

No. 688,290.

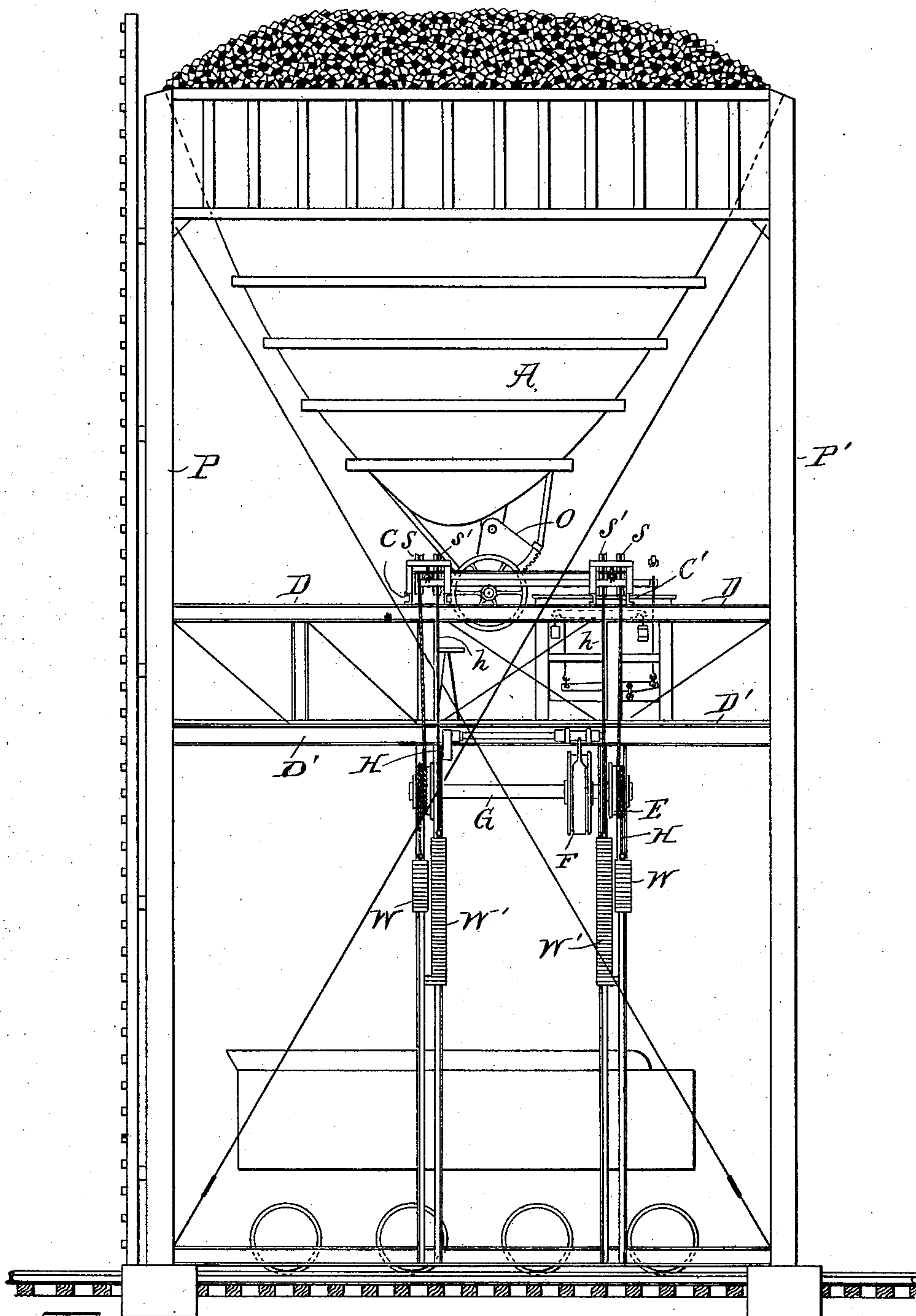
Patented Dec. 10, 1901.

A. E. BROWN.  
APPARATUS FOR UNLOADING COAL.

(Application filed Apr. 13, 1901.)

(No Model.)

5 Sheets—Sheet 1.



Witnesses:

*H. Griswold.*

*James Ryan Maydon.*

FIG. 1

Inventor.

