

J. DORMAN.
HOISTING APPARATUS.

No. 173,917.

Patented Feb. 22, 1876.

Fig. 1.

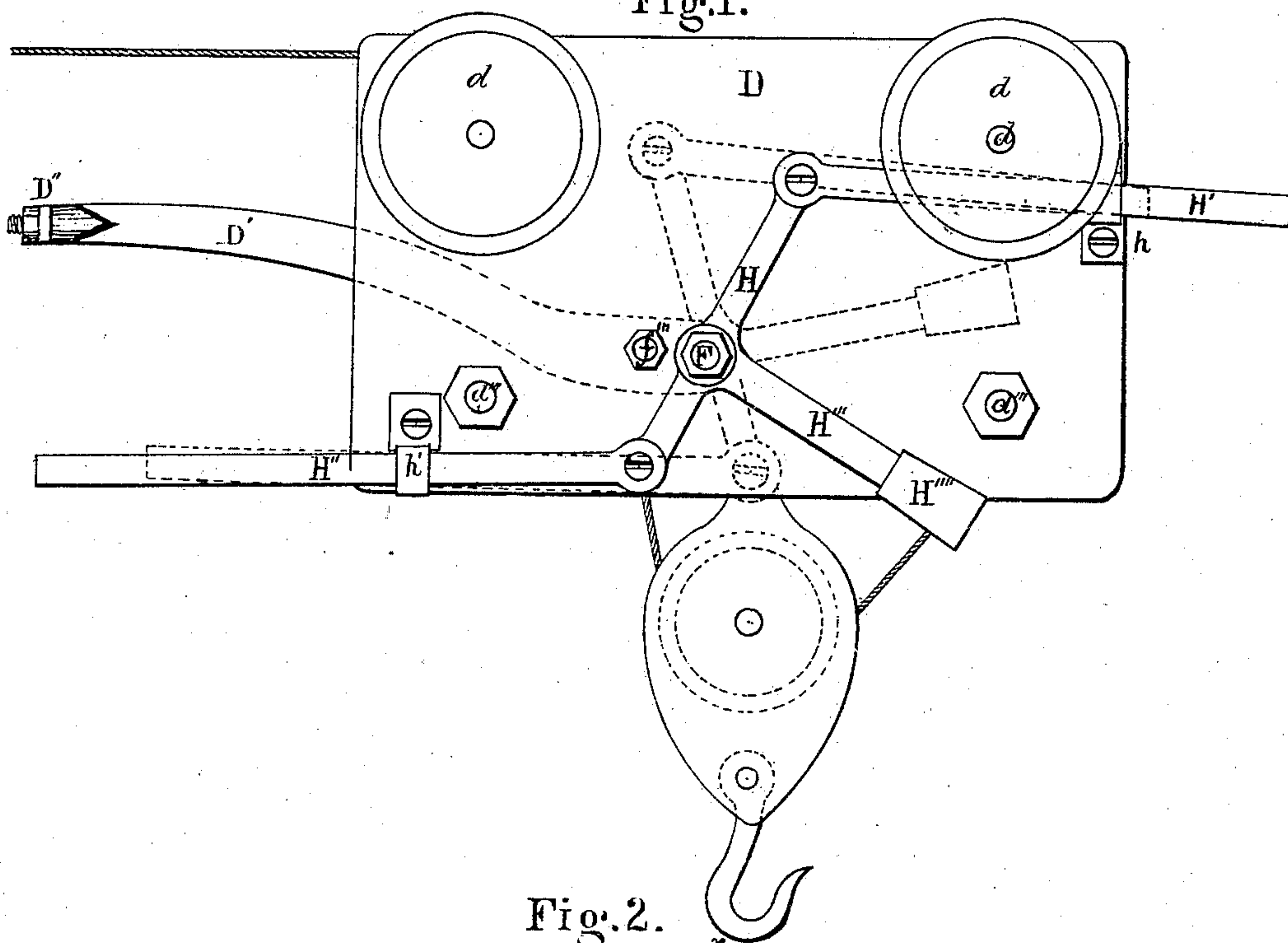


Fig. 2.

