

No. 778,113.

PATENTED DEC. 20, 1904.

P. B. CLARKE.
CUT-OFF ACTUATING MECHANISM.

APPLICATION FILED JAN. 26, 1901.

NO MODEL.

5 SHEETS—SHEET 1.

Fig. 1.

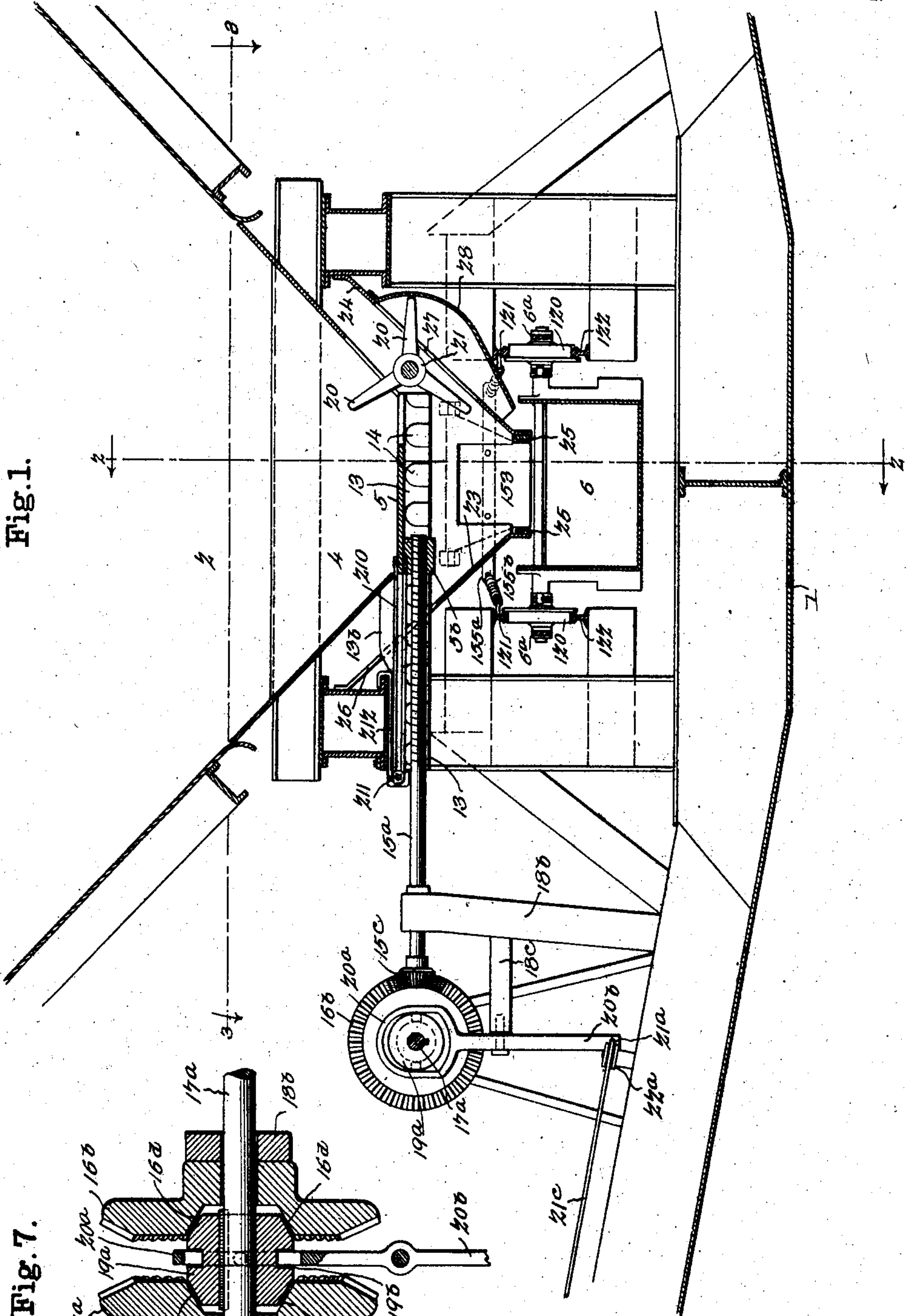
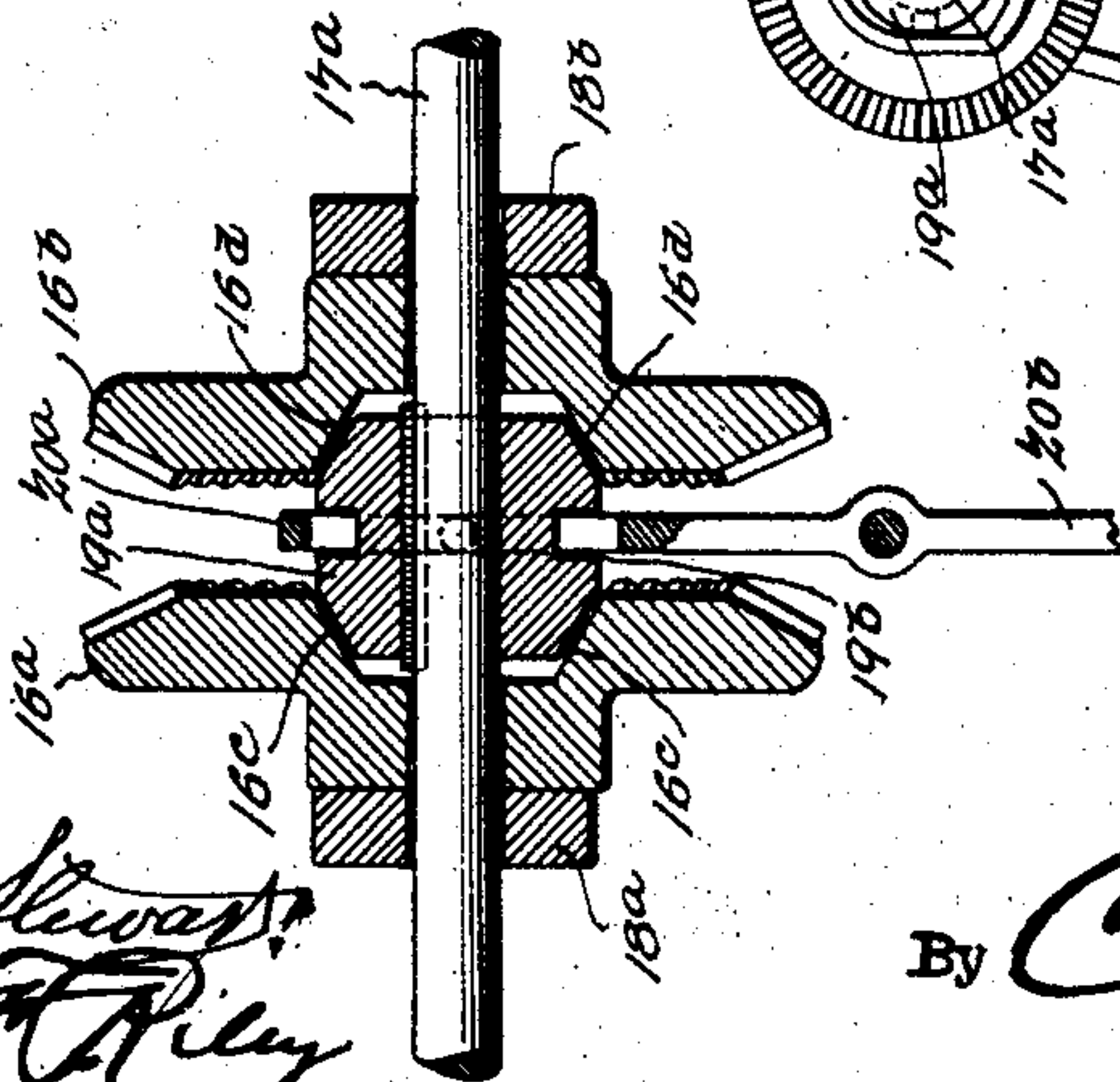


