

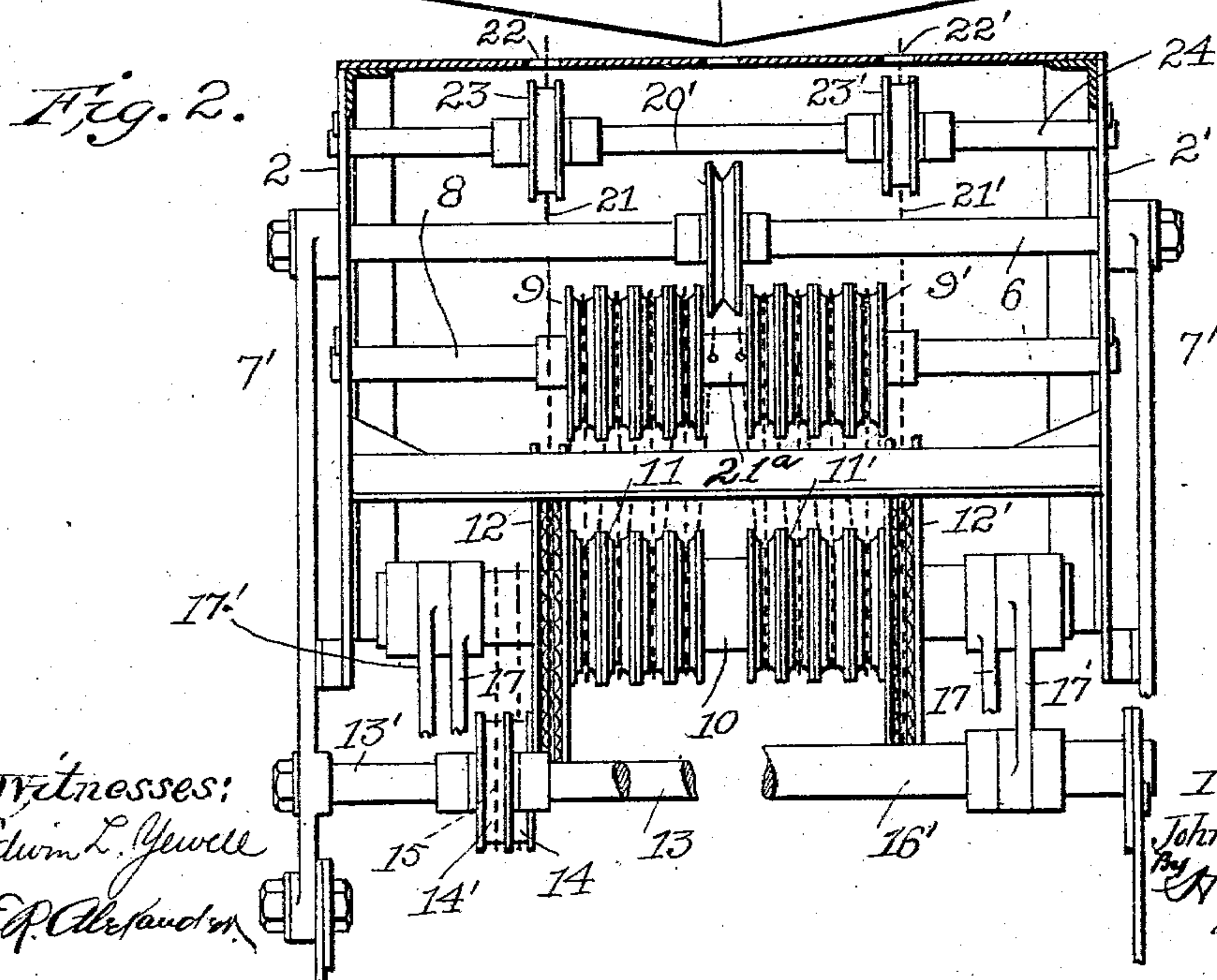
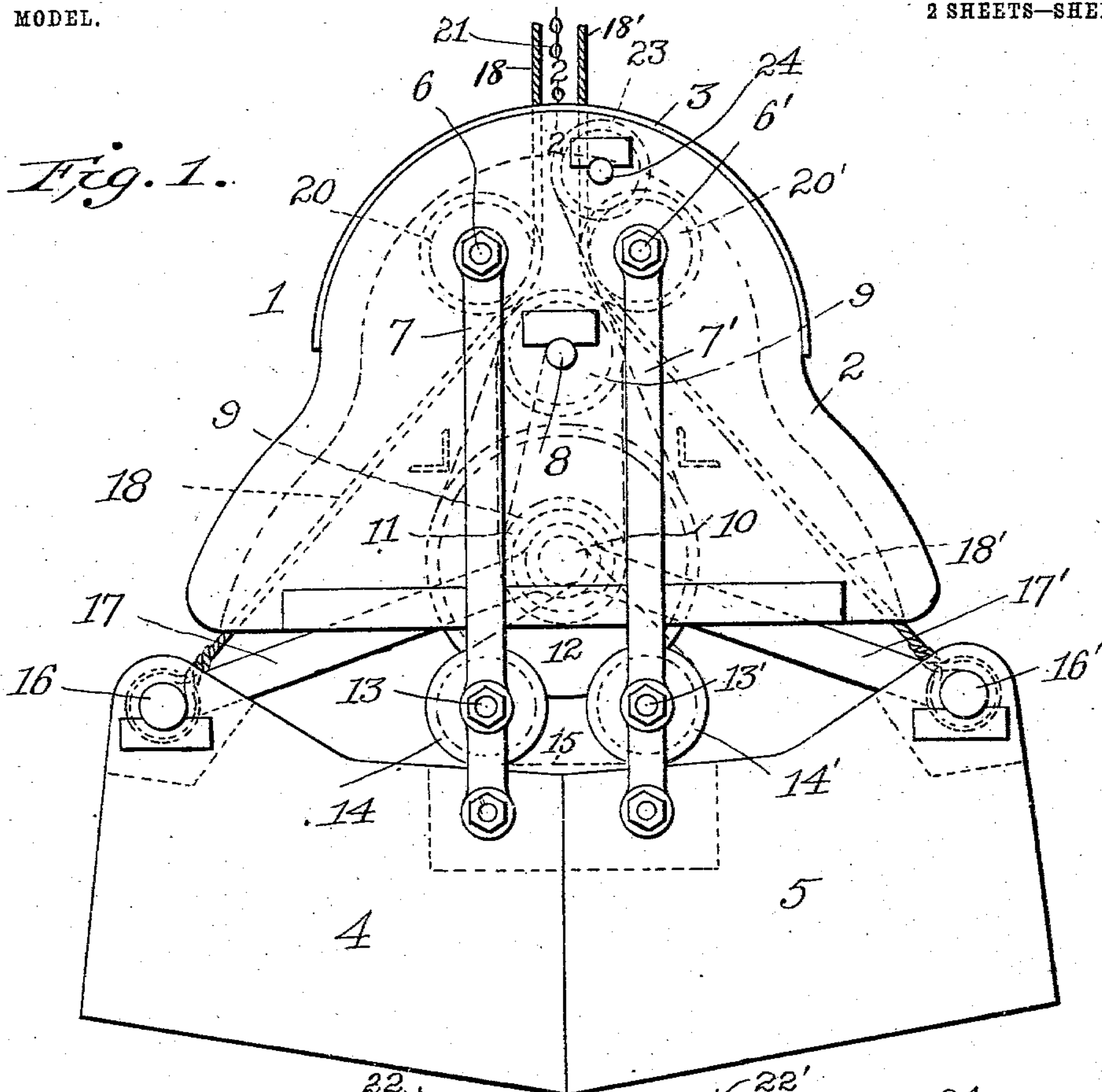
No. 751,956.

