

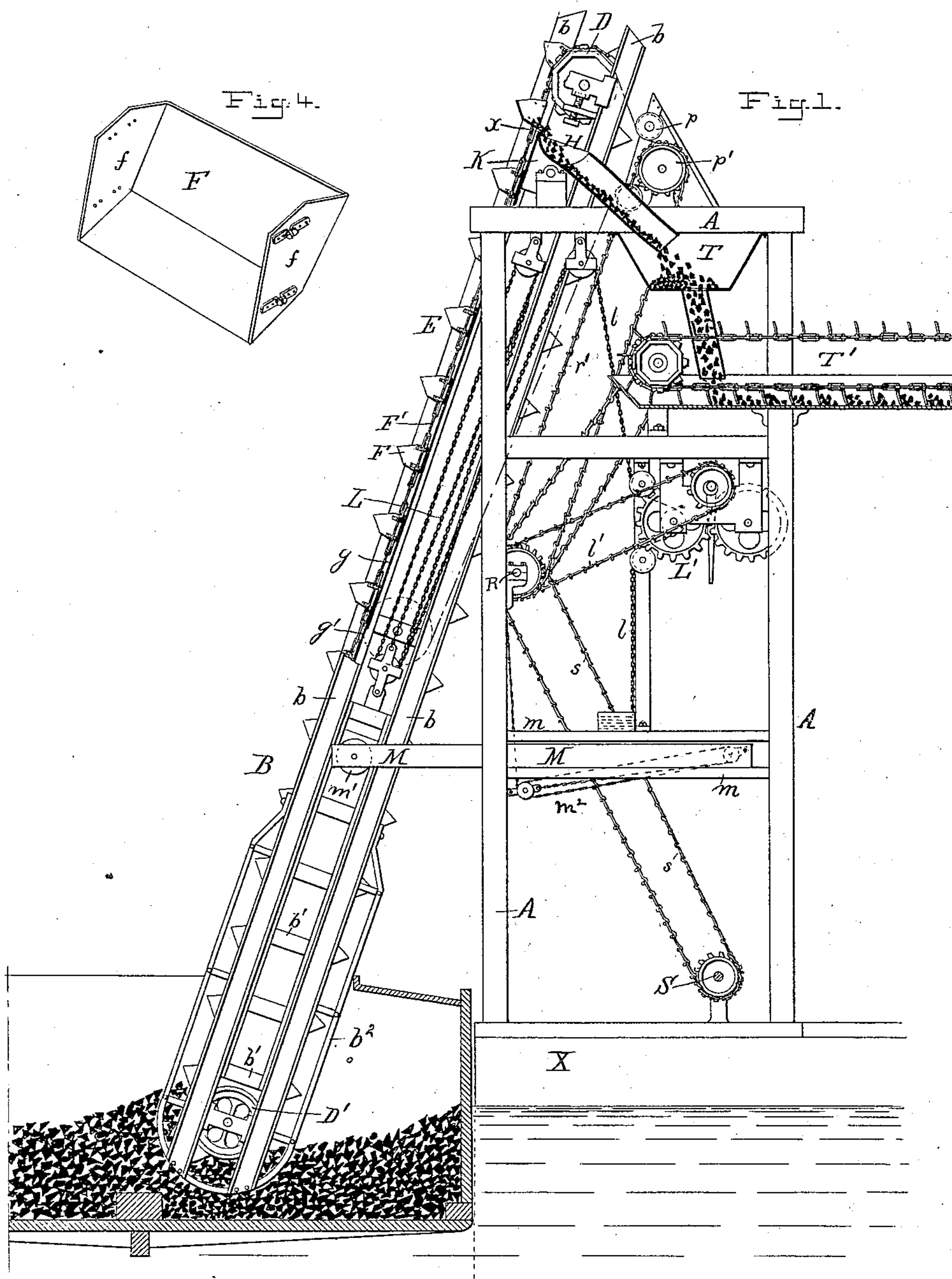
(No Model.)

3 Sheets—Sheet 1.

C. A. CASE.
ELEVATOR.

No. 433,762.

Patented Aug. 5, 1890.



