

A. G. McKEE.

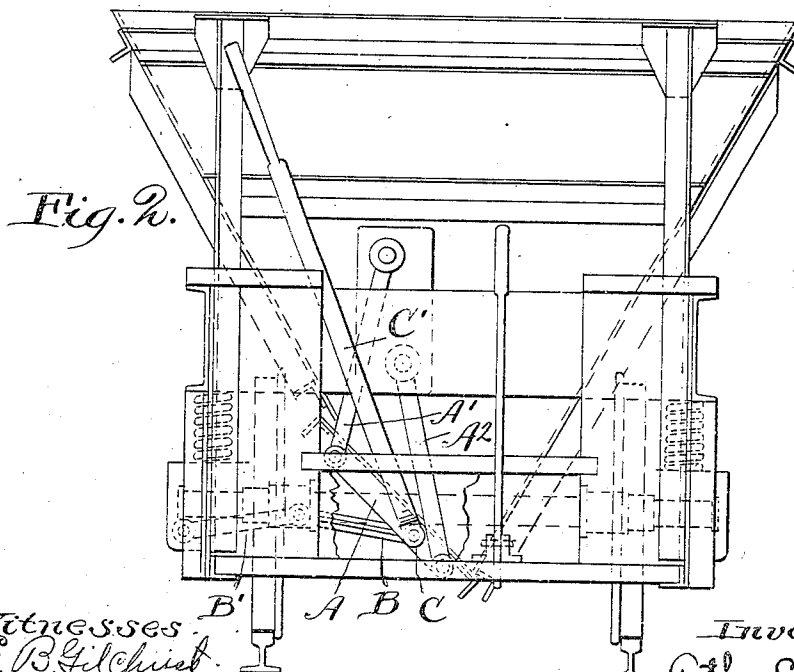
