

No. 734,433.

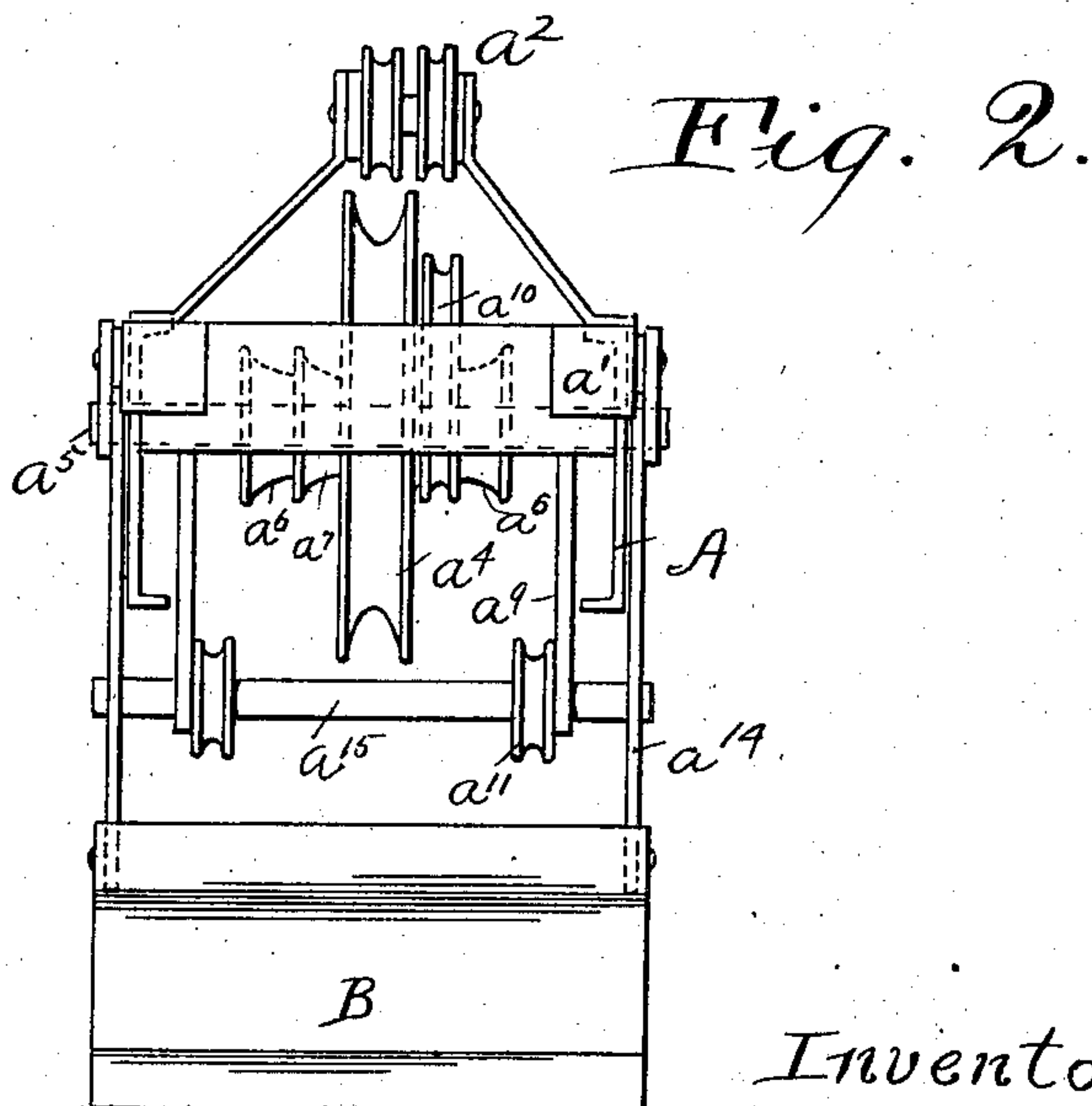
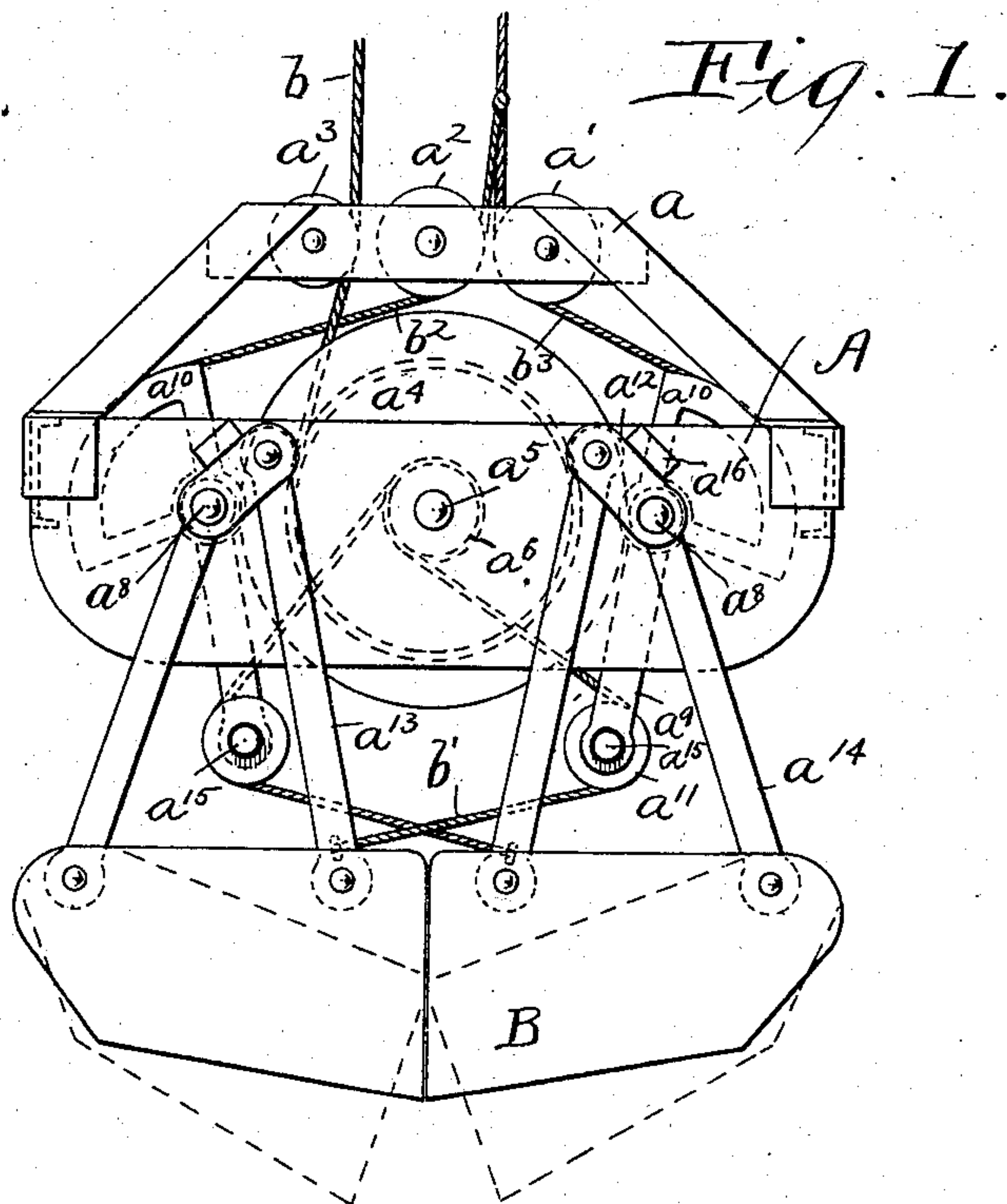
PATENTED JULY 21, 1903.