PATENTED FEB. 9, 1904.

J. C. SLOCUM.  
CLAM SHELL BUCKET.  
APPLICATION FILED DEC. 19, 1903.

NO MODEL.

2 SHEETS—SHEET 1.



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2 SHEETS—SHEET 2.

Fig. 3.

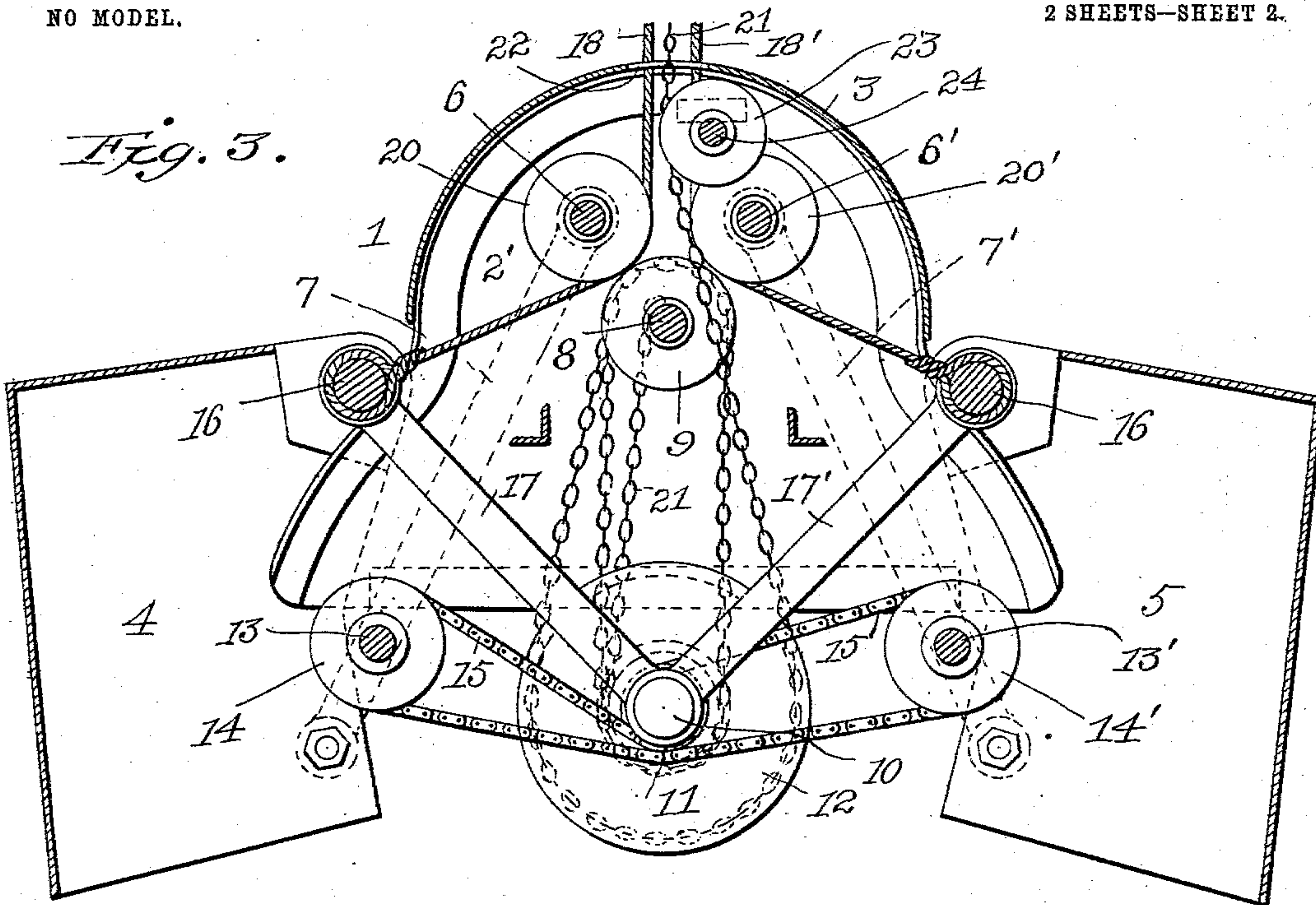
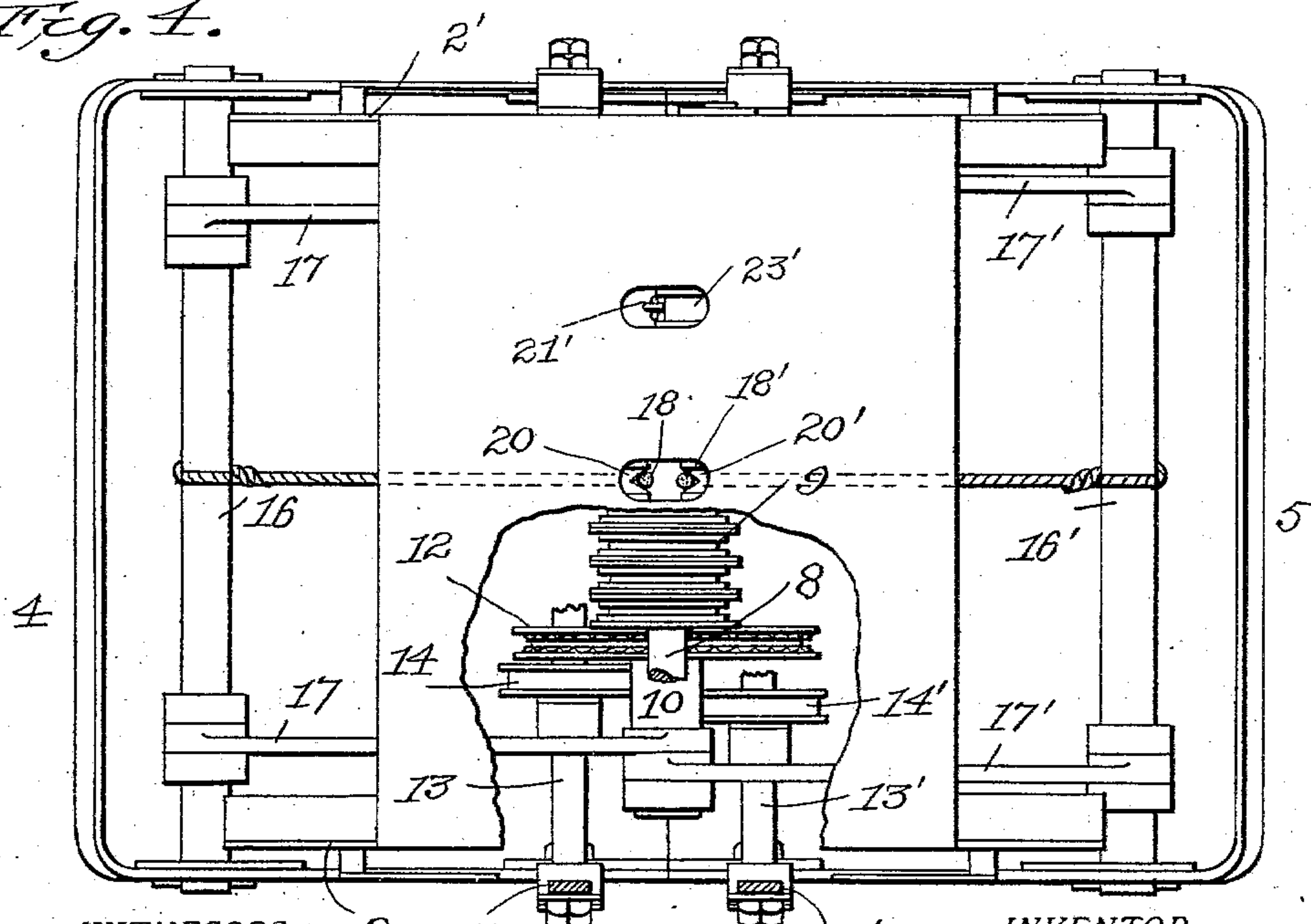