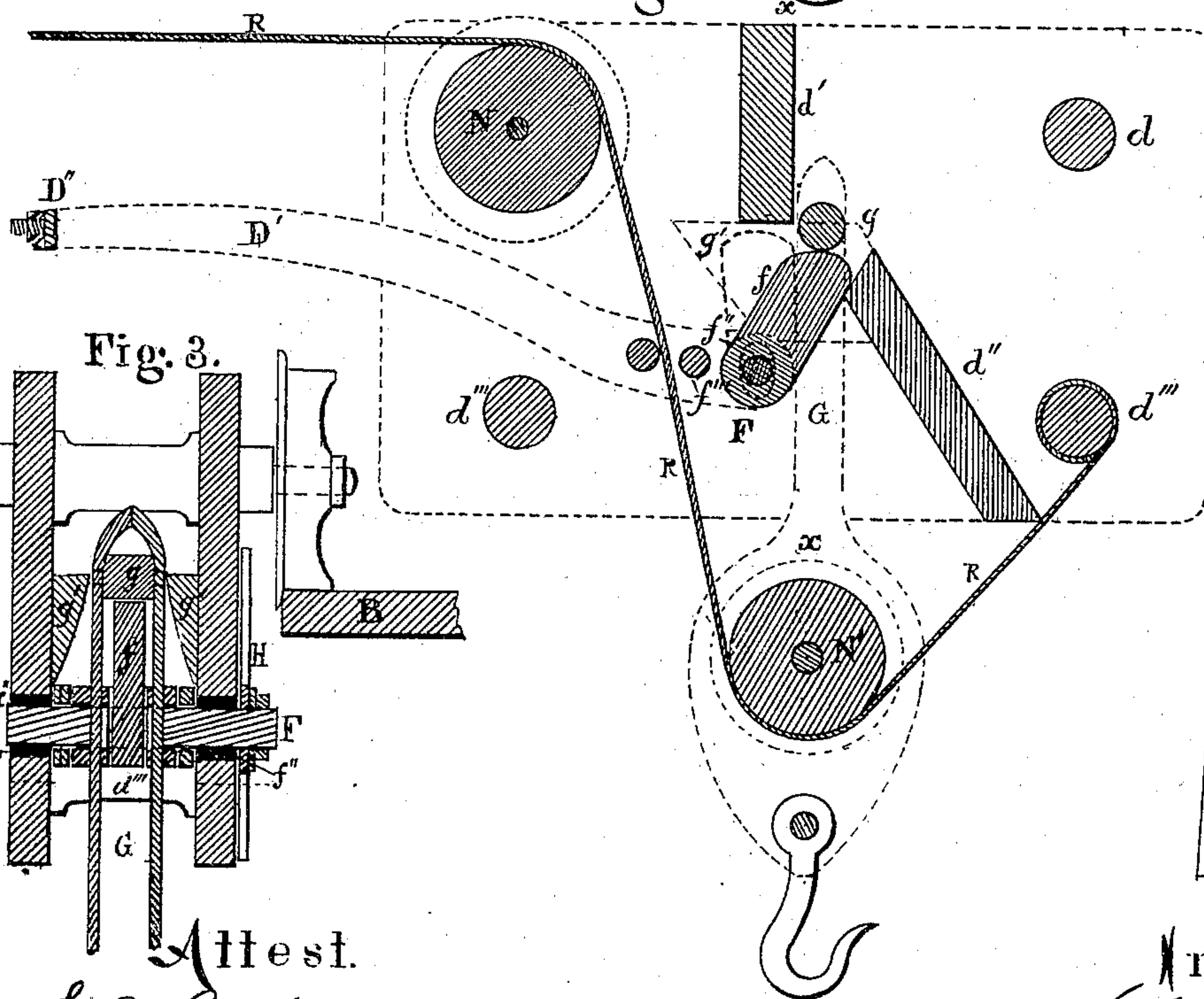
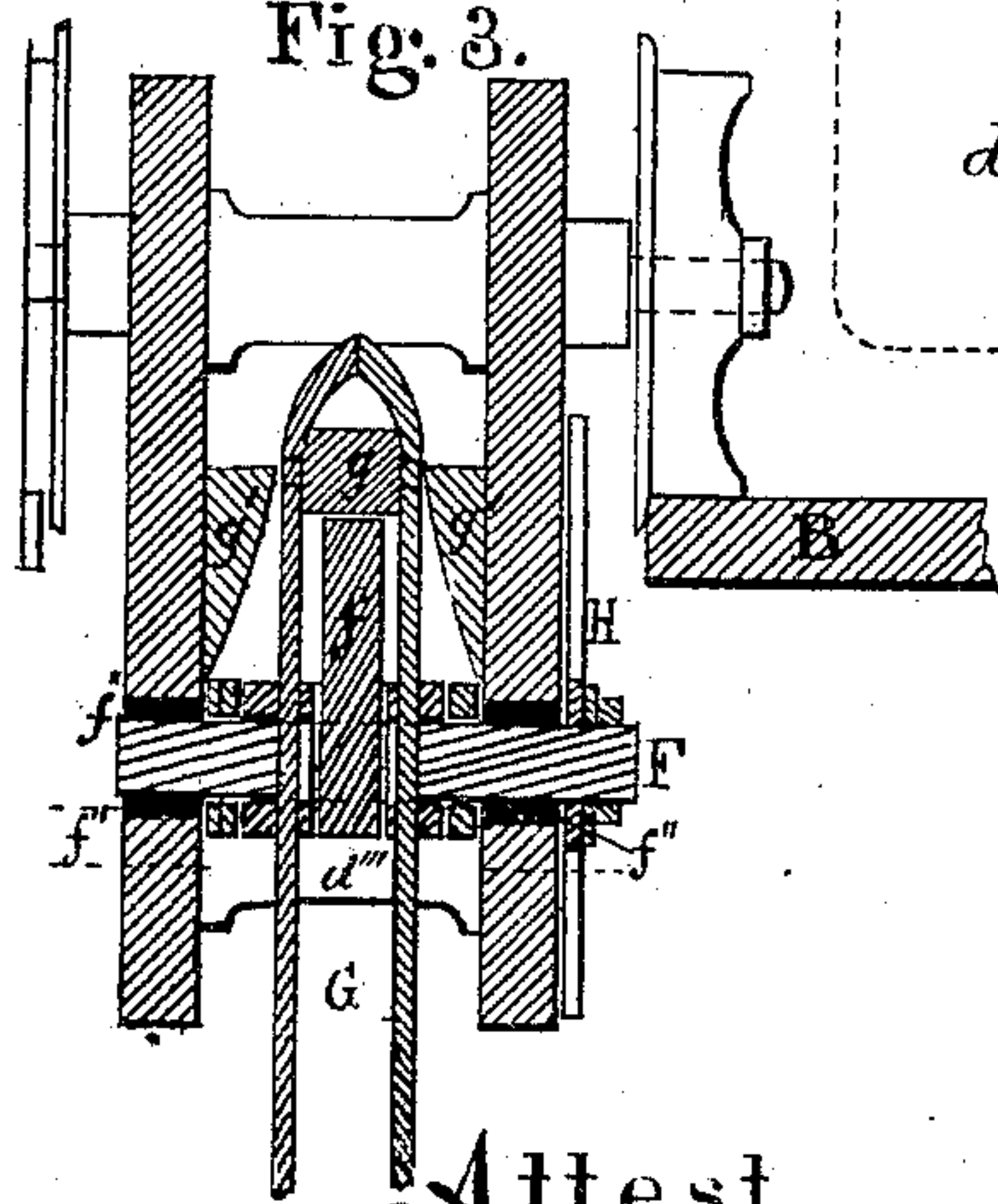