Fig. 7.



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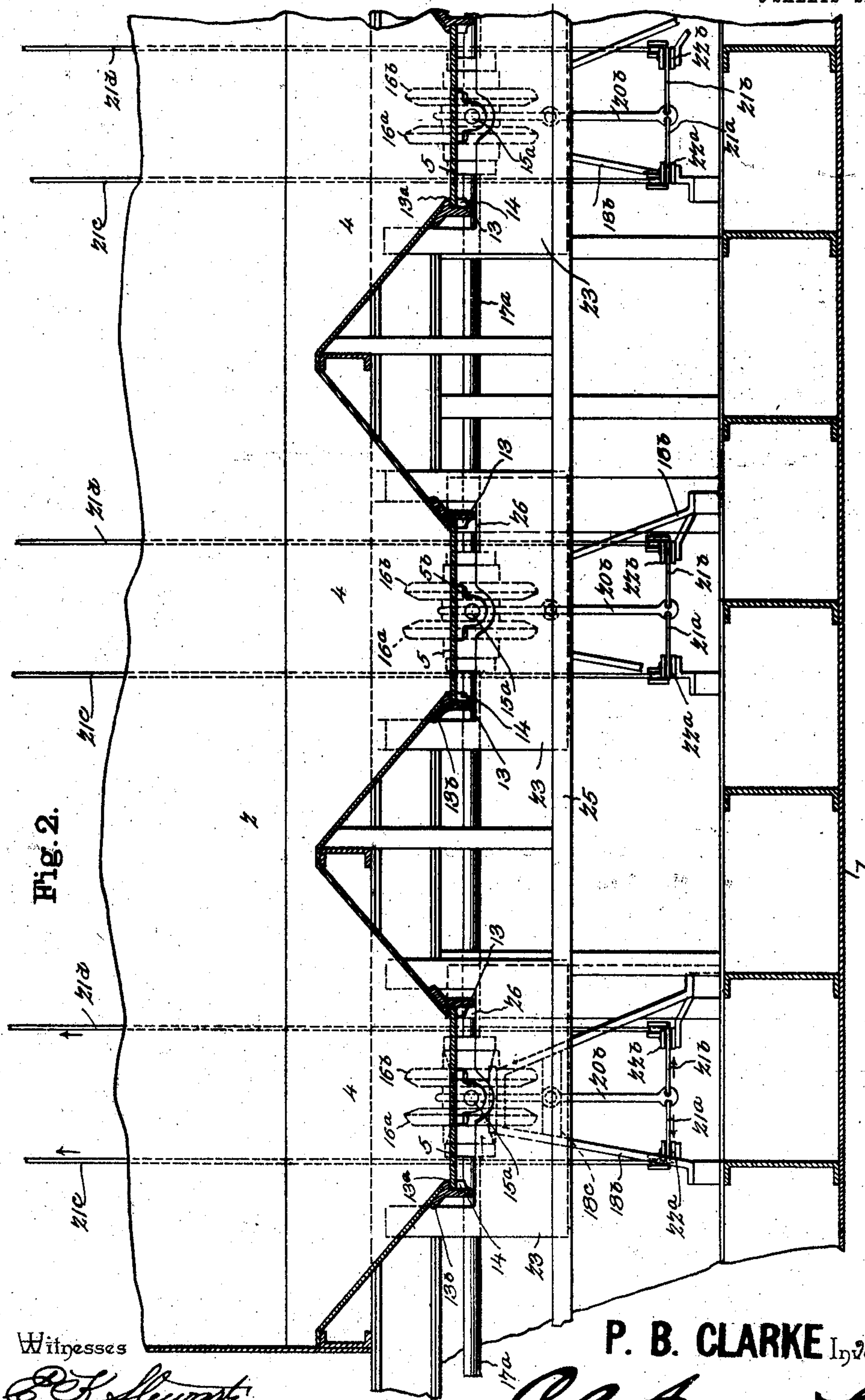
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5 SHEETS—SHEET 2.



