No. 672,076. Patented Apr. 16, 1901.

N. P. COWELL.

DUMPING CAR.

(Application filed Apr. 24, 1900.)

(No Model.) 3 Sheets—Sheet 1.

Fig. 1.

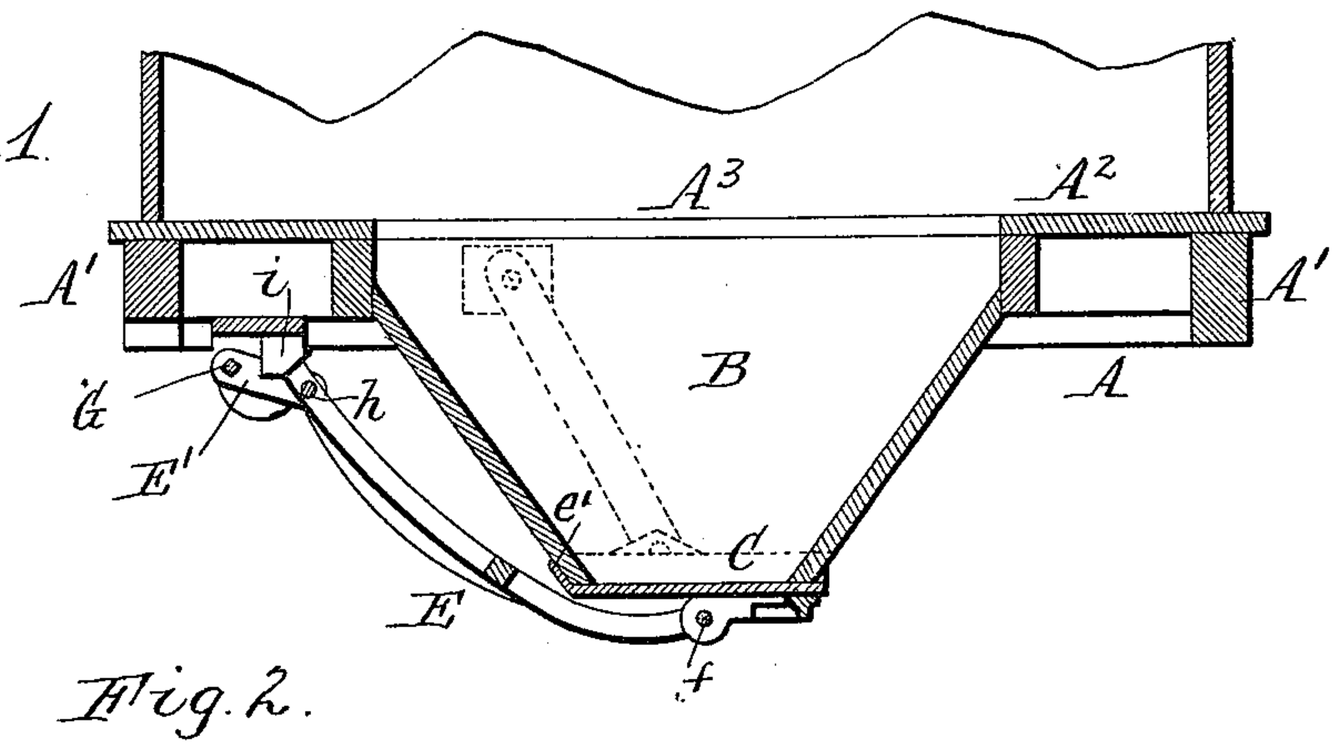


Fig. 2.

