

No. 747,481.

PATENTED DEC. 22, 1903.

H. L. REYNOLDS.
EXCAVATING BUCKET.

APPLICATION FILED JUNE 17, 1903.

NO MODEL.

2 SHEETS—SHEET 1.

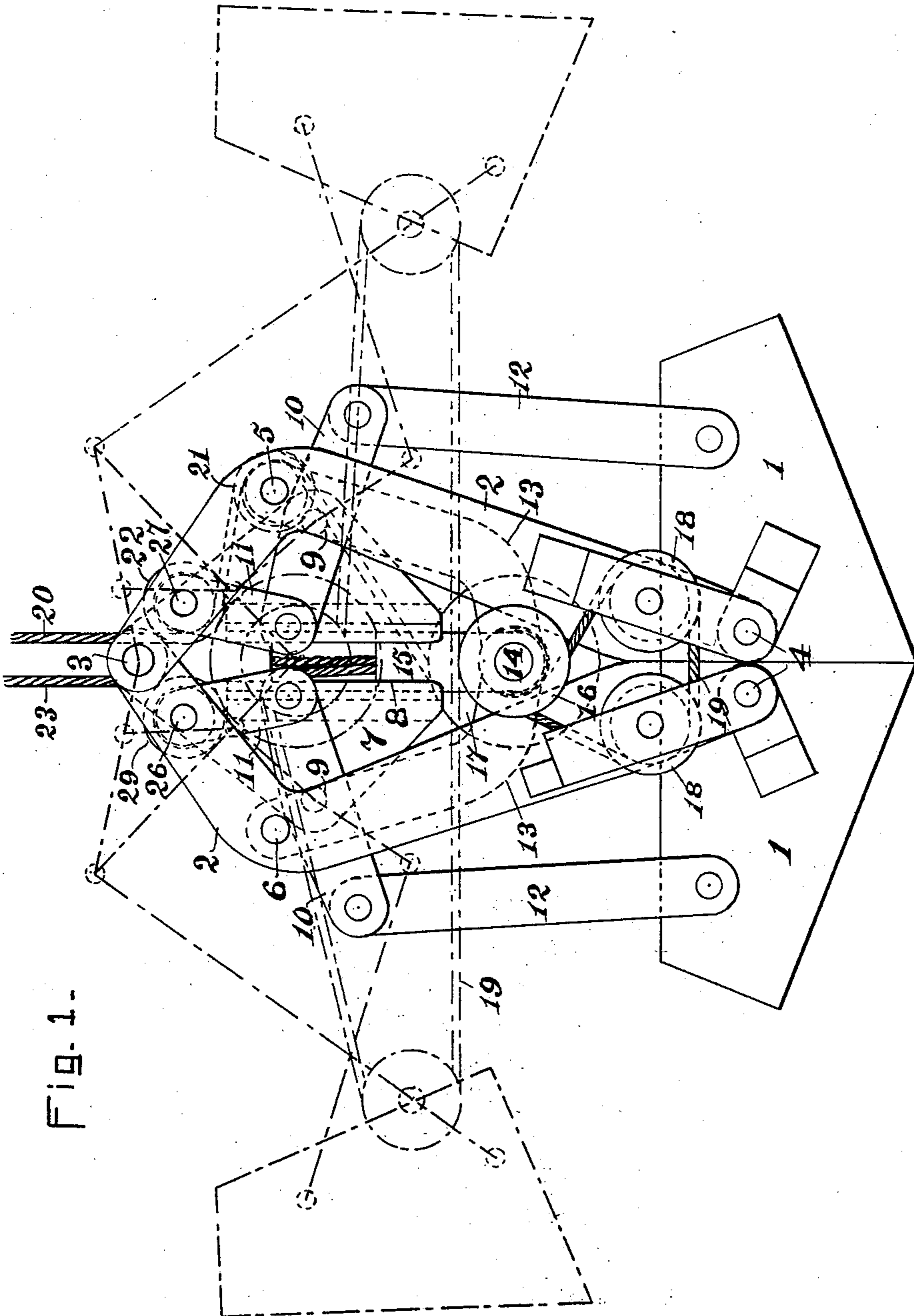


Fig. 1-

WITNESSES:

Lee de Forest
Spencer Mien

INVENTOR

Henry L. Reynolds

No. 747,481.

