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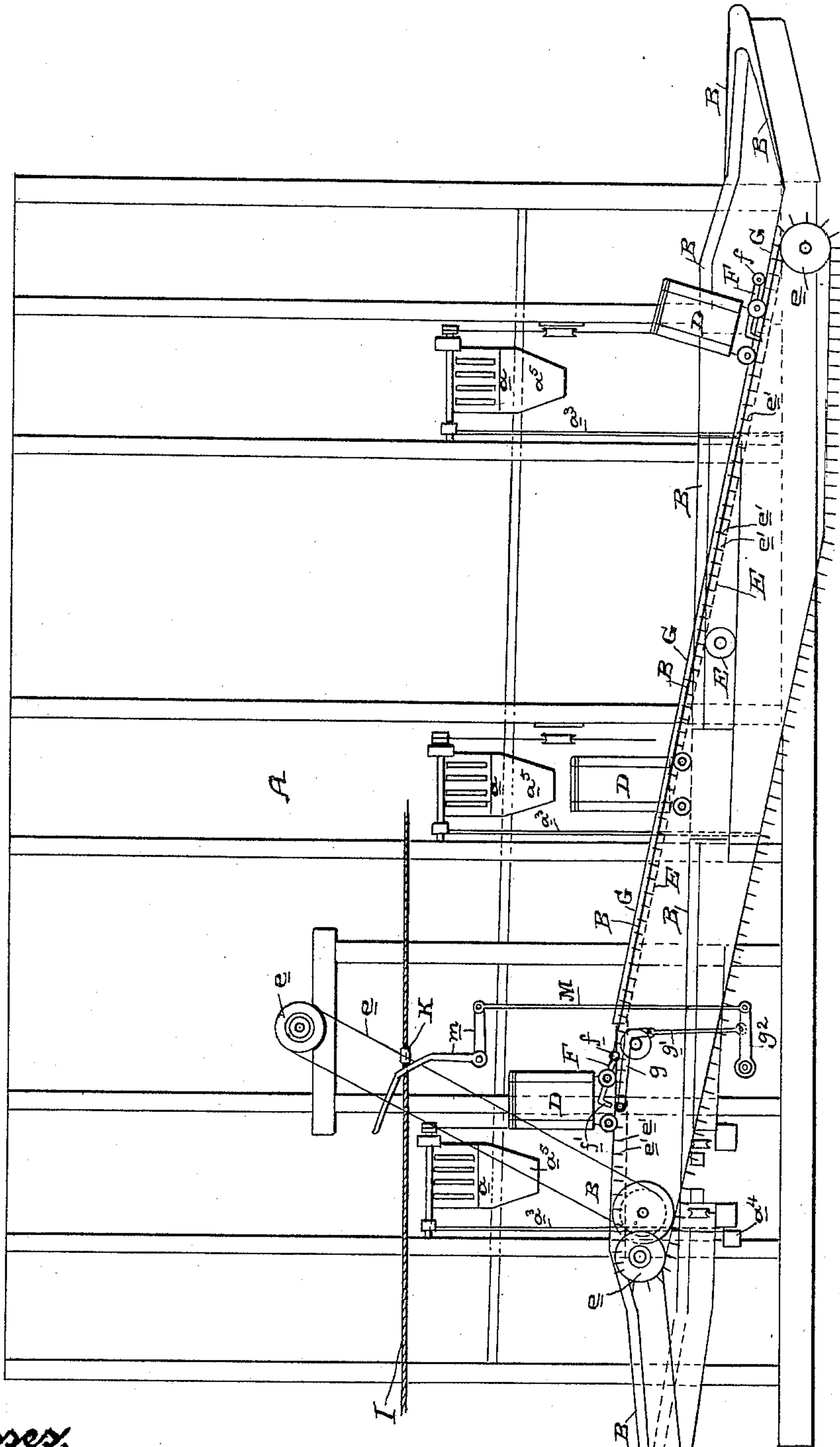
B. MCINTIRE.

SELF LOADING MECHANISM FOR WIRE ROPE TRANSMISSION.

No. 432,191.

Patented July 15, 1890.

Fig. 1.



Witnesses,  
Geo. H. Strong  
of House

Inventor,  
Bartlett McIntire  
By Dewey & Co. atty

(No Model.)