WITNESSES:

E. J. Griswold
John Revell

INVENTOR

Charles A. Case
BY
Horton and Horton
his ATTORNEYS

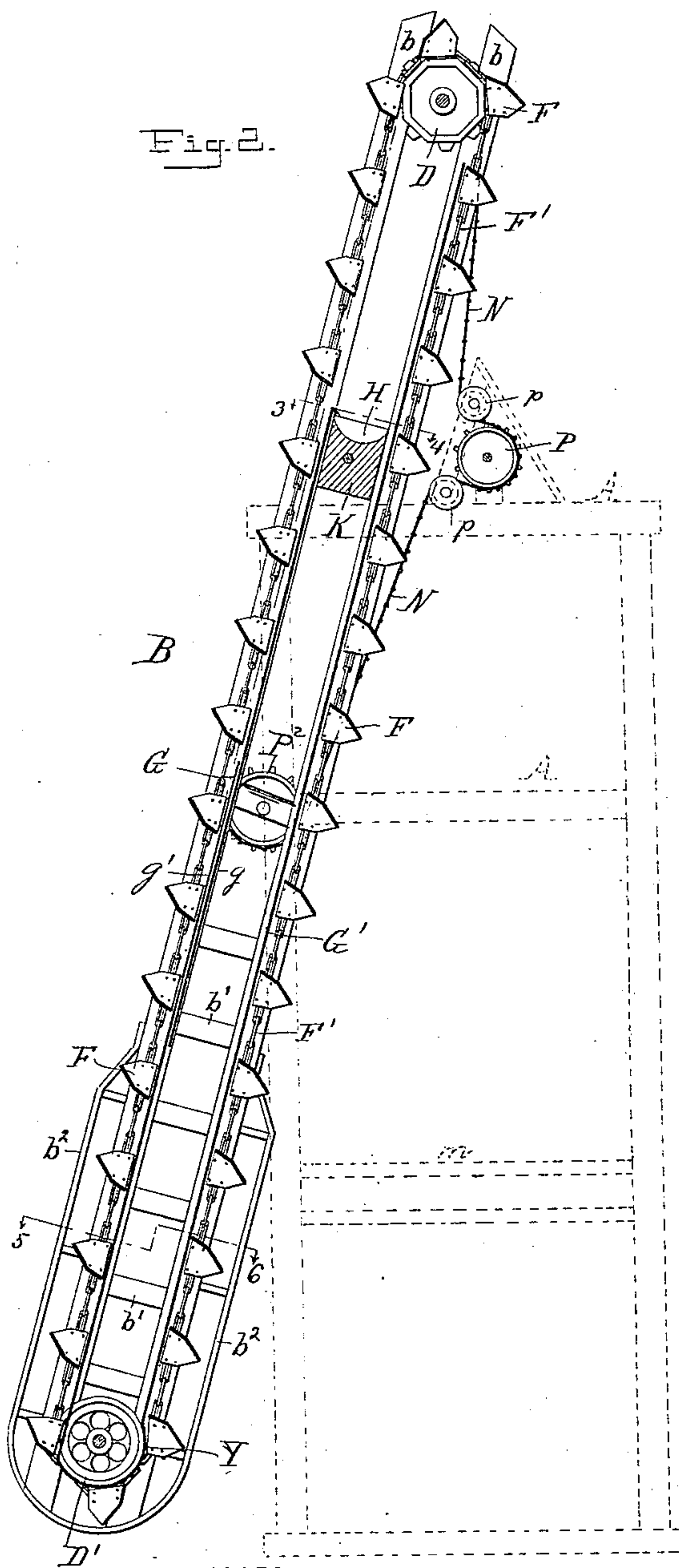
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3 Sheets—Sheet 2.

