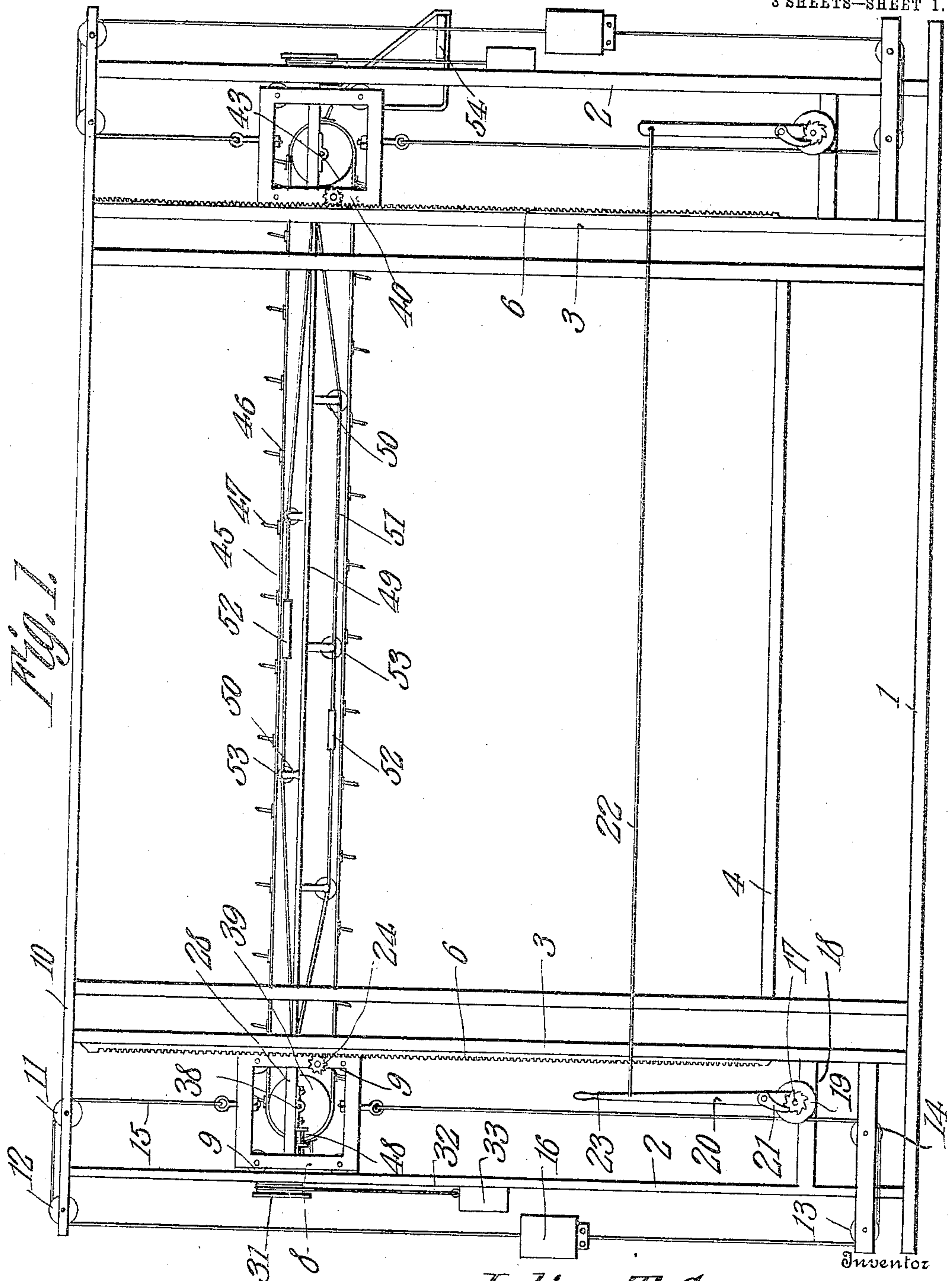


J. T. CAPERS.
 APPARATUS FOR HANDLING ACID PHOSPHATE AND THE LIKE.
 940,583. APPLICATION FILED NOV. 28, 1908. Patented Nov. 16, 1909.