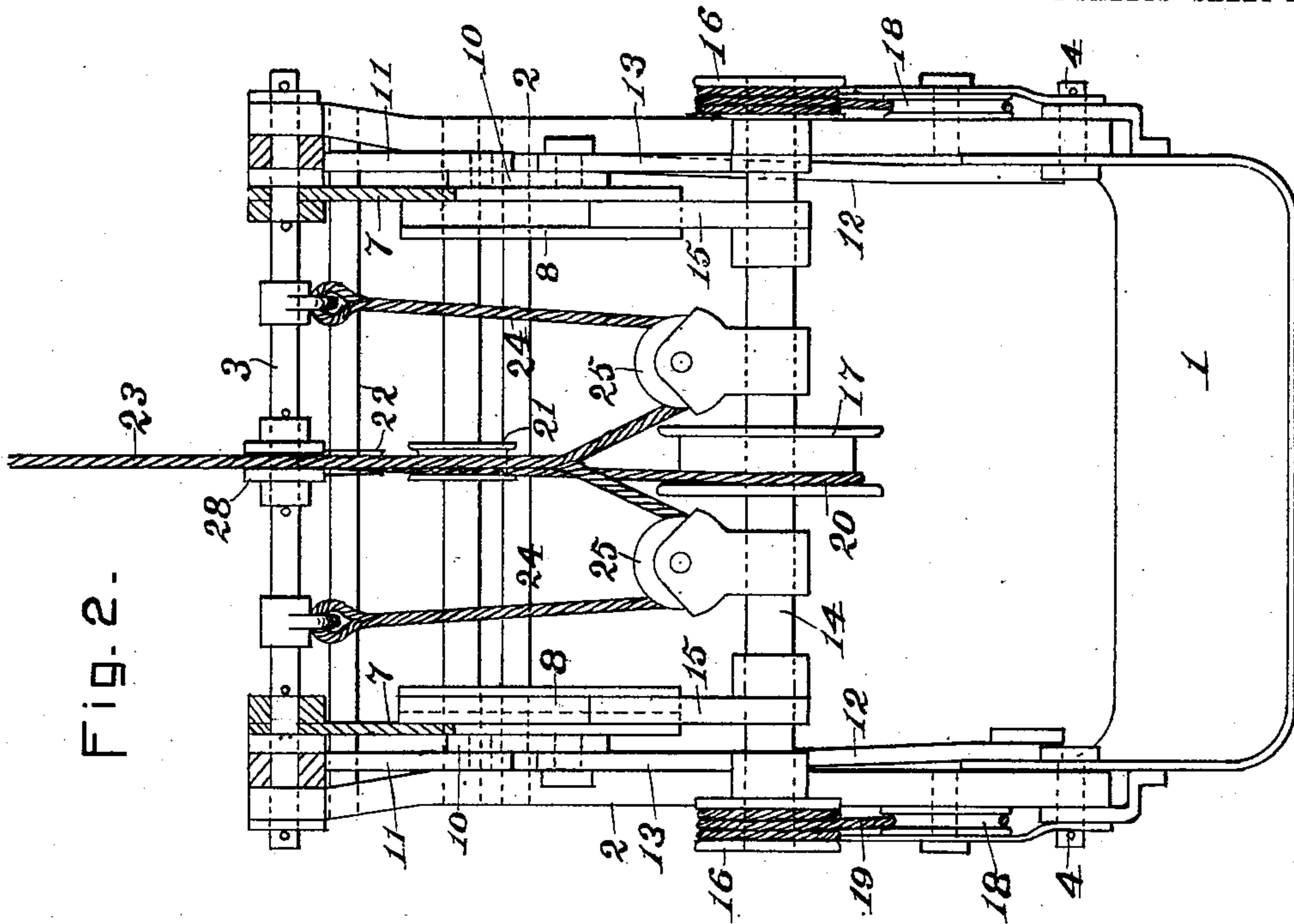
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2 SHEETS—SHEET 2.



WITNESSES:

Lee de Fouet,
Spencer Miller

INVENTOR

Henry L. Reynolds.

UNITED STATES PATENT OFFICE.

HENRY L. REYNOLDS, OF JERSEY CITY, NEW JERSEY, ASSIGNOR TO THE
LIDGERWOOD MANUFACTURING COMPANY, OF NEW YORK, N. Y., A
CORPORATION.

EXCAVATING-BUCKET.

SPECIFICATION forming part of Letters Patent No. 747,481, dated December 22, 1903.