C. A. CASE.
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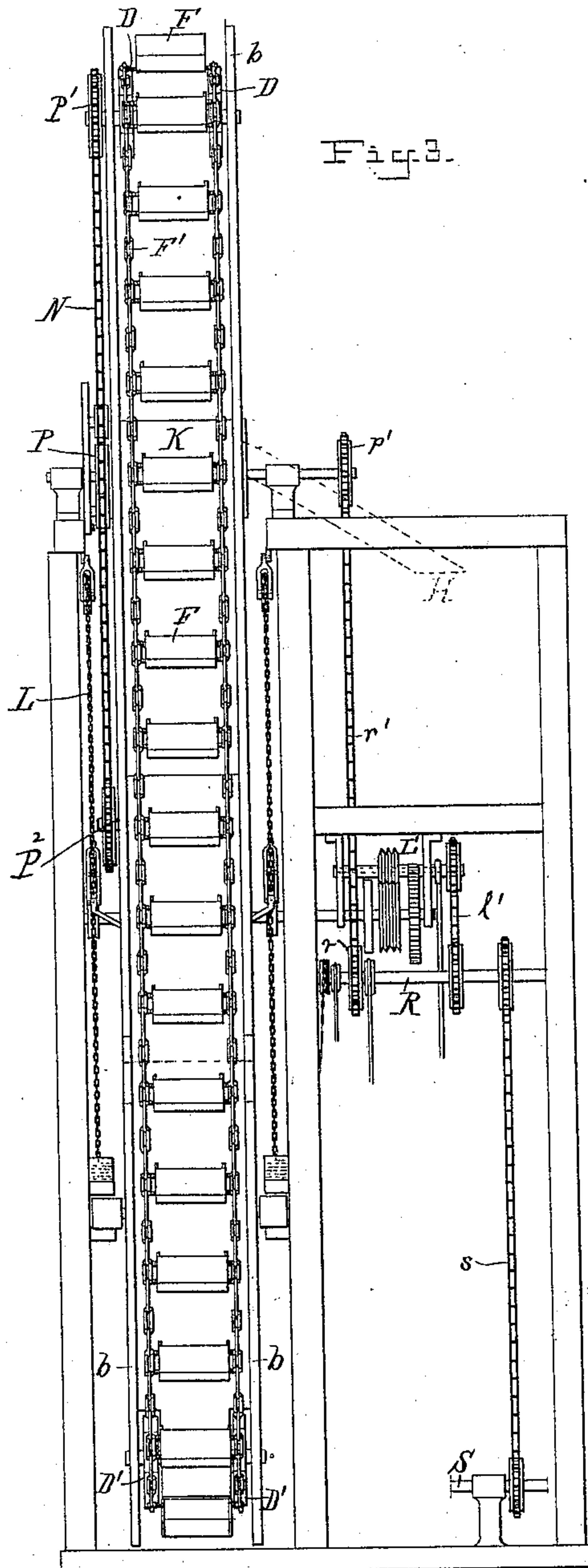