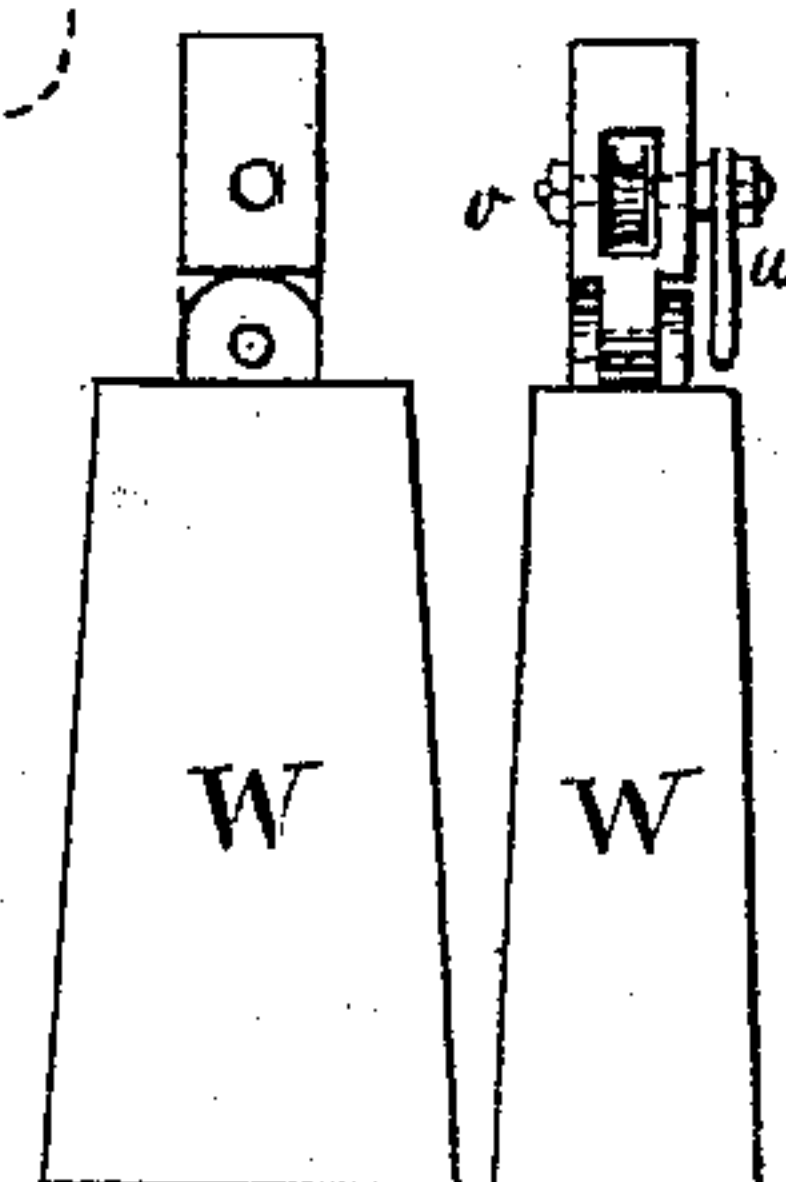
Fig. 3.



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Fig. 4.