Application filed June 17, 1903. Serial No. 161,894. (No model.)

To all whom it may concern:

Be it known that I, HENRY L. REYNOLDS, a citizen of the United States, and a resident of Jersey City, Hudson county, New Jersey, have
5 invented certain new and useful Improvements in Excavating-Buckets, of which the following is a specification.

My invention relates to improvements in excavating or dredging buckets.

10 The object of my invention will be disclosed in the following specification and its scope will be defined by the claims terminating the same.

15 In the drawings accompanying herewith I have shown my invention embodied in a form now preferred by me.

20 In the drawings, Figure 1 is a side elevation of my device, the closed position being shown in full lines and the open position being indicated diagrammatically by broken lines, which outline the buckets or scoops and indicate the center lines of the various levers and links. Fig. 2 is a central sectional elevation at right angles to Fig. 1, showing one-
25 half the device in elevation.

My device is of that type of excavating-buckets having two opposed scoops or buckets which are supported and operated by a system of levers and links, so as to widely
30 separate the buckets and then bring them together with a scraping action, so that in some materials it may loosen the material at the time of loading. With this latter object in view I have so designed the parts as to place the buckets or scoops with their bottom sur-
35 faces in a substantially vertical plane when the scoops are at their extreme separation preliminary to loading and so that as the closing operation is commenced the scoops
40 will be rapidly tilted to a favorable digging or scraping angle and be then maintained approximately at this angle until completely closed. In order to secure this action, the "scoops," by which term I mean the lower
45 bucket-like members which contain the material, are pivotally carried by hangers or levers, which in turn are pivoted at or near their upper ends, so as to swing toward and from each other. The scoops being pivoted

to the hangers must be controlled in their an- 50
gular position by other auxiliary means, which means consist of mechanisms which are in turn actuated and controlled by the swinging of the hangers.

In the drawings, 1 represents the scoops; 2, 55
the hangers, which are connected therewith by means of the pivots 4 and which are connected at their upper ends by means of a pivot 3, said pivot preferably consisting of a bar or rod extending transversely of the
60 bucket and serving as a pivot for the hangers upon both sides of the bucket. The pivot 3 is also secured to a central frame or base which maintains a constant position relative to the center line of the bucket. This base, 65
as herein shown, consists of two plates 7, which are located one at each side of the bucket. Upon this base are mounted the scoop-controlling devices, which consist of the levers 10, pivoted upon said base by 70
means of pivot 9 and the links 11 and 12, which respectively connect one end of said levers with the hangers and the other ends of said levers with the scoops. As the hangers
75 swing outwardly or inwardly they rock the scoop-controlling levers 10 upon their pivots, and thus affect the scoops in such a manner as to rapidly tilt the same during the ex-
treme outer portions of their swing and main- 80
tain them approximately in a constant angular position during the inner and major portion of their swing.

The means by which the hangers 2 are swung to open the bucket consists of toggle levers or links 13, which are pivoted to the
85 hangers by means of pivots 5 and 6, the same preferably consisting of rods which extend transversely of the bucket and connect the hangers of opposite sides. The central pivot
90 14 of said toggle-links is upon the central line of the bucket. For the correct operation of such a bucket it is desirable that this central line of the bucket be maintained in constant relation with the base 7. As a preferred means for securing this end I provide a guide which
95 insures the correct travel of the pivot 14 of the opening-links relative to the base. This guide 8 is formed by slotting the base and se-

curing thereto of the guide-bars 8, which, as herein shown, are of a Z-section and receive a block or bar 15, which is carried by the pivot 14. Other means than that described might
5 be employed for accomplishing the same purpose.

The pivot 14 is preferably a shaft extending transversely of the bucket and connecting the opening-links of opposite sides. The
10 opening-rope 23 may then be connected with this shaft, so that when strain is put upon this rope the weight of the bucket will be carried by said shaft, and said weight will tend to cause the toggle to open, and thus cause
15 the bucket to open. In some cases a direct connection to the shaft 14 would not provide sufficient opening power. To increase this power, pulleys 25 may be placed upon the shaft 14 and the rope 23 divided into two parts
20 24, which pass first about the pulleys 25 and then upward to a connection with the main pivot-shaft 3.