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*by George C. Wing*  
*his attorney*

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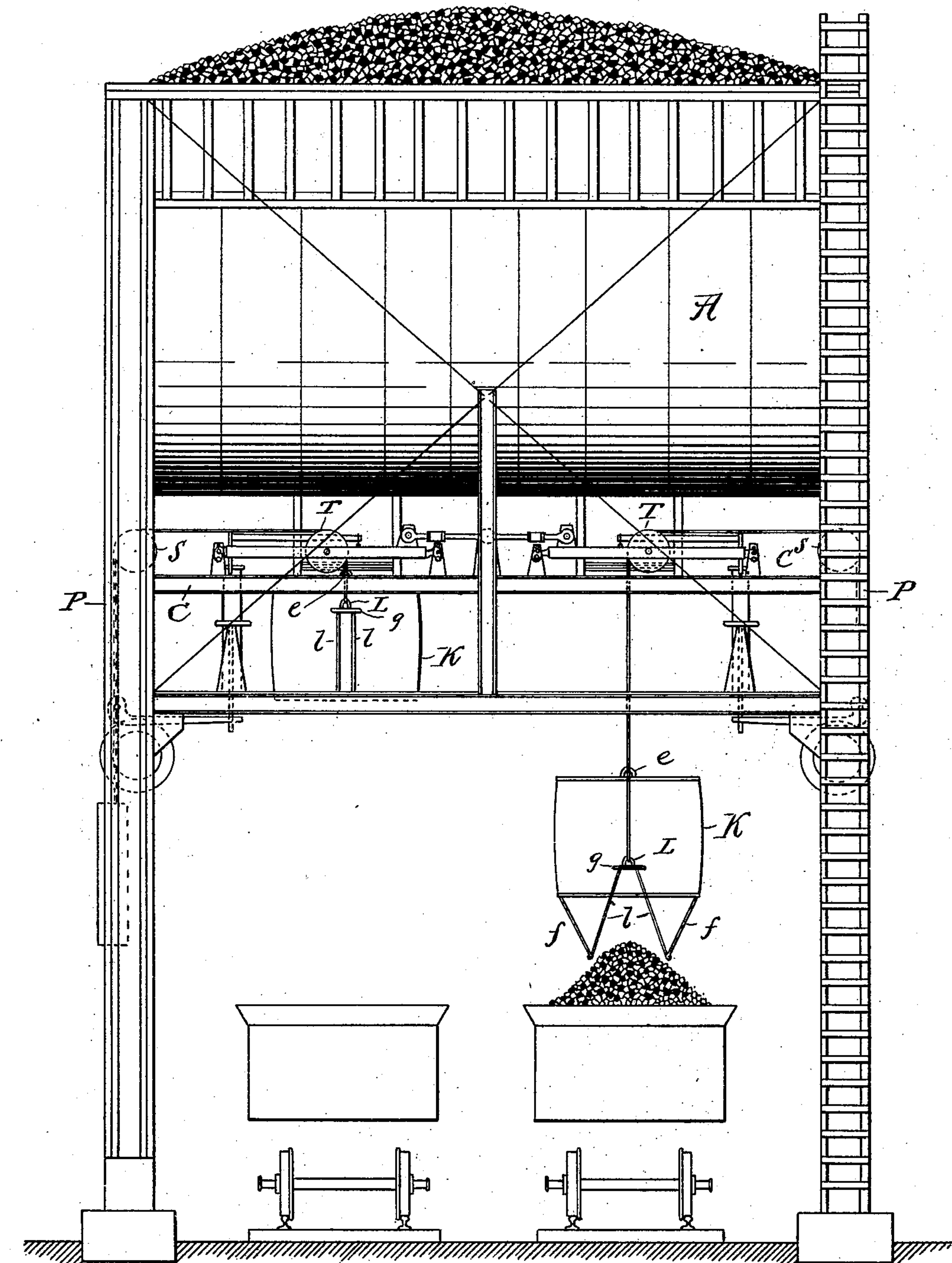
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A. E. BROWN.  
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Fig. II