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Witnesses

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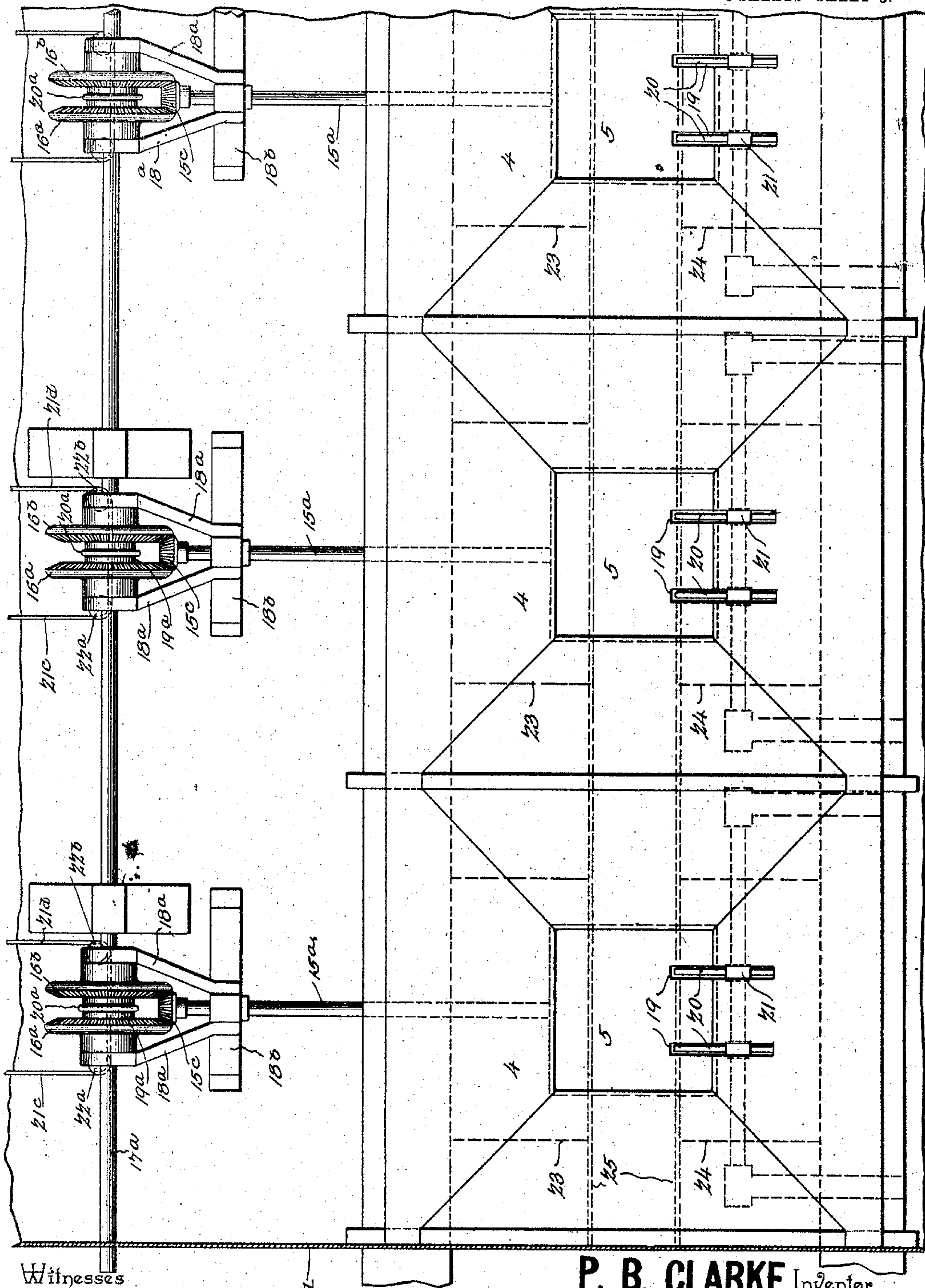
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5 SHEETS—SHEET 3.



Witnesses

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Fig. 3.

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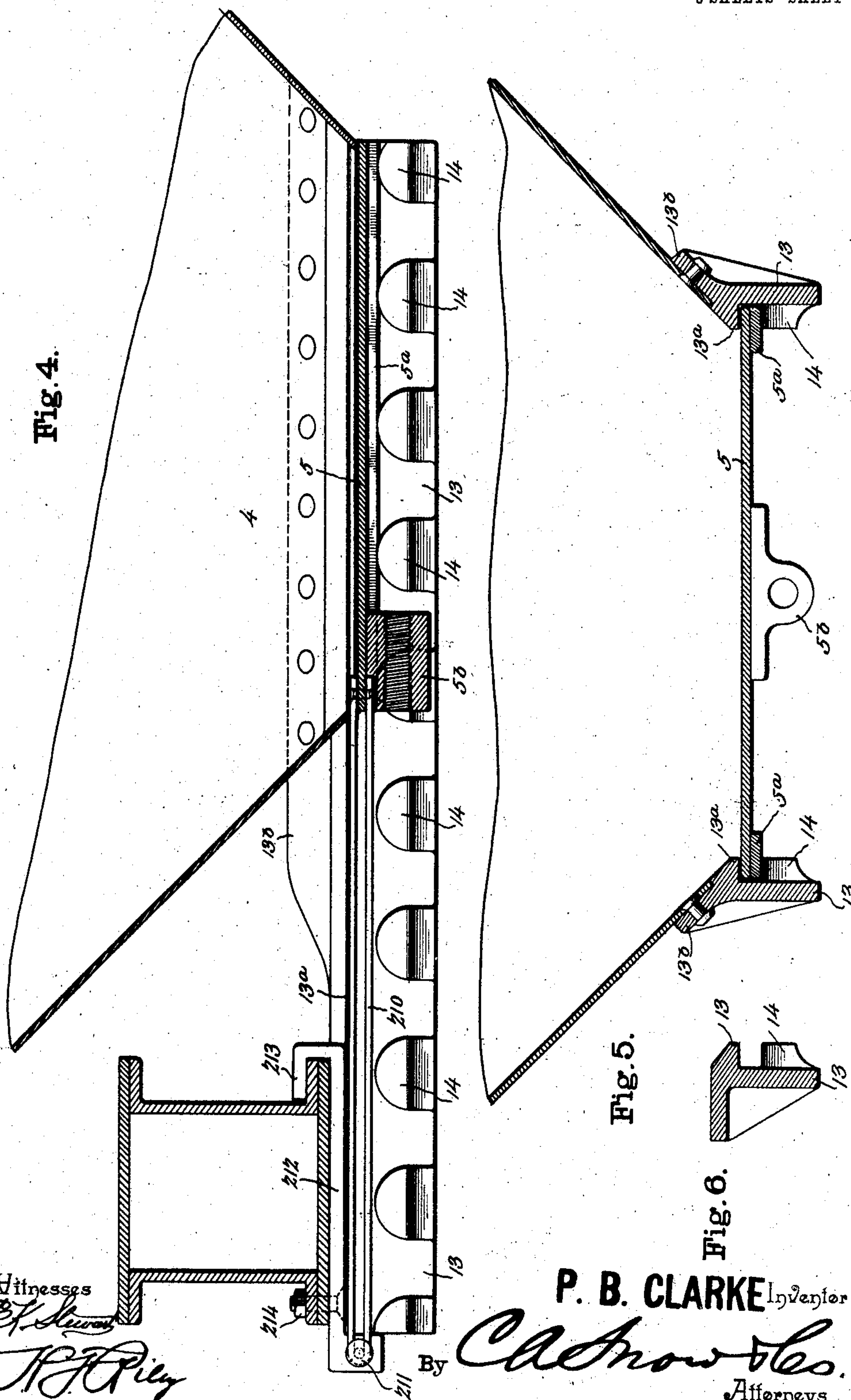
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5 SHEETS—SHEET 4.