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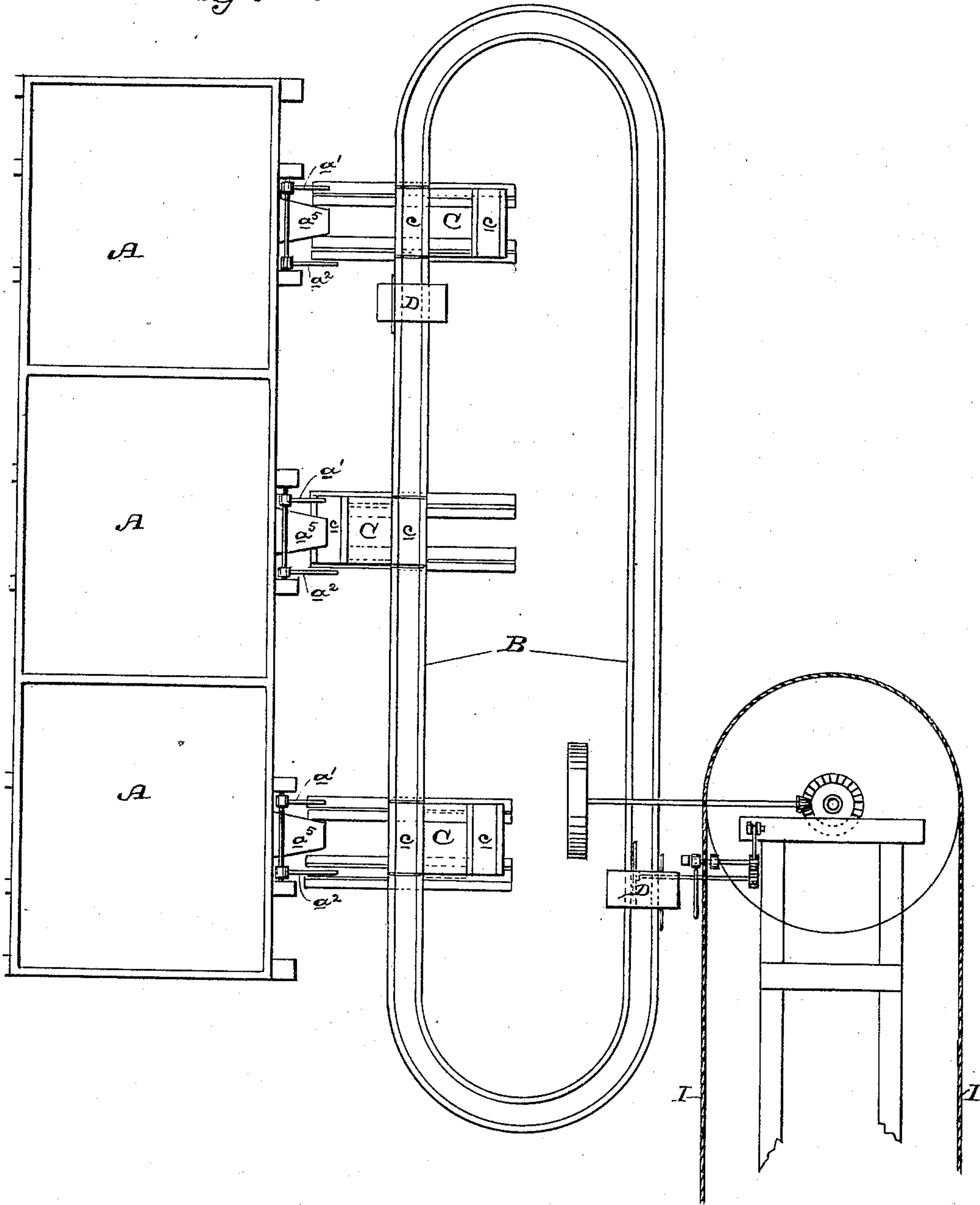
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Fig. 2.



