

No. 725,794.

PATENTED APR. 21, 1903.

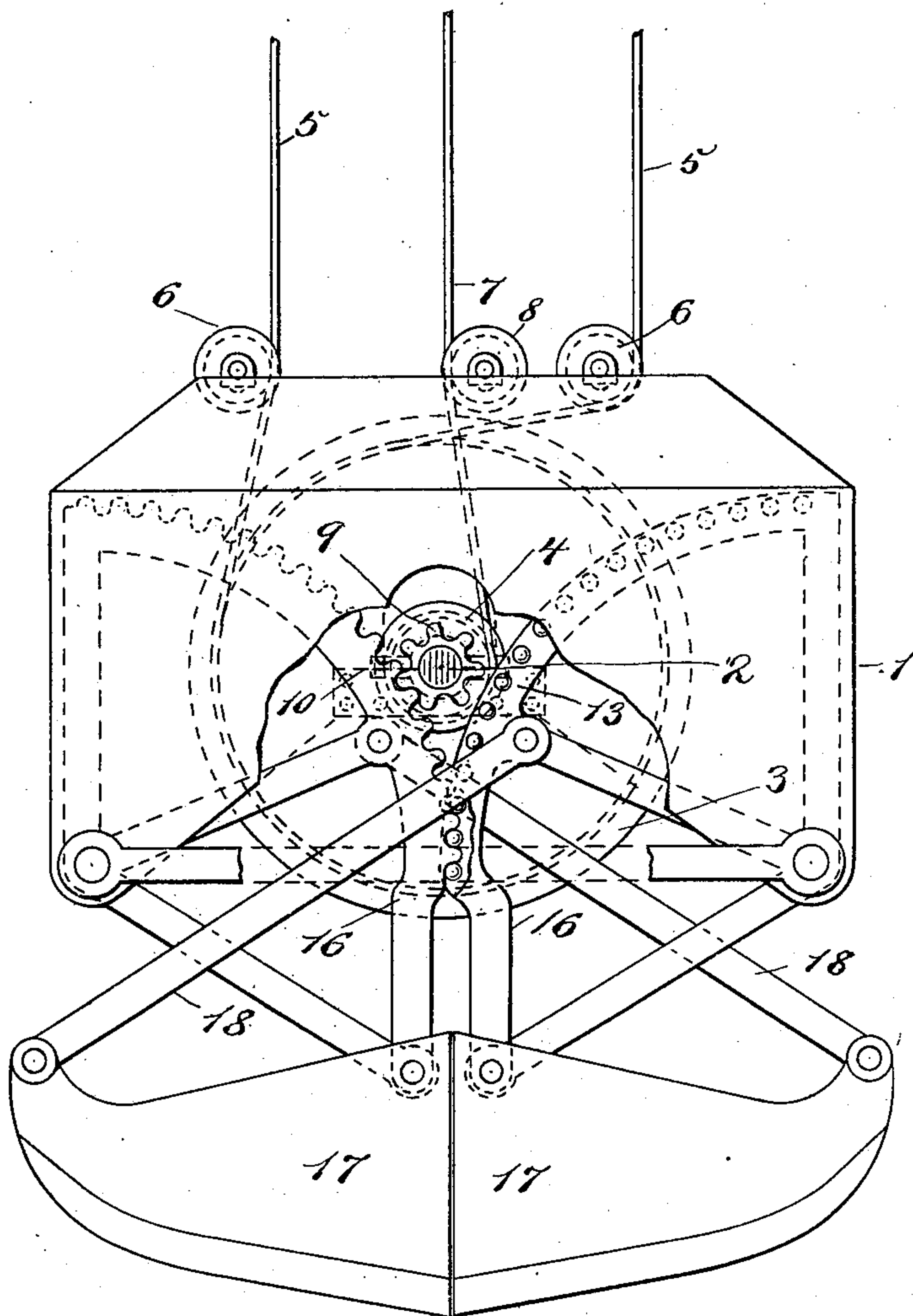
S. SWEDENBORG.
CLAM SHELL BUCKET.

APPLICATION FILED JAN. 14, 1903.

NO MODEL.