The bucket-closing means herein shown comprise a windlass device which is mounted
25 upon said shaft 14 and has closing-ropes 19, winding upon drums 16, placed one at each side of the bucket and in line with pulleys 18, journaled upon the hangers 2. When the drums 15 are turned in one direction,
30 they will wind up the ropes 19, and thus will cause the hangers and the scoops to approach each other. These drums 16 are turned by means of a larger drum 17, which is centrally mounted upon the shaft 14 and which receives the closing-rope 20. This closing-rope
35 is preferably passed over a pulley 21, which is mounted upon the transverse shaft or rod 5, thence over a pulley 22, which is mounted upon the transverse shaft 27, which forms
40 one of the pivots connecting the upper ends of the links 11 with the hangers 2. This arrangement prevents the strain of the closing-rope from acting upon the opening-toggle to resist closing the bucket. This rope is confined to a central position at the upper end
45 of the bucket by means of collars 28 upon the main pivot 3. The opening rope 23 is also restrained by the same collars and by a pulley 29, mounted upon the transverse rod
50 26, which forms the pivotal connection for the upper ends of links 11.

In a bucket of this character, in which the scoop-controlling means are not carried by the hangers or some member moving there-
55 with, as upon a base, it is essential to a correct operation that the movement of the hangers should be symmetrical with relation to the pivots of said scoop-controlling means. This is herein secured by connecting the pivot
60 14 at the center of the opening-links with the base by sliding connection, such as that which has been described.

It is evident that many of the parts herein shown might be changed somewhat in their
65 proportion and location and might also be replaced by other and equivalent mechanisms

without essentially changing the character of the device. I do not, therefore, wish to be limited to the exact mechanism herein shown and described.

What I claim, and desire to secure by Letters Patent, is—

1. An excavating-bucket comprising two opposed scoops, a central frame or base, hangers pivoted to said frame and to the scoops,
75 means for swinging said hangers symmetrically with relation to the frame, and means actuated by the hangers to control the angular position of the scoops by the swinging of the hangers.

2. An excavating-bucket comprising a central frame or base, hangers pivoted thereto, opposed scoops pivoted to the hangers, means for swinging said hangers symmetrically with
80 relation to the base, and means mounted on said base and connected with the hangers and scoops for controlling the angular position of the scoops.

3. An excavating-bucket comprising a central frame or base, hangers pivoted thereto,
90 opposed scoops pivoted to the hangers, means for swinging the hangers symmetrically with relation to the base, levers pivoted upon said base, and links connecting said levers respectively with the scoops and with the
95 hangers.

4. An excavating-bucket comprising opposed scoops, swinging hangers pivoted to the scoops, pivoted scoop-controlling levers, means for swinging said hangers, and means
100 for maintaining a constant relative position of the pivots of the hangers and of the scoop-controlling levers, and of said pivots with the central line of the bucket.

5. An excavating-bucket comprising a central frame or base, hangers pivoted thereto,
105 opposed scoops pivoted to the hangers, scoop-controlling levers pivoted to the base, links connecting one end of said levers with the hangers above the pivots of said levers, links
110 connecting the other ends of said levers with the scoops, and means for swinging the hangers.

6. An excavating-bucket comprising a central frame or base, hangers pivoted thereto,
115 opposed scoops pivoted to the hangers, scoop-controlling levers pivoted to the base, links connecting one end of said levers with the hangers above the pivots of said levers, links
120 connecting the other ends of said levers with the scoops, and means for swinging the hangers symmetrically with relation to the center line of the base.

7. An excavating-bucket comprising opposed scoops, a central frame or base, hangers
125 pivoted to said base and to the scoops, and connected links pivoted to the hangers and having guiding engagement with the base.

8. An excavating-bucket comprising opposed scoops, a central frame or base having
130 a guide thereon, hangers pivoted to the base

in line with said guide and also pivoted to the scoops, links pivoted to the hangers and having guiding engagement with the said guide, and means operated by the hangers
5 for controlling the angular position of the scoops.

9. An excavating-bucket comprising opposed scoops, a central frame or base having a guide thereon corresponding in direction
10 with the center line of the bucket, hangers pivoted to said base and to the scoops, links connected with the hangers and controlled by said guide, and means carried by said base
15 and actuated from the hangers for controlling the angular position of the scoops.

10. An excavating-bucket comprising a central frame or base having a guide corresponding in direction with the center line of the bucket, hangers pivoted to the base symmetrically of said central line, opposed scoops
20 carried by the hangers, links pivoted to the hangers and to each other to form an opening-toggle, the common pivot of said toggle being constrained by said guide to move in
25 the central line of the bucket, and an opening-rope connected with the common pivot of the said toggle.