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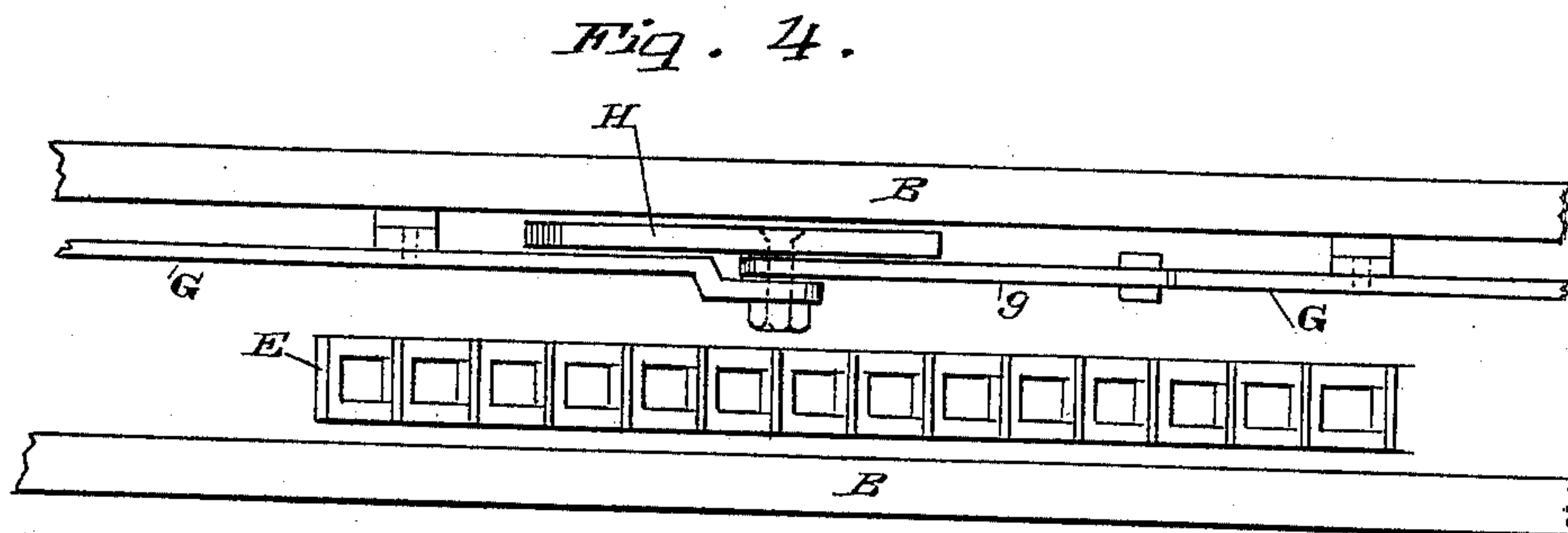
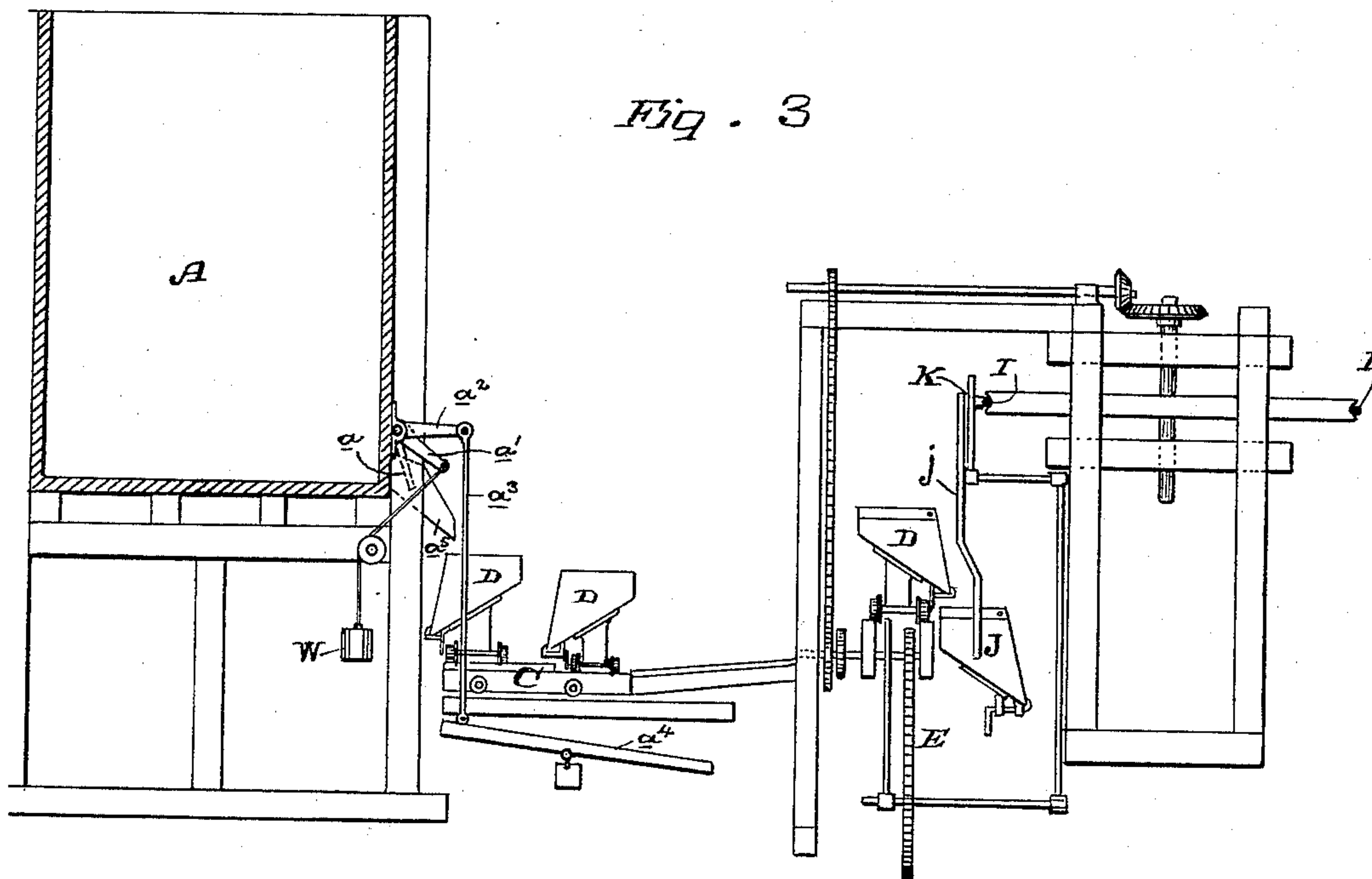
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(No Model.)