C. L. SAUNDERS.
HOISTING BUCKET.

APPLICATION FILED SEPT. 17, 1902.

NO MODEL.

4 SHEETS—SHEET 1.



Witnesses.
E. B. Gilchrist
H. M. Davis

Inventor
Cecil L. Saunders,
By his Attorneys,
Thurston & Bates.

No. 734,433.

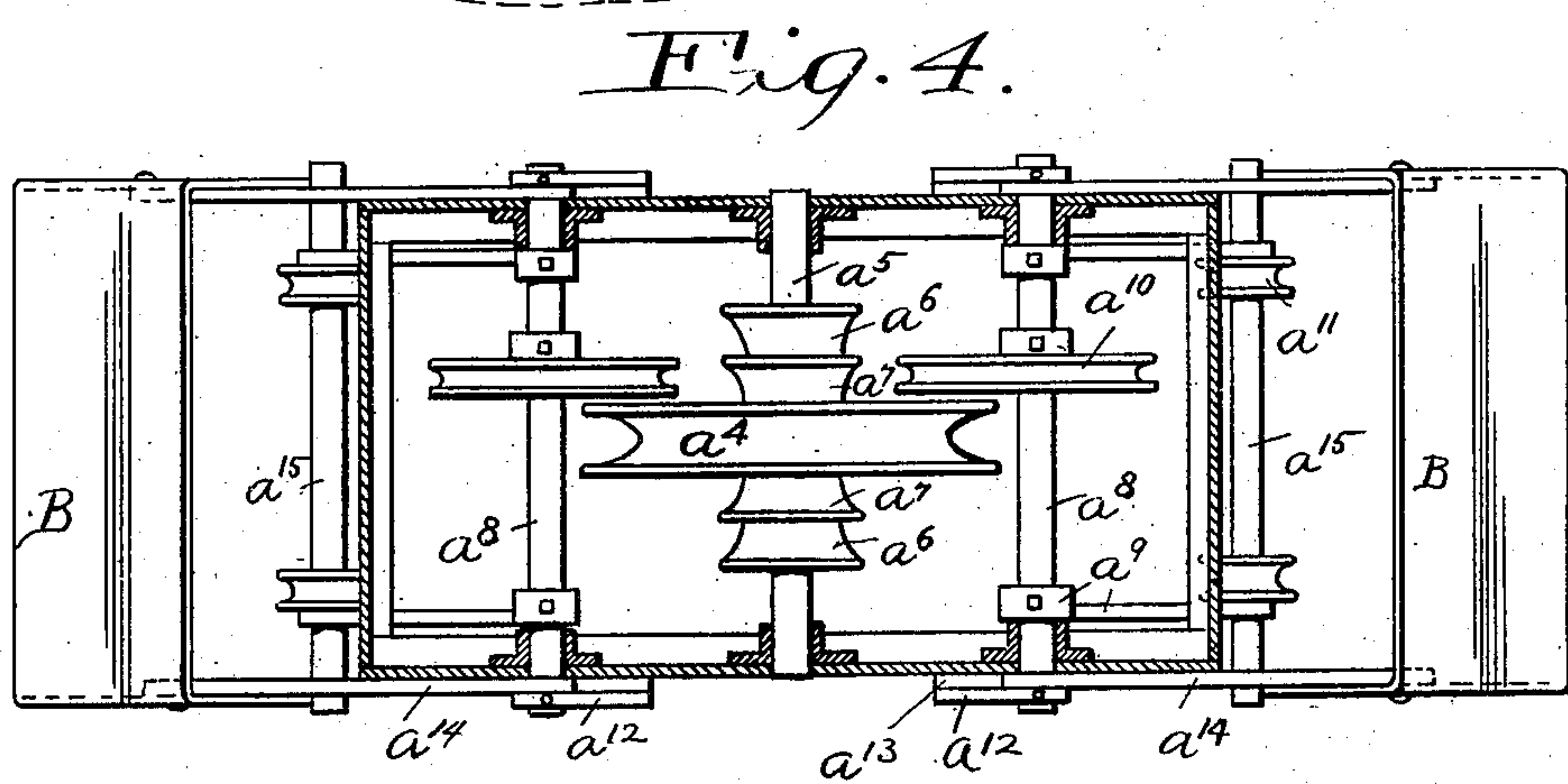
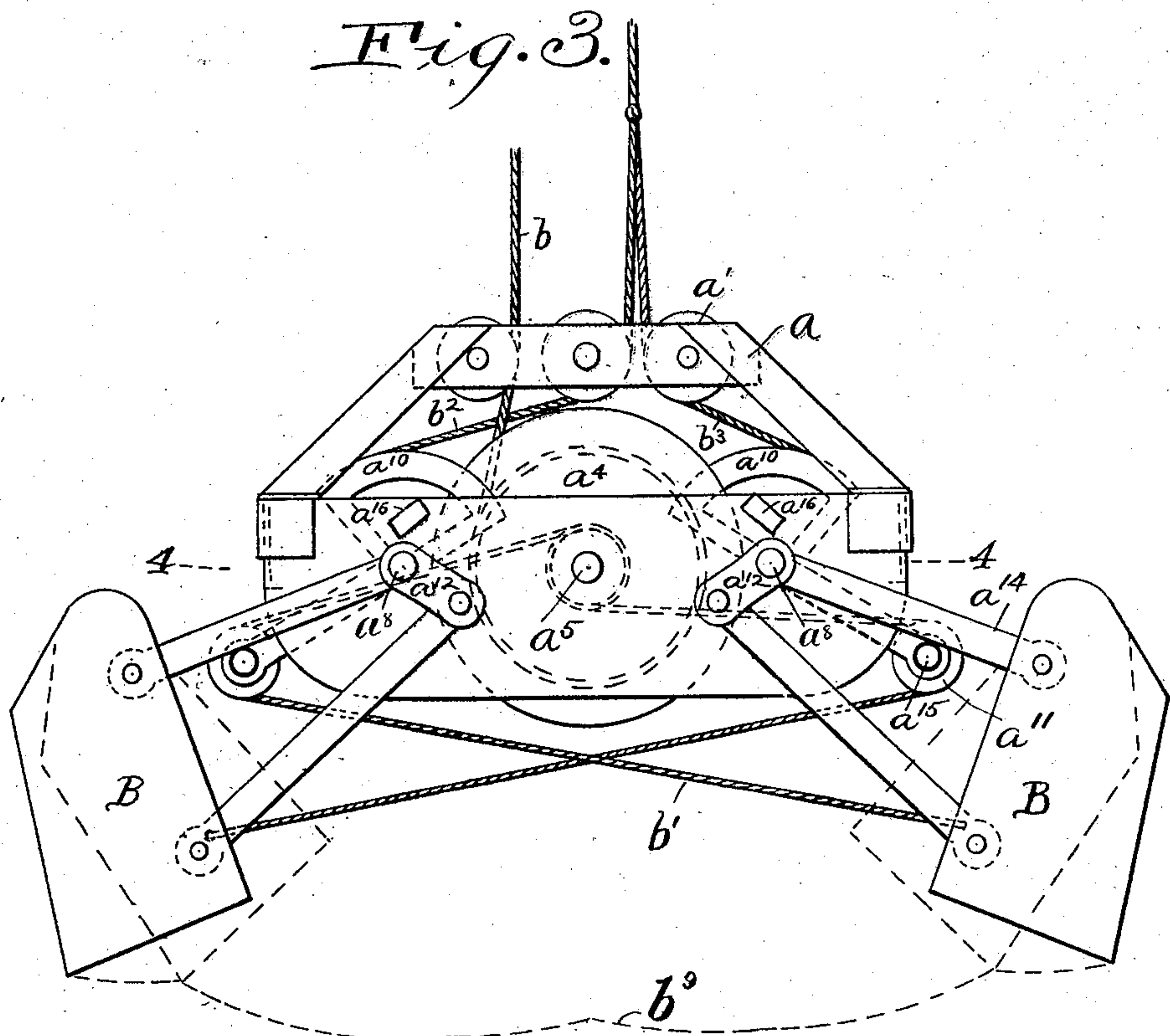
PATENTED JULY 21, 1903.

