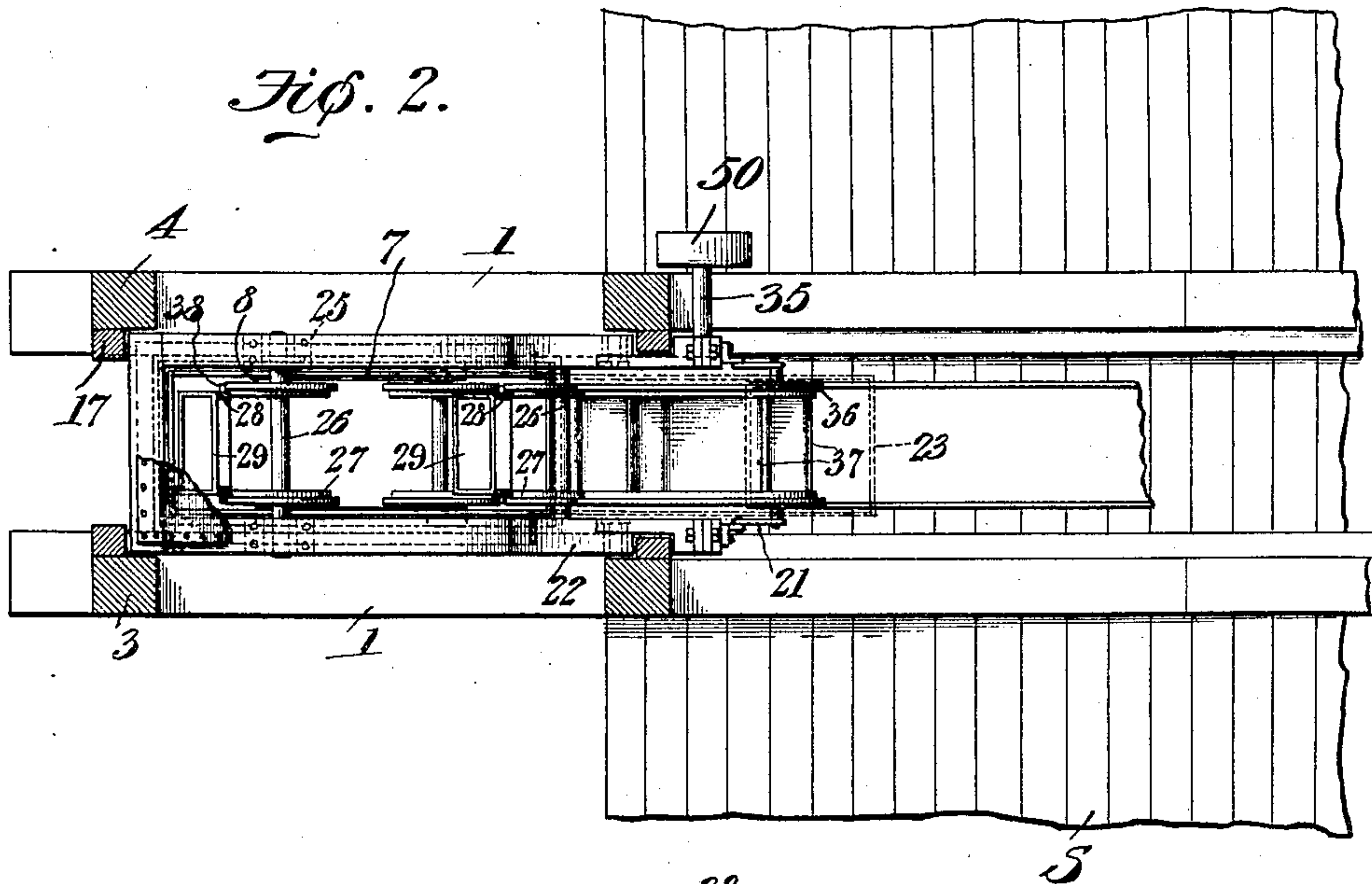


Fig. 3.