3 SHEETS—SHEET 1.

Fig. I.



Witnesses:

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B. Thompson.

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Swan Swedemborg,
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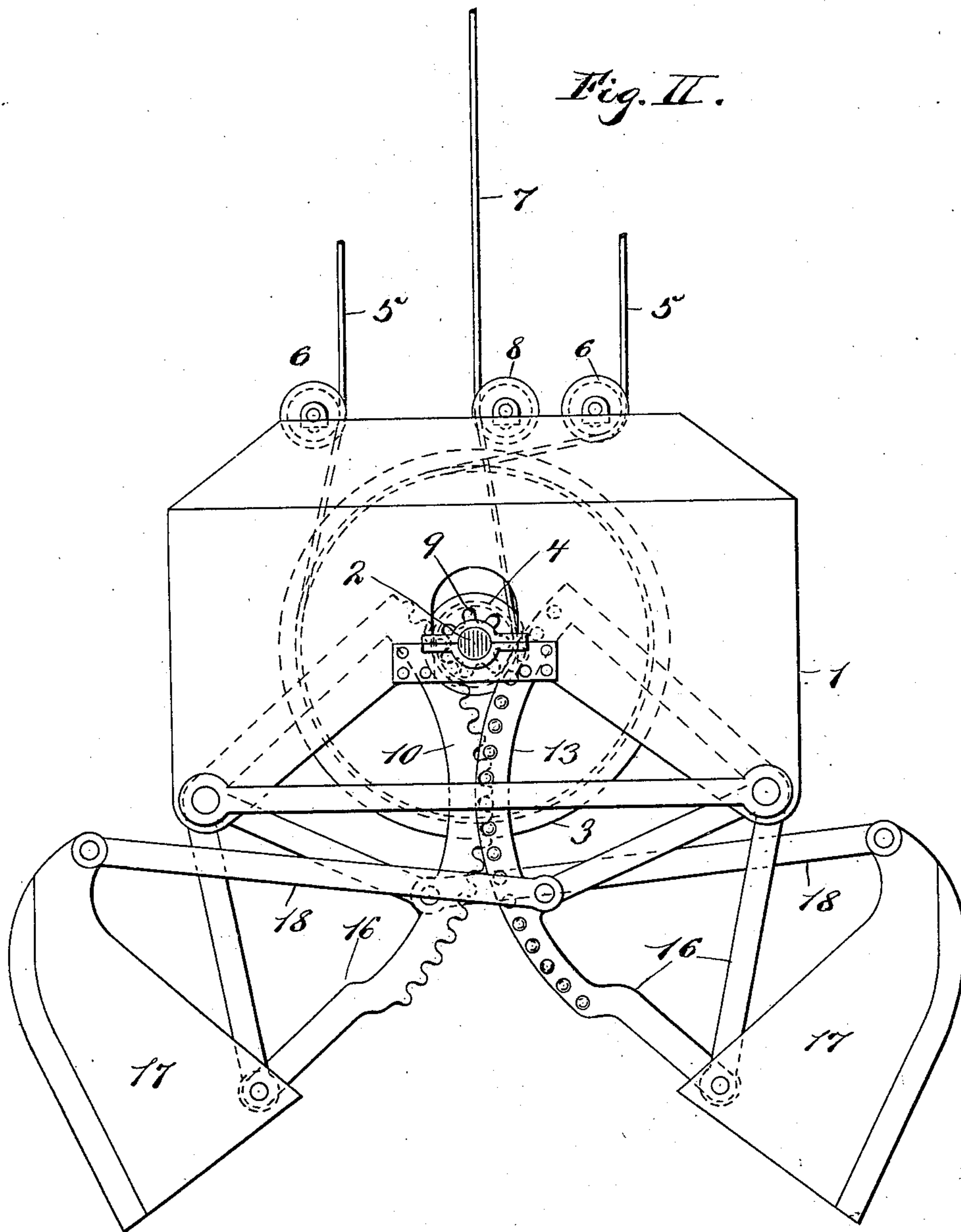
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3 SHEETS—SHEET 2.



Witnesses:

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3 SHEETS—SHEET 3.