3 SHEETS—SHEET 1.



Witnesses

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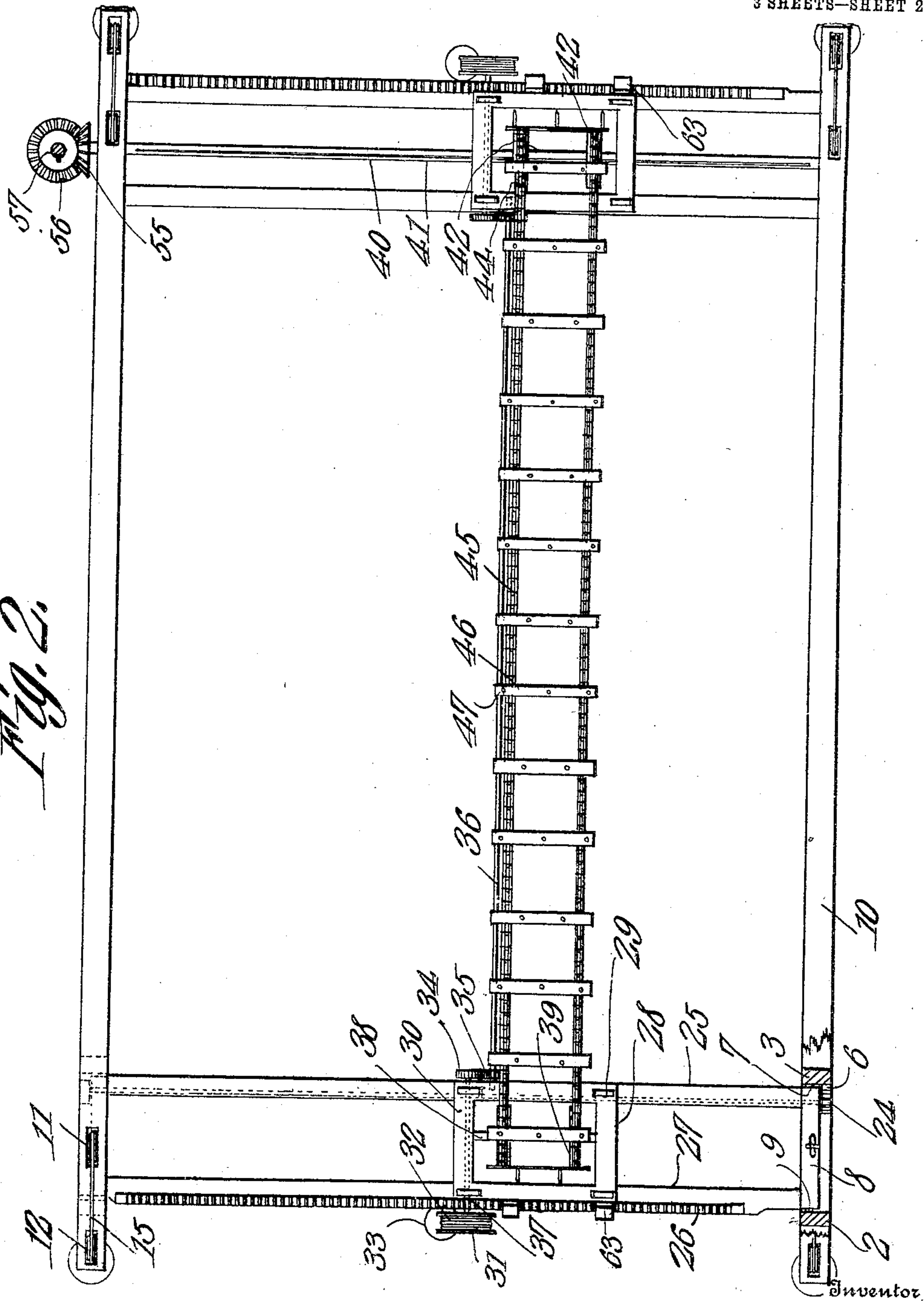


Fig. 2.