C. L. SAUNDERS.
HOISTING BUCKET.

APPLICATION FILED SEPT. 17, 1902.

NO MODEL.

4 SHEETS—SHEET 2.



Witnesses.
E. B. Gilchrist
H. M. Wise

Inventor
Cecil L. Saunders,
By his Attorneys,
Thurston & Bates.

C. L. SAUNDERS.
HOISTING BUCKET.

APPLICATION FILED SEPT. 17, 1902.

NO MODEL.

4 SHEETS—SHEET 3.

Fig. 5.

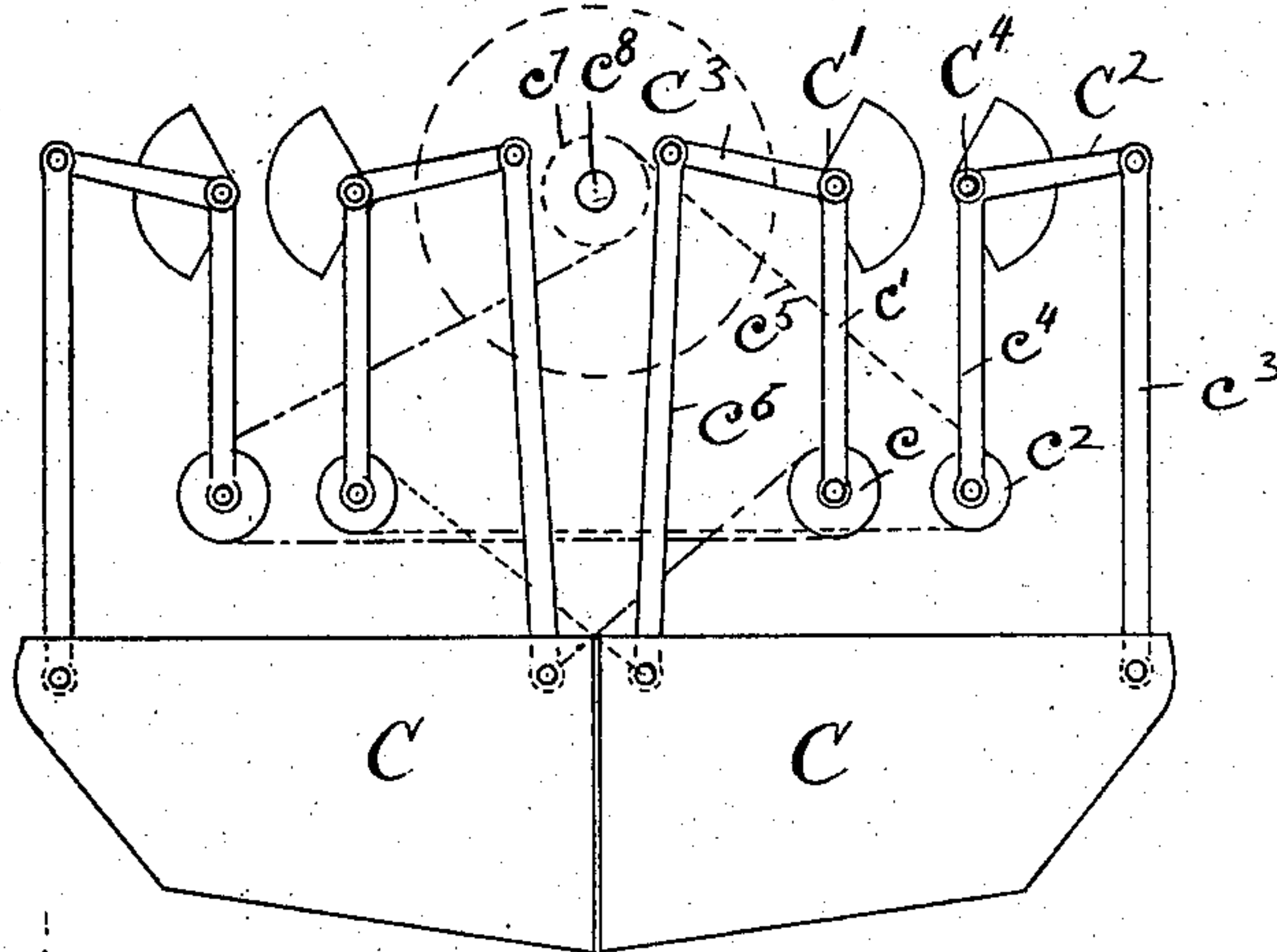


Fig. 6.