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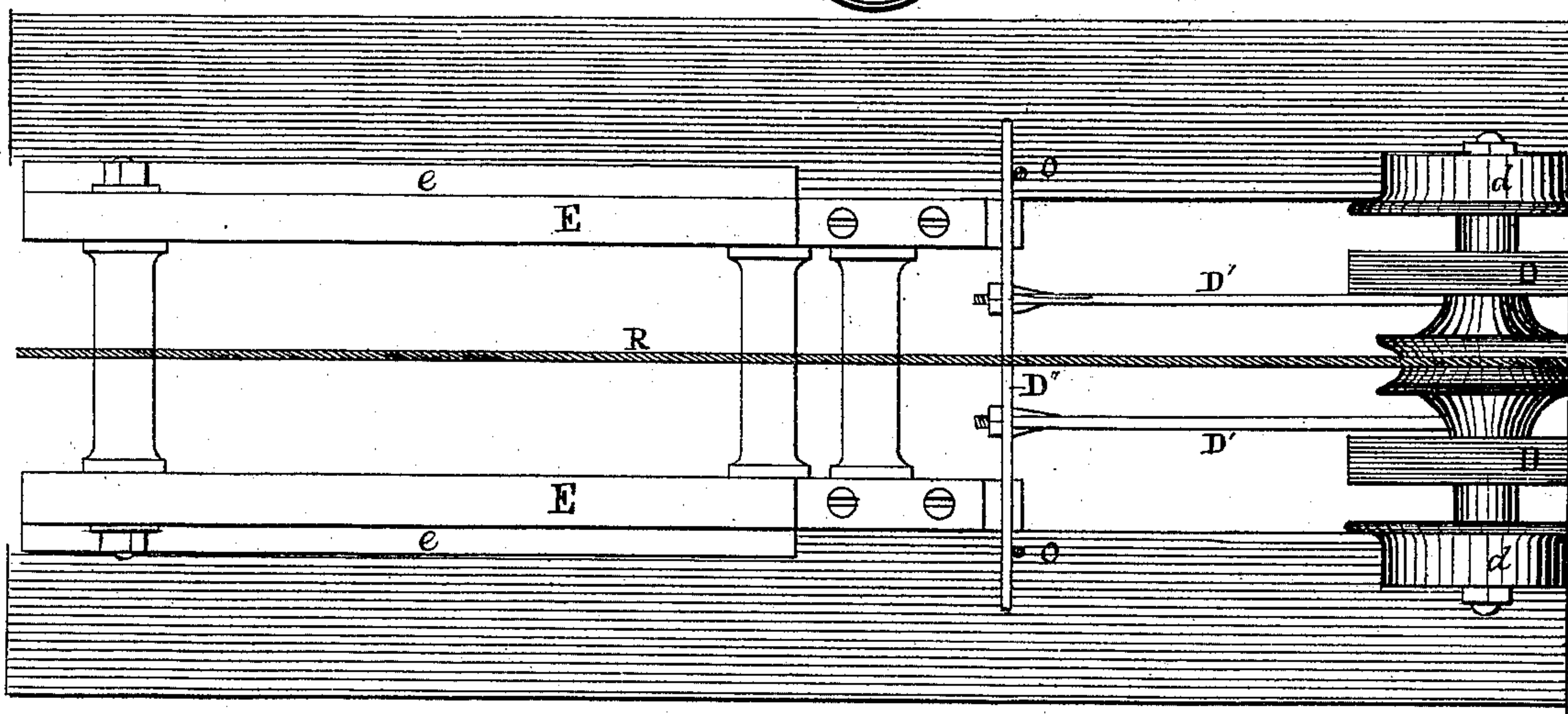
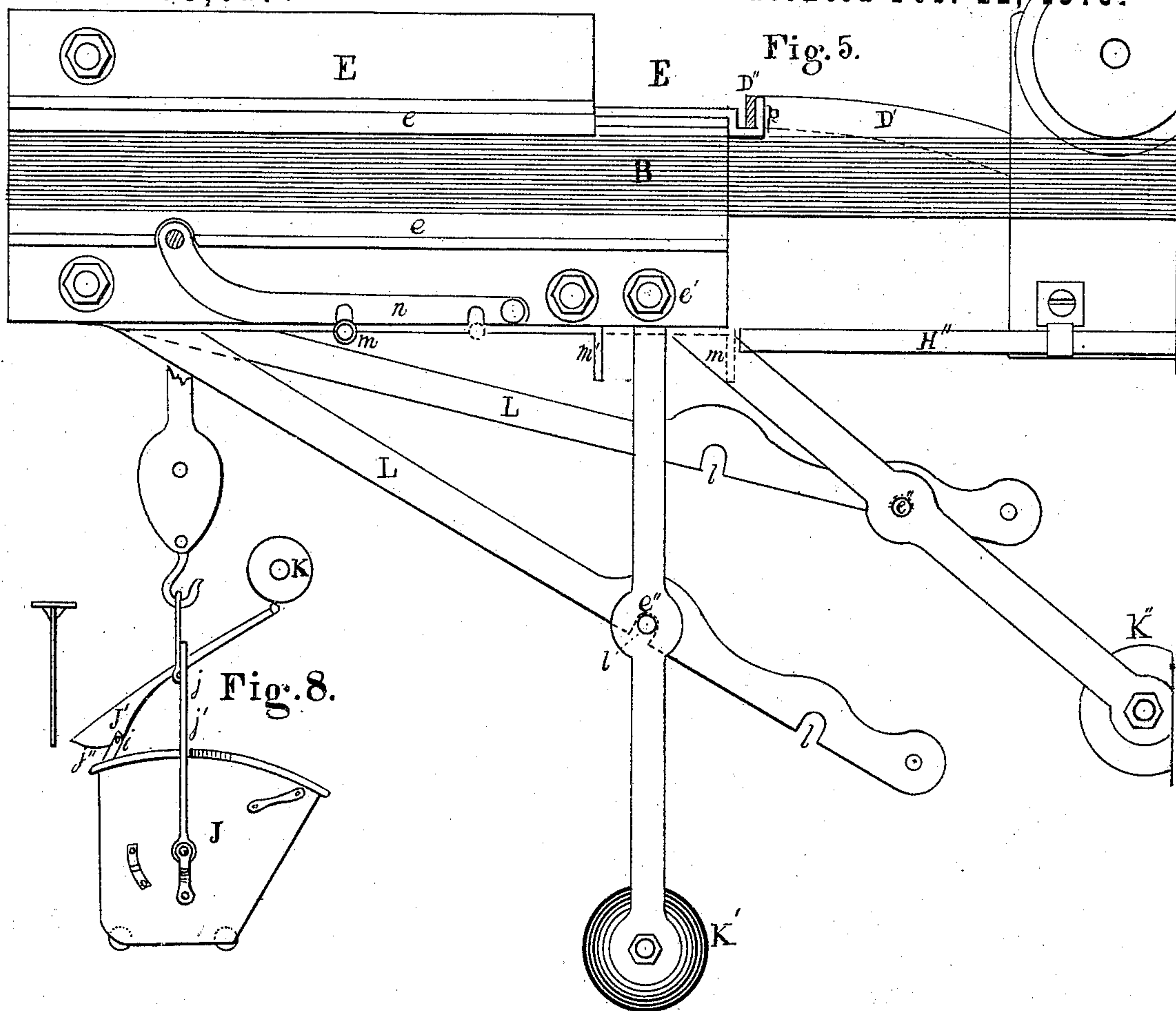