Fig. 4.



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# UNITED STATES PATENT OFFICE.

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## CLAM-SHELL BUCKET.

SPECIFICATION forming part of Letters Patent No. 751,956, dated February 9, 1904.

Application filed December 19, 1903. Serial No. 185,788. (No model.)

*To all whom it may concern:*

Be it known that I, JOHN C. SLOCUM, a citizen of the United States, residing at Columbus, in the county of Franklin and State of Ohio, have invented certain new and useful Improvements in Clam-Shell Buckets, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to improvements in clam-shell and grab buckets, the object being to provide a mechanism of this sort having its parts so constructed and arranged that the bucket is capable of large carrying capacity and so supported that it can be operated with a minimum of power, together with power parts capable of transmitting a high closing force with the utmost economy.

Figure 1 is a side elevation of a clam-shell bucket embodying my improvements. Fig. 2 is a section on line 2 2 of Fig. 1. Fig. 3 is a view, partly in section, showing the positions of the parts when the scoops are separated to the utmost to receive a load. Fig. 4 is a plan view of the bucket with the frame parts partly broken away. Fig. 5 is a detail view of the chain for controlling the front ends of the scoops.

In the drawings, 1 indicates a supporting-frame for the scoops or buckets, it having the side walls 2 2 and the top wall 3. Preferably this frame is approximately the shape shown—that is to say, so as to flare or widen from the top downwardly.

4 and 5 indicate the scoop or bucket sections, which are movably suspended from the above-described frame.