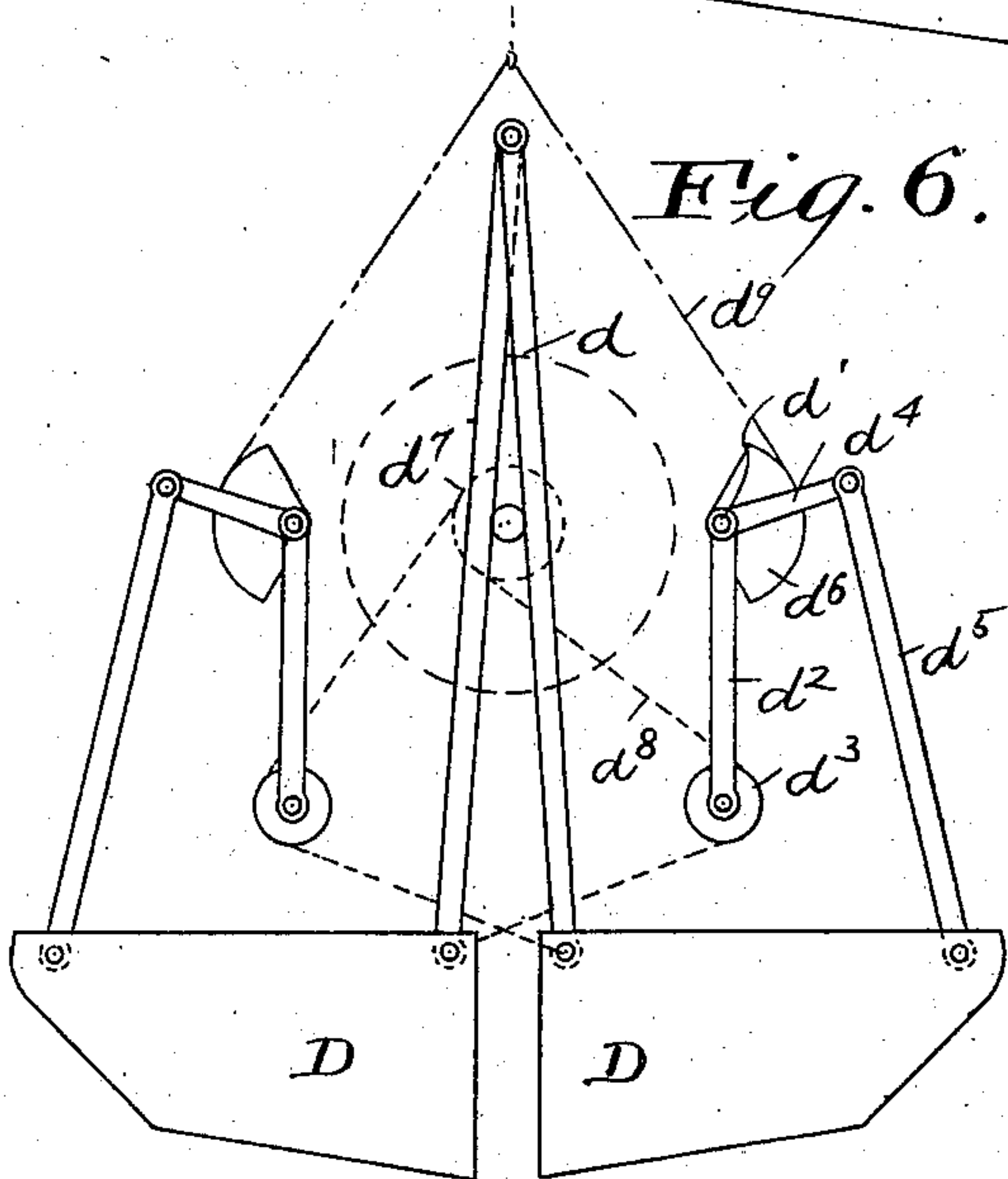
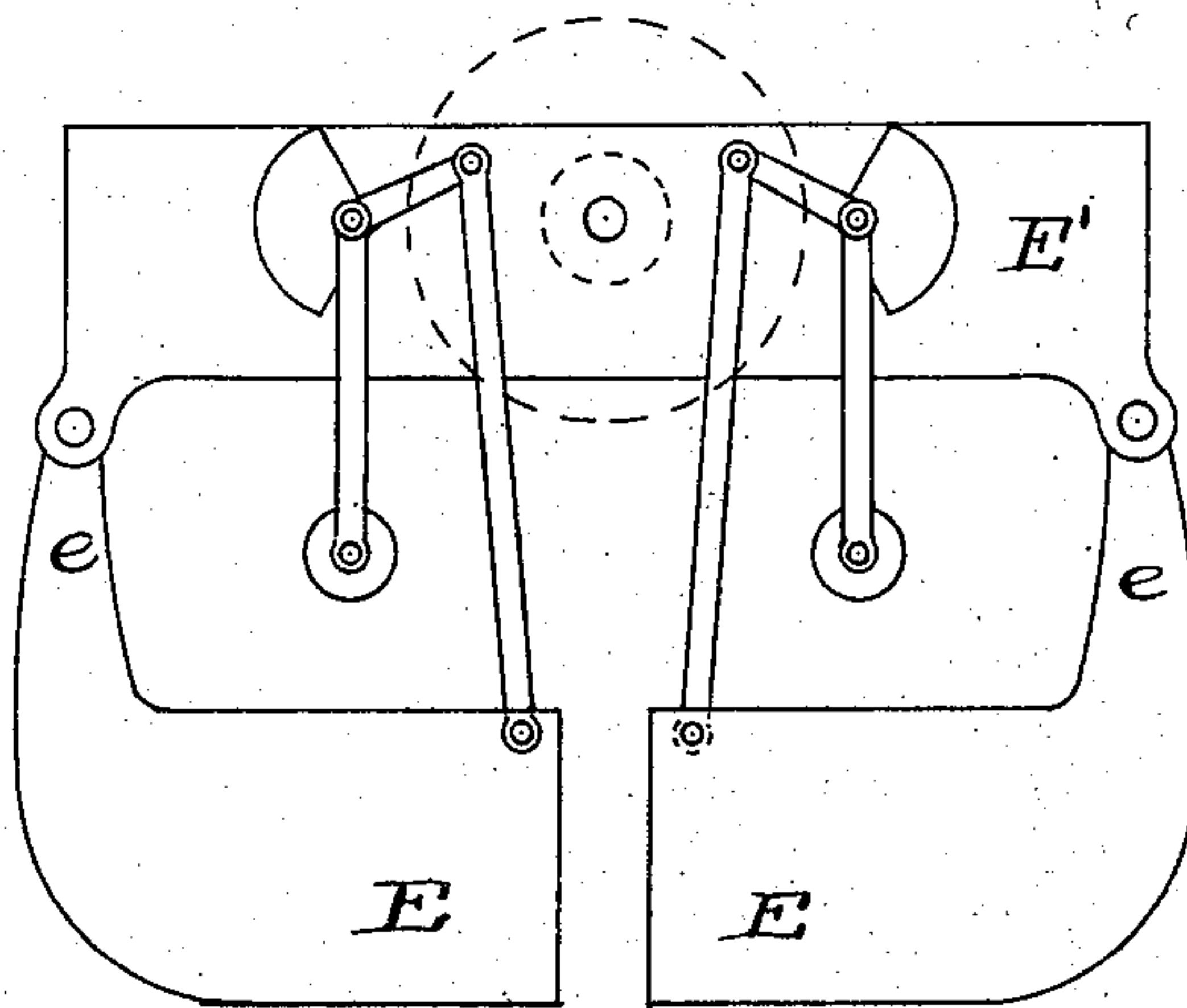