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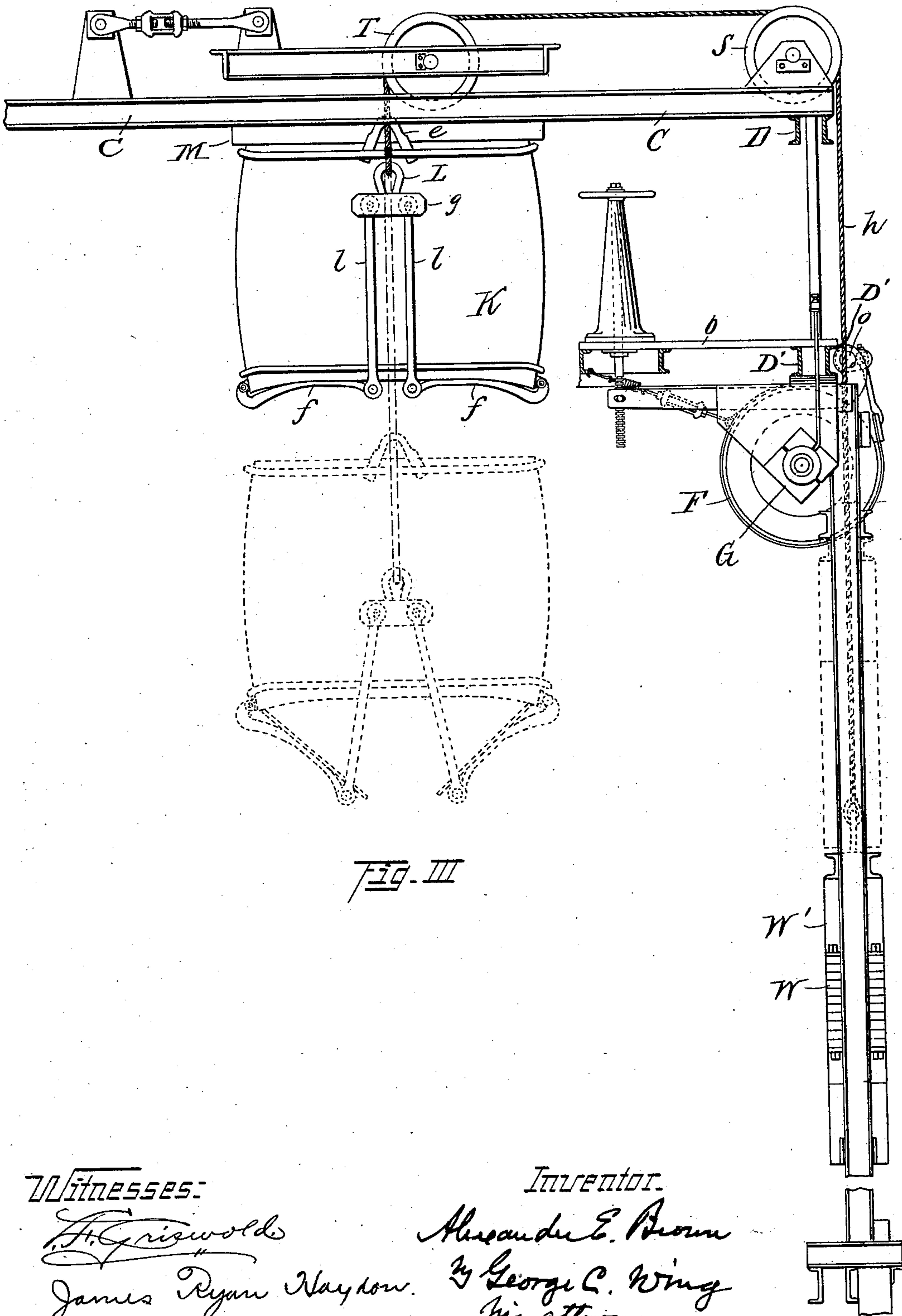
Patented Dec. 10, 1901.

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(No Model.)



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Inventor:

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his attorney*



No. 688,290.