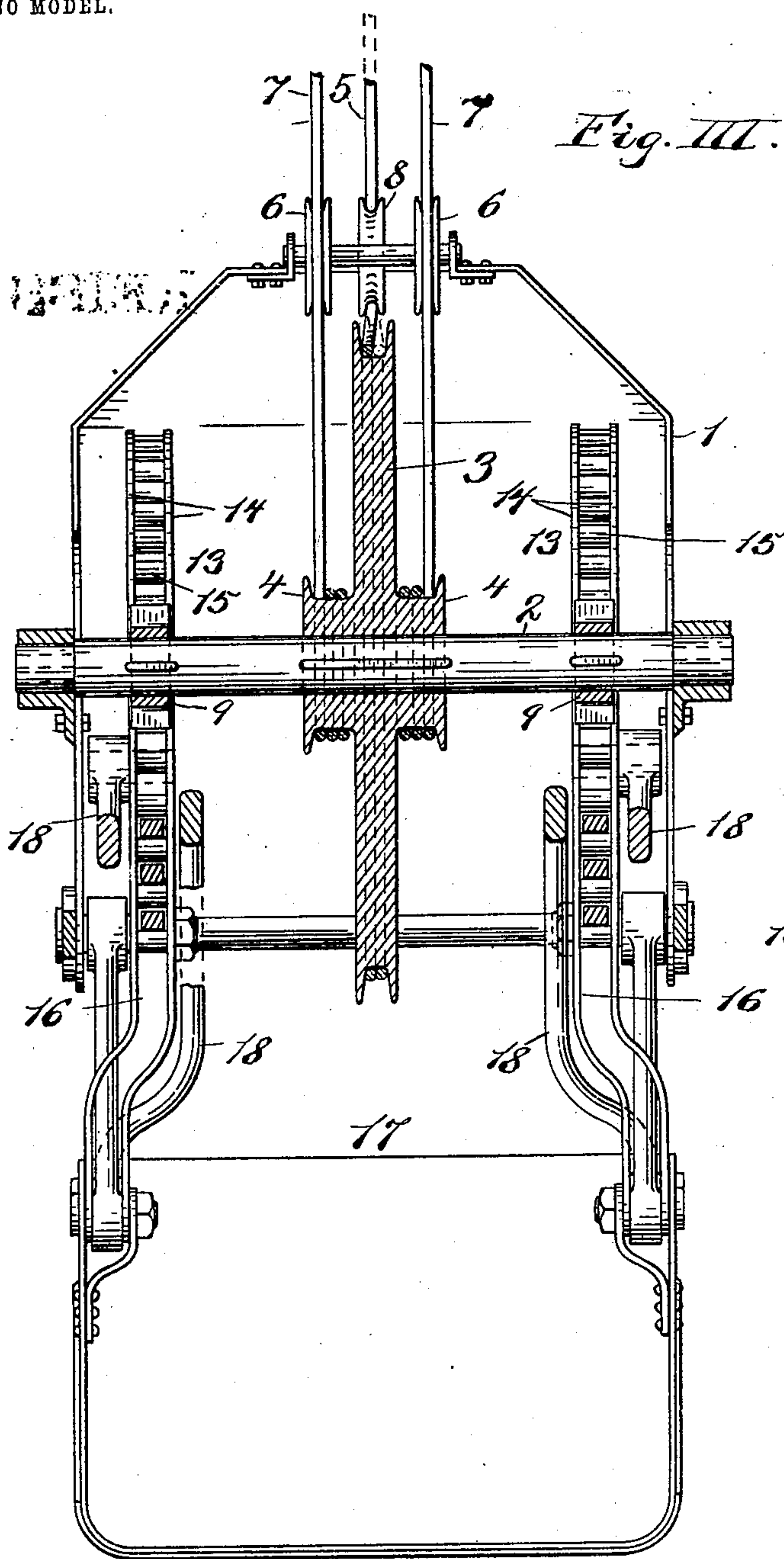


Fig. IV.