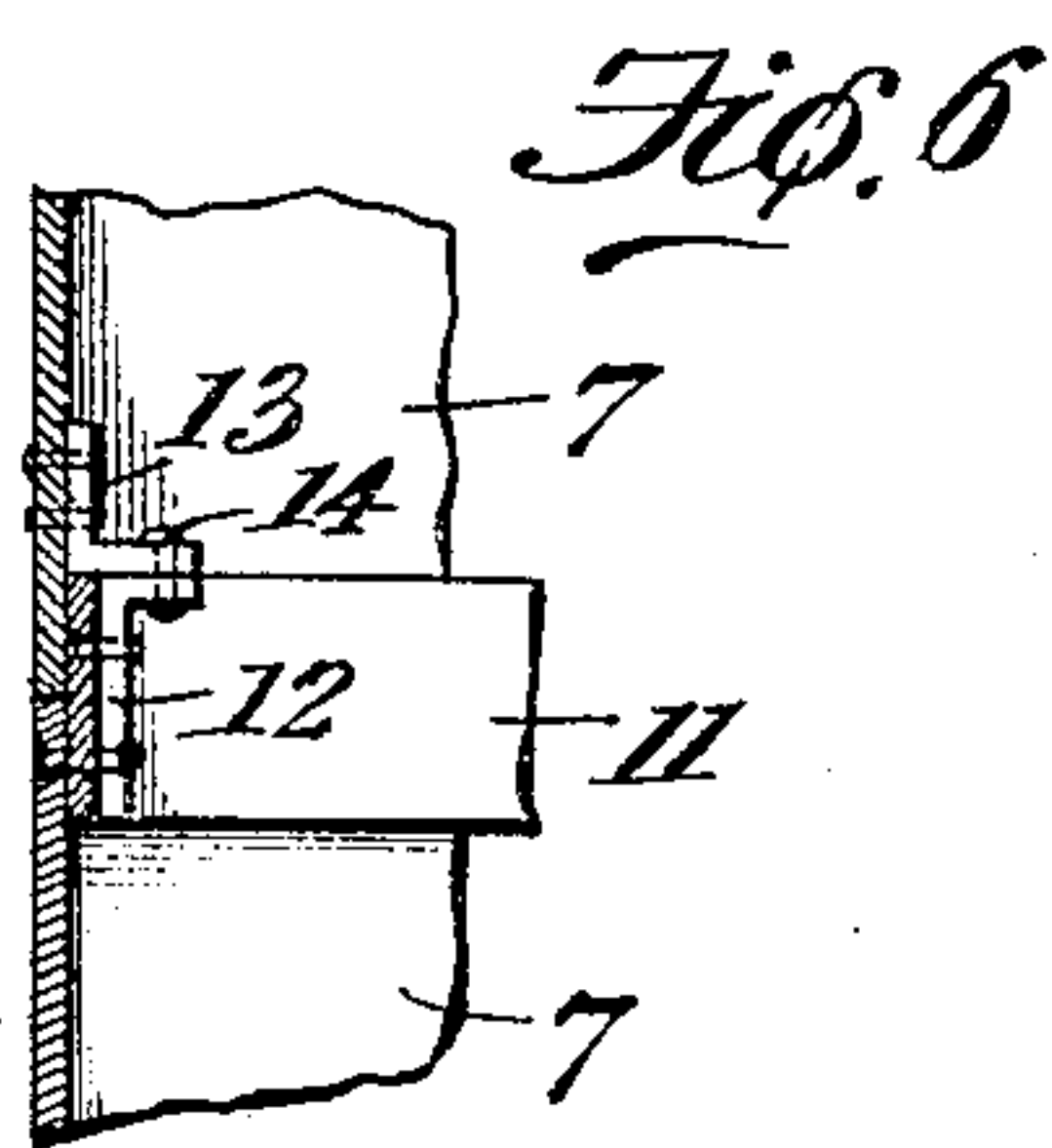
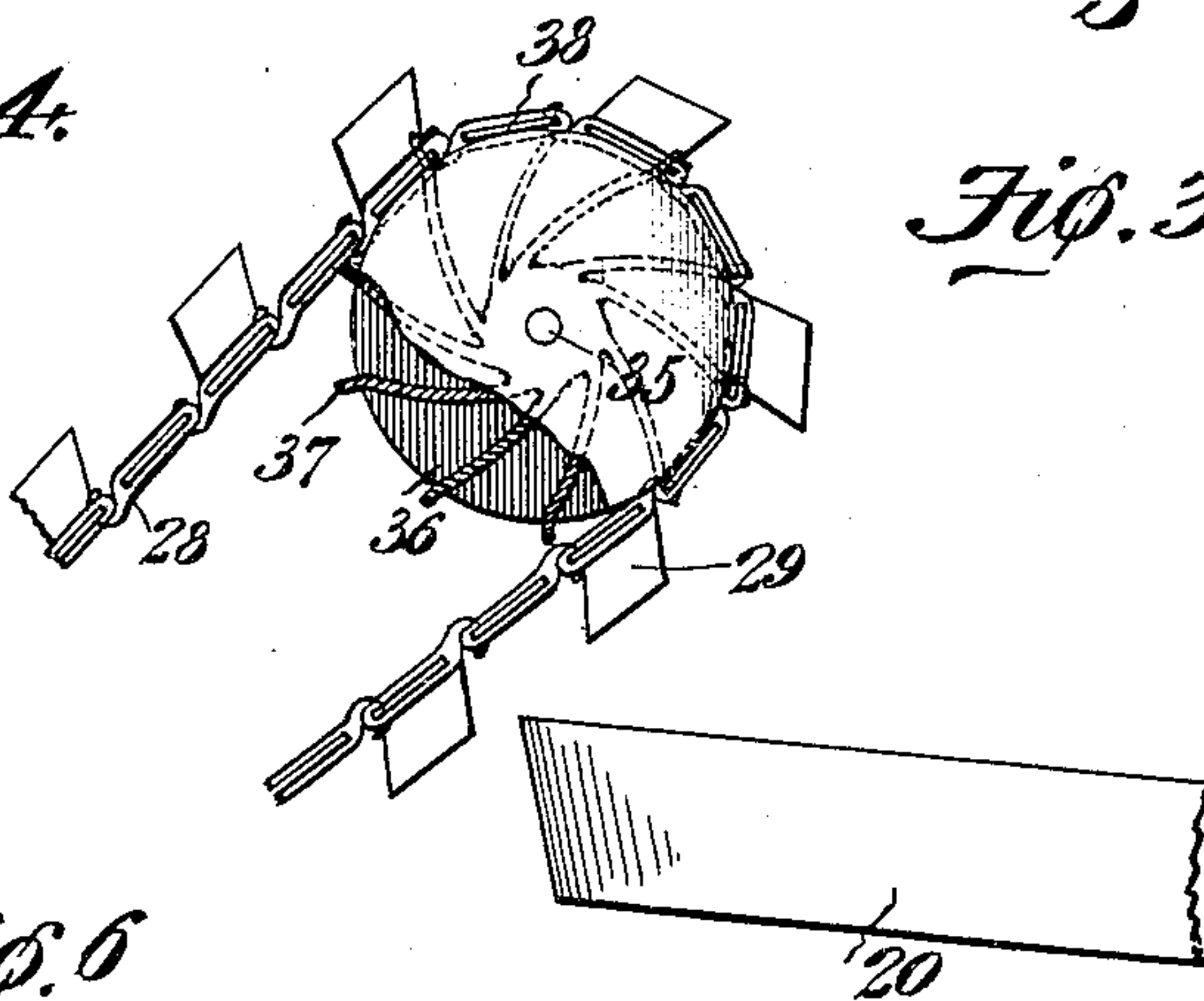