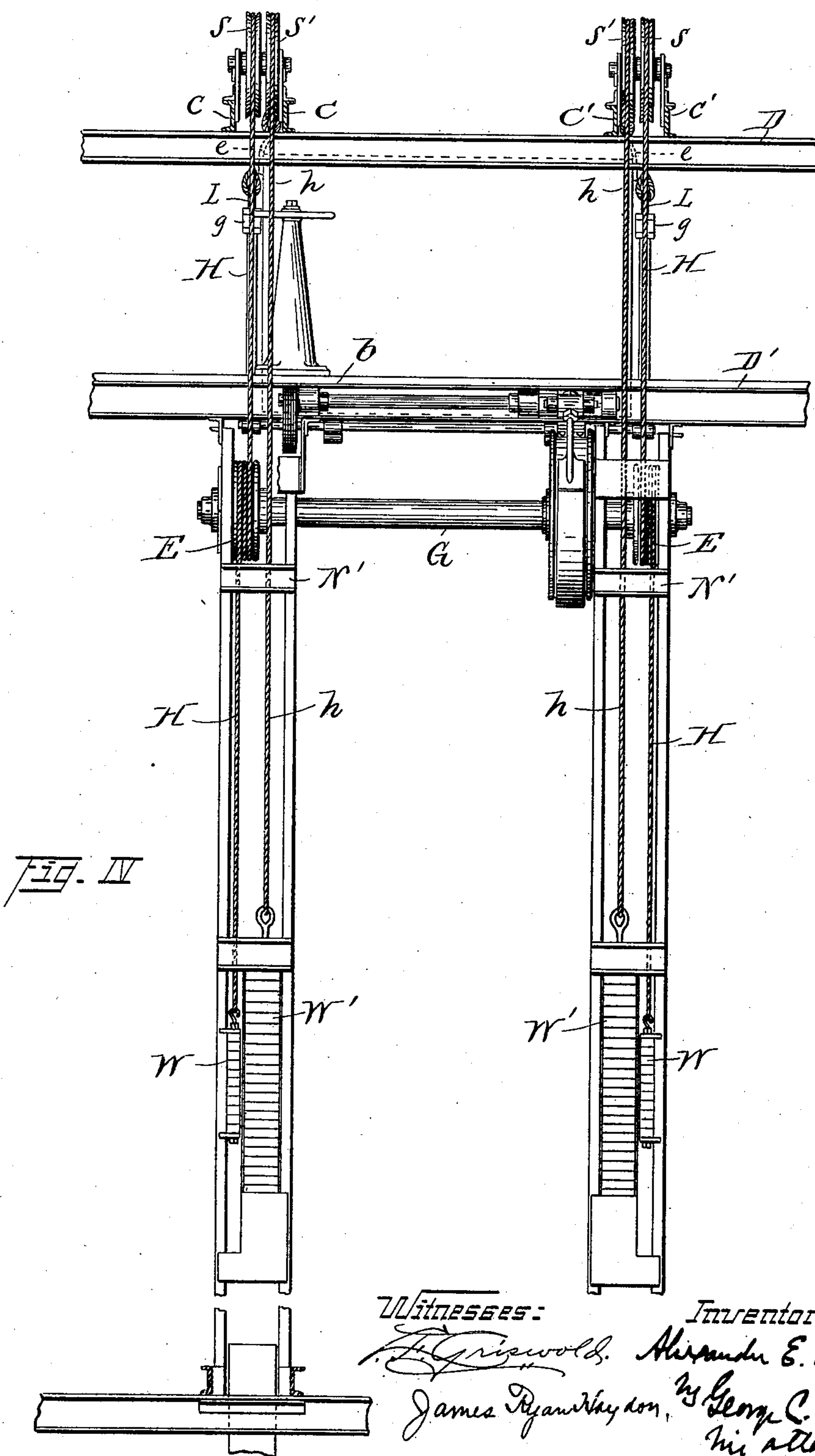
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APPARATUS FOR UNLOADING COAL.

(Application filed Apr. 13, 1901.)

(No Model.)

5 Sheets—Sheet 4.



Witnesses:

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*James Ryan & Son,*

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No. 688,290.