Witnesses

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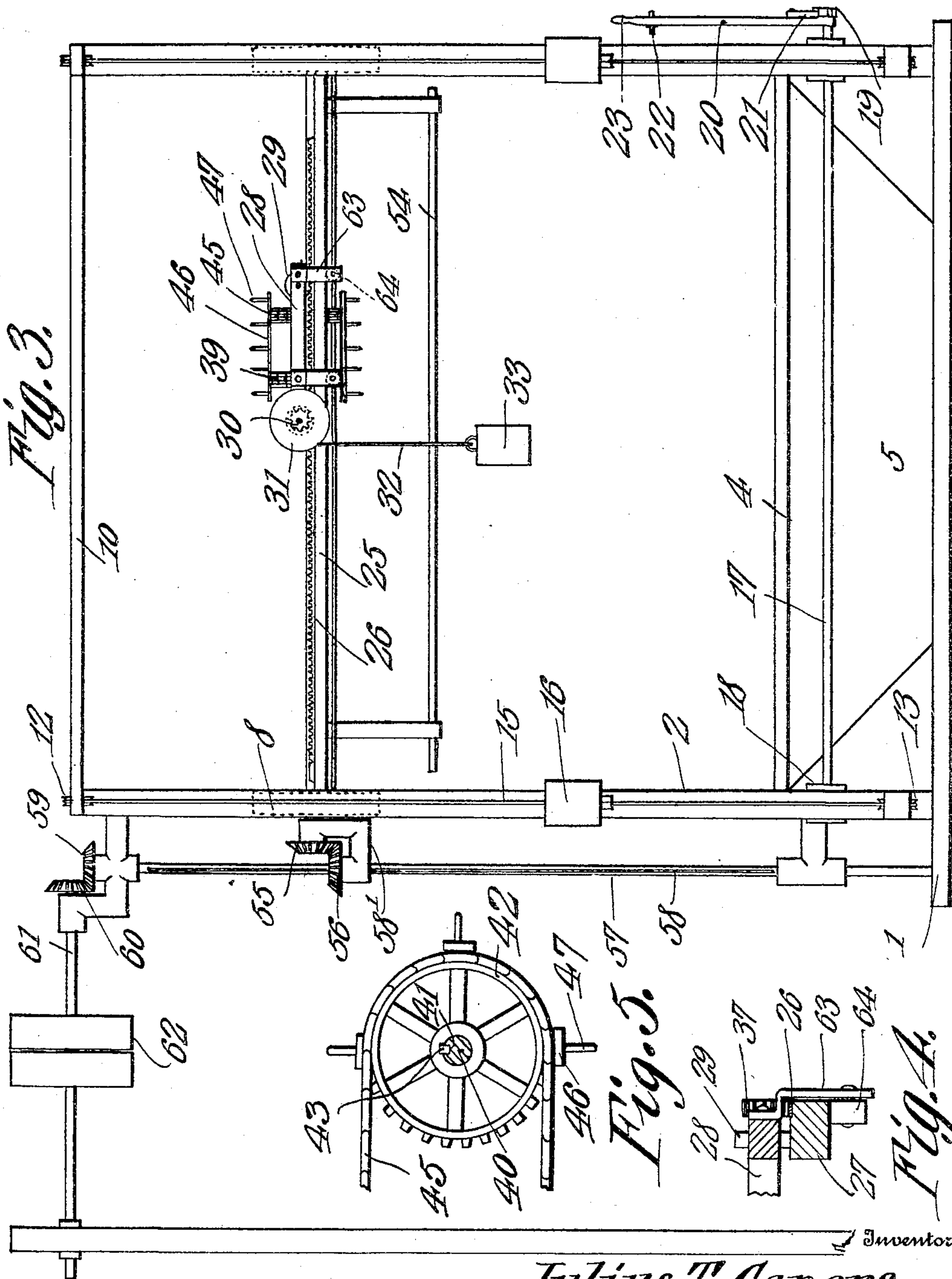
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3 SHEETS—SHEET 3.