Fig. 7.



Witnesses.
E. B. Gilchrist
H. M. Wise

Inventor.
Cecil L. Saunders;
By His Attorneys,
Thurston & Bates.

No. 734,433.

PATENTED JULY 21, 1903.

C. L. SAUNDERS.
HOISTING BUCKET.

APPLICATION FILED SEPT. 17, 1902.

NO MODEL.

4 SHEETS—SHEET 4.

Fig. 8.

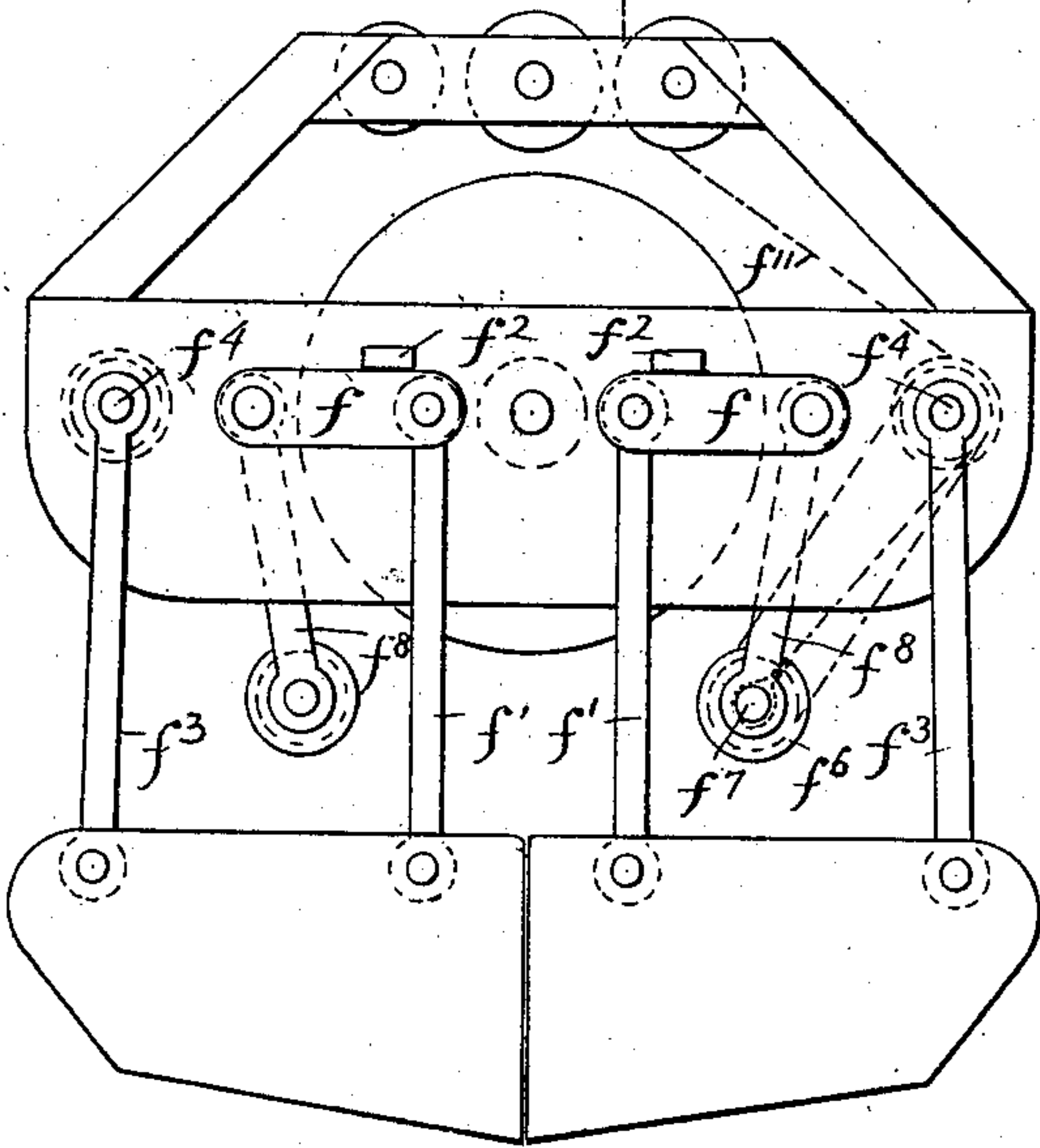


Fig. 9.