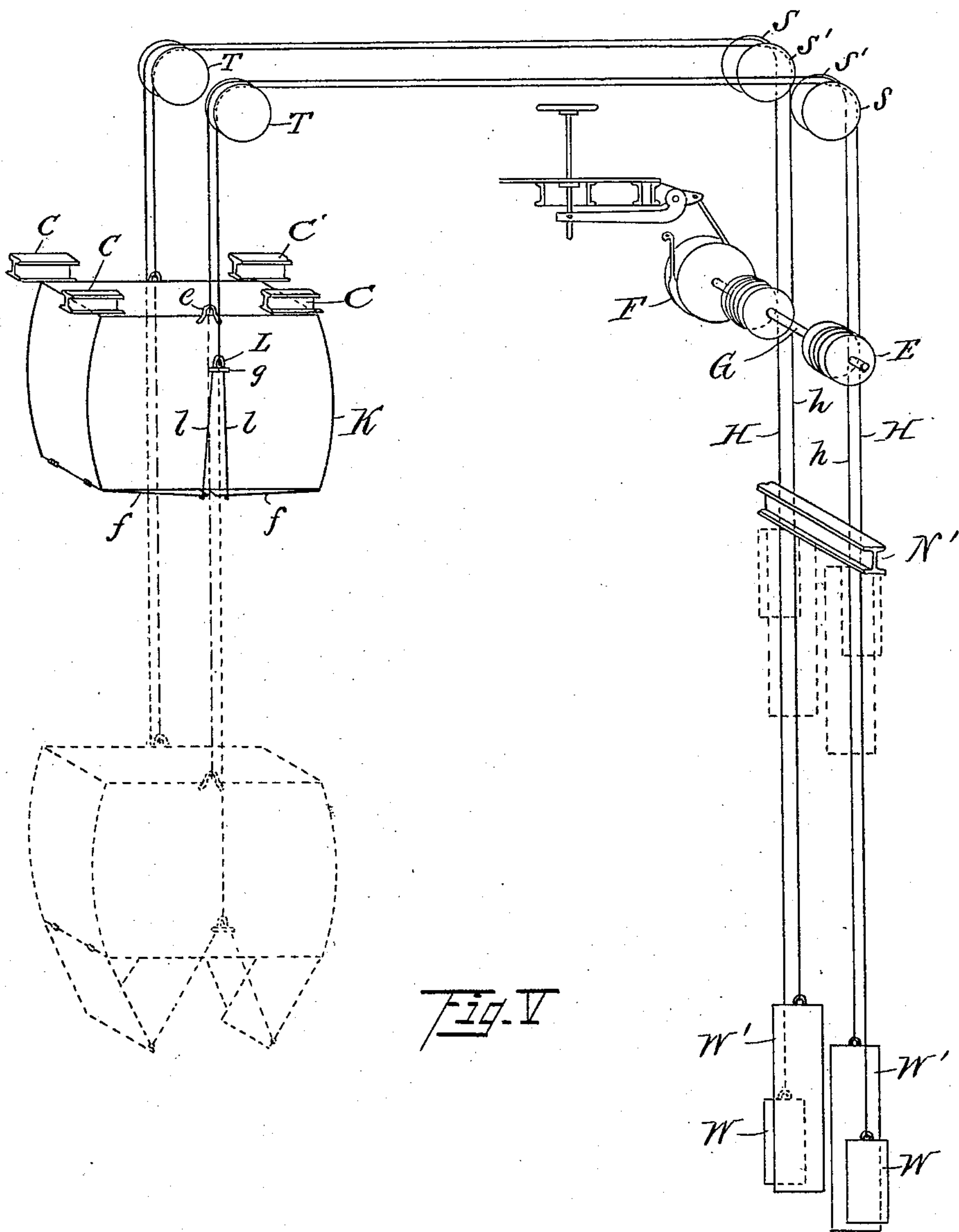
Patented Dec. 10, 1901.

A. E. BROWN.  
APPARATUS FOR UNLOADING COAL.

(Application filed Apr. 13, 1901.)

(No Model.)

5 Sheets—Sheet 5.



Witnesses:

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James Ryan Haydon.

Inventor.

Alexander E. Brown  
By George C. Wing  
his attorney



# UNITED STATES PATENT OFFICE.

ALEXANDER E. BROWN, OF CLEVELAND, OHIO, ASSIGNOR TO BROWN HOISTING MACHINERY COMPANY, A CORPORATION OF DELAWARE.

## APPARATUS FOR UNLOADING COAL.

SPECIFICATION forming part of Letters Patent No. 688,290, dated December 10, 1901.

Application filed April 13, 1901. Serial No. 55,746. (No model.)

*To all whom it may concern:*

Be it known that I, ALEXANDER E. BROWN, a citizen of the United States, residing at Cleveland, in the county of Cuyahoga and State of Ohio, (whose post-office address is No. 1151 Prospect street, in said city,) have invented a new and useful Apparatus for Unloading Coal and Like Material from Storage-Bins or other Receptacles; and I hereby declare the following to be a full, clear, and exact description of the same, reference being had to the drawings accompanying and making a part of this specification.