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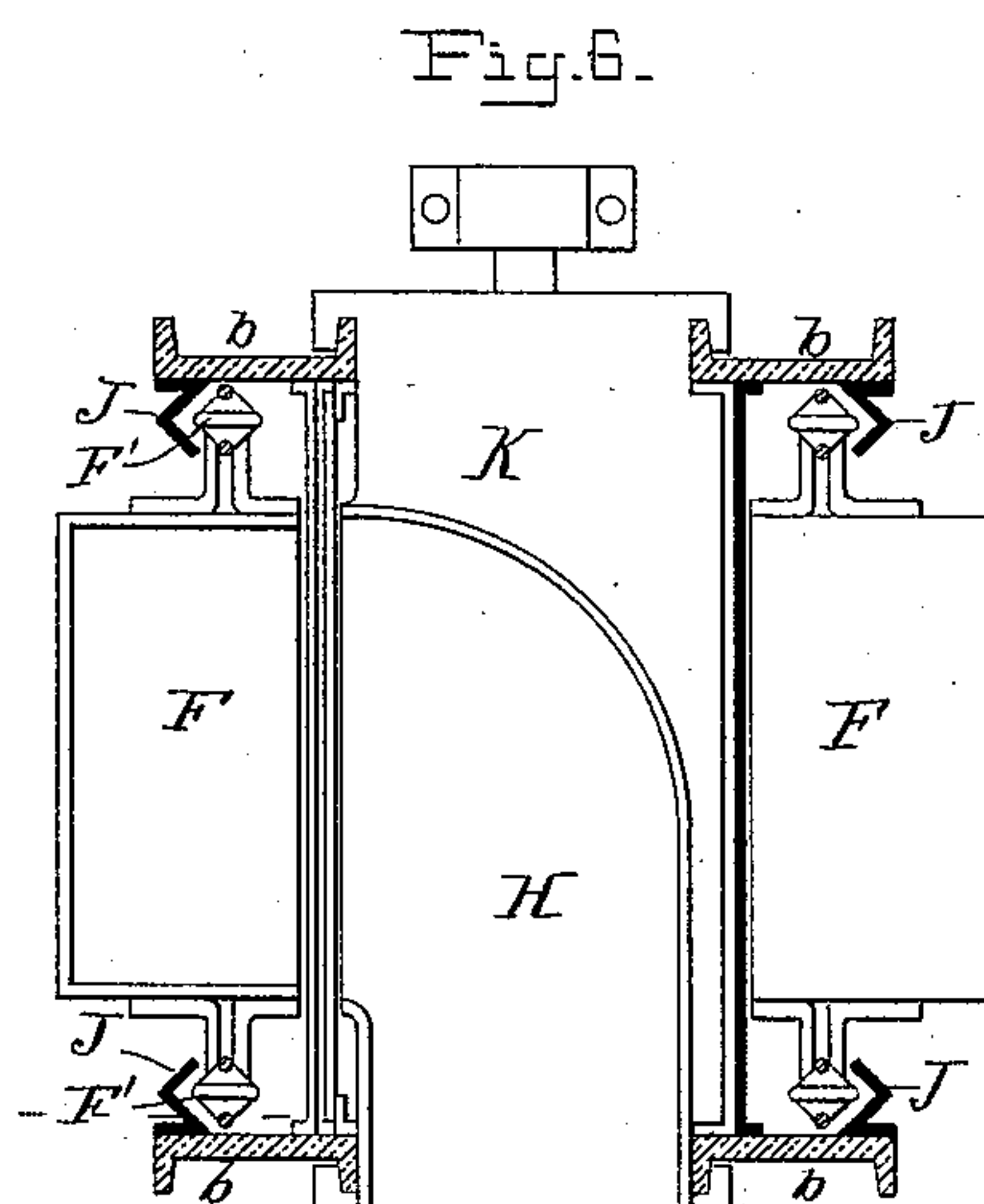
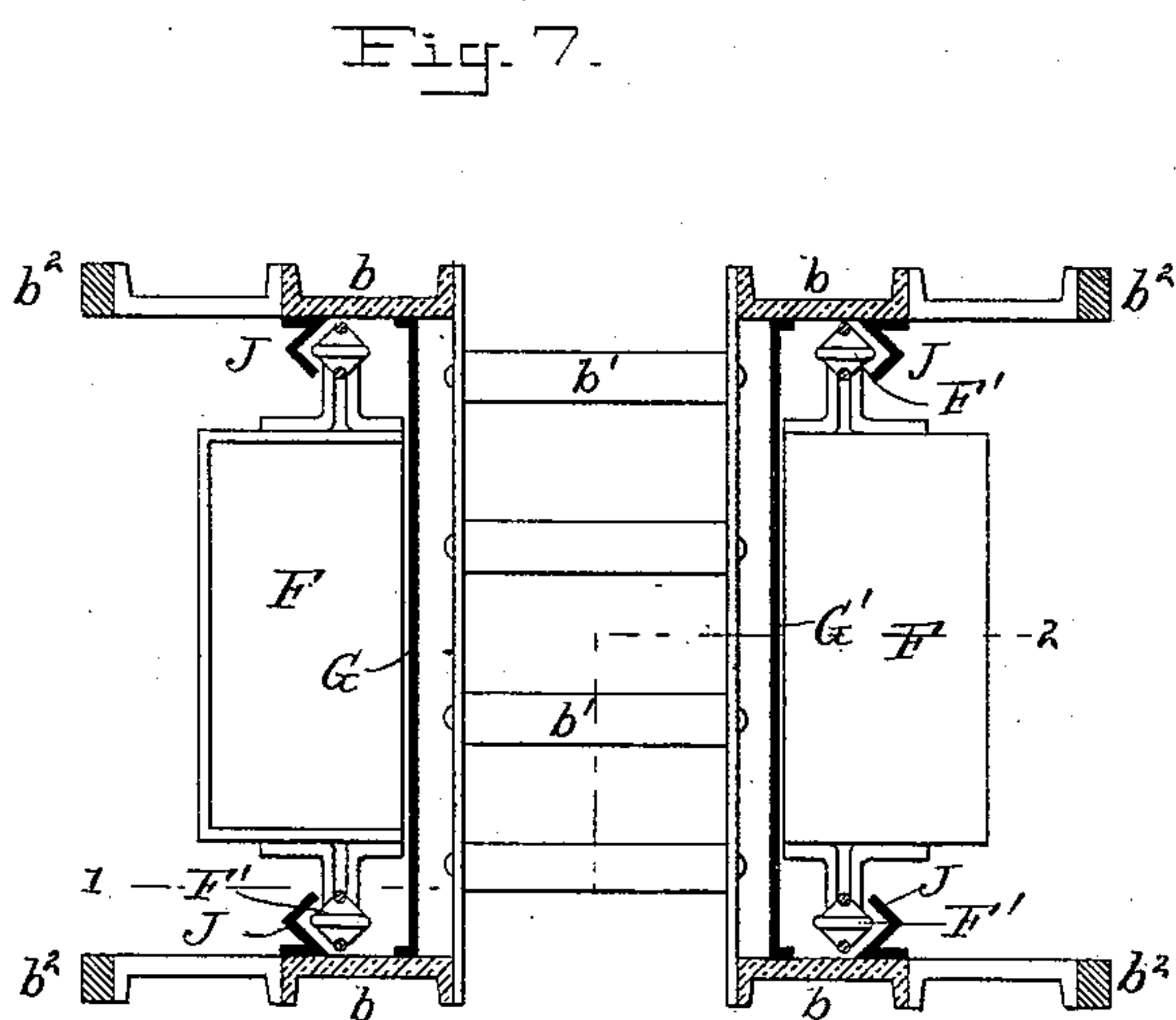
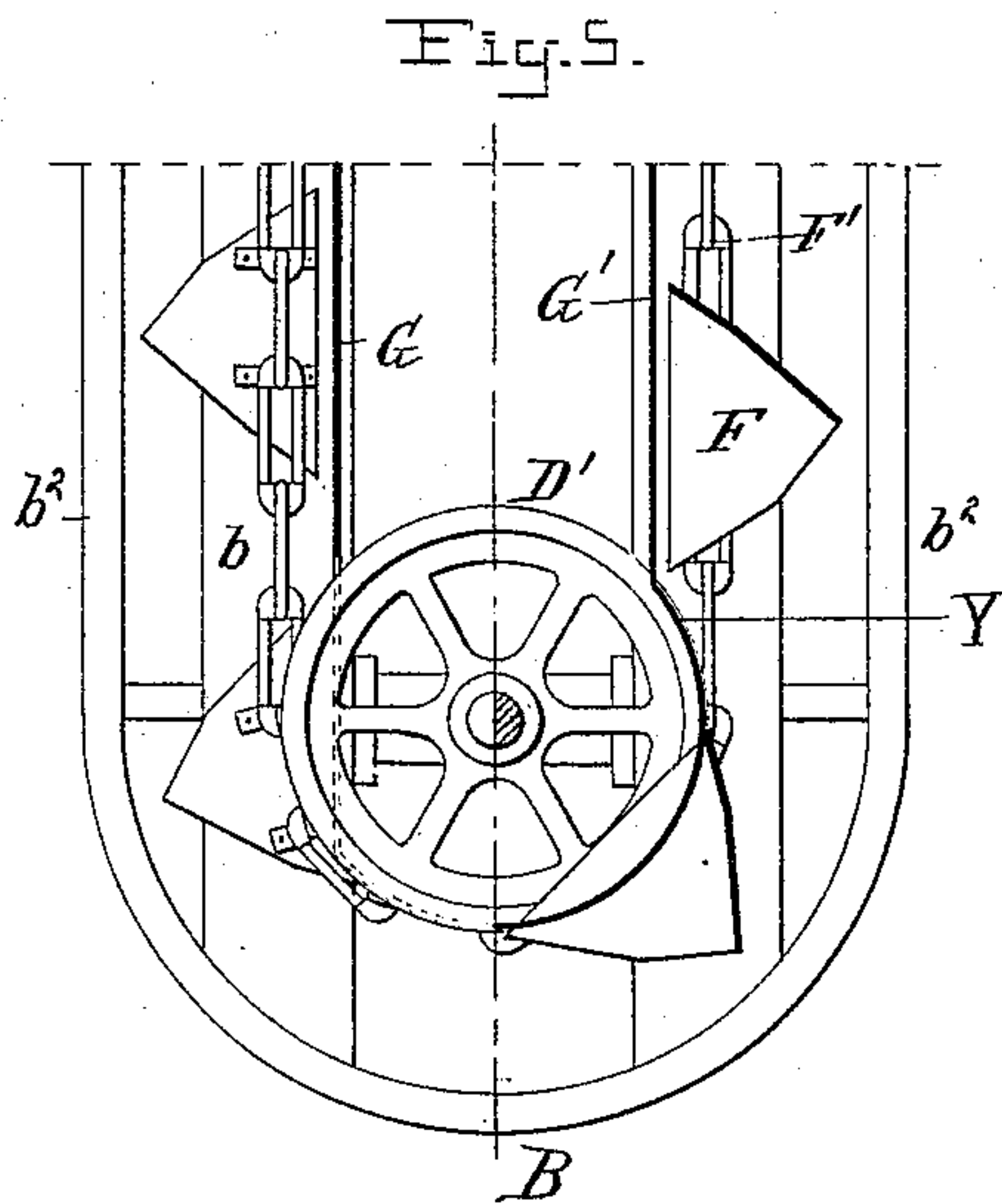