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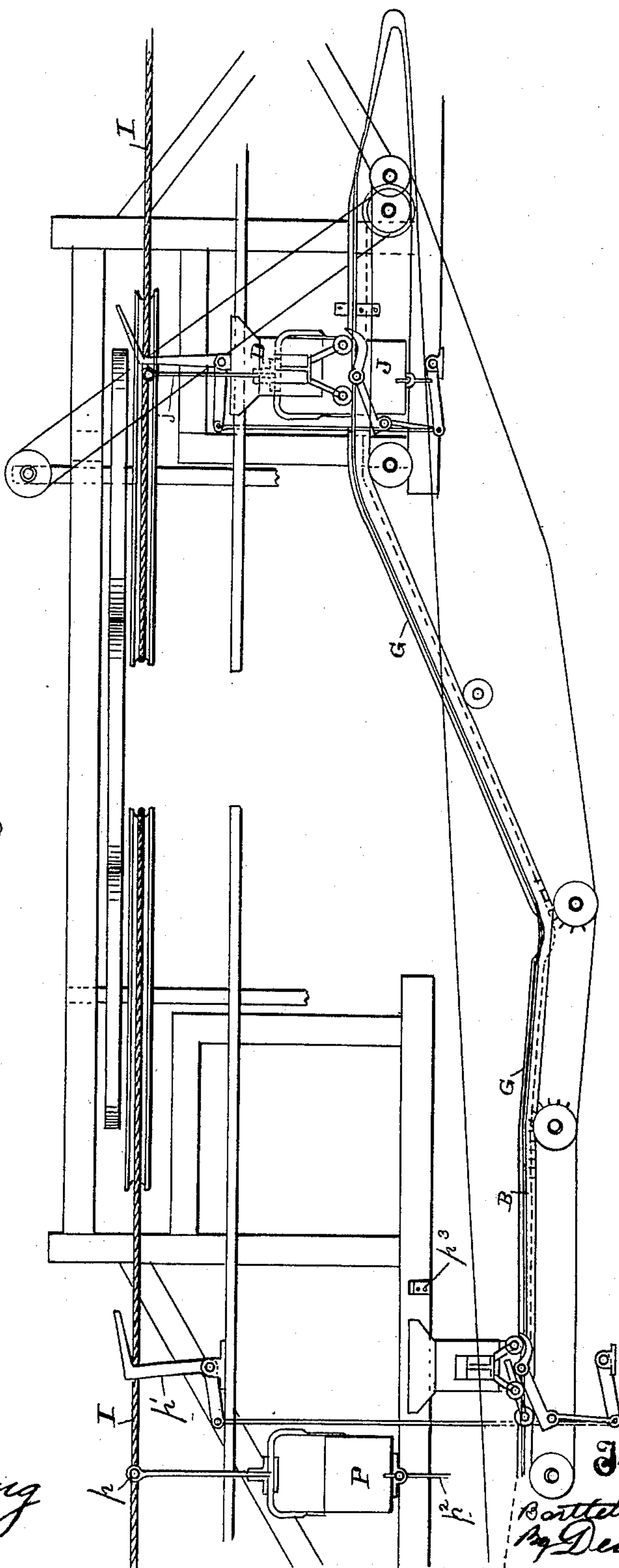
B. McINTIRE.

SELF LOADING MECHANISM FOR WIRE ROPE TRANSMISSION.

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Fig. 5.



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(No Model.)

5 Sheets—Sheet 5.

B. McINTIRE.

SELF LOADING MECHANISM FOR WIRE ROPE TRANSMISSION.

No. 432,191.

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Fig. 7.