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UNITED STATES PATENT OFFICE.

JULIUS T. CAPERS, OF MONTGOMERY, ALABAMA.

APPARATUS FOR HANDLING ACID PHOSPHATE AND THE LIKE.

940,583.

Specification of Letters Patent.

Patented Nov. 16, 1909.

Application filed November 28, 1908. Serial No. 464,825.

To all whom it may concern:

Be it known that I, JULIUS T. CAPERS, a citizen of the United States, residing at Montgomery, in the county of Montgomery and State of Alabama, have invented a new and useful Apparatus for Handling Acid Phosphate and the Like, of which the following is a specification.

This invention relates to an apparatus for handling acid phosphate and similar materials, and it consists in the novel construction and arrangement of its parts as hereinafter shown and described.

The object of the invention is to provide an apparatus of the character indicated which includes a holder or container, sometimes referred to as a bin, and which is adapted to hold the material to be operated upon, which is provided with a delivery chute. A disintegrator, in the form of a series of endless chain belts carrying teeth, is arranged for orbital movement within the said container, and means is provided for raising and lowering the disintegrator and for simultaneously causing the same to traverse the container in a lateral direction with relation to its orbital movement. The teeth carried by the said disintegrator are adapted to engage the material and break the same into fine particles, and, at the same time, convey the said material to the delivery chute of the container.

In the accompanying drawings:—Figure 1 is a side elevation of the apparatus: Fig. 2 is a top plan view of the same: Fig. 3 is an end view of the same. Fig. 4 is a detail sectional view of a portion of a carriage used in the apparatus. Fig. 5 is a detail fragmentary view showing a key and keyway used in the apparatus.

The apparatus consists of the base or foundation 1, upon which are erected the end uprights 2, 2. The uprights 3 are also mounted upon the base 1 and are spaced from the uprights 2. The bottom 4 is located above the base 1 and communicates at one end with a delivery chute 5. The gear racks 6, 6 are mounted upon the uprights 3, but are of less transverse breadth than the breadth of the said uprights 3, thus leaving the treads 7 upon those sides of the said uprights 3 which carry the gear racks 6.

The uprights 2 and 3 are arranged in pairs, and a frame 8 is mounted between each pair of the said uprights. The said frames 8 are provided at their sides with

the rollers 9, and those rollers at one side of the said frames bear upon the sides of the uprights 2, while the rollers at the opposite sides of the said frames bear upon the treads 7 of the uprights 3. The upper ends of all the uprights 2 and 3 are connected together by the beams 10. The pulleys 11 and 12 are journaled in the beams 10, and the pulleys 13 and 14 are journaled just above the base or foundation 1.

A cable 15 is attached at one end to each of the frames 8 and passes up over a pulley 11 and 12, and then down under a pulley 13 and 14, and up and connects at its opposite end with the lower side of one of the frames 8. A weight 16 is mounted upon the cable 15 and is located between the pulleys 12 and 13. The shafts 17 are journaled between the pulleys 14 and the lower sides of the frames 8 and carry the drums 18, around which the cables 15 wind as they pass from the pulleys 14 toward the lower sides of the frames 8. The ratchet wheels 19 are mounted upon the shafts 17 and a lever 20 is fulcrumed upon each shaft 17. Each lever 20 is provided with a pawl 21, adapted to engage the ratchets of that wheel 19 which is mounted upon the same shaft 17. The lever 20 upon one shaft 17 is pivotally connected with the lever 20 upon the other shaft 17 by a connecting rod 22, and one of the levers 20 is provided with a handle end 23, whereby the said lever may be reciprocated, and through the connecting rod 22, the other lever may be correspondingly moved. The weights 16 serve as counterbalance weights for the frames 8 and the parts carried thereby. It will be seen that as the levers 20 are swung laterally the pawls 21 carried thereby will engage the ratchet wheels 19, and cause the shafts 17, together with the drums 18 mounted thereon, to rotate. Thus the cables 15 are moved longitudinally, and the frames 8 are moved up or down between the uprights 2 and 3. The pinions 24 are journaled upon the frames 8 and mesh with the racks 6.