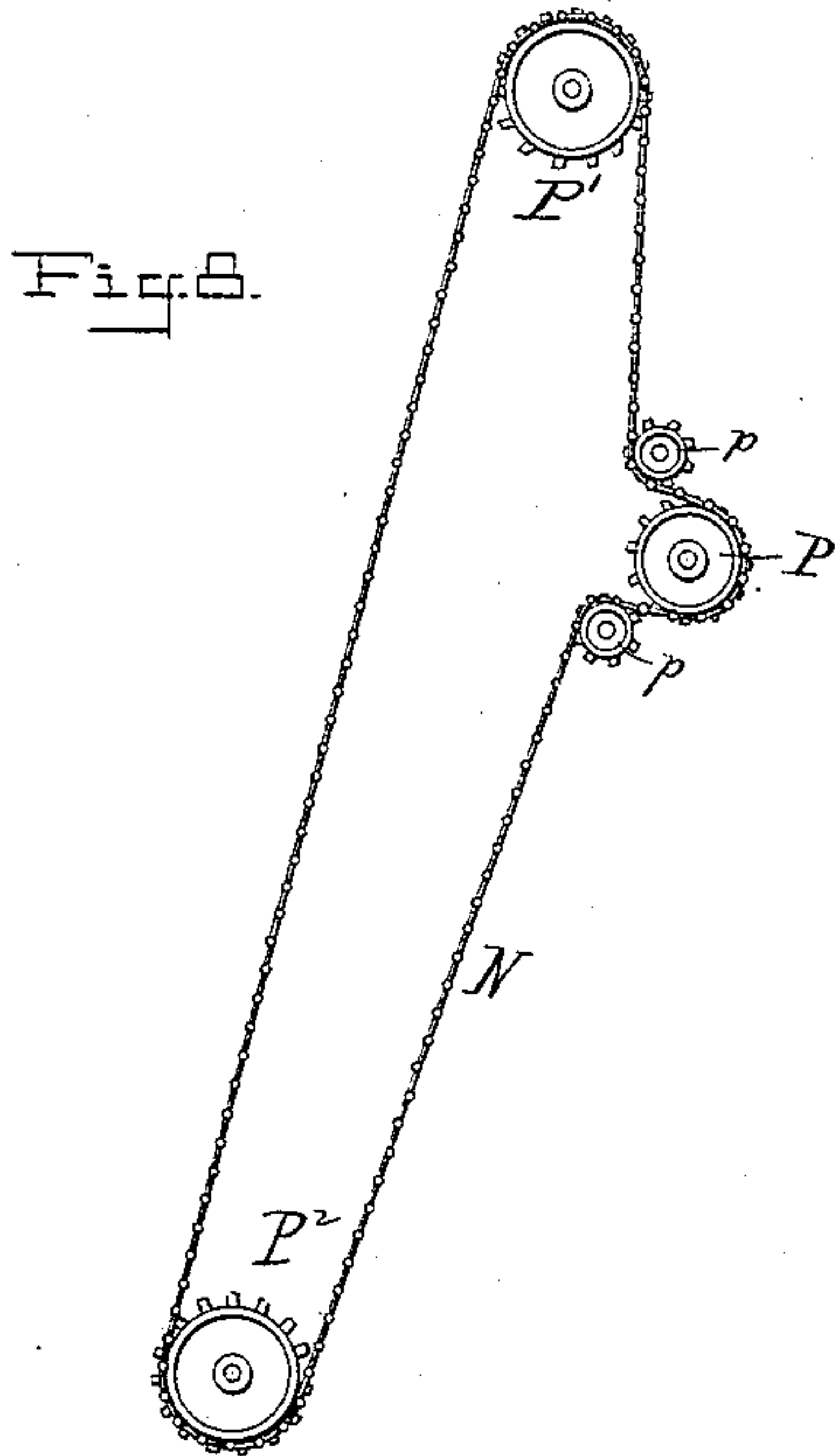
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3 Sheets—Sheet 3.