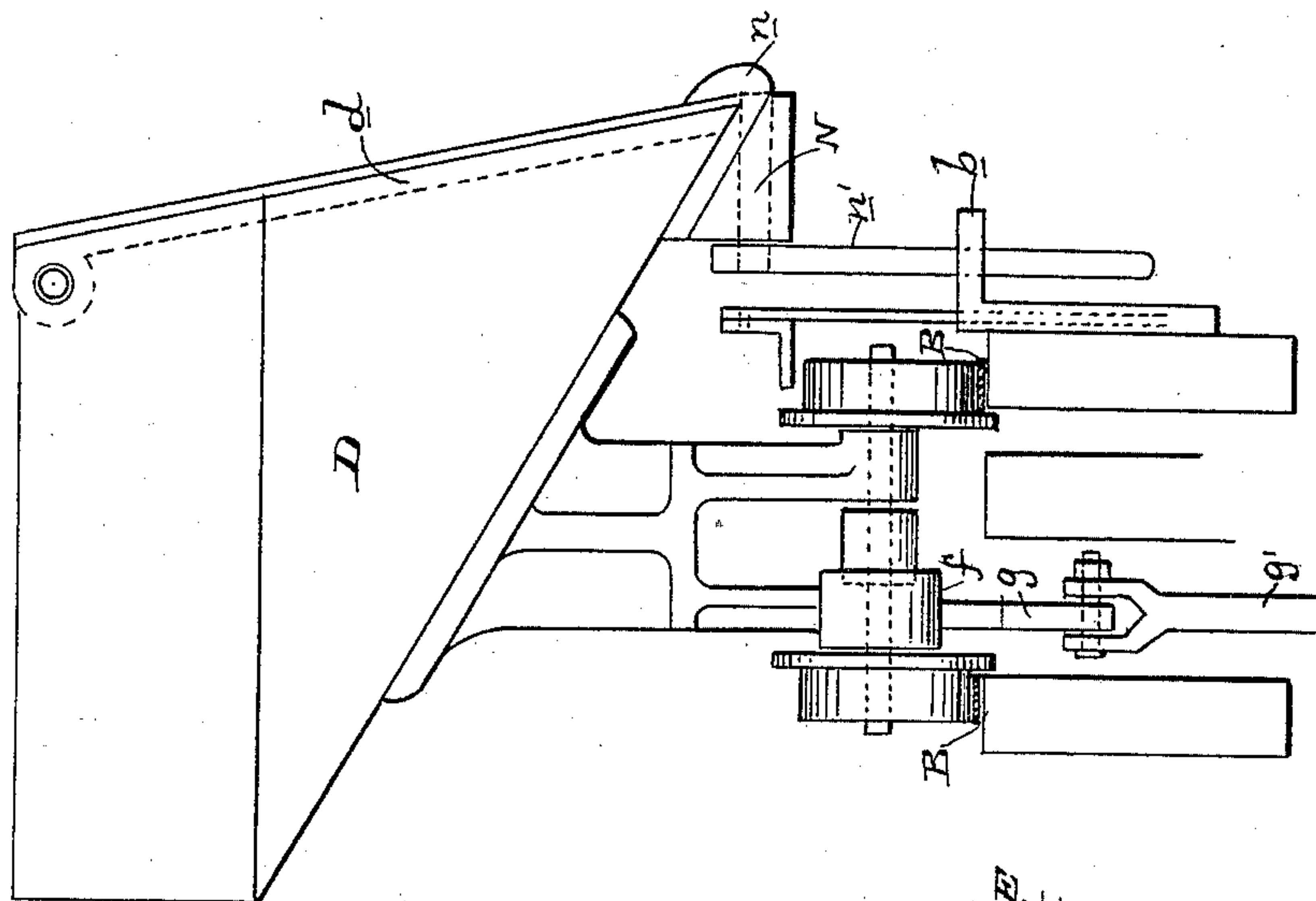
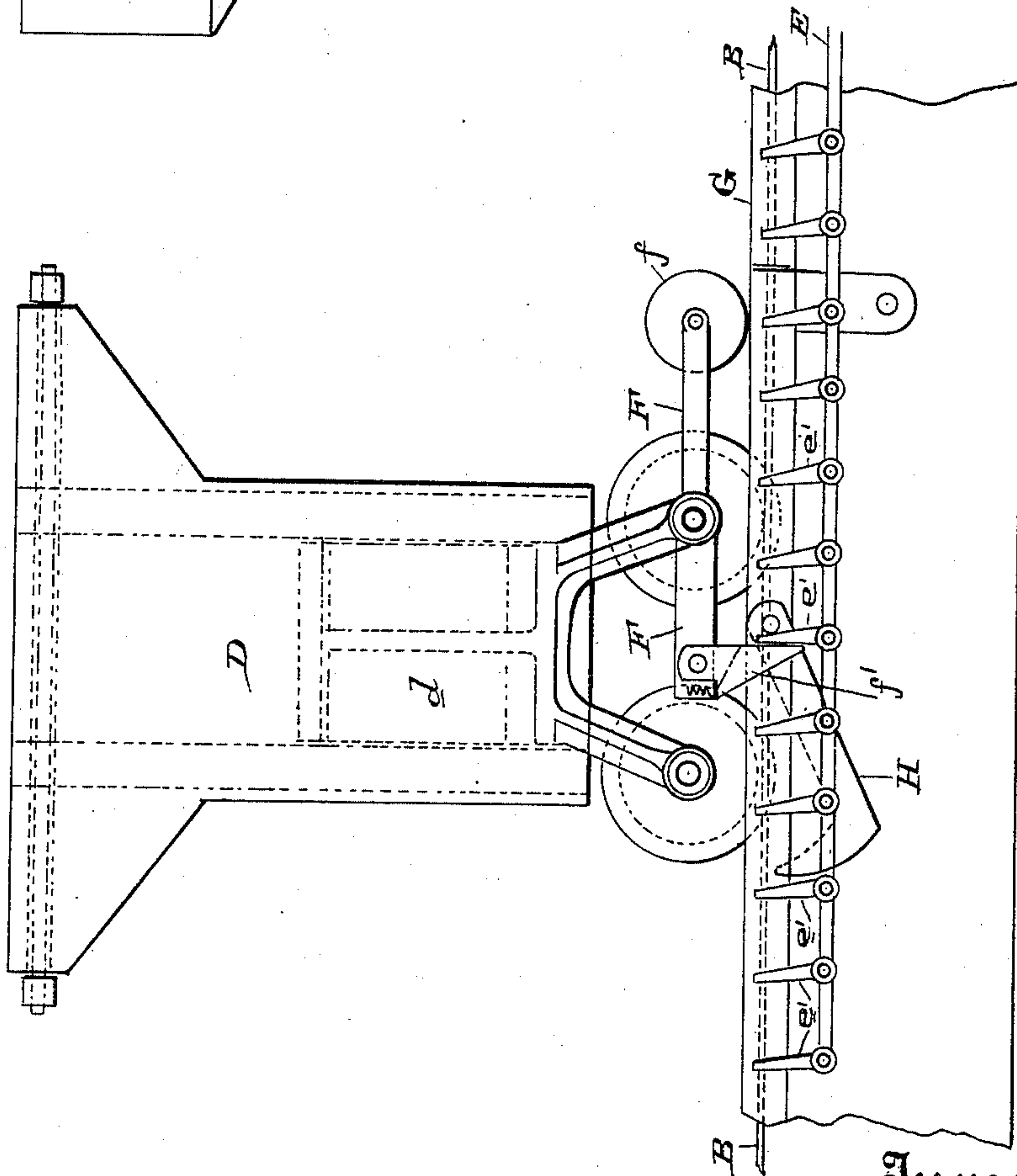