6 6' are horizontal shafts having their ends secured in the side walls 2 2 of the frame near the top thereof. Upon these are supported or to them are pivoted the upper ends of the links 7 7', which at their lower ends are pivotally connected to the inner ends of the scoops 4 and 5, respectively.

8 is a shaft arranged horizontally and having its axis situated in the central transverse planes of the mechanism, preferably at a point below the shafts 6 6', this shaft having its ends

secured in the side walls 2 2 of the frame. It carries two sets of loosely-mounted pulleys 9 9'.

10 is a horizontally-arranged suspended shaft adapted to move down and up in a path between the side walls of the frame, it first receding downwardly from and then approaching the stationarily-arranged shaft 8. It is also provided with two sets of loosely-mounted pulleys 11 11', the pulleys of these sets being respectively situated beneath the corresponding pulleys of the sets 9 9' of the shaft 8. Each pulley of each of the lower sets is correlated with and coöperates with a corresponding pulley of one of the upper sets. The shaft 10 is also provided with two power-wheels 12 12', rigidly secured to it and preferably situated outside of the sets of pulleys 11 11', respectively.

13 13' are transversely-arranged shafts having their ends supported by the pairs of links 7 7', respectively.

14 14' are chain-wheels arranged on the shafts 13 13', respectively. The wheels 14 14' are arranged in vertical longitudinal planes outside of the vertical longitudinal planes of the power-wheels 12 12', respectively.

15 is a chain used for closing or drawing together the scoops 4 and 5. This chain is fastened at each end to the shaft 10 and passes around the wheels 14 14'. It controls the front ends of the scoops during their closing movements.

16 16' are shafts or bars secured to the rear ends of the scoops 4 and 5, respectively.

17 17' are controlling-links for the heels of the buckets, those at 17 having their outer ends pivotally connected to the shaft or bar 16 and those at 17' being similarly connected to the shaft or bar 16'. The inner ends of all the links 17 17' are pivotally mounted on the said shaft 10 preferably outside of the vertical longitudinal planes of the chain 15.

18 18' are the opening-ropes for the scoops 4 and 5, respectively. They are secured to the shafts or bars 16 16', respectively, and extend around antifricition guide-sheaves 20 20',



mounted on the shafts 6 6', and thence said ropes extend up through an aperture in the top wall of the frame to the point of support.

I prefer to use chains for operating the power-wheels and system of pulleys which control the closing of the buckets. These chains (indicated by 21 21') have their lower ends secured to some fixed point within the frame. I have shown them secured to a collar 21<sup>a</sup>, secured to the shaft 8 between the series of pulleys 9 9' thereon. From this collar 21<sup>a</sup> they are carried downward around the innermost pulleys of the sets of pulleys 11 11', respectively. Thence they are carried upward around the innermost pulleys of the sets on the shaft 8 and then to the second pulleys of the sets on the shaft 10, and so on in the well-known manner of the ropes in a block-and-tackle system. Finally they are carried around the power-wheels 12 12', respectively, the peripheries of which are grooved and indented; as shown, in order to provide gripping-surfaces, with which the chain-links engage to cause the rotation of the shaft 10 as it is drawn up relative to the shaft 8 and to the bucket-frame. These closing-chains extend up through the apertures 22 22' in the top wall 3 of the frame, being guided thereto by the antifriction-sheaves 23 23', respectively, loosely mounted on a transversely-arranged shaft 24, which has its ends rigidly secured to the side walls 2 2 of the frame.

The operation of the bucket is as follows: Assuming the bucket to be closed, as shown in Fig. 1, the operator applies power to the opening-ropes 18 18', causing the heel ends of the buckets to be raised, at the same time permitting the chains or ropes which control the closing devices to be paid out, thereby allowing the shaft 10 to move downward away from the shaft 8, unwinding as it so moves the chain 15, so as to permit the scoops or bucket-sections 4 and 5 to swing to the position shown in Fig. 3. The entire bucket structure is then permitted to descend into the material to be scooped up. Power is next applied to the closing-chains 21 21'. It is transmitted through the power-wheels 12 12' to the shaft 10, which is thereby caused to revolve and wind up the chain 15, which draws the scoops or bucket-sections together. This same application of power tends to draw the shaft 10 upward relative to the shaft 8, the transmission being effected through the system of cooperating pulleys on the two shafts, respectively.