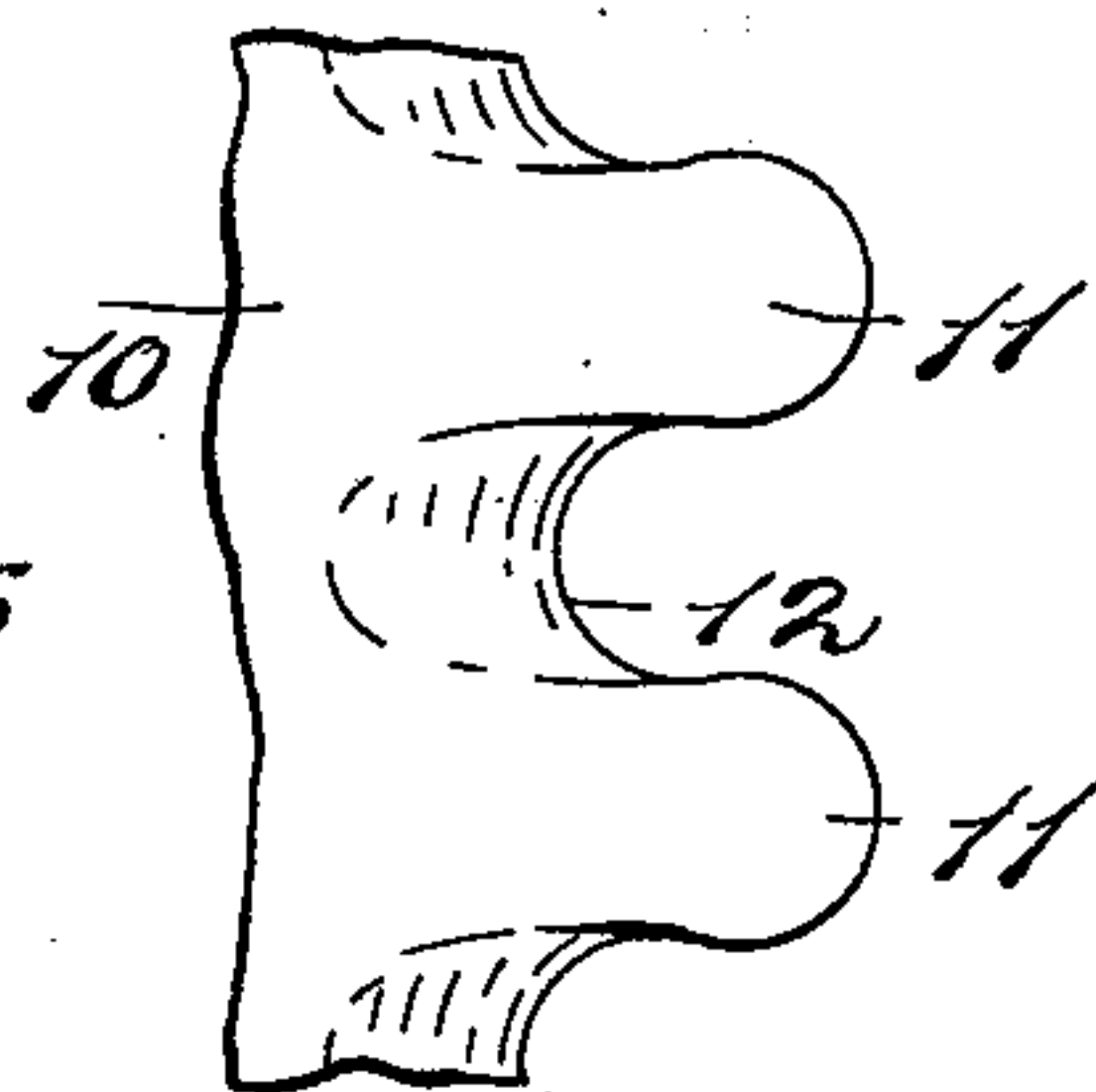
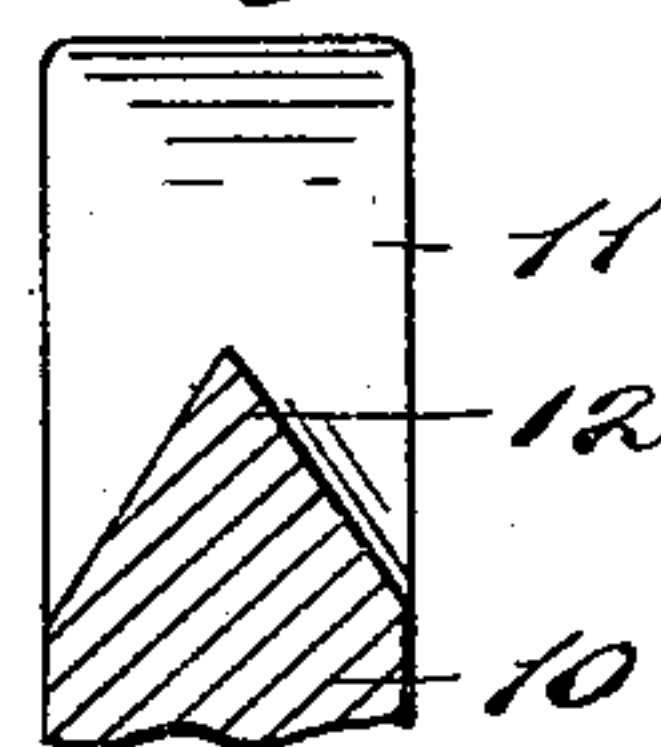