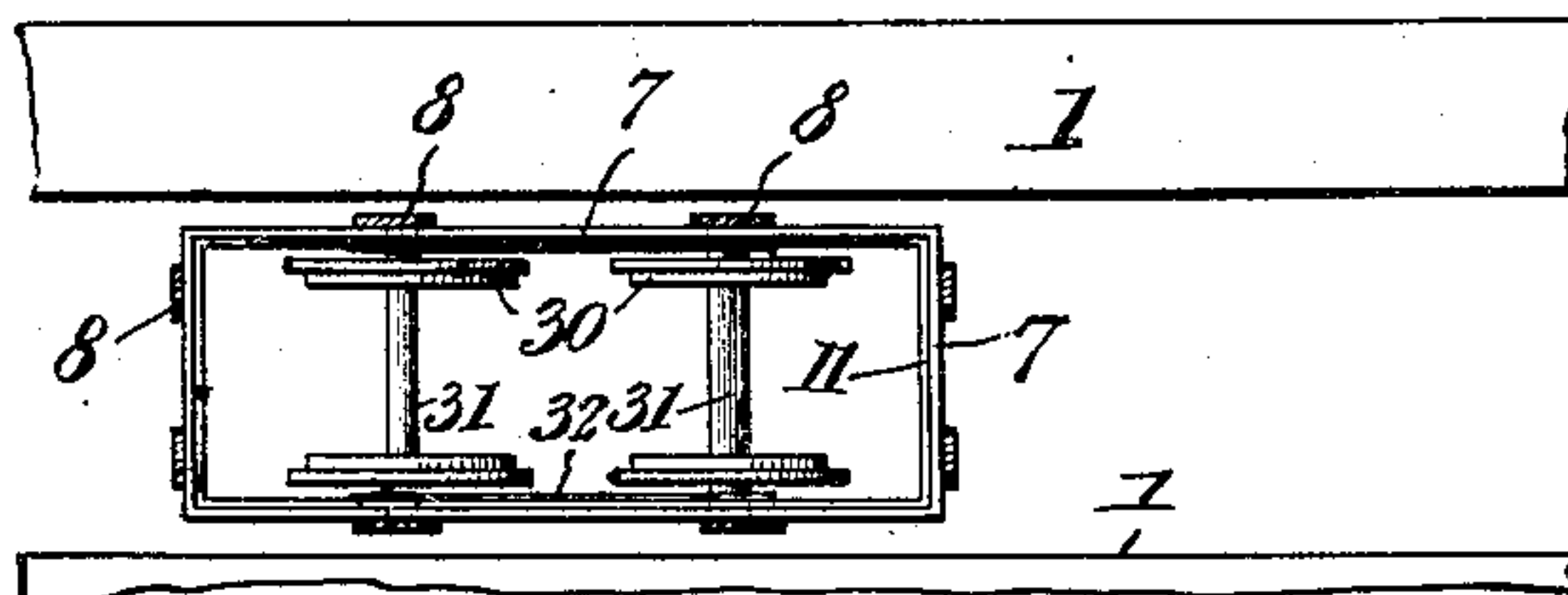