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5 SHEETS—SHEET 5.

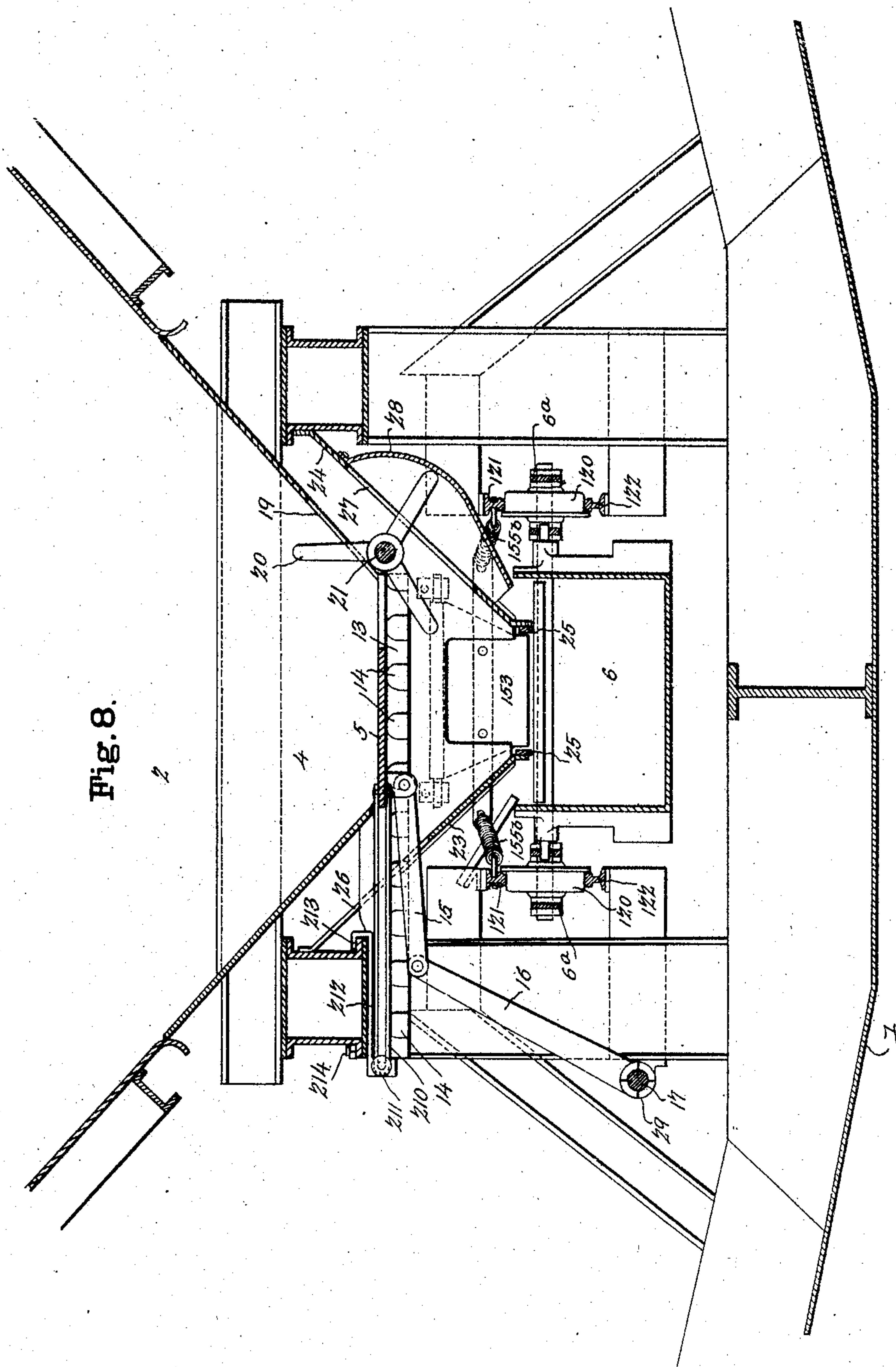


Fig. 8.

Witnesses

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UNITED STATES PATENT OFFICE.

PEETE B. CLARKE, OF NEW YORK, N. Y.

CUT-OFF-ACTUATING MECHANISM.

SPECIFICATION forming part of Letters Patent No. 778,113, dated December 20, 1904.

Application filed January 26, 1901. Serial No. 44,779.

To all whom it may concern:

Be it known that I, PEETE B. CLARKE, a citizen of the United States, residing at New York, in the county of New York and State of New York, have invented a new and useful Cut-Off-Actuating Mechanism, of which the following is a specification.

The invention relates to improvements in cut-off-actuating mechanism for controlling the flow of material from bins or compartments to a conveyer.

The object of the present invention is to improve the construction of mechanism for actuating sliding doors or cut-offs for controlling the flow of material from bins or compartments to a conveyer and to provide simple and efficient means for enabling one or more sliding doors or cut-offs to be opened and closed at the same time and to permit such operation to be performed at a point remote from the cut-offs with absolute certainty.

The invention consists in the construction and novel combination and arrangement of parts hereinafter fully described, illustrated in the accompanying drawings, and pointed out in the claims hereto appended.

In the drawings, Figure 1 is a transverse sectional view of a portion of a bin or compartment of a barge provided with cut-off-actuating mechanism constructed in accordance with this invention. Fig. 2 is a vertical longitudinal sectional view of the same on line 2 2 of Fig. 1. Fig. 3 is a horizontal sectional view on the line 3 3 of Fig. 1. Figs. 4 and 5 are enlarged detail sectional views illustrating the manner of mounting the sliding doors or cut-offs. Fig. 6 is a detail sectional view of one of the horizontal bars which form the ways for the sliding doors or cut-offs. Fig. 7 is an enlarged detail sectional view illustrating the construction of the friction-clutch. Fig. 8 is a transverse sectional view similar to Fig. 1 and illustrating a modification of the invention.

Like numerals of reference designate corresponding parts in all the figures of the drawings.