Fig. V.



Witnesses:

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UNITED STATES PATENT OFFICE.

SWAN SWEDENBORG, OF ASHTABULA, OHIO.

CLAM-SHELL BUCKET.

SPECIFICATION forming part of Letters Patent No. 725,794, dated April 21, 1903.

Application filed January 14, 1903. Serial No. 133,958. (No model.)

To all whom it may concern:

Be it known that I, SWAN SWEDENBORG, a citizen of the United States, and a resident of Ashtabula, county of Ashtabula, and State of Ohio, have invented certain new and useful Improvements in Clam-Shell Buckets, of which the following is a specification, the principle of the invention being herein explained and the best mode in which I have contemplated applying that principle, so as to distinguish it from other inventions.

The annexed drawings and the following description set forth in detail one mechanical form embodying the invention, such detail construction being but one of various mechanical forms in which the principle of the invention may be used.

In said annexed drawings, Figure I represents a side elevation of my improved clam-shell bucket, showing it closed; Fig. II, a similar view of the open bucket; Fig. III, a transverse section of the closed bucket; Fig. IV, a detail side view of the cogs of one of the quadrant-racks, and Fig. V a cross-section of the same.

The bucket has a frame or casing 1, in the middle of which is a transverse shaft 2, journaled in bearings in the sides of the frame. This shaft has a large pulley 3 at its middle and two smaller pulleys 4, one at each side of the large pulley. Two hoisting-ropes 5 are secured to the large pulley and may be wound upon the same, and said ropes are guided on guide-sheaves 6, journaled in the top of the frame, one near each end of the same. Two opening-ropes 7 are secured to and may be wound upon the two small pulleys and are guided by two guide-sheaves 8, journaled in the middle of the top of the frame. Two pinions 9 are secured upon the shaft, one near each end, and mesh with two cogged quadrant-racks 10, fulcrumed at the centers of their frames in the lower corner of the frame. These racks have cogs 11, the spaces between which are sharpened from the sides to an edge 12, as will be hereinafter more fully referred to. These quadrant-racks mesh with an opposed pair of quadrant-racks 13, fulcrumed at the centers of their frames in the opposite lower corner of the frame. These racks consist each of two parallel segmental bars 14, having short round rods 15 between

them to thus form open racks. The sector-shaped frames 16 of the racks extend a distance below the quadrant-racks, and the upper and inner corners of the clam-shell jaws 17 are pivoted to the lower corners of the frames. Links 18 are pivoted to the outer ends of the jaws and to the segments a distance from the lower ends of the racks. The outer ends of the jaws are curved upward, so as to bring the pivots of the links even with the pivots of the frames and jaws when the jaws are closed. The sides of the jaws are closed, and the bottoms of the jaws are preferably flat for about one-half of their length from their meeting edges, whereupon they curve upward, so as to allow the ore, coal, or dirt or whatever substance they are working in to easily slide outward as the jaws close into such substance.