Fig. 5.



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UNITED STATES PATENT OFFICE.

SHERMAN L. CRAWFORD AND LESTER J. CRAWFORD, OF HOQUIAM, AND
WILLIAM F. CRAWFORD, OF BREMERTON, WASHINGTON.

GOLD-DREDGING MACHINE.

SPECIFICATION forming part of Letters Patent No. 792,250, dated June 13, 1905.

Application filed October 31, 1904. Serial No. 230,879.

To all whom it may concern:

Be it known that we, SHERMAN L. CRAWFORD and LESTER J. CRAWFORD, residing at Hoquiam, in the county of Chehalis, and WILLIAM F. CRAWFORD, residing at Bremerton, county of Kitsap, State of Washington, citizens of the United States, have invented a new and useful Gold-Dredging Machine, of which the following is a specification.

10 This invention relates to gold-dredging machines.

The objects of the invention are, without adding to the cost of the machine or increasing the number of its parts, materially to augment its dredging capacity, to cause the dredging mechanism to traverse a larger area than with devices of this character heretofore used, to insure discharge from the scoops or shovels of all the material removed, to adapt the machine, with the expenditure of the minimum of labor, to dredge in either deep or shallow water, to improve the general construction of the scoops, to facilitate lengthening or shortening of the scoop-carrying chains, and generally to improve apparatus of this character.

With the above and other objects in view, as will appear as the nature of the invention is better understood, the same consists in the novel construction and combination of parts of a gold-dredging machine, as will be hereinafter fully described and claimed.

In the accompanying drawings, forming a part of this specification, and in which like characters of reference indicate corresponding parts, there is illustrated one form of the embodiment of the invention capable of carrying the same into practical operation, it being understood that the elements therein exhibited may be varied or changed as to shape, proportion, and exact manner of assemblage without departing from the spirit thereof.

In the drawings, Figure 1 is a view in side elevation, partly in section, of a dredging-machine constructed in accordance with this invention. Fig. 2 is a view in horizontal section, taken on the line 2 2 of Fig. 1 and looking in the direction of the arrow thereon. Fig. 3 is a sectional detail view of a novel form of combined sprocket-wheel and bucket with a

portion of the chains and scoops combined therewith. Fig. 4 is a detail view of one of the scoops. Fig. 5 is a view in horizontal section, taken on the line 5 5 of Fig. 1 and looking in the direction of the arrow thereon. Fig. 6 is a sectional detail view showing the manner in which the sections of the casing are assembled.

Referring to the drawings, S designates a portion of a scow or boat supporting the apparatus. This scow is provided with two beams 1, which project beyond its stern and serve as supports for the superstructure 3, from which the dredging mechanism is supported. The superstructure consists of vertical beams 4, in this instance four in number, as clearly shown in Fig. 2, a plurality of horizontal braces 5, and a plurality of angular braces 6. The general form of superstructure herein shown is one that has been found effective in use; but it is to be understood that the invention is not to be limited to the precise construction shown, as other arrangements may be employed and still be within the scope of the invention.