2 designates a portion of a bin or compartment of a barge 1, and the said bin or compartment 2 is provided at its bottom with a

series of depending hoppers 4, having sliding doors or cut-offs 5, adapted to be opened to permit coal or other material to be discharged into buckets 6 of an endless conveyer 6^a. The endless conveyer 6^a has one of its flights arranged beneath the depending hopper 4, as indicated in Fig. 1 of the accompanying drawings, and the sliding doors or cut-offs are adapted to be successively opened, whereby the strain on the conveyer incident to filling the buckets with coal or other material will be reduced to a minimum. The bin or compartment is spaced sufficiently from the bottom of the barge to provide the necessary room for the conveyer, and the sliding door or cut-off 5 is mounted in suitable ways, preferably consisting of opposite horizontal bars 13, provided at intervals with bosses or enlargements 14, rounded at their upper edges to reduce the friction to a minimum and to prevent material from accumulating on them. The upper portions of the horizontal bars 13 are enlarged to form inner horizontal shoulders 13^a and to provide inclined flanges 13^b, as clearly illustrated in Fig. 5 of the accompanying drawings, and the said shoulders 13^a are located above the rounded bosses or enlargements 14 and are spaced therefrom and cooperate therewith to form the ways for the sliding door or cut-off 5. The inclined flanges are recessed at their upper or inner faces to receive the lower edges of the front and rear walls of the hoppers 4 of the bin or compartment, and the said walls are secured to the flanges 13^b by rivets or other suitable fastening devices. The enlargements at the upper portions of the bars 13 overhang the bosses or enlargements 14 and serve to shed the material and prevent the same from lodging on the said bosses or enlargements 14. Each door is preferably provided at its side edges with metal cleats 5^a, forming wear-plates and resting upon the enlargements or bosses 14 to receive the wear incident to the sliding of the door or cut-off. The sliding movement of the door or cut-off is affected by a horizontally-disposed shaft 15^a, disposed transversely of the bin at one side thereof and provided at its inner portion with screw-threads 15^b, which engage threads of a fixed nut 5^b, secured to