Fig. 6.

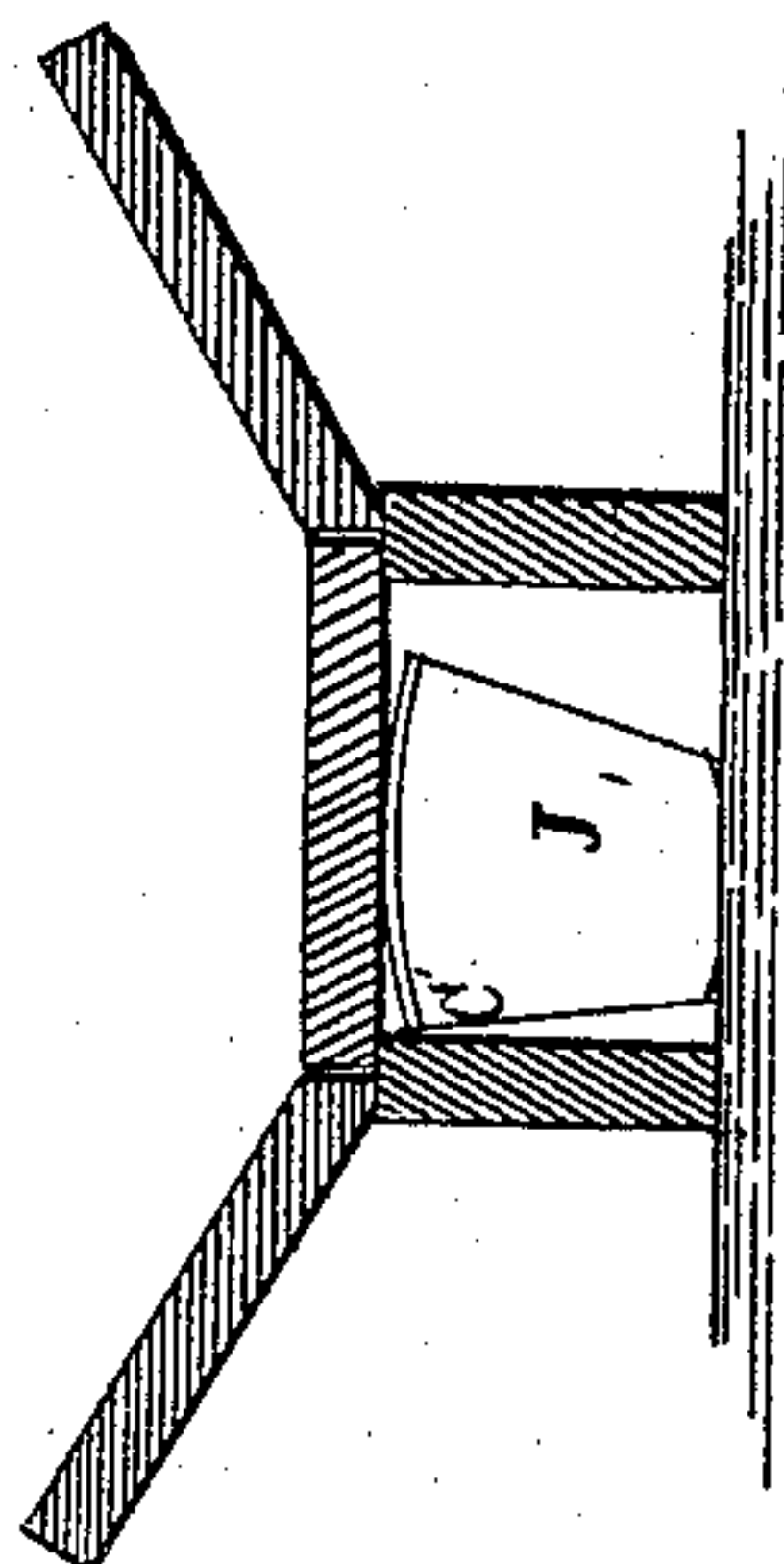
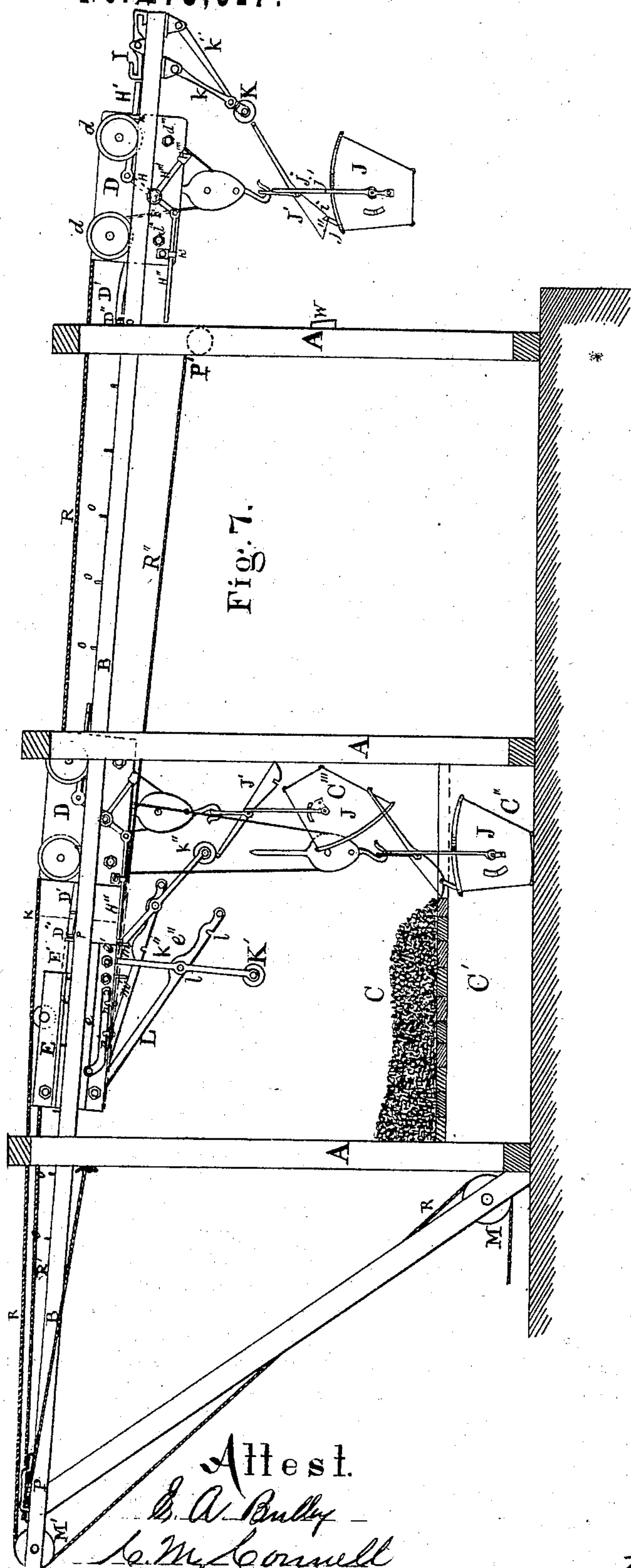
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UNITED STATES PATENT OFFICE

JERRY DORMAN, OF GEORGETOWN, DISTRICT OF COLUMBIA.

IMPROVEMENT IN HOISTING APPARATUS.

Specification forming part of Letters Patent No. **173,917**, dated February 22, 1876; application filed January 29, 1876.

To all whom it may concern:

Be it known that I, JERRY DORMAN, of Georgetown, in the county of Washington and District of Columbia, have invented certain new and useful Improvements in Hoisting Apparatus; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to which it pertains to make and use the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

Figure 1 is a side elevation of the carriage. Fig. 2 is a longitudinal section of the same. Fig. 3 is a transverse section on line *x x* of Fig. 2; Fig. 4, side and end views of the counterpoise-weight. Fig. 5 is a side elevation of a sliding carriage connected to the other carriage. Fig. 6 is a top view of Fig. 5. Fig. 7 is a side elevation of the whole arrangement. Fig. 8 is a view of the bucket, and Fig. 9 is a cross-section of a coal-bin.

This invention relates to improvements in the apparatus for hoisting, conveying, and lowering coal or other material from the wharf to a vessel, and by simply turning the bucket, and by the adjustment of certain devices, the coal or other material can be conveyed from the vessel to the wharf, as will be more particularly hereinafter described.