Fig. 6.



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# UNITED STATES PATENT OFFICE.

BARTLETT MCINTIRE, OF SAN FRANCISCO, CALIFORNIA.

## SELF-LOADING MECHANISM FOR WIRE-ROPE TRANSMISSION.

SPECIFICATION forming part of Letters Patent No. 432,191, dated July 15, 1890.

Application filed January 27, 1890. Serial No. 338,277. (No model.)

*To all whom it may concern:*

Be it known that I, BARTLETT MCINTIRE, a citizen of the United States, residing in the city and county of San Francisco, State of California, have invented an Improvement in Self-Loading Mechanisms for Wire-Rope Transmission; and I hereby declare the following to be a full, clear, and exact description of the same.

My invention relates to the general class of mechanism included in the system of transportation by means of wire rope, said system being employed commonly in mines, where the ore is placed in carriers suspended by clips from a traveling cable or rope, whereby the carriers are transported to suitable points and distances.

My invention consists in the novel combination and arrangement of parts hereinafter fully described, and specifically pointed out in the claims, and the object of which is to provide for automatically loading the carriers of the endless rope.

Referring to the accompanying drawings for a more complete explanation of my invention, Figure 1 is a front view of the arrangement of my invention. Fig. 2 is a plan of the same. Fig. 3 is a vertical section. Fig. 4 is a detail of construction. Fig. 5 shows a modification. Figs. 6 and 7 show the dumping-car with mechanism.

A is a hopper or bin to contain the ore, and from which it is taken to be transported. In the front of this hopper or bin are the grated doors  $a$ , having connected with their pivotal axis an arm  $a'$ , from which is suspended a weight  $W$ , whereby the doors are held normally closed. Said doors are also provided with a second arm  $a^2$ , from which a rod  $a^3$  extends downwardly to a pivoted treadle  $a^4$ , upon one end of which the workman places his foot, whereby the doors may be opened. A discharge-chute  $a^5$  is in direct communication with the doorway.

B is a car-track, which is practically a continuous one, here shown of an elongated pattern. This track extends along in front of the hopper and below each of its doors, where it is level; but in other portions it is made with suitable inclines, whereby the cars upon it may run down by gravity toward one end, and after reaching the highest point, by means

hereinafter described, they may run down to the level portion again.

The track B, where it passes in front of the hopper, is intersected at points opposite each door of the hopper by rolling platforms C, which carry one or two lines  $c$  of short tracks, which are adapted to be brought into line with the main track, thereby continuing it.