My said invention relates to that class of devices or apparatus wherein a dumping-bucket receives its load from an overhead supply-reservoir when brought beneath a discharge-orifice in the same and thereafter is lowered to make its dump into cars, locomotive-tenders, or other place of deposit; and the feature of my invention which distinguishes it generally from others of the class is that both the hoisting of the bucket to receive the load and the lowering and dumping of the same are accomplished automatically, all by the mechanical arrangements I shall now describe in detail.

In the accompanying drawings like characters of reference indicate the same parts.

Figure I is a skeleton view of a coal-storage bin equipped with my invention in a direction toward the ends thereof. Fig. II is a like view of the same constructions in the direction of their sides. Fig. III is a side elevation of my apparatus on a more enlarged scale. Fig. IV is an end elevation on a similar scale. Fig. V is a diagrammatic side view of the device, disclosing in perspective the several operative parts and indicating in dotted lines the relative position of certain of those parts when the dumping-bucket is at the opposite extreme of its travel from the point occupied by the same as shown in full lines.

Figs. I and II disclose a duplication of my invention, which is a preferable form of the same.

Referring now to the several figures, A represents a storage-bin provided with a discharge-orifice at its lower portion, which orifice, or rather the parts controlling the same, is designated by the letter O. This orifice

may be opened or closed by any suitable means. The bin A is supported at its four corners by posts P P' and framework, as shown. Figs. I and II introduce a weighing-scale for use in connection with the process of unloading to determine the loads that are from time to time withdrawn from the bin.

Parallel with the side of the bin A and on either side of the discharge-orifice O (see Fig. II) two channel-beams C and C' are fastened at their extremities to two other fixed beams D D', extending between the posts P P' at right angles to the beams C C'. Stops M M are provided on the beam C C' below the sheave T T to limit the upward movement of the bucket K. Upon the beams D, at a distance equal to the width of the bucket to be employed, two pairs of sheaves S and S' are severally mounted. Beneath one of these pairs of sheaves (see Figs. III and IV) and attached to the lower cross-beam D' is a bracket or platform b, provided with means by which an operator standing on the same can regulate a friction-brake F. This brake-wheel F is itself affixed to a shaft G, which in turn is suitably supported by or journaled in two parallel columnar parts that are fastened to the lower cross-beam D', as shown more conspicuously in Fig. IV. The means for operating said brake F from the platform b or other suitable station is of course a non-essential to my present invention. As represented in the drawings herewith, such means involve a partial turn of a shaft o in the channel-beam D', whereby motion is transmitted to the band of said friction-brake F, fastened to the shaft o, and the said friction-brake is operated as occasion requires.

Keyed or otherwise rigidly fastened to the shaft G at points directly below the sheaves S are drums E E, and wound around the same a sufficient number of turns to secure them against slipping are cables H H. One portion of the cables H H (shown in the drawings) extends below said drums E and is attached to counterweights W, while the other portion of the cables is carried upwardly over the sheaves S S to and over sheaves T T (located in any convenient manner in the framework of the bin structure) above the point for operating the bucket K. Thence the cables are



carried downwardly to the opposite sides of said bucket, where they are fastened to the loops or eyes L. The bucket K is cubical in form and is provided with two flaps *f f*,  
 5 hinged, respectively, to the bucket at its lower edge and of suitable dimensions to be closed against the bucket, and thereby form a bottom to the same. At the exterior of opposing sides of the bucket K two links *l l* are  
 10 pivotally connected at their upper ends to a cross-bar *g*, provided with the loop or eye L, and the lower ends, respectively, to the flaps *f f*, that make up the bottom of the bucket. On these same sides of the bucket and mid-  
 15 way of the upper edge ears *e e* are fastened, to which are attached a second pair of cables *h h*. The cables *h* pass upwardly over drums or sheaves, located similarly to the sheaves T T, to and freely about the sheaves S' S',  
 20 from which they extend downwardly and are attached to counterweights W' W'. The counterweights W' W' should together be somewhat heavier than the body proper or shell of the bucket K, and the counterweights  
 25 W W should likewise exceed in weight the combined weight of the flaps *f f*. At predetermined points, to encounter the weights W' W' in their ascent, stops N' N' are provided. Their precise location should be at  
 30 such distance above the counterweights W' W' as is equal to that of the intended fall of the bucket K from the point of its filling to the point it lets go and is freed of its load.