In the usual conveying means heretofore employed the material can only be transported in one direction; but in this invention by the use of a simple apparatus the material can be transported in either direction, or a vessel may be unloaded of its freight, and loaded by the return bucket with other freight, thus economizing time.

In the drawing *A A A* represent trestles, which are erected at any convenient place over the bins, or other deposit of coal or other material, and high enough for all practical purposes. On the trestles are the rails *B B*. *C* is the coal-yard, which is formed with false or second bottoms of movable boards, elevated above the floor at such a distance that when the bucket is placed on the latter the coal can be shoveled into it without being raised, and as the coal is removed the boards can be

easily taken away for the bucket to be kept well under the edge thereof, as seen in Fig. 7. *D* represents a carriage placed on four flanged wheels *d, d*. *E* is a sliding carriage, having the function of an adjustable stop, and furnished with cleats *e e* on the sides, under and over the rails *B B*, to clasp them, and admit of sliding along the rails, yet to support the carriage in position on them. The carriage *D* is made with two solid sides, as seen in Fig. 3, having between them a vertical partition-board, *d'*, and a sloping partition-board, *d''*. These sides are kept together by rods or bolts *d''' d'''*, and the axles of the wheels *d d* serve as braces also, to strengthen the sides. Through the carriage *D* is a rock-shaft, *F*, having an arm, *f*, curved at its upper end, as seen in section, Fig. 2. This arm is designed to support the pin or bolt *g* of the sheave-lance *G*, as seen in Figs. 2 and 3, when in the position as therein shown, but is capable of movement from under the bolt *g* when the rock-shaft is rotated, as will be explained hereinafter. On the shaft *F* is also fastened, on the outer end, as seen in Fig. 1, a lever or bell-crank, *H*, which moves with the shaft. To the upper end is pivoted a sliding bar, *H'*, kept in place by a strap, *h*, on the side of the car. To the lower end of *H* is also pivoted another sliding bar, *H''*, secured by a similar strap, *h'*. From the pivot of lever *H*, extending at right angles to it, is an arm, *H'''*, with a counter-weight, *H''''*, which invariably brings the whole system to the position shown in Fig. 1 and Fig. 2 when at rest, thereby placing arm *f* under the vertical line of the bolt *g* of the lance *G*, whether the lance be as represented in Figs. 1, 2, and 3, or below the carriage, as in Fig. 7.

The purpose of this arrangement is as follows: When the lance is in position, and the bucket with its load is suspended from the hook of the pulley, as shown in the outer end of Fig. 7, and the car is run down ready to lower the bucket, the stop *I*, which is to the left of its pivot, will force the slide-bar *H'* back to the position shown in dotted lines in Fig. 1, which rotates the rock-bar *F* and carries the arm *f* over to the left, as seen in dotted lines in Fig. 2, and, consequently, from under the bolt *g*, so that the sheave and bucket are

supported only by the fall or rope R, which can then be backed to permit the bucket to descend.

Should it be desired to dump the load and not to lower it, the following is the process: The carriage D is allowed to descend as before, but the stop I is thrown over to the right, as at I', and, consequently, the slide-bar H' can run down without being shoved in. The catch-lever J' of the bucket J is pivoted at j to the bucket-handle j'. At its lower end j'' there is a notch, which catches over a pin in the projecting stem i of the back part of the bucket J. The lower end is made broad, and so weighted that it will fall to its position when relieved from the roller K. The upper end of the lever J' is T-shaped, as seen at Fig. 8, and is at such a height that when it passes toward the double spindle-roller K, which is pivoted at the lower end of a hinged bracket, k, and supported by a hinged brace, k', the upper end of the lever passes under the roller K, and thereby releases the lower end of J' from the pin in i, and, consequently, as the center of gravity of the load in the bucket J is beyond the point of support, the bucket turns over and discharges its load, and immediately returns to its normal position, as the bucket itself is arranged to do this, and the pin in i engages the notch j'' again.

The pull upon the rope will immediately draw the carriage back to the upper end of the track, where the following result will occur, viz: The upper slide-carriage E is so arranged that, by the rope R', which is fastened to the upper end of it, passing through a pulley, P, on the rail, and thence to any convenient point for fastening, it is secured. Another rope is fastened to the slide-carriage E, and passes over a pulley, P', on one of the outer posts A, and to its end is attached a counterweight, W, shown in Fig. 4, heavy enough to pull down the slide-carriage E when it may have been pulled up by the pressure of the lower carriage, as seen in Fig. 7, at the upper end.

Slide-carriage E has within it a frame of metal bars suspended by pivot-bolts e', and braced in the middle by bolts e'', and at its lower end having a double spindle-roller, K', similar to K, at the outer end of the railway. This frame is braced by another frame, L, having in it two notches, l l', to support it in either of the two positions shown in Fig. 7.

If the object is to lower the bucket into the yard or bin, the spindle-roller must be in a vertical position, as at K'; then the slide-bar H'' of the carriage D will strike against a stop, m, on the lower edge of slide-carriage E, which has been brought forward and held there by a stop-handle, n, being dropped over a knob in slide m'. This forces slide-bar H'' to the right, and the rock-bar F is again turned, the arm f removed from under the bolt g, and the brace and sheave, with the bucket, are lowered, as seen in Fig. 7, at C''.