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UNITED STATES PATENT OFFICE.

CHARLES A. CASE, OF NEW YORK, N. Y.

ELEVATOR.

SPECIFICATION forming part of Letters Patent No. 433,762, dated August 5, 1890.

Application filed April 30, 1890. Serial No. 349,998. (No model.)

To all whom it may concern:

Be it known that I, CHARLES A. CASE, a citizen of the United States, and a resident of New York city, New York, have invented Improvements in Elevators, of which the following is a specification.

My invention consists of improvements in elevators having endless chains of buckets for elevating coal, ores, grain, and other granular material, my invention being also applicable to dredging and excavating machines.

One of the main objects of my invention is to so construct the elevator, as to facilitate the discharging of the buckets, and particularly in the case of coal to lessen the breakage at the point of discharge from the upper part of the conveyer. This and other objects of my invention, which need not here be enumerated in detail, are attained by constructing the elevator as hereinafter described.

In the accompanying drawings, Figure 1 is a side elevation, with part in section and part broken away, of an elevator adapted for the unloading of barges. Fig. 2 is a vertical section through the elevator-leg, the fixed frame being shown in dotted lines. Fig. 3 is a corresponding front elevation with the fixed frame and its parts shown in full lines. Fig. 4 is a perspective view, drawn to an enlarged scale, of one of the buckets. Fig. 5 is a view of the lower end of the elevator-leg, the section being taken on the line 1 2, Fig. 7. Fig. 6 is a sectional plan view on the line 3 4, Fig. 2. Fig. 7 is a sectional plan view on the line 5 6, Fig. 2. Fig. 8 is a diagrammatic view of the endless chain and wheels for imparting motion to the endless chain of buckets.