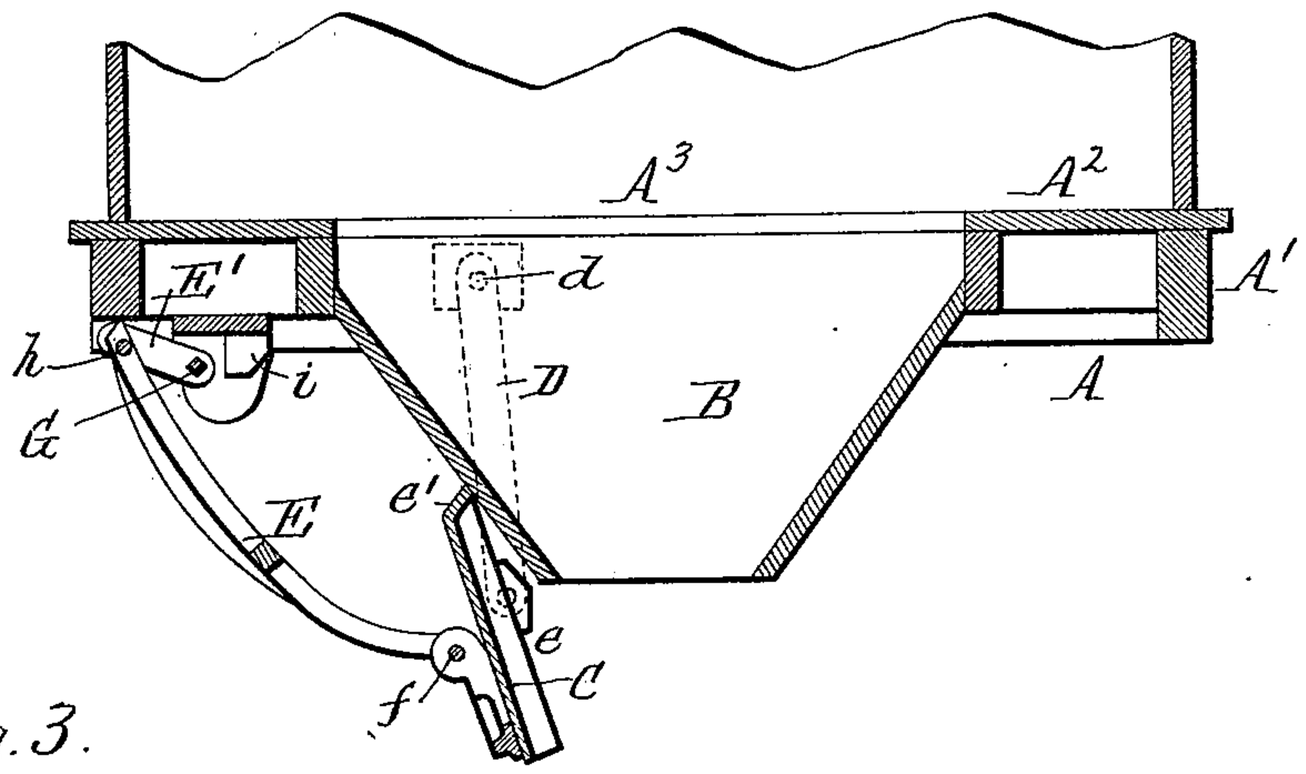
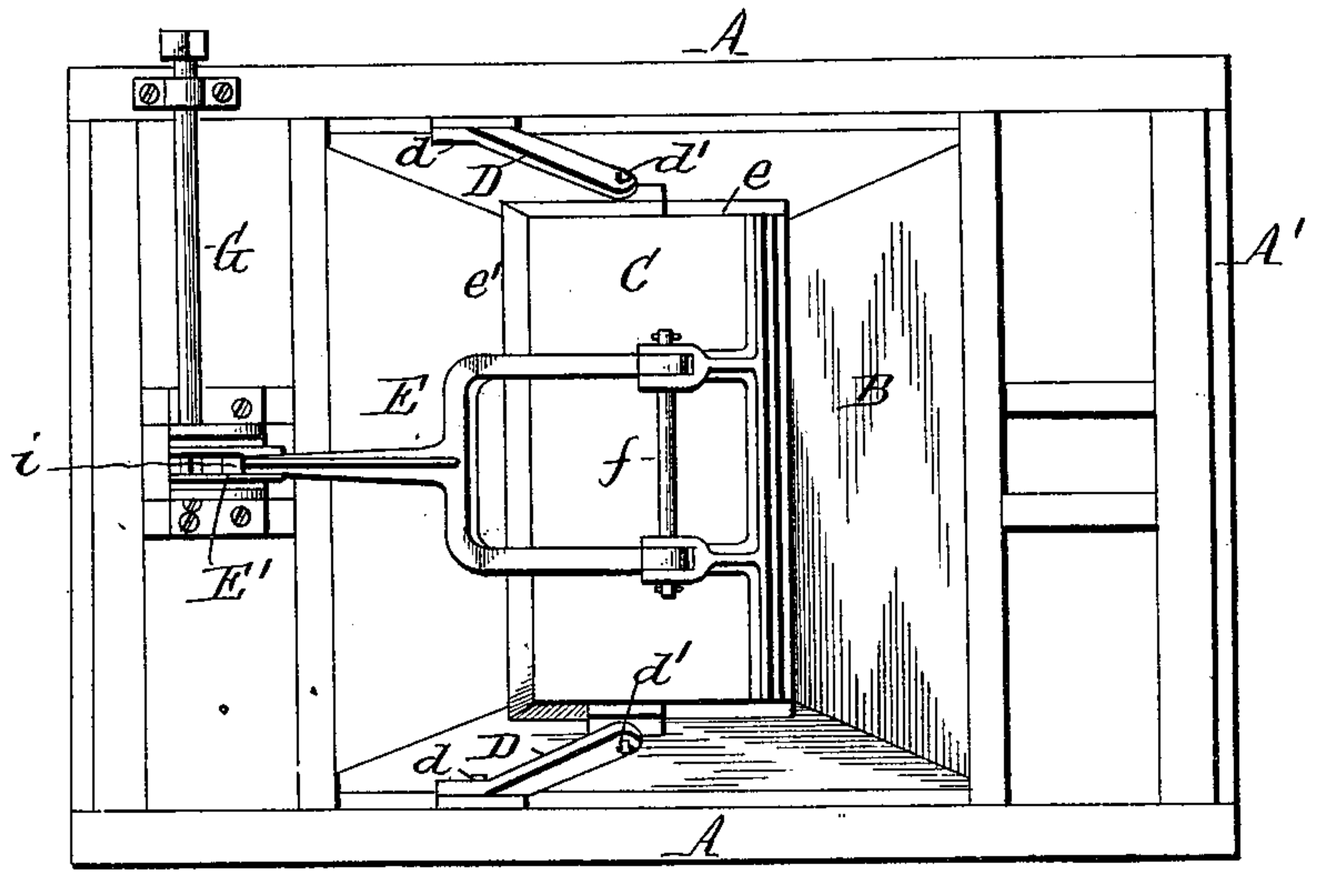