The frames 8, at one side of the apparatus, are connected with the frames 8 at the other side thereof by the transversely disposed track-bars 25. The said bars are arranged in pairs, and the outer bar of each pair is provided with a gear rack 26 and a tread portion 27 upon its upper surface. The carriages 28 are provided with rollers 29, which are adapted to travel upon the tread surfaces of the track bars 25 and 27. The shafts 30

are journaled for rotation at the ends of the carriages 28, and are provided at their outer ends with the drums 31. The cables 32 wind upon the drums 31 and are connected at their lower ends with the weights 33. The pinions 34 are mounted at the inner ends of the shafts 30 and mesh with the pinions 35 which are fixed to the end portions of the shaft 36. The said shaft 36 is journaled at its end portions in the carriages 28 located at the opposite ends of the apparatus, and movement on the part of one shaft 30 is transmitted through the shaft 36 and the connecting parts with the other shaft 30. The pinions 37 are mounted upon the shafts 30 and mesh with the rack bars 26 mounted upon the track bars 27.

From the above description, it will be seen that when the cables 32 are wound upon the drums 31 in one direction, and the weights 33 are free to descend by gravity, the said drums 31 will be turned, which movement will be transmitted to the shafts 30, and from the said shafts 30 to the shaft 36. As the shafts 30 rotate, the pinions 37 which are in mesh with the rack bars 26 will cause the carriages 28 to move in the same direction and longitudinally along the track bars 25 and 27. Thus means is provided for moving the said carriages from one side of the apparatus to the other. The direction in which the carriages 28 are moved is governed by the direction in which the cables 31 are wound upon the drums 32.

A shaft 38 is mounted upon one of the carriages 28, and the sprocket wheels 39 are journaled for rotation upon the said shaft 38. A shaft 40 is journaled for rotation between the track bars 25 and 27 of that carriage 28 opposite to the said carriage 28 upon which is mounted the shaft 38. The shaft 40 is provided along its length with a key-way 41. A drum 42 is mounted upon the shaft 40 and is provided with a key 43, which is located in the key-way 41 of the said shaft 40. The drum 42 is provided with the sprocket rims 44, which occupy the same vertical planes as the sprocket wheels 37. The sprocket chains 45 pass around the sprocket rims 44 and the sprocket wheels 39 and are connected together by the cross-bars 46, which, in turn, are provided with the teeth 47. Means 48 is mounted upon the carriage 28 for shifting the shaft 38, whereby the slack of the chains 45 may be increased or taken up. The carriages 28 are connected together by a bar 49, to which are attached the strut posts 50. The truss rods 51 are connected at their end portions with the end portions of the said bar 49, or with the inner edge portions of the said carriages 28, and lie against the ends of the strut posts 50. Each truss rod 51 is provided with a turn-buckle 52, and each strut post 50 is provided with a sprocket wheel 53. Those wheels 53

which are mounted upon the upwardly disposed strut post 50, bear against the upper runs of the sprocket chains 54, while those wheels 53 which are mounted upon the downwardly disposed strut post 50 bear against the lower runs of the said sprocket chains. Thus it will be seen that means is provided for keeping the upper and lower runs of the said chains 45 at proper relative distances from each other, and that the said chains are supported in substantially horizontal lines at the middle portions of their upper and lower runs, and are held against the lateral sag or bowing.

An operator's platform 54 is attached to the track bars 25 and 27 at one end of the apparatus, and is adapted to move vertically with the same.