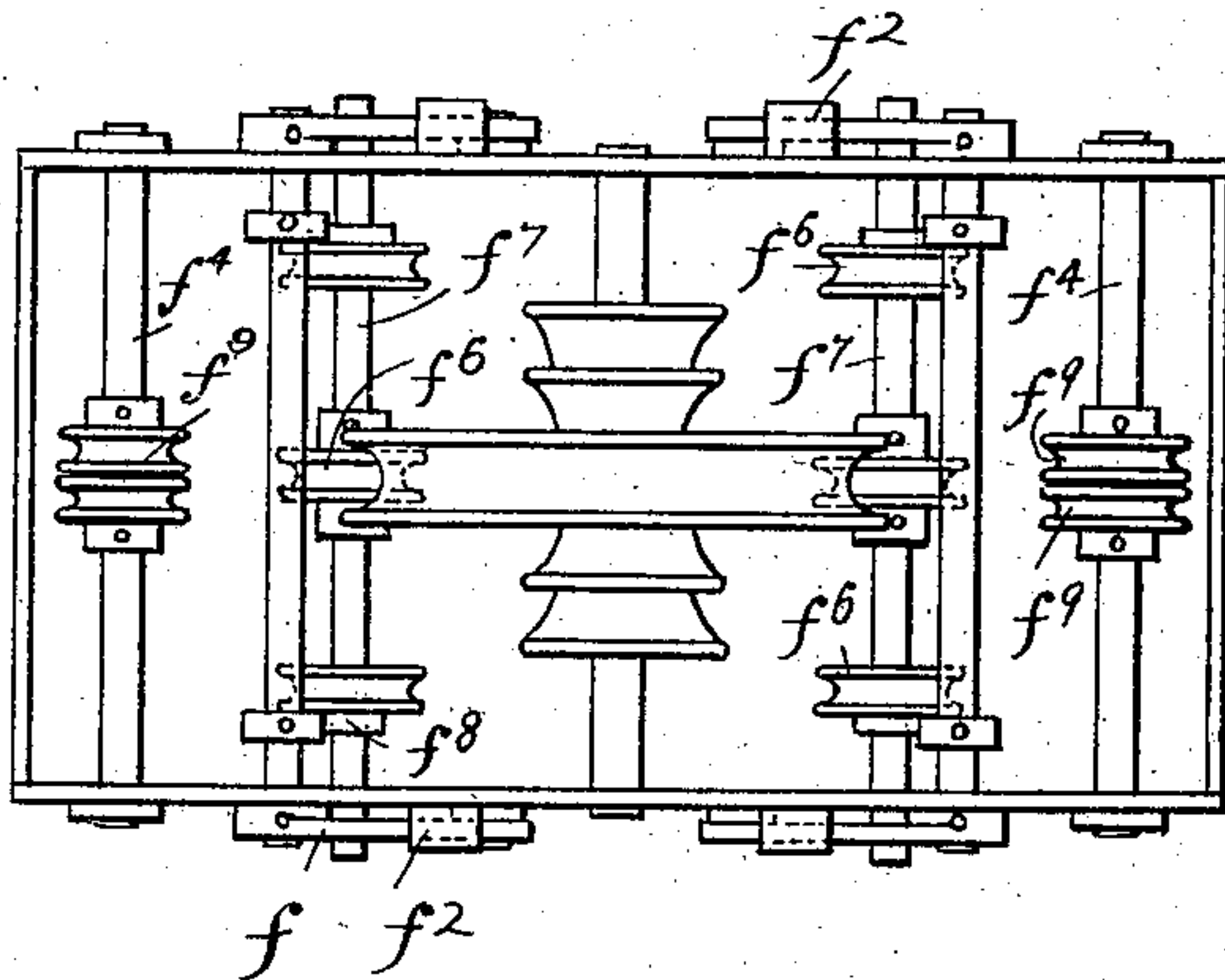
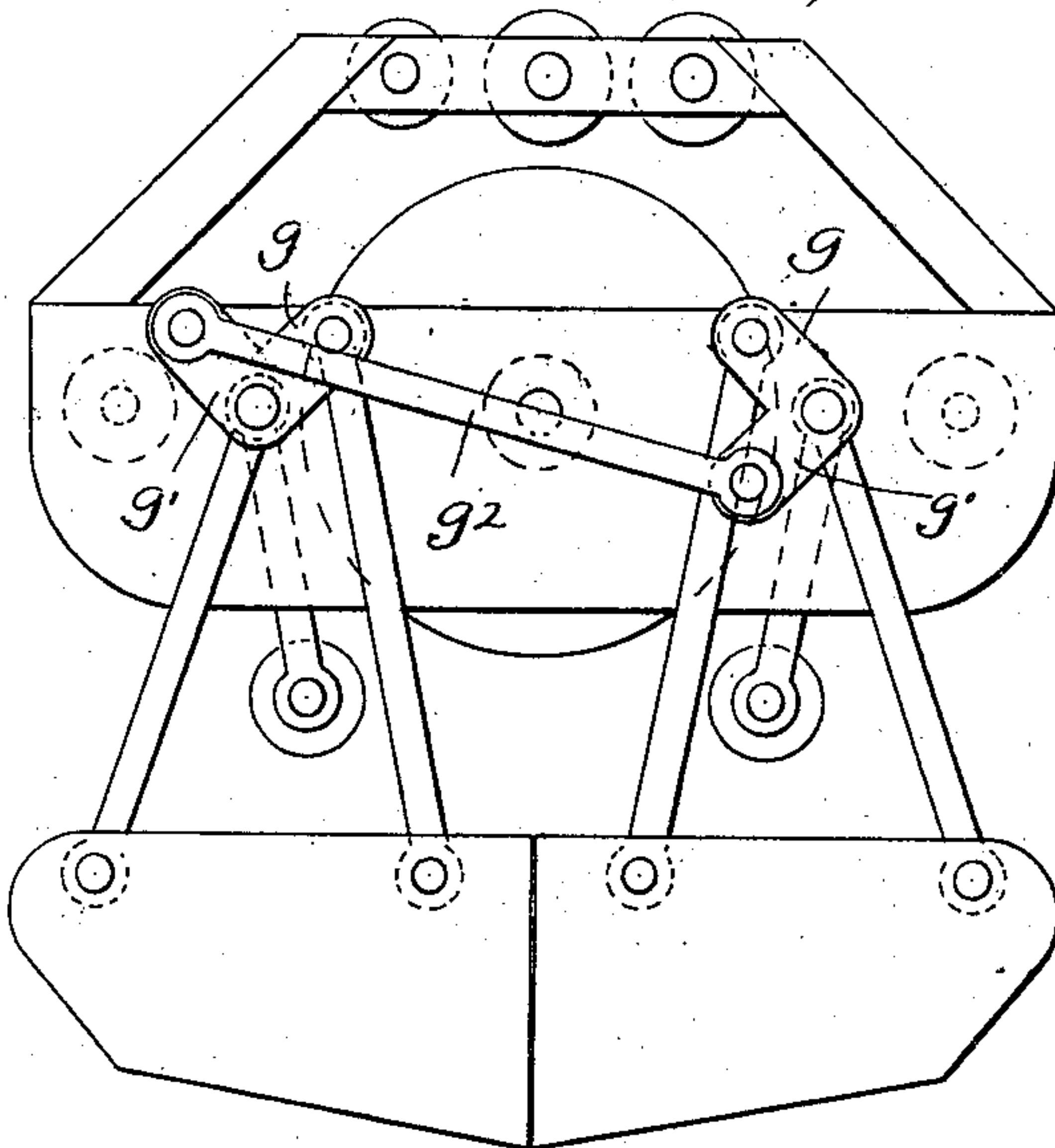


Fig. 10.