Having thus described a form of apparatus  
 35 that embodies my said invention, its operation is as follows: The bucket K being empty and the shaft G free to move in its journals, the counterweights W' W' will draw the bucket up against the channel-beams C and C'  
 40 and under the orifice O of the bin A to a position for filling. At the same time by reason of the preponderance in weight of the counterweights W W over the flaps *f f* the latter through the links *l l* and the cables *h h*  
 45 are brought into bearing against the lower edge of the bucket K and the bucket closed. The operator should now actuate the friction-brake F to prevent any counter-revolution of the shaft G when the load is introduced and  
 50 a consequent opening of the flap-bottom *f f*. The bucket is next filled to any desired and predetermined limit, whereupon the preponderance in weight is shifted to the bucket K and its contents, the counterweights W' W'  
 55 overcome thereby, and the bucket itself allowed to descend. To effect a descent, however, the friction-brake F should be released from tension sufficiently to permit this. Because of the connection described of the  
 60 cables H H with the flaps *f f* through the links *l* and loops L the descent of the bucket will rotate the shaft G and cause the cables H H, wound in a frictional degree around the drums E E, to pay out at a pace or at a  
 65 rate that is exactly calculated to that of the descent, but which will not allow the flap-bottom *f f* to open during the operation.

When the bucket and its load have in this manner traveled downward to the predetermined limit, it is plain that the counter-  
 70 weights W' W' will have ascended an equal distance and encountered stops N' N', and thus arrested any further downward movement of the bucket proper or shell K. The weight of the bucket's cargo or load, however,  
 75 is now excessive as compared with that of the counterweights W W, opposed to the same, and must instantly force the flaps *f f* open and discharge the load. This being done and a further release of the brake for the  
 80 purpose being effected, the normal relations between the bucket proper and its counterweights W' W' will be restored and the bucket will ascend to its place for filling, and on the  
 85 arrest of said ascent of the bucket-shell K as it encounters the limiting-stops M M, and a further release of the brake F sufficient to permit the weights W W to descend, the flaps or bottom *f f* will thereby be drawn up to  
 90 their closed position and the bucket itself closed to receive a load. The brake F, however, must now be firmly set in order to hold the flaps or bottom in their closed position against the load to be next introduced.

I am aware that unloading apparatus have  
 95 heretofore been devised wherein buckets with hinged bottoms have been employed and the bucket raised and lowered by means of a counterweight; but in every such apparatus it is an essential feature that the opening of  
 100 the bottom of the bucket is only accomplished after the limit of the descent of the shell of the bucket is reached, and the closing of the same is always completed before the ascent of the shell of the bucket takes place. In the  
 105 operation, however, of the combination of the various parts of the bucket, counterweights, and controlling device making up my invention and apparatus the opening of the bottom of the bucket is effected, as in former  
 110 cases, after the descent of the shell of the same has reached its limit; but the closing thereof after a discharge of the load is not and cannot be effected until the shell has again risen to its uppermost limit at the origi-  
 115 nal point for receiving a load. By reason of this characteristic of my invention and its operation it is plain that material once dumped thereby will not be again picked up by the flaps *f f*, inasmuch as they remain open dur-  
 120 ing the entire ascent of the bucket to its said uppermost limit.

What I claim, and desire to secure by Letters Patent, is—

An apparatus for receiving and discharg-  
 125 ing coal and other material consisting of a bucket having a bottom hinged, or otherwise movably connected thereto; one or more cables attached to said sides or shell of said bucket at their one end and passing over and  
 130 being supported by a system of sheaves or drums provided for the purpose, and fastened, at their other ends, to a counterweight or counterweights, heavier than the shell or



body of said bucket; one or more cables connected at their one end to links, or other suitable means of closing the bottom of said bucket, when counter force is exerted on said  
5 cable, or cables, the said cable or cables passing over and being supported by a system of sheaves and drums, provided for the purpose, and wound around and controlled by a drum, or drums in said system, and; attached, at  
10 to their other end, to a counterweight or counterweights, heavier than said bottom of said

bucket, together with suitable means of stopping the ascent of said first-named counterweight, or counterweights, at any predetermined point, and, means for controlling said 15 drum, or drums, all substantially as shown and described.

ALEX. E. BROWN.

In presence of—  
F. G. TALLMAN,  
M. MILLARD.