A beveled pinion 55 is fixed to one end of the shaft 40 and meshes with a beveled pinion 56 which is keyed upon the vertically disposed shaft 57. A bracket 58' holds the pinions 55 and 56 in proper relative position with relation to each other. The key-way 58 of the shaft 57 extends longitudinally thereof, and a beveled pinion 59 is fixed to the upper end of the shaft 57 and meshes with a beveled pinion 60, mounted upon the shaft 61. The shaft 61 is journaled in horizontal position and is provided with a power pulley 62. Thus it will be seen that when power is applied to the pulley 62, the shaft 61 is rotated, which rotary movement is transmitted through the beveled pinions 59 and 60 to the shaft 57, which, in turn, transmits the rotary movement through the beveled pinions 56 and 55 to the shaft 54. As the shaft 54 rotates the drum 42 is carried around with the same, and the chains 45 are moved in elongated orbits. Inasmuch as the carriages 28 may be moved from side to side of the apparatus, as above described, and the track rails 25 and 27 may be moved vertically with relation to the frame-work of the apparatus, it will be seen that as the said chains 45 and the attached arms and pins mounted thereon move in orbits, the said chains may move from one side of the apparatus to the other, and, at the same time, may move vertically. Consequently, any material which lies in the path of movement of the said chains is operated upon by the said teeth and engaged and disintegrated, as indicated, and conveyed to the discharge chute 5. Thus the material is separated from the bulk, and passes into the said chute in proper commercial condition.

As illustrated in Fig. 4 of the drawing, the carriage 28 may be provided with hangers 63 which extend down along the track 27 and carry rollers 64 which travel against the under side of the track and prevent the said carriage from tilting when subjected to strain.

Having described my invention, what I

claim as new, and desire to secure, by Letters Patent, is:—

1. An apparatus for handling phosphate comprising a container, an endless belt mounted for orbital movement along the conveyer, teeth carried by the belt, and means for moving the belt vertically and laterally while the belt is describing its orbital movement.

2. An apparatus for handling phosphate and the like comprising a container, carriages mounted for lateral movement at the ends of the container, shafts longitudinally disposed with relation to the carriages, an endless belt mounted for orbital movement about the said shafts and teeth carried by the belt.

3. An apparatus for handling phosphate and the like comprising a container, track-ways located at opposite ends of the container, carriages mounted for movement along the said track-ways, means for raising and lowering the track-ways, shafts longitudinally disposed upon the carriages, an endless belt mounted for orbital movement about the said shafts and teeth carried by the belt.

4. An apparatus for handling phosphate and the like comprising a container, carriages mounted for lateral movement at the ends of the container, means operatively connecting said carriages together, whereby their lateral movement will occur simultaneously, means for raising and lowering the carriages, shafts longitudinally disposed upon the carriages, an endless belt mounted for orbital movement about the said shafts and means carried by the belt.

5. An apparatus for handling phosphate and the like comprising a container, track-ways located at the opposite ends of the container, frames mounted for vertical movement at the opposite ends of the container and being connected with the said track-ways, means for raising and lowering the

said frames and track-ways, carriages mounted for movement upon the track-ways, shafts longitudinally disposed upon the carriages, an endless belt mounted for orbital movement about the said shafts and teeth mounted upon the belt.

6. An apparatus for handling phosphate and the like comprising a container, vertically disposed uprights located at the opposite ends of the container, frames mounted for movement between the said uprights, counterbalance weights connected with the said frames, lever mechanisms for effecting the movement of the frames, track-ways connected with the frames and located at the opposite ends of the container, carriages mounted for movement along the said track-ways, shafts longitudinally disposed upon the carriages, an endless belt mounted for orbital movement about the said shafts and teeth carried by the belt.

7. An apparatus for handling phosphate and the like comprising a container, uprights located at the opposite ends of the container, frames mounted for movement between the uprights, cables attached to the frames, upper and lower pulleys about which the said cables pass, counterbalance weights attached to the said cables, drums about which the said cables pass, lever mechanisms for rotating the drums, track-ways attached to the frames and located at the opposite ends of the container, carriages mounted for movement along the track-ways, shafts longitudinally disposed upon the carriages, an endless belt mounted for orbital movement about the shafts, and teeth carried by the said belt.

In testimony that I claim the foregoing as my own, I have hereto affixed my signature in the presence of two witnesses.

JULIUS T. CAPERS.

Witnesses:

H. C. TOMPKINS,
LILLIAN SINGLEY.