Fig. 3.



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(No Model.) 3 Sheets—Sheet 2.

Fig. 4.

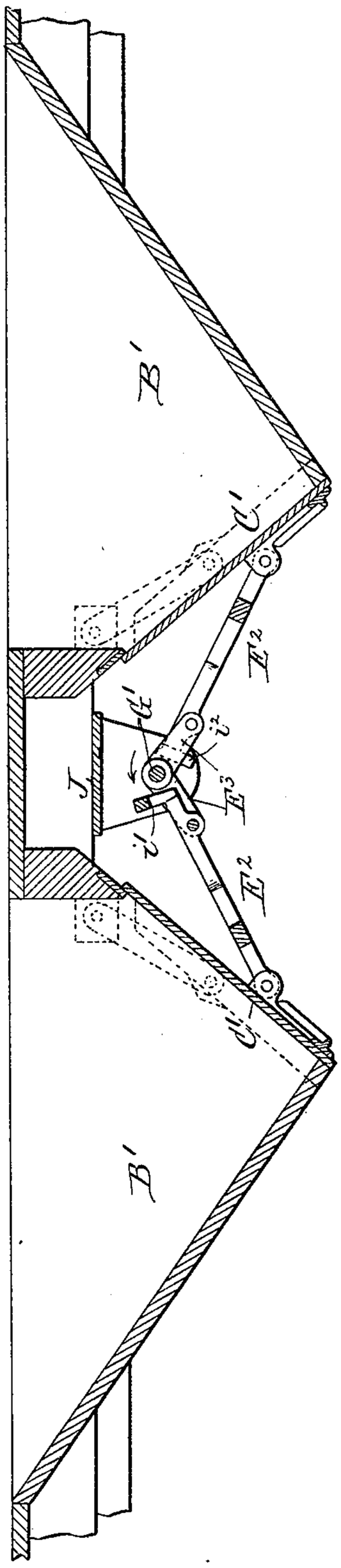
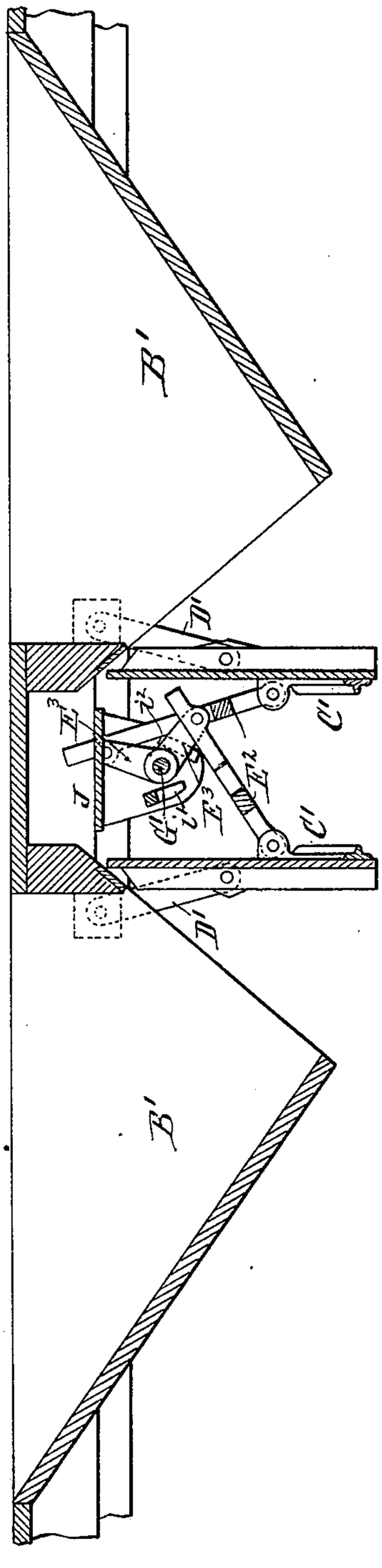