In practice the hoisting-ropes are suitably connected to a hoisting-drum or other similar device, which may pay out or draw in upon said ropes in unison with the draft upon or release of the hoisting-ropes. We will assume that the bucket is open and resting with its open jaws upon the surface of the ore or coal pile or whatever other substance the bucket is operated upon. Draft is now exerted upon the hoisting-ropes, which will first rotate the large pulley and the pinions upon the same, the opening-ropes being free to pay out as they are wound upon the small pulleys. The revolving pinions will raise the cogged segments or quadrant-racks and the open quadrant-racks meshing with them. This will cause said racks to raise and draw together the inner ends of the jaws, closing them together in the substance between them, and the links will push outward upon the upturned outer ends of the jaws, forcing the latter into a horizontal position. The jaws will thus dig out of the substance the load to be hoisted, and when the jaws are closed the hoisting-ropes will hoist and support the full bucket until the latter is conveyed to the point of unloading. When the bucket is unloaded, it may be lowered toward the dump or held suspended over the same, and draft is exerted upon the opening-ropes to unwind them off from the small pulleys and to thus reverse the former movement of the pinions. This will open the jaws of the bucket, and the

links will draw upon the outer ends of the jaws to tilt them into a nearly-vertical position. After the bucket is emptied the same is again conveyed to a point above the point where it is to be loaded, whereupon the bucket is lowered, suspended by the opening-ropes, and the hoisting-ropes paying easily out until it again is ready to bite into the substance to be conveyed, when draft is again exerted upon the hoisting-ropes, the opening-ropes being easily drawn without draft upon their pulleys. Two hoisting-ropes and two opening-ropes are illustrated and preferably used on account of the better balance and greater steadiness attained for the bucket; but one rope of each kind may be used instead of two. When the bucket is operated in coal or ore or other lumpy substance, it may happen that lumps of the substance may get in between the racks as they close together. The sharp edges of the interdental spaces of the cogged rack will cut such lumps or throw them to one side, and small lumps may be easily forced through the open spaces between the cog-rods of the open rack.

The bucket opens and closes by positive movement and cannot be hoisted until completely closed. The hoisting-ropes acting upon the large pulley will close the jaws with great force and less speed and will hold them firmly closed, while the opening-ropes acting upon the small pulleys will open the jaws with great speed and by only using the slight force necessary.

Other modes of applying the principle of my invention may be employed for the mode herein explained. Change may therefore be made as regards the mechanism thus disclosed, provided the principles of construction set forth, respectively, in the following claims are employed.

I therefore particularly point out and distinctly claim as my invention—

1. In a clam-shell bucket, the combination

with two jaws, of a pair of opposed sectors having means for rocking them upon their opposed centers and having the inner ends of the jaws hinged at the lower ends of their segments, and links each pivoted to the outer end of a jaw and to the segment of the opposite sector.

2. In a clam-shell bucket, the combination with two jaws, of a pair of opposed sectors having segmental racks meshing with each other and fulcrumed to rock on opposed centers and having the inner ends of the jaws hinged at the lower ends of the segments, links each pivoted to the outer end of a jaw and to the segment of the opposite sector, and a pinion meshing with one of the segmental racks and having means for revolving it in opposite directions.

3. In a clam-shell bucket, the combination of two jaws 17, sector-shaped frames 16 fulcrumed on opposite centers and having intermeshing quadrant-racks 10 and 13 and having the inner ends of the jaws pivoted at the lower ends of such racks, links 18 pivoted to said racks and to the outer ends of the jaws, a shaft having pinions meshing with racks 10, a large pulley 3 upon said shaft, a hoisting-rope upon said pulley, a small pulley 4 upon the shaft, and an opening-rope upon said pulley.

4. In a clam-shell bucket, two quadrant-racks meshing with each other and actuating the jaws, one of said racks consisting of two parallel bars having short and round transverse rods to form an open rack and the other rack being cogged and having the spaces between the cogs formed with sharp edges.

In testimony that I claim the foregoing to be my invention I have hereunto set my hand this 27th day of December, A. D. 1902.

SWAN SWEDENBORG.

Witnesses:

SWAN FRIED,

OSCAR J. STRANG.