In the drawings I have illustrated my invention as applied to that class of elevators which are adapted more particularly for the unloading of barges, there being a fixed frame upon the wharf or upon a floating lighter with a movable or adjustable elevator-leg carrying the endless chain of buckets, this leg being adapted to be lowered into the bottom of the hold of the barge for the unloading of coal or other granular material therefrom.

In Figs. 1, 2, and 3, A is the fixed framework on the wharf or lighter X, and B is the movable elevator-leg, which can be raised or lowered, as hereinafter described, and which

carries the endless chain of buckets. The frame-work of this adjustable leg B may be built in any suitable way, and in the drawings I have shown it as built up of two pairs of channel-bars *b*, the bars of each pair being united by suitable braces or bars *b'*. The lower end of the elevator-leg is provided with the usual guard-bars *b²*. In the bearings at the upper and lower ends of this elevator-leg I have mounted the wheels D and D', over which the endless chain E of buckets passes. The upper wheels D are preferably sprocket-wheels, and power is applied to the shaft carrying these sprocket-wheels D, as hereinafter described. The lower wheels D' may be plain or grooved traction-wheels.

In elevators with endless chains or buckets as usually constructed the coal or other granular material is discharged by the turning of the buckets over the top wheel, the material being thrown out of the buckets into a chute at that point. This method of emptying the buckets carries with it the objection that in some cases it involves an undesirable construction, and in the case of coal particularly it involves a certain amount of breakage of the coal, which it is desirable to avoid.

I provide for the easy discharge from the buckets with the least possible breakage of the coal or other material by making all the elevator-buckets open at the back but with sides as usual, and by providing a relatively stationary backing over which these buckets travel. This backing terminates at a desired point below the upper wheel, and there is a curved lateral chute at that point, so that as the buckets successively pass the upper end of this stationary backing the coal will slide over the top and out upon the chute into a proper receptacle. This allows of the discharge of the coal with an easy motion instead of the throwing action which results from discharging the buckets in turning over the upper wheels.

As shown in the perspective view, Fig. 4, each bucket F is of the usual form, with sides *ff*, but without the usual individual back. These buckets may be mounted on any suitable construction of bands, chains, or belts, provided the backs of the buckets are left open. In the drawings I have shown these buckets F as carried by endless chains F', of

the construction known as the "Dodge chain;" but I do not wish to limit myself to that particular form. These chains, belts, or bands pass over a pair of sprocket-wheels *D D* at the top and a pair of traction-wheels *D' D'* at the bottom of the elevator-leg. On the elevating side of the leg, between the front channel-bars *b b*, is provided the stationary backing *G*, which in this instance, for reasons explained hereinafter, is made up in two overlapping pieces *g g'*. This backing of sheet metal lies immediately behind the line of the upwardly-traveling buckets. The path of movement of these buckets upward is so close to this backing *G* that the coal gathered up by the buckets will be retained therein until each bucket successively reaches the top edge *x*, Fig. 1, of the backing, when, as the bucket rises, its contents will slide down an inclined curved chute *H*, Fig. 6. I prefer to place sheet-metal backing *G'* behind the descending line of buckets, as shown in Fig. 2. At the point where this backing *G'* meets the lower wheels *D'* it is curved outward, as shown at *Y* in Fig. 5, so that the inverted bottom of the bucket will be closed by this curved portion *Y* when the bucket begins its lower turn and passes around between the wheels and picks up the coal or other granular material. Angle-irons or guides *J* (shown in Fig. 6) may be provided to keep the bucket-chains in line. This elevator-leg is vertically adjustable upon a block *K*, which is pivoted in suitable bearings upon the frame-work *A*.

To raise or lower the elevator-leg, suitable hoisting-tackle *L* is provided, preferably at both sides, the free ends *l* of the hoisting chains or ropes passing over the drum of a suitable hoisting apparatus *L'*, the construction of which, however, forms no part of my present invention. The lower end of the leg of the elevator may be swung toward or from the fixed frame by swinging the block *K* upon its pivots by any suitable means. In the present instance I have shown a pair of arms *M*, adapted to slide in suitable guides *m* in the fixed frame-work and having anti-friction rollers *m'* bearing upon the frame-work of the leg. Suitable tackle *m²* is provided to force these slides, and consequently the lower end of the leg, outward. On releasing the tackle the elevator-leg may be moved inward, and when it is raised by the tackle *L* this lower end may be withdrawn entirely within the frame-work *A* on the wharf or lighter. It may be here mentioned that it is on account of this necessary adjustment of the elevator-leg that the backing *G* for the buckets is made in two parts *g g'*, one part *g* being carried by the swinging block *K* on the fixed frame and the other by the elevator-leg, and these two parts *g g'* overlap each other to a sufficient extent to prevent any break in the continuity of the backing *G*, even when the elevator-leg is lowered as far as it can go.