Witnesses.
E. B. Gilchrist
H. M. Voss

Inventor
Cecil L. Saunders,
By his Attorneys,
Thurston & Bates

UNITED STATES PATENT OFFICE.

CECIL L. SAUNDERS, OF CLEVELAND, OHIO, ASSIGNOR TO JOHN McMYLER,
OF CLEVELAND, OHIO.

HOISTING-BUCKET.

SPECIFICATION forming part of Letters Patent No. 734,433, dated July 21, 1903.

Application filed September 17, 1902. Serial No. 123,771. (No model.)

To all whom it may concern:

Be it known that I, CECIL L. SAUNDERS, a citizen of the United States, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented a certain new and useful Improvement in Hoisting-Buckets, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings.

It is customary to employ a bucket for unloading ore from cars and vessels, and these buckets frequently have two scoops which are drawn together in the ore by means of suitable ropes which are connected to any source of power. Buckets of this character heretofore have had certain disadvantages, the principal one of which is the fact that when the two scoops are drawn together it requires too much power, and many times the cutting edges of the scoops hang upon the floor-boards of the car or vessel and do not close completely, thus spilling the load and frequently not gathering any load at all, as well as injuring the floor.

It is the primary object of this invention to obviate these difficulties by arranging a bucket wherein the scoop will close in substantially a horizontal position and the cutting edges will slide upon the boards of the bottom of the car or vessel without injuriously scraping them.

It is also an object of the invention described herein to arrange the scoops so that they will form a chute or hopper when emptying the load in order that the discharge therefrom will be concentrated.

The invention may be best summarized as consisting in the construction and combination of parts to the above ends, as hereinafter described, and pointed out definitely in the claims.

Referring to the drawings, Figure 1 is a side elevation of my improved bucket closed. Fig. 2 is an end view thereof; Fig. 3, a side elevation of the bucket in an open position; Fig. 4, a section on line 4 4 of Fig. 3; Figs. 5, 6, and 7, diagrammatic views showing modified forms of my invention; Fig. 8, a side elevation of still another modification; Fig. 9, a top plan view of the bucket shown in

Fig. 8, and Fig. 10 a side elevation of still another modification.

Referring to the drawings by letters, A is a frame of substantially the form shown, having a head a , in which are mounted three sheaves a^1 , a^2 , and a^3 . In the frame A is also mounted the operating-drum a^4 , rigid with the shaft a^5 . Smaller drums a^6 a^7 are rigid upon this shaft a^5 for the purpose of receiving the ropes which close the bucket. Mounted in suitable bearings are two other shafts a^8 , one on either side of the drum a^4 . These shafts project from the outside of the frame a suitable distance for receiving links. Segments a^{10} are keyed to each of the shafts a^8 for the purpose of rocking the same, and arms a^9 are also keyed to the shaft a^8 adjacent to the frame and extend downward in the position shown in Fig. 1. Sheaves a^{11} are provided on the ends of these arms and rotate upon a shaft a^{15} , which extends from one arm on one side of the frame to a corresponding arm on the opposite side thereof and project a sufficient distance from either side to engage the links which support the scoops.

On the ends of the shafts a^8 are keyed short arms a^{12} , to which are pivoted links a^{13} . These links are in turn pivoted to the forward portion of the scoops B. Links a^{14} are loosely mounted upon the ends of the shafts a^8 and are pivoted in turn to the rear portion of the scoops B. There are two arms a^9 and two short arms a^{12} for each one of the shafts a^8 . There are also two sets of the links a^{13} and a^{14} on either side of the frame and connected to the scoops.

The operating-ropes are connected to the scoops in the following manner: The closing-rope b passes down in the groove of the sheave a^3 and around the drum a^4 several turns. Separate ropes b' are connected from each one of the smaller drums around the corresponding sheave on one of the arms a^9 and fastened to the opposite scoop adjacent to the pivotal point of the link a^{13} . The arrangement of the closing-rope b and the ropes b' is such that when the power is applied to the former each of the ropes b' will be wound upon their respective drums and the scoops will be drawn together.

The opening means which is provided in this instance consists of a single rope having two portions $b^2 b^3$, which pass in opposite directions around the sheaves $a' a^2$. One of these ropes is fastened to one of the segments a^{10} , and the segments are so keyed upon the shaft a^8 that when the bucket is in a closed position power applied to the rope will rock each shaft a^8 until the ends of the shaft a^{15} engage the two links a^{14} , fastened to the rear of the scoops, and pull the same until each scoop is in the position shown in Fig. 3, the ropes b' having been unwound from the small drums and the closing-rope b having been wound upon the large drum a^4 . The bucket is now in position to take its load.

The bucket in its open position is let down into the ore or other material and power applied to the closing-rope b . The rope b will tend to unwind from the drum a^4 , and the unwinding of this drum rotates the same, and hence rotates the small drums on either side thereof. This operation winds the ropes b' upon said small drums, pulling each rope around its sheave a^{11} and exerting the pulling force upon the forward end of the opposite scoop. It will be seen that upon the first pull of the rope b' on the sheave a^{11} the arms a^9 will rock the shafts a^8 until the ends of the shafts a^{15} engage the forward links a^{13} , bringing the scoops into the position shown in Fig. 3 in dotted lines. Then the buckets will be drawn substantially upon the shafts a^8 as a pivot until the short arms a^{12} engage the stops a^{16} , secured to the side of the frame, when the arms a^9 will be held from further inward movement and the rope b' will pull the scoops closed. When the short arms a^{12} strike the stops a^{16} and the scoops are being closed by the ropes b' , the movement is substantially horizontal, as indicated by the dotted line b^9 in Fig. 3, thus allowing the cutting edges of the scoops to travel toward each other and cut through the material rather than scrape it up, which would be the result should the scoops not be thrown into this horizontal position.

In the modification shown in Fig. 5 two cross-shafts C' and C^4 are provided on each side of the center, and arms $c' c^4$, carrying sheaves $c' c^2$, are keyed to each one of these shafts. Short links C^2 and C^3 are also keyed to the shafts C^4 and C' and are connected by links c^3 and c^6 to the front and rear of each scoop C . The closing-ropes c^5 in this instance pass from each one of the small drums c^7 on the main shaft c^8 , out to the sheave c^2 on the furthest arm c^4 , across to the sheave c on the innermost arm c' on the opposite side of the center, and from thence to the front end of the scoop.

Fig. 6 is also a modification, showing the front ends of the scoops D supported by the links d , pivoted at their upper ends to the frame. (Not shown.) A cross-shaft d' is mounted on each side of the center of the frame. To each one of these shafts d' is keyed

an arm d^2 , carrying a sheave d^3 , and a short arm d^4 , which is connected by a link d^5 to the rear end of each scoop. Each one of the opening-ropes d^9 in this instance passes down around a segment d^6 , mounted upon one of the shafts d' . The closing-ropes d^8 pass from the small drums d^7 around their respective sheaves d^3 to the forward ends of the scoops.