Fig. 5.



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No. 672,076. Patented Apr. 16, 1901.

N. P. COWELL.

DUMPING CAR.

(Application filed Apr. 24, 1900.)

(No Model.) 3 Sheets—Sheet 3.

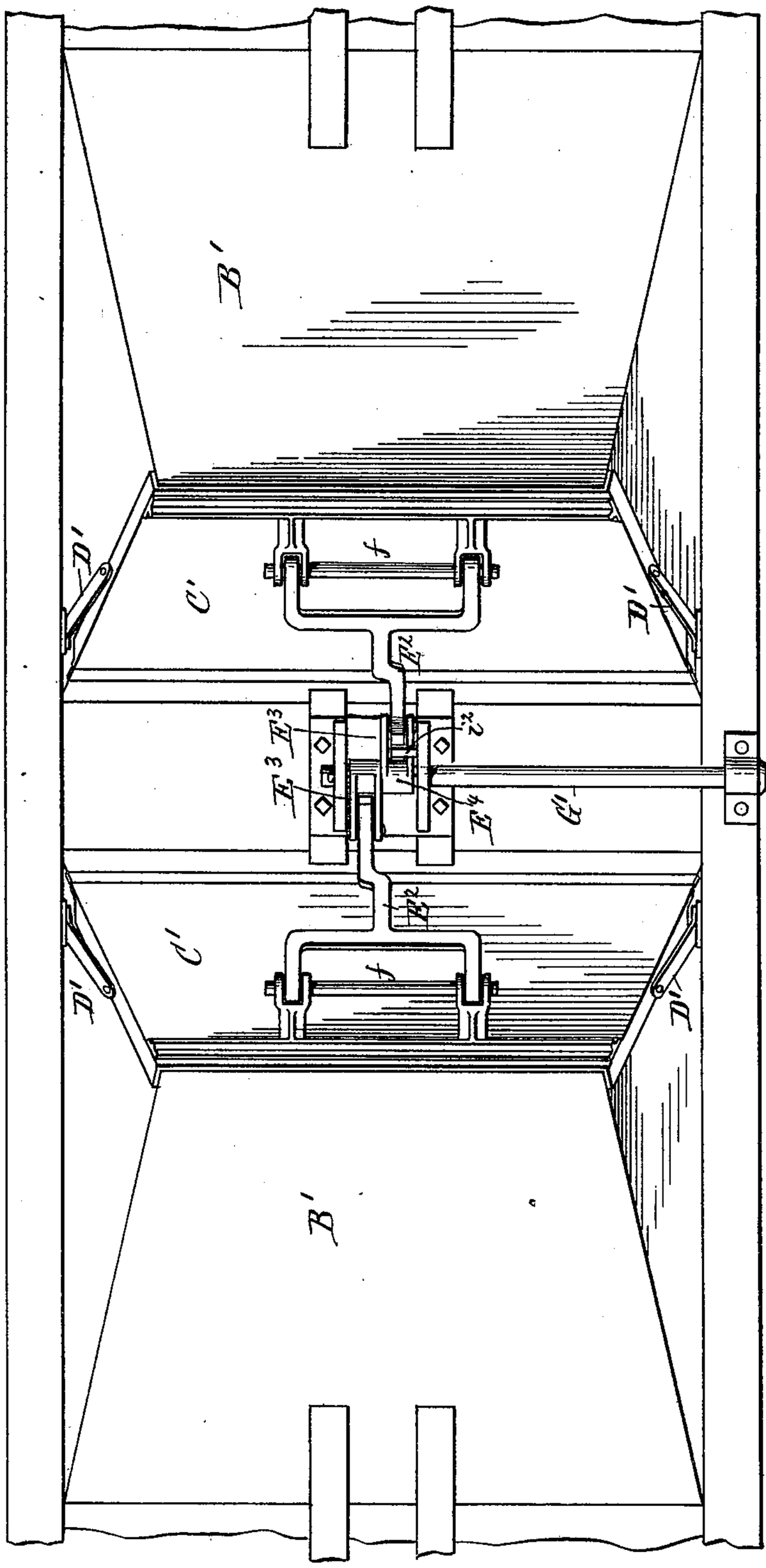

Fig. 6.

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UNITED STATES PATENT OFFICE.

NEWELL P. COWELL, OF LANCASTER, NEW YORK, ASSIGNOR OF ONE-HALF TO ERNEST W. EWELL, OF SAME PLACE.

DUMPING-CAR.

SPECIFICATION forming part of Letters Patent No. 672,076, dated April 16, 1901.

Application filed April 24, 1900. Serial No. 14,109. (No model.)

To all whom it may concern:

Be it known that I, NEWELL P. COWELL, a citizen of the United States, residing at Lancaster, in the county of Erie and State of New York, have invented new and useful Improvements in Dumping-Cars, of which the following is a specification.

This invention relates to dumping-cars having a hopper-bottom or a chute or chutes through which the load is discharged.

One of the objects of my invention is to support the discharge door or gate of the hopper or chute in such manner that it hangs a comparatively short distance below the mouth of the hopper or chute in its open position, thus permitting the use of a correspondingly deeper hopper or lower chute without the liability of the door coming in contact with the ground.

Another object of my invention is to provide the door with a strong operating mechanism of simple construction which firmly holds the same in its closed position and which at the same time permits the door to be easily released for dumping the load.

In the accompanying drawings, consisting of three sheets, Figure 1 is a vertical longitudinal section of a hopper-bottom dumping-car provided with my improvement, showing the door of the hopper-bottom closed. Fig. 2 is a similar view showing the door opened. Fig. 3 is a bottom plan view of the car with the door closed. Fig. 4 is a fragmentary vertical longitudinal section of a dumping-car having chutes provided with my improved doors, showing the latter closed. Fig. 5 is a similar view showing the doors open. Fig. 6 is a fragmentary bottom plan view of said car.

Like letters of reference refer to like parts in the several figures.