and depending from the sliding door or cut-off at one end thereof. The transversely-disposed shaft 15^a, which is journaled in suitable bearing, has a pinion 15^c keyed or otherwise
 5 secured to its outer end, and this pinion, which is provided with bevel-teeth, is arranged between and meshes with a pair of gear-wheels 16^a and 16^b, loosely mounted on a longitudinal shaft 17^a and adapted to be alternately
 10 coupled thereto to rotate the transverse shaft 15^a for opening and closing the sliding door or cut-off 5. The gear-wheels 16^a and 16^b, which are provided with hub extensions, are preferably mounted between a pair of arms
 15 18^a of a support 18^b, which is preferably in the form of an approximately A-shaped standard, as indicated in Fig. 2 of the accompanying drawings. The gear-wheels 16^a and 16^b are provided at their inner opposite faces with
 20 centrally-arranged inwardly-tapered recesses 16^c and 16^d, adapted to receive an oppositely-tapered clutch-section 19^a and forming smooth faces for engaging the same. The sliding clutch or clutch-section 19^a, which is keyed or
 25 otherwise secured to the longitudinal shafts 17^a, has a limited movement sufficient to carry it into and out of engagement with either of the gear-wheels 16^a and 16^b, and it is also adapted to occupy an intermediate position,
 30 as illustrated in Fig. 7 of the accompanying drawings, to prevent either of the gear-wheels from being rotated. The sliding clutch-section is adapted to be actuated by the means hereinafter described to carry it into engage-
 35 ment with one of the gear-wheels, and when it is in engagement with one of the gear-wheels 16^a and 16^b the engaged gear-wheel communicates motion to the pinion and rotates the transverse shaft 15^a and opens or closes the
 40 sliding door or cut-off, according to the direction of the rotation of the transverse shaft 15^a. The other gear-wheel is rotated by the pinion, and it simply revolves loosely on the shaft 17^a without affecting the operation of
 45 the mechanism. When the sliding clutch is shifted from the said engaged gear-wheel to the other gear-wheel, the latter is positively connected with and actuated by the shaft 17^a and it communicates motion to the pinion and
 50 rotates the transverse shaft in the opposite direction from that in which it was previously rotated. By this construction the shaft 15^a may be rotated in either direction to open and close the sliding cut-off. The sliding
 55 clutch-section, which has tapered ends, is provided with a central annular groove 19^b, receiving a loop or yoke 20^a of an upright lever 20^b, fulcrumed between its ends on a horizontal arm 18^c of the support 18^b and adapted
 60 to be oscillated to slide the clutch-section from one gear-wheel to the other. The lower end of the shifting lever 20^b is connected to the lower adjacent ends 21^a and 21^b of a pair of operating ropes or cables 21^c and 21^d, extend-
 65 ing from the said lever to a suitable point,

preferably the deck of the barge, and either of these flexible connections 21^c and 21^d may be pulled upon to actuate the sliding clutch-section.

In operating the sliding door or cut-off one 70 of the flexible connections extending from the shifting lever is pulled upon to throw the sliding clutch-section into engagement with one of the gear-wheels, and the said flexible connection is held taut to maintain the slid- 75 ing clutch-section in engagement with such gear-wheel until the sliding door or cut-off has reached the limit of its movement and the flexible connection is then released. When the flexible connection is released, the fric- 80 tion on the inclined engaged face of the sliding clutch-section will cause the latter to move to its intermediate position, and the engaged gear-wheel will be stopped by the means hereinafter described for limiting the sliding 85 movement of the door or cut-off. When the door or cut-off has reached the limit of its movement, the increased friction incident to the stoppage of the transverse shaft 15^a and the gear-wheels will be readily felt by the op- 90 erator and will indicate when the flexible connection is to be released. The flexible connections are arranged on suitable guide-pulleys 22^a and 22^b, as indicated in Figs. 1, 2, and 3 of the accompanying drawings; but any 95 form of guides and any form of flexible connections may be employed for shifting the lever 20^b. The longitudinal shaft 17^a is designed to be continuously rotated and may be connected by any suitable gearing with the 100 engine or other motive power, and a series of sliding doors or cut-offs may be operated independently of one another and may be successively opened and closed.