If the vessel is to be unloaded, the bucket will be turned around, as at C'''; then the lever J' will have its upper end to the left, run under the spindle-roller K', thrown into the position at K'', the stop m will be drawn back to m', and held there by the notch n' over the knob, which allows the slide-bar H'' to run under the slide-carriage E without releasing the lance G; consequently the lever J' is released from the bucket, and it tilts to the left and discharges its load as it did when first described at the lower end, and as seen at C''', Fig. 7. Along the line of the rails B B are placed projecting pins o o, &c., for the purpose of holding the cross-head D'' of the projecting arms D' of the carriage D. The construction of the arms is as follows: They are pivoted on a through-bolt, f''', their upper ends sustained by a cross-head, D'', which projects beyond the line of their sides and over rails B B, to be stopped when down, by the pins o o, &c. Their lower ends carry the rock-shaft F, the bearings of which are sustained in elongated slots f'' in the sides of the carriage. The operation of this construction is as follows: When the load is in the bucket, and the pin g of the sheave-lance G is held up by the arm f, the shaft F finds its bearing at the bottom of the slot f'', and the arms D' are raised above the tops of the pins o o, &c.; but when the shaft F is forced with the arm f to the left, the weight of the load is taken from it and the arms D' are heavy enough to drop to the rails B B, and consequently between the pins o o, and thus retain the carriage in position. At the lower end the first pin is so arranged as to be in advance of the carriage, so that when the bucket is to be drawn up the rope will not pull up the carriage, but it will remain stationary until the lance-head G has arisen above the arm f, and then, so soon as the weight of bucket, &c., bears upon arm f, the shaft F falls in its slot, and arm D' is elevated again, and the pull of the rope R draws the carriage D upward, and this without a stop in the operation, as the cross-head D'' is relieved automatically from behind the pin o. The carriage E, at the lower end, has a recess, E', formed in it, for the purpose of permitting the projecting arms D' and cross-head D'' to lap over, so that the slide-bar H'' of the carriage D may strike against the projection m under carriage E, for the purpose of lowering the bucket. Below this recess are square-formed hooks p p, into which the cross-head D'' can drop as carriage D runs back, and be retained until the weight is again thrown upon the shaft F, when cross-head D'' is lifted out of these hooks, and the carriage D can run down the railway, as above described. These arms D' are shown in section, Figs. 2 and 3, with the slot f'' in dotted lines around the shaft F, f''' being the pivot on which it turns.

The rope or fall, technically so called,

passes from a drum, M, over a leading pulley, M', supported on a shaft on the rails B B, and then over a pulley on slide-carriage E, and then over the pulley N on the carriage D, and down through it to the pulley N' in the sheave, and around under it to the bolt d''' in the carriage, when it is made fast.

The form of the entrance in the carriage D is sloping on three sides, viz., under the partition d'' , as in Fig. 2, and on the sides g' , as seen in Fig. 3, so that the lance-head, which is curved, as seen in both Figs. 2 and 3, will be guided directly into the proper position by sliding along these sloping sides, and forces the arm f away until it passes the end, which fall into the lance below the bolt g , and thus sustains it. The lance is made double or hollow, as seen in Fig. 3, to admit the arm f below the bolt g . In Fig. 4 is represented the counter-weight W to be suspended to the rope R'', which passes over pulley P'. The small pulley w is formed eccentrically, and has a handle, w' , by which it can be operated. The rope sustaining the weight W, when drawn down, can pass freely under the pulley w ; but when pulled in the other direction the pulley jams it against the bottom of the sheave, and thus holds the weight. This device is made to accommodate the lengths of line according to the distance which the sliding car E may be along the railway. The handle w' is to turn the pulley when the weight has to be adjusted. The stop I may be adjusted at any position along the rail B, whereby the bucket may be lowered at any point desired in the whole distance of the line of railway.

In the place of the rails B B and supporting trestle-work, with slight modifications, the apparatus herein described may be supported on a wire rope or ropes where the situation would be better adapted therefor.

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

1. In a hoisting and conveying apparatus, a rock-shaft, F, having projecting arm f , in combination with bell-crank lever H, slide H', and an adjustable stop, I, substantially as and for the purpose described.

2. A rock-shaft, F, having projecting arm f , in combination with bell-crank lever H, slide H'', and a stop, m , in the sliding carriage E, substantially as and for the purpose described.

3. The combination of projecting arms pivoted at f''' , having at the upper end a projecting cross-head, and at the lower end supporting the rock-shaft F and its arm f , slots f'' in the sides of the carriage to admit of vertical play therein, and pin g of the lance G, for the purpose of lifting the cross-head D'' over the pins $o o$, substantially as and for the purpose described.

4. The hollow lance of the sheave, with its pin g , substantially as and for the purpose described.

5. The combination of the arm f of shaft F, the lance-head, and pin g , with the sloping guide and support d'' , substantially as and for the purpose described.

6. The trip-lever J', having its lower end weighted, and at its upper end a cross-head, all substantially as and for the purpose described.

In testimony that I claim the foregoing as my own invention, I affix my signature in presence of two witnesses.

J. DORMAN.

Witnesses:

C. M. CONNELL,
ALFRED CLOUGHLY.