Referring to Figs. 1, 2, and 3, A represents the longitudinal or side sills, and A′ the cross-sills or timbers, of the car. A^2 is the car-floor, having the discharge-opening A^3, and B is the discharge-hopper arranged under the opening A^3. C is the door or gate, which is applied to the mouth or horizontal lower end of the hopper and which is suspended from the bottom of the car by longitudinally-swinging links or hangers D, so that the door swings bodily lengthwise of the car in opening and closing it. The upper ends of the links D are pivoted to the inner sides of the side sills A, as shown in Fig. 3, and their lower ends are pivoted to upwardly-extending side flanges *e* of the door at at a point between the front and rear edges of the same. The door is also preferably provided at its rear edge with a similar flange *e′*, which bears against the adjacent inclined wall of the hopper B. The front edge of the door has no flange to facilitate the flow of the dumped load over the same. The upper pivots *d* of the links D are located some distance in rear of the plane of their lower pivots *d′* in the closed position of the door, as shown in Fig. 1, so that the door when released has a tendency to swing rearwardly and clear the mouth of the hopper, as shown in Fig. 2.

The door is operated by a longitudinal push-bar E and an actuating-arm E′. This push-bar is bifurcated at its lower end and pivoted to the under side of the door by a transverse pintle *f*. The actuating-arm E′ is rigidly secured at its inner end to a transverse rock-shaft G and is pivoted at its opposite end to the upper end of the push-bar E by a transverse pin *h*. The rock-shaft G is journaled in suitable bearings secured to the side and center sills of the car, and its outer end is square or flat sided and adapted to receive a removable crank for turning the shaft. The upper end of the push-bar E extends beyond the adjacent pivot *h* and abuts against a stop *i* in the closed position of the door, as shown in Fig. 1. The contiguous faces of this stop and the push-bar E are beveled, so that the latter bears squarely against the stop, as shown. In the closed position of the door the push-bar E and the actuating-arm E′ are nearly in line with each other and their connecting-pin is located slightly on the inner side of the dead-center, or a line drawn through the rock-shaft G and the lower pivot *f* of the push-bar E. In this position of the parts the upper end of the push-bar bears against the stop *i*, thereby locking the door in its closed position and at the same time relieving the upper pivot *h* from strain. In order to open the door, the rock-shaft G is turned in the proper direction to swing the actuating-arm E′ downwardly and outwardly