In the construction shown in Fig. 7 the parts are similar to those described in Fig. 1, with the exception that the scoops E have upwardly-extending portions e , which are pivoted to the frame E' .

Figs. 8 and 9 represent another modification and show the short arms f of such a length and in such a position that the links f' , connecting them with the forward ends of the bucket, are in substantially a vertical line, and they also show the links $f^3 f^3$, which support the rear ends of the scoops, pivoted at a point on the frame which is separate from the pivotal point of the short link. It will be seen from these figures that when the short arms engage the stops f^2 each scoop will then cease to go down into the material, but will slide in flat. In this construction a shaft f^4 is provided at each end of the frame and extends out beyond the sides thereof, so as to form a pivot for the links f^3 . Upon each of the shafts f^4 are two idle sheaves $f^9 f^9$. Each pair of these sheaves, with the idle sheaves f^6 upon the shaft f^7 at the lower ends of the arms f^8 , forms a construction for a three-part line for pulling upon the arms f^8 . In operating the bucket according to this construction each opening-rope f^{11} is passed around its respective sheave in the head, around one of the sheaves on the shaft f^4 , around the sheave f^6 upon the shaft f^7 , back again to the other sheave upon the shaft f^4 , and is secured to the shaft f^7 .

Fig. 10 is still another modification and shows the bucket constructed along the lines of that shown in Fig. 1, except that the short arms g are provided with other short arms g' , which are connected by links g^2 for the purpose of closing the scoops in unison. It will be seen from this construction that any movement of either of the short arms g will be conveyed to the other through this link g^2 .

I claim—

1. In a hoisting-bucket, the combination with the frame of a power-driven shaft, a scoop, two links pivoted to the frame and pivoted to said scoop, one in advance of the other, and connections between said power-driven shaft and said scoop to cause it to be first shifted upon the lower end of the rear link as a pivot and then shifted upon the pivots of both of said links, substantially as described.

2. In a hoisting-bucket, the combination with the frame of an operating-shaft, scoops, links pivoted to said frame and also pivoted to said scoops, mechanism for controlling the forward ends of said scoops, whereby they will form a hopper when being emptied and

whereby they will travel flat when being closed, and connections between said operating-shaft and said scoop-controlling mechanism substantially as described.

5 3. In a hoisting-bucket, the combination with the frame, of scoops pivoted to said frame, a rock-shaft provided in each end of the frame, connections between said rock-shaft and the front ends of said scoops for
10 controlling the same, whereby the front ends may be dropped when opened and whereby the scoops will travel in substantially flat when being closed, and means for operating said rock-shaft, substantially as described.

15 4. In a hoisting-bucket, the combination, with the frame, of scoops pivotally carried by said frame, arms pivotally carried by said frame, links connecting said arms with the forward ends of said scoops, and means
20 for moving said arms so as to drop the front of said scoops when they are being opened, substantially as described.

5 5. In a hoisting-bucket, the combination, with the frame, of scoops, links pivoted to
25 said frame and also pivoted to said scoops near their rear ends, arms pivotally carried by said frame, other links connecting said arms and the forward ends of said scoops, and means for moving said arms to raise the
30 front edge of the bucket as it is being closed, substantially as described.

6. In a hoisting-bucket, the combination, with the frame, of scoops, links pivoted to
35 said frame and also pivoted to said scoops at their rear ends, a rock-shaft mounted in either end of said frame, short arms rigid on said rock-shafts, links connecting said short arms and the forward ends of said scoops, means for rocking said shaft so as to drop
40 the front of said scoops when they are being opened and so as to bring the buckets in substantially flat when being closed, substantially as described.

7. In a hoisting-bucket, the combination,
45 with the frame, of scoops pivotally carried thereby, arms pivotally carried by the frame, links connecting said arms to the forward ends of said scoops, other arms rigid with the arms first mentioned, said latter arms being adapted to swing some distance inde-
50 pendently of said links or engage the same, and means for moving said last-mentioned arms, substantially as described.

8. In a hoisting-bucket, the combination,
55 with the frame, of scoops, links pivoted to the rear ends of said scoops, said links being in turn pivoted to the frame, a rock-shaft mounted in each end of said frame, short arms rigid with said rock-shafts, links pivoted to said
60 short arms and to the forward ends of said scoops, arms pivoted to said rock-shafts for operating the same, means for operating said

arms, and suitable stops for said short arms, substantially as described.

9. In a hoisting-bucket, the combination, 65
with the frame, of scoops pivotally carried thereby, arms pivotally carried by the frame, links connecting said arms to the forward ends of said scoops, other arms rigid with the
70 arms first mentioned, said latter arms being adapted to swing some distance independently of said links or engage the same, sheaves on the ends of said last-mentioned arms, and cables playing around said sheaves, substan-
75 tially as described.

10. In a hoisting-bucket, the combination, with the frame, of scoops pivotally carried at
80 their rear thereby, links supporting the forward ends of said scoops, arms to operate said scoops, sheaves in the ends of said arms, cables playing around said sheaves, a pair of drums adapted to wind in said cables, and means for rotating said drums, substantially
as described.

11. In a hoisting-bucket, the combination, 85
with the frame, of rock-shafts in either end of the same, links also pivoted to either end of said frame, scoops pivoted at their rear ends to said links, short arms carried by said
90 rock-shafts, links between said short arms and the forward ends of said scoops, other arms carried by said rock-shafts, sheaves on the ends thereof, a closing-drum mounted in said frame, small drums rigid with said clos-
95 ing-drum, ropes adapted to be wound upon said small drums and passing around said sheaves and secured to the forward ends of said scoops, said ropes being adapted to operate said rock-shafts in one direction to close
100 the bucket, means for rocking said shaft in the contrary direction, and suitable stops for said short arms, substantially as described.

12. In a hoisting-bucket, the combination, with the frame, of a closing-drum mounted
105 in said frame, smaller drums rigid with said drum, a rock-shaft at either end of said frame, links pivoted upon said rock-shaft, scoops pivoted to the lower ends to said links, short arms on said rock-shafts, links connecting
110 said short arms with the forward ends of said scoops, operating-arms also on said rock-shaft, sheaves carried by said operating-arms, a segment on each one of said rock-shafts, suitable ropes secured to said small drums and passing around said sheaves and connected
115 to the forward ends of said scoops, substantially as described.

In testimony whereof I hereunto affix my signature in the presence of two witnesses.

CECIL L. SAUNDERS.

Witnesses:

ALBERT H. BATES,
B. W. BROCKETT.