D are the loading-cars. These are mounted and adapted to travel upon the track B, and when one car comes upon one of the rolling platforms and upon the track  $c$  thereof said platform can then be pushed inwardly toward the hopper, whereby the car is carried under the discharge-chute  $a^5$  of the hopper-door, while the other track  $c$  of said platform is brought into line with the main track B, thereby enabling a second car to pass over the first platform and onto the next one, whereupon it too can be pushed in toward the hopper-chute, bringing its second line of track into line with the main track B and enabling a third car to pass along to the third platform, and so on throughout the series. From the lowest end of the track B said track extends on an upward grade on its outer side, and between its rails is an endless drive-chain E, which is mounted upon suitable sprocket-pulleys, and derives a traveling motion by means of suitable power-transmitting devices. (Represented generally by  $e$ .) This chain has extending upwardly from each link an engaging-pin  $e'$ , and said chain (which may be termed a "sprocket-chain") follows the upward trend or grade of the track B. Pivotaly mounted upon one of the car-axes is a swinging arm F, having at its rear end a guide-roller  $f$  and at its forward end a catch-bar  $f'$ , which is secured thereto so as to move in one direction only, and said catch-bar extends downwardly within the path of the engaging-pins  $e'$  of the sprocket-chain. The roller  $f$  of the swinging arm travels upon a fixed guide-rail G, so that the arm is held in such a position that its catch-bar is depressed and is engaged by the sprocket-chain, whereby the car is picked up at the lowest portion of the track B and is carried up the incline. The track B at the head of the incline is made level again, as shown, and at the beginning of this level portion the guide-rail G terminates and is succeeded by a piv-



oted trip-bar  $g$ , the free end of which is held normally depressed below the adjacent end of the rail  $G$  by means of a connecting-link  $g'$  and pivoted lever  $g^2$  below, the weight of which holds the trip-rail in this position. The consequence is that when the car arrives on the upper level portion of the track B its roller  $f$ , falling off the end of the rail  $G$  onto the depressed end of the trip-rail  $g$ , thereby raises the catch-bar  $f'$  at the other end of the arm  $F$  out of engagement with the pins  $e'$  of the drive or sprocket chain, so that the car remains stationary momentarily, and is held in this position by a brake bar or catch  $H$ , which is pivoted to the end of the trip-rail  $g$ , and is operated by its depression so as to throw up its hooked end in front of the wheel.

I is the traveling cable or rope of the transmission system. I have not deemed it necessary herein to show the entire arrangement of this rope, it being understood that it is mounted suitably and directed throughout a definite course. Upon this rope is suspended a number of carriers, one of which is represented by  $J$ , suspended by a hanger  $j$  from a clip  $K$ , which is secured to the rope. The relative position of the parts is as shown in Fig. 3, where it will be seen that the carrier  $J$  is below the bottom of the car-body and just at one side thereof, so that when it comes alongside of said car the material from the car can be dumped into the carrier upon opening the gate of the car; but it is necessary that this dumping shall take place while the carrier is still traveling, because the rope  $I$  is not stopped at any time, and consequently the car must be again picked up and must travel along at the same speed as the carrier. For this purpose the speed of the cable and the speed of the drive-chain is made the same.

The mechanism for again engaging the car is automatic, and is as follows: Connected with the lever  $g^2$  is a rod or link  $M$ , which extends upwardly and is connected with a pivoted bell-crank lever  $m$ , the upper arm of which projects into the path of clip  $K$  of the carrier hanger. Now when the clip reaches the upper arm of this lever it comes in contact with it and raises it, whereby, through the connecting-rod  $M$ , the lever  $g^2$  below is raised, and through its connecting rod or link  $g'$  the trip-rail  $g$  is raised, thereby acting, through contact with the roller  $f$ , to rock arm  $F$  and throw its forward or catch end  $f'$  down again into engagement with one of the pins  $e'$  of the drive-chain, and this same movement throws down the brake-catch  $H$ , thereby releasing the car. This takes place exactly when the carrier reaches the side of the car, and thereupon both car and carrier move along at the same rate of speed.

The side of the car is provided with a hinged gate  $d$ , which swings outwardly, but is held in place by means of a catch or button  $n$  at the bottom overlapping it, said catch or button being upon a rock-shaft  $N$ , from

the inner end of which extends downwardly a contact-arm  $n'$ .

From the side of the main track  $B$  extends outwardly a fixed lug or arm  $b$ , against which the arm  $n'$  of the rock-shaft is adapted to come in contact as the car proceeds. This contact rocks the fastening-button  $n$ , so that the door of the car is released and swings open by the weight of the material behind it, thereby allowing the contents of the car to fall out into the adjacent and underlying carrier, which continues upon its way, while the car itself is carried by the drive-chain to the end of the elevated portion of the track  $B$ , and thence descends by a suitable grade in the track to the other and level side of it in front of the hopper again.