The casing or boot is composed of a plurality of sections 7, which are adapted to be disconnected or connected, according to the depth of the water in which the machine is working. As herein shown, there are four of these sections employed; but, as will be obvious, a greater or lesser number may be used, and as this will be obvious, detailed illustration of any further arrangement is deemed unnecessary. The casing, as shown in Fig. 2, is rectangular in cross-section and is constructed, preferably, of sheet-steel reinforced externally by the braces 8, secured at the point of juncture of the sections by bolts 9. Upon the interior of the upper end of each section of the casing there is arranged a band 11, which constitutes a slip-joint for engaging the adjacent section and also to reinforce the connection between the sections to prevent them from yielding under the strains transmitted from the dredging mechanism. Connected to the bands 11 at each of the four corners of the casing is an angle-iron or lug 12, which mates with a similar angle-iron or lug 13 on the

adjacent section, and through the two projecting members of the irons are passed bolts 14, which serve positively to hold the sections against separation.

5 The upper ends of the braces 8 are detachably bolted to the frame-pieces 15 of a hood or shell 16, the lower portion of which works upon guides 17, secured to the inner sides of the vertical beams 4. The upper portion 18
10 of the hood is disposed at an angle to the base portion, which latter is supported by the beams 1, as clearly shown in Fig. 1, and this inclined portion of the hood projects beyond the superstructure, thus to bring its discharge-
15 mouth 19 over a sluice-box 20, which discharges into the scow, the sluice-box being supported at its outer end by rods 21, connected with the upper frame-pieces 22 of the hood. The hood-cover 23 is made of suitable
20 sheet metal and is secured to the frame-pieces by being riveted or bolted thereto.

The lower portion of the hood is provided with two horizontal frame-pieces 24, upon which are arranged journal-boxes 25, of which
25 there are in this instance four, that are designed to receive the ends of shafts 26, carrying sheaves 27, around which passes a sprocket-chain 28, carrying the scoops or shovels 29. The lower bend of the sprocket-
30 chain passes around pairs of sheaves 30, mounted upon shafts 31, journaled in bearing-boxes formed in a transverse brace member 32 adjacent to the lower end of the boot, the two shafts 31 being in horizontal alinement
35 for a purpose that will presently appear.

The upper portion of the hood-frame is provided with a pair of extensions 33, which carry journal-boxes 34, in which is journaled
40 the shaft 35 of a sprocket-wheel 36, that constitutes a means to catch and to discharge into the sluice-box any earth that might escape from the scoops in moving around the said wheel. This is effected by constructing the
45 wheel with two heads connected by vanes 37, which are disposed on planes tangential to the axis of rotation of the wheel and have their outer edges projected beyond the peripheries of the heads, thus effectively to catch any material that may escape from the
50 scoops. The peripheries of the heads subserve the further function of guides for the sprocket-chain, the links of which are provided with laterally-projecting wings 38, that engage with the peripheries of the heads
55 and also with the flanges of the sheaves 27 and 30, and this causes the chain to be positively driven and to be held from any lateral movement which would interfere with its proper operation.

60 The scoops constitute one of the essential features of the present invention, inasmuch as a novel means is combined therewith to secure the positive discharge of any wet sand or earth that would otherwise cling thereto.
65 Each scoop, as shown in Fig. 4, consists of a

body 39, having an outer wall 40, which constitutes the shovel, and a link member 41, having at one terminal a hook 42 and at its other terminal a bar 43 to interlock with the hook
70 of the adjacent scoop. The rear end of the scoop is formed by a door 44, which is hinged in any suitable manner at 45 to the link and which when the scoop passes the dead or vertical center of the sprocket-wheel will drop to the position shown in dotted lines in Fig. 4,
75 and thus permit any sand or earth clinging thereto to fall between the space formed by the side bars of the links and into the buckets formed by the vanes between the heads of the sprocket-wheel 36. As will be seen by refer-
80 ence to Fig. 1, the outer walls of the buckets or scoops project a sufficient distance over the scoop-box to insure discharge therein of all the matter lifted by the former.

The object of employing two sheaves 30 at
85 the lower end of the boot is to cause the scoops to traverse practically a straight plane and by so doing to take up a larger percentage of earth than would be possible if they moved through the arc of a circle, which would re-
90 sult if but a single sheave were employed, and by this arrangement a square cut into the bottom of the river is made, resulting in the lifting and depositing of the largest possible
95 amount of earth or sand with a minimum expenditure of labor.