Motion is imparted to the endless chain of

buckets by means of an endless-chain belt or band *N*, passing around a driving-wheel *P* in bearings on the fixed frame *A*, and over wheels *P'* and *P²* in fixed bearings on the leg above and below the block *K* or swinging center of the leg. In this case the upper wheel *P'* is fixed directly on the axis of the sprocket-wheels *D*. On each side of the driving-wheel *P* is provided a guide-wheel *p*. Thus, however much the elevator-leg may be raised or lowered or otherwise adjusted, the driving-chain *N* will accommodate itself to that adjustment. The driving-wheel *P* and the guide-wheels *p p* are in such relation to the swinging block *K*, on which the elevator-leg is adjusted, that the inward and outward movements of the lower end of the leg of the elevator will not materially affect the driving-power of the chain *N*. Power may be applied to the driving-wheel *P* by any suitable means, and in this instance I have shown a chain *r'*, from a wheel *r* on the main shaft *R*, passing over a wheel *p'* on the shaft of the driving-wheel *P*. From the main shaft *R* motion can be applied to the hoisting devices *L'* through the belt or chain *l'*. This main shaft *R* may receive motion from the shaft *S* of a steam-engine or other prime mover through a belt or chain *s*.

The curved chute *H*, which discharges the material out laterally between the lines of traveling buckets, is carried by the block *K*, and in connection with this chute there may be provided a suitable hopper *T*, and below the latter again a conveyer *T'*, of any suitable construction.

I claim as my invention—

1. An elevator having an endless chain of buckets, each of which has sides but no individual back, in combination with a stationary backing, over which the buckets in elevating travel, all substantially as described.

2. An elevator having an endless chain of buckets with sides but no individual backs, and a stationary backing over which the buckets in elevating travel, and a chute leading from the upper end of the stationary backing to carry off the material as the buckets discharge.

3. An elevator-leg having an endless chain of buckets without individual backs, wheels at the top and bottom for the endless chain, a backing over which the upwardly-moving buckets pass and which terminates below the upper wheel, and a chute at the upper end of this backing to carry off the material as it discharges from the buckets.

4. An elevator consisting of a fixed frame and an elevator-leg vertically adjustable with reference to the frame and having an endless chain of buckets, a stationary backing for the buckets made of two overlapping parts, one carried by the leg and the other carried by a part on the frame, and a chute to carry off the material discharged from the buckets at the upper end of the said backing, all substantially as described.

5. The combination of the fixed frame and adjustable leg of an elevator having an endless chain of buckets with a guide-block pivoted to the fixed frame and on which the said leg is vertically adjustable, and a backing for the buckets made of two overlapping parts, one carried by the leg and the other by the swinging block on the fixed frame, all substantially as set forth.

6. An elevator consisting of a fixed frame, an elevator-leg adapted to be adjusted vertically and to be swung inward or outward and having an endless chain of buckets with wheels over which the endless chain passes, in combination with an endless driving-chain passing over wheels in fixed bearings on the elevator-leg above and below its swinging center and over a driving-wheel on the fixed frame, substantially as and for the purposes set forth.

7. The combination of a fixed frame of an elevator with a guide-block in bearings thereon, an elevator-leg vertically adjustable on the guide-block and having an endless chain of buckets passing around wheels on the elevator-leg, a driving-chain, a driving-wheel for the latter on the fixed frame adjacent to the swinging guide-block, and guide-wheels for the chain adjacent to the said driving-wheel, all substantially as set forth.

8. The combination of an endless chain of buckets having open backs with the lower wheels of an elevator-leg and a shield or guide for the buckets having an outward curve where the said buckets begin to make their lower turn, all substantially as set forth.

9. An elevator having an endless chain of buckets with open backs and a stationary backing over which the buckets in elevating travel, with wheels around which the buckets are carried, and a curved chute at the top of the backing and leading out laterally from between the two lines of traveling buckets.

10. An elevator having an endless chain of buckets, wheels around which the buckets are carried, and a stationary backing behind the upwardly-moving buckets and between the two lines and terminating at a point below the upper wheel, with a chute at the top of the backing leading out laterally from between the lines to carry off the material discharged over the top of the backing, all substantially as described.

11. The combination of the fixed frame and the leg of an elevator having an endless chain of buckets adapted to discharge from their backs, with a guide-block pivoted to the fixed frame and on which the said leg is vertically adjustable, a backing extending upward from the lower end of the leg to the said block, and a chute carried by and extending laterally from the block, all substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

CHARLES A. CASE. 1

Witnesses:

ALBERT POPKINS,
HUBERT HOWSON.