past the dead-center. As soon as the upper pivot *h* passes outwardly beyond the dead-center the weight of the load completes the opening movement of the door, causing the parts to assume the position shown in Fig. 2. The door in opening turns into a vertical position and at the same time swings bodily rearward and clears the mouth of the hopper B. The door is closed by turning the rock-shaft G in the opposite direction. In closing the door the same turns into a horizontal position and at the same time swings forwardly under the lower end of the hopper. If desired, the stop *i* may be located in any other suitable place where it limits the movement of the push-bar E or the actuating-arm E′ after passing the dead-center, but it is preferably located, as shown in the drawings, so as to receive the thrust of the push-bar, and thereby relieve the connecting-pivot *h*.

My improved door operating and locking mechanism is also applicable to dumping-cars having chutes which slope toward each other, as shown in Figs. 4, 5, and 6. In this modification of the invention, C′ represents the doors which are applied to the beveled lower ends of the chutes B′ and which are suspended from the side sills of the car by links D′, as in the first-described construction. In this case the rock-shaft G′, from which the doors are operated, is arranged centrally between the two chutes, and each door is provided with a push-bar E^2 and an actuating-arm E^3. The two actuating-arms are formed on a hub or sleeve E^4, which is keyed or secured to the rock-shaft, so as to turn therewith, and the two arms are arranged substantially at right angles to each other and pivoted to the push-bars, respectively. *i′* i^2 are a pair of stop-lugs depending from the inner bracket J of the rock-shaft and arranged in line with the two push-bars E^2, respectively, as shown in Fig. 6, so as to form abutments for the upper ends of said bars in the closed position of the doors, as shown in Figs. 4 and 6.

In order to unlock and open the doors of the chutes, the rock-shaft G′ is turned in the direction of the arrow in Fig. 4, which movement causes the push-bars and actuating-arms to assume the position shown in Fig. 5.

My improved door-operating mechanism while insuring a tight and reliable closure of the door affords a favorable leverage which enables the door to be easily released in opening it, and the door is at the same time supported at such an elevation that it permits the use of a deep hopper or chute.

I claim as my invention—

1. The combination with a car having a hopper-bottom or chute, of links or hangers depending from the car on opposite sides of said hopper-bottom or chute, a door applied to the mouth of the hopper-bottom or chute and pivoted between its front and rear edges to the lower ends of said links, an operating-shaft provided with an arm, and a push-bar pivoted at one end to the door and at its opposite end to said arm, substantially as set forth.

2. The combination with a car having a hopper-bottom or chute and a swinging door applied to the mouth thereof, of a horizontal rock-shaft carrying an actuating-arm, a push-bar pivoted at one end to the door and at its opposite end to said actuating-arm, and a stop which is arranged on the car between said rock-shaft and said hopper-bottom or chute and on the inner side of a line passing through said rock-shaft and the lower pivot of said push-bar, whereby said stop arrests the inward movement of said push-bar and said actuating-arm after the same have passed the dead-center, substantially as set forth.

3. The combination with a car having a hopper-bottom or chute and a swinging door applied to the mouth thereof, of a horizontal rock-shaft having an actuating-arm, a push-bar pivoted at its lower end to the door and at its upper end to said actuating-arm, and a stop arranged to receive the thrust of the upper end of said push-bar, in the closed position of the door, substantially as set forth.

4. The combination with a car having a pair of opposing chutes and swinging doors applied to the mouths thereof, of a transverse rock-shaft arranged between said chutes and provided on opposite sides thereof with actuating-arms, push-bars pivoted at their outer ends to said doors, respectively, and near their inner ends to said actuating-arms, respectively, and separate stops arranged in line with said push-bars and forming abutments for the inner ends of said bars in the closed position of the doors, substantially as set forth.

Witness my hand this 5th day of April, 1900.

NEWELL P. COWELL.

Witnesses:

JNO. J. BONNER,

CLAUDIA M. BENTLEY.