11. An excavating-bucket comprising a central frame or base having a guide corresponding in direction with the center line of the bucket, hangers pivoted to the base symmetrically of said central line, opposed scoops
30 carried by the hangers, links pivoted to the hangers and to each other to form an opening-toggle, the common pivot of said toggle being constrained by said guide to move in
35 the central line of the bucket, and an opening-rope reeved between the common pivot of said toggle and the pivot of the hangers.

12. An excavating-bucket comprising a central frame or base having a guide corresponding in direction with the center line of the bucket, hangers pivoted to the base symmetrically of said central line, opposed scoops
40 carried by the hangers, links pivoted to the hangers and to each other to form an opening-toggle, the common pivot of said toggle being constrained by said guide to move in
45 the central line of the bucket, and a single opening-rope branching into two parts which are reeved between the central pivot of the
50 opening-toggle and the top of the hangers.

13. An excavating-bucket comprising a central frame or base having a guide corresponding in direction with the center line of the bucket, hangers pivoted to the base symmetrically of said center line, opposed scoops
55 carried by the hangers, links pivoted to the hangers and to each other to form an opening-toggle, the common pivot of said toggle being constrained by said guide to move in
60 the center line of the bucket, pulleys carried by the central pivot of said toggle one at each side of the bucket, and a single central closing-rope branching and each branch passing

about one of said pulleys and upward and secured at the upper part of the bucket.

14. An excavating-bucket comprising a central frame or base, hangers pivoted thereto, opposed scoops carried by the hangers, means
70 for constraining said hangers to swing symmetrically with relation to the center line of said base, a shaft extending transversely of the bucket, a central drum on said shaft adapted to receive a closing-rope, two drums
75 upon said shaft at opposite sides of the bucket, a pulley upon each hanger in line with the side drums, and ropes having their ends secured to said side drums and passing over
80 said pulleys.

15. An excavating-bucket comprising a central frame or base, hangers pivoted thereto, opposed scoops pivoted to the hangers, means carried by said base and actuated by the hangers to control the angular position of the
85 scoops, opening-toggles connecting said hangers, a transverse shaft forming the common pivot for said toggles, a drum upon said shaft at each side of the bucket, a pulley upon each hanger in line with said drums, closing-ropes
90 secured to said drums and passing around said pulleys, and a rope and drum for turning said shaft.

16. An excavating-bucket comprising opposed scoops, swinging hangers pivoted to the
95 scoops, scoop-controlling levers pivoted independently of the hangers, and means for swinging said hangers and scoop-controlling levers in a fixed relation.

17. An excavating-bucket comprising opposed scoops, swinging hangers pivoted to the
100 scoops, scoop-controlling levers pivoted independently of the hangers, and means connecting said hangers and scoop-controlling levers to swing them together.

18. An excavating-bucket comprising opposed scoops, swinging hangers pivoted to the
105 scoops, scoop-controlling levers, fixed pivots for said levers and means for swinging said hangers and scoop-controlling levers in a definite relation.

19. An excavating-bucket comprising opposed scoops, swinging hangers pivoted thereto, scoop-controlling levers, fixed pivots for said levers laterally removed from the center
115 line of the bucket, means connecting one end of said levers with the scoops, and means for swinging said hangers and levers in a definite relation.

20. An excavating-bucket comprising opposed scoops, swinging hangers pivoted to the
120 scoops, scoop-controlling levers pivoted independently of the hangers, and means connecting said levers with a scoop and its hanger.

21. An excavating-bucket comprising opposed scoops, swinging hangers pivoted to the
125 scoops, scoop-controlling levers pivoted independently of the hangers, and means connecting opposite ends of said levers respectively with a scoop and with a hanger for said scoop.

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22. An excavating-bucket comprising op-
posed scoops, swinging hangers pivoted to the
scoops, scoop-controlling levers pivoted inde-
pendently of the hangers, links connecting
5 one end of said levers with the outermost
parts of the scoops and links connecting the
other ends of said levers with the hangers of
the corresponding side of the bucket.

In testimony whereof I have hereunto af-
fixed my signature, this 15th day of June, 1903, in the presence of two witnesses.

HENRY L. REYNOLDS.

Witnesses:

SPENCER MILLER,
EMERSON R. NEWELL.