The general operation of the mechanism may be briefly stated to be as follows: The empty car coming upon the level portion of the track  $B$  on the hopper side is run upon one of the tracks  $c$  of the first rolling platform  $C$ , and by the operator is then pushed inwardly with said platform into such position that upon opening the door of the hopper by means of the treadle, as heretofore described, the ore will pass out into the car. While this is being done a second car passing along the track  $B$  crosses the second rail  $c$  of the first platform and reaches the second platform, with which it is moved inwardly toward the hopper to receive its load, while a third car passes by the second platform to the third one and is pushed inwardly to receive its load, and so on throughout the series. The first car being now loaded, its platform is drawn back, so as to bring the line of short rails  $c$ , upon which the car stands, into line with the track  $B$ , whereupon said car is pushed along the main track over the second and third platforms and to the downward grade of the track, so that it runs clear around by gravity to the other end of the track. At this end it is immediately picked up by the sprocket-chain and carried up the grade to the elevated portion of the track above, where, being temporarily released, it awaits the arrival of one of the carriers of the traveling rope. Upon this arrival the car is again engaged by the sprocket-chain and the carrier and car travel together, the car discharging into the carrier, and being thence moved to the grade of the track at the end it is run down to the hopper side again. A second car is likewise in course of operation, and a third following it, and so on.

I do not confine myself to receiving the ore from a fixed hopper or bin, as my mechanism, with but the slightest alteration, may be employed to load the cars from the carriers of one rope and to carry the load to the carriers of a second rope, which system might be called a "dumping" and "reloading" system.

In Fig. 5 I have shown the adjacent ends of the two rope systems. The mechanism shown on the right is precisely the same as that heretofore described for dumping the contents of



the car into the carrier. That shown on the left takes the place of the fixed hopper or bin heretofore described, and is shown as consisting of a superposed carrier P, the clip  $p$  of which is adapted to come in contact with the bell-crank lever  $p'$ , corresponding to the bell-crank lever  $m$ , heretofore described, said lever being connected with and operating devices below substantially similar to those heretofore described, and by which the car is thrown into engagement with the drive or sprocket chain, so that the car and carrier move for a short time together, the car receiving the contents of the carrier, the gate of which is opened by the contact of an arm  $p^2$  of the carrier with a fixed lug or stop  $p^3$ .

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a loading mechanism for wire-rope transmission, the inclined track B and the traveling sprocket-chain moving up the track-incline, in combination with the cars moving upon said track, each car having a pivoted arm F, the catch  $f'$  on one end of said arm adapted to engage the sprocket-chain, the roller  $f$  on the other end of said arm, and the fixed guide-rail G, on which said roller bears, whereby the catch is held to its engagement with the sprocket-chain, substantially as herein described.

2. In a loading mechanism for wire-rope transmission, the inclined track B and the traveling sprocket-chain moving up the incline, in combination with the cars traveling on the track, the swinging arms F, carried by the cars and having a catch  $f'$  at one end engaging the sprocket-chain and a roller at the other end, a fixed guide-rail G, on which said roller rests, and a normally-depressed trip-rail  $g$  below the level of the top of the guide-rail, whereby when the roller reaches the top of the guide-rail it drops off and down onto the trip-rail, thereby removing its catch from the sprocket-chain and stopping the car, substantially as herein described.

3. In a loading mechanism for wire-rope transmission, the track B, the traveling sprocket-chain, and the swinging trip-rail  $g$ , in combination with the car on the track, the swinging arm F, carried by the car, the catch  $f'$  at one end of the arm adapted to engage the sprocket-chain, the roller  $f$  at the other

end of the arm and resting on the trip-rail, and a means for raising said trip-rail to swing the arm and re-engage its catch with the sprocket-chain, substantially as herein described.

4. In a loading mechanism for wire-rope transmission, the combination of the car, the suspended carrier adapted to be brought into juxtaposition with the car, whereby the load may be delivered from one to another, a drive-chain for advancing the carrier, a trip-rail, a bell-crank lever  $m$ , actuated by the carrier, connections between said lever and trip-rail, the swinging arm on the car, and a fixed contact and mechanism operated thereby to open the car or carrier to deliver the load from one to the other, substantially as herein described.

5. In a loading mechanism for wire-rope transmission, the track B and the traveling sprocket-chain, the car on the track, the swinging arm F of the car having the catch  $f'$  on one end engaging the sprocket-chain, and the roller  $f$  on the other end, and the swinging trip-rail  $g$ , adapted to come in contact with and raise the roller, whereby the catch is brought down into engagement with the sprocket-chain, in combination with the transmission-rope I, the carrier J, the hanger  $j$  of the carrier, and the clip K of the hanger, the bell-crank lever  $m$ , with which the clip is adapted to come in contact, and connections between said lever and the trip-rail, whereby the latter is raised to effect the engagement of the car with the chain and the simultaneous travel of the car and the carrier of the rope, substantially as herein described.

6. In a loading mechanism for wire-rope transmission, the combination of the track B, the traveling sprocket-chain, the car on the track, the arm F, carried by the car, having a catch on one end and a roller on the other, the swinging trip-rail  $g$ , bearing under the roller, and the brake hook or bar H, connected with the trip-rail, substantially as herein described.

In witness whereof I have hereunto set my hand.

BARTLETT MCINTIRE.

Witnesses:

S. H. NOURSE,  
H. C. LEE.