As stated at the outset of the specification, the casing is adapted to be lengthened to adapt the apparatus to operate at any desired depth,
100 and to secure this result the hood is made vertically movable to permit insertion of an additional section when necessary. As shown in Fig. 1, the lower end of the boot rests upon the bottom of a river, and when an additional
105 section is to be added the bolts 46, holding the brace-rods assembled with the lower section of the hood, are removed, and the hood is then bodily raised through the medium of a rope 47, which passes over a sheave 48, located
110 at the top of the superstructure. A section is then bolted to the upper section of the casing through the medium of the angle-irons 12 and 13 and bolts 14, and the hood is then lowered and the bolts 46 placed in position. Of
115 course when an additional section is added it will be necessary to lengthen the sprocket-chains, and to effect this additional links are included, the links of the chain of course having been unhooked when the hood was raised.
120 To prevent the chain from dropping down within the casing when a new section of casing is added, a bar or pin is employed, which is passed through openings 49 in the upper section of the boot and in between the links
125 of the chain. This is done before the links are unhooked, and by throwing the loose ends of the chain back over the edge of the upper casing-section they will be prevented from falling down into the casing.

In the operation of the machine the cutting 130

is done with rapidity and certainty and practically no loss of material ensues, owing to the fact that after each scoop has completed its cut the sharp turn that it takes in passing around one of the sheaves 30 will prevent any escape of earth, and no discharge takes place until the scoop has passed the vertical center of the sprocket-wheel 36, when the dumping is effected in the manner already heretofore described.

To effect driving of the sprocket-wheel, a pulley 50 may be combined with the shaft 35, as shown in Fig. 2, and around which will pass a belt leading to a suitable source of power.

While the construction and arrangement of parts herein shown have been found thoroughly effective in use, it is to be understood that the invention is not to be limited thereto, as various changes in the construction and mode of assemblage of the parts may be adopted without departing from the scope of the invention or sacrificing any of the advantages thereof.

Having thus described the invention, what is claimed is—

1. In a dredging-machine, a hood, a casing supported thereby, and excavating mechanism arranged within the hood and casing and having its active portion operable in a substantially horizontal plane.

2. In a dredging-machine, a hood, a casing supported thereby and adjustable to various lengths, and excavating mechanism arranged within the casing and also adjustable to various lengths.

3. In a dredging-machine, the combination with a hood, of an extensible casing, and extensible excavating mechanism arranged within the hood and casing and having its operative portion disposed below the plane of the lower end of the casing.

4. In a dredging-machine, the combination with an inclined hood provided with a discharge-mouth, of a casing supported by the hood and having excavating mechanism arranged to discharge through the mouth.

5. In a dredging-machine, a hood, a casing supported thereby, and excavating mechanism working within the hood and casing.

6. In a dredging-machine, a hood having a

discharge-mouth, a casing supported by the hood, and excavating mechanism working in the hood and in the casing.

7. In a dredging-machine, a superstructure, a hood supported thereby, a casing supported by the hood, and excavating mechanism working within the hood and casing.

8. In a dredging-machine, a superstructure, a hood supported thereby and capable of vertical movement, a casing supported by the hood, and excavating mechanism arranged within the hood and casing.

9. In a dredging-machine, the combination with a hood, of a boot or casing consisting of a plurality of sections each provided with a plurality of lugs adapted to mate when the sections are assembled, and means for clamping the lugs together.

10. In a dredging-machine, the combination of an endless conveyer consisting of scoops each having an automatic dumping-door, and a sprocket-wheel provided with spaced vanes forming pockets into which the scoops discharge.

11. In a dredging-machine, a hood having an outward-inclined portion provided with a discharge-mouth a casing supported by the hood, and an endless conveying mechanism operating within the hood and casing.

12. In a dredging-machine, the combination with a hood, of a boot or casing comprising a plurality of rectangular sections, a band secured internally of each casing and projecting above the upper ends thereof, braces secured externally of the casing and projecting above the upper edges thereof, lugs secured to the bands, and means for assembling the lugs.

In testimony that we claim the foregoing as our own we have hereto affixed our signatures in the presence of two witnesses.

SHERMAN L. CRAWFORD.

LESTER J. CRAWFORD.

WILLIAM F. CRAWFORD.

Witnesses to signatures of S. L. and L. J. Crawford:

WALTER S. FORTINER,

TOM. E. QUIN.

Witnesses to signature of W. F. Crawford:

I. J. KOST,

J. W. CADDEES.