I believe myself to be the first to have provided a clam-shell bucket in which use is made of a system of cooperating pulleys for reducing the power necessary to cause the closing of the scoops or buckets and in which both the vertical and rotary motion of one of the

pulley-carrying shafts is utilized for closing the scoops or buckets.

It will be noted that the closing of the scoops or bucket-sections is effected through a train of closing devices comprising rotary elements on the shaft 8, which are fixed against vertical movement relative to the frame and the rotary elements on the shaft 10, which are adapted to move up and down relative to those on the shaft 8. When the buckets are in the position shown in Fig. 3, ready to receive a load, the power applied through the closing-chains 21 21' tends to draw the shaft 10 upwardly relative to the shaft 8 and also to rotate said shaft 10. The vertical movement of the said shaft 10 causes the links 17 17' to impart an outward thrust to the heel ends of the buckets 4 and 5, respectively, while the rotation of the said shaft tends to wind up the chain 15, which pulls the front ends of the buckets together. The front and heel ends of the scoops or bucket-sections are thus controlled during the closing operation by the movement of the shaft 10.

I claim—

1. The combination of the frame, two oppositely-arranged scoops or buckets, the links connecting the buckets with the frame, the shaft adapted to move up and down relative to the frame and means connecting said shaft with both the heel and front ends of each bucket and adapted to impart a thrust upon the heel ends and a pull upon the front ends as the shaft is raised relative to the frame to close the buckets, substantially as set forth.

2. The combination of the frame, two oppositely-arranged buckets supported therefrom, the shaft for controlling the closing of the buckets, adapted to move up and down relative to the frame, and means connecting said shaft both with the heel and front ends of each bucket and adapted to impart a thrust upon the heel ends and a pull upon the front ends of the buckets as said shaft is drawn upward relative to the frame, substantially as set forth.

3. The combination of the frame, two oppositely-arranged buckets supported therefrom, the shaft for controlling the closing of said buckets and adapted to move up and down relative to said frame, the links connecting the said shaft with the heel end of each bucket, and winding chains or ropes connecting said shaft with the front end of each bucket, substantially as set forth.

4. The combination of the frame, the oppositely-arranged scoops or buckets, the shaft for controlling the closing of said buckets adapted to move up and down relative to the frame and to rotate about its axis during said movement, means connecting said shaft with the heel end of each bucket to impart a thrust thereto as the shaft is drawn upward relative to the frame, and means connecting said shaft with



the front end of each bucket adapted to pull them together as the shaft is drawn upward relative to the frame, substantially as set forth.

5 5. The combination of the frame, the two oppositely-arranged buckets supported therefrom, the shaft for controlling the closing movements of the buckets arranged to move up and down relative to the frame and to rotate about its axis during such movement, 10 means connecting said shaft with the heel end of each bucket adapted to impart a thrust thereto as the shaft is moved upward relative to the frame, winding chains or ropes connecting said shaft with the front end of each bucket and 15 adapted to be wound up on the shaft and to pull the front ends of the bucket together as said shaft is moved upward relative to the frame, substantially as set forth.

20 6. The combination of the frame, the two oppositely-arranged scoops or buckets, the supporting-links for each bucket, the shaft for controlling the closing movement of the buckets adapted to move up and down relative to the said frame, the supporting-shaft for the 25 said bucket-closing shaft, means connecting said bucket-closing shaft with the heel end of each bucket, and means connecting said shaft with the front end of each bucket, substantially as set forth.

30 7. The combination of the frame, the two

oppositely-arranged buckets or scoops, the principal links for supporting said scoops or buckets from the frame, the shaft for controlling the closing movements of the buckets adapted to move up and down relative to the 35 frame, means connecting said shaft with the heel end of each bucket and means connecting said shaft with said bucket-supporting links at points near the front ends of the buckets, substantially as set forth. 40

8. The combination of the frame, the two oppositely-arranged scoops or buckets, the links supporting said scoops or buckets from the frame, the shaft for controlling the closing movements of the buckets arranged to 45 move up and down relative to the frame, the shaft mounted in said frame and adapted to support said bucket-closing shaft, the thrust-links connecting said bucket-closing shaft with the heel end of each bucket, and the winding 50 chains or ropes connecting the said bucket-closing shaft with the said supporting-links for the buckets at points near the front ends of the said buckets, substantially as set forth.

In testimony whereof I affix my signature in 55 presence of two witnesses.

JOHN C. SLOCUM.

Witnesses:

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F. C. BOZENHARD.