The walls at one side of the hoppers are 105 provided with slots 19 to permit the passage of arms 20 of agitators 21, and the inner ends of the sliding doors or cut-offs are provided with corresponding slots which register with the slots 19 and which form opening for the 110 agitators. The agitators, which may be operated by any suitable means, are adapted to cause the coal or other material to flow downward, and they prevent a mass of coal or other material from lodging or arching the 115 bin or compartment. The material is directed into the buckets of the conveyer by oppositely-inclined plates 23 and 24, terminating directly above the buckets and forming supports for longitudinal bars 25, which hold the 120 buckets in the position shown in Fig. 1. The plate 23 at one side of the barge is provided with a slot or opening 26 to afford a passage-way for the sliding door or cut-off and for the mechanism for actuating the same, and the 125 plate 24 at the opposite side of the barge is provided with slots or openings 27 to permit the passage of the arms of the agitators. The plate 24 has a guard 28 secured to its lower face and adapted to direct into the buckets 130

any material escaping through the slots or openings of the plate 24.

The movement of the sliding doors or cut-offs in both forms of the invention is limited by means of a sliding link 210 and a pin 211 of a bracket 212. The link 210, which may be connected with the adjacent edge of the sliding door or cut-off 5 in any suitable manner, is disposed horizontally and is approximately U-shaped. The pin 211, which is preferably headed, projects horizontally from the bracket 212 and extends through the opening of the link 210. The bracket 212, which is provided with a depending arm for supporting the projection or pin 211, consists of a bar or piece of metal provided at its inner end with a hook 213 for engaging the adjacent bottom flange of a channel-iron beam. The bracket is secured adjacent to its depending arm to a flange of a beam by means of a bolt 214 or other suitable fastening device; but any other form of bracket may be provided. The inward or closing movement of the sliding door or cut-off is limited by the bend or outer end of the link engaging the stop of the bracket 212, and the outward or opening movement of the sliding door or cut-off is limited by the depending arm of the bracket, which is arranged to be engaged by the said sliding door or cut-off. By this construction the threaded shaft or screw 15^a is prevented from moving the sliding door or cut-off too far, and the arm 16, which is arranged at an inclination when the sliding door or cut-off is open or closed, will not operate to slide the said door or cut-off beyond the position to which it is carried by the longitudinal rock-shaft.

The endless conveyer 6^a, which does not constitute any portion of the present invention, is provided at intervals with wheels 120, arranged between upper and lower longitudinal rails 121 and 122.

The excess of coal or other material is scraped from the buckets by means of a trimmer 153, located at the front side of each depending hopper and consisting of a plate, hinged at its upper edge and provided with laterally-extending arms 155^a, which are connected by coiled springs 155^b with the adjacent upper rails 121. The front wall of the conveyer is provided with an opening to permit the material to engage the trimmer.

It will be seen that the sliding doors or cut-offs are adapted to move freely in opening and closing, that they are positively actuated, and that they are adapted to be operated independently of one another. It will also be apparent that when either of the flexible connections which extend from the shifting lever

is pulled upon the sliding clutch-section will be carried into engagement with one of the gear-wheels and that as soon as the said flexible connection is released the sliding clutch-section will be carried automatically out of engagement with the gear-wheel with which it is in contact by the friction, and the two gear-wheels by being connected with each other by the pinion will be prevented from being rotated accidentally by the sliding clutch-section.

What I claim is—

1. The combination of a bin or compartment provided with ways composed of bars provided at intervals with rounded lugs or enlargements, a sliding door or cut-off arranged on the rounded lugs or enlargements, means for limiting the movement of the sliding door or cut-off, and actuating mechanism connected with and adapted to operate the sliding door or cut-off, substantially as described.

2. The combination of a bin or compartment provided with ways provided with longitudinal shoulders and having rounded lugs or enlargements located beneath the shoulders, a sliding door or cut-off supported by the lugs or enlargements, and actuating mechanism connected with and adapted to open and close the sliding door or cut-off, substantially as described.

3. The combination of a bin or compartment provided with a depending hopper, a conveyer located beneath the hopper, a sliding cut-off arranged at the bottom of the hopper, oppositely-inclined plates located beneath the hopper and provided with openings, operating mechanism located at one side of the bin or compartment and extending through the opening of one of the plates and connected with the cut-off, an agitator located at the opposite side of the hopper and extending there-through, said agitator operating in the opening in the adjacent inclined plate, and a guard located above the conveyer and arranged in rear of the agitator, substantially as described.

4. The combination of a bin, a sliding cut-off, a horizontal link fixed to one end of the cut-off, a stop receiving the link for limiting the movement of the cut-off, a nut carried by the cut-off, a threaded shaft engaging the nut and frictional gearing for operating the shaft, substantially as described.

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

PEETE B. CLARKE.

Witnesses:

JOHN FRENCH,
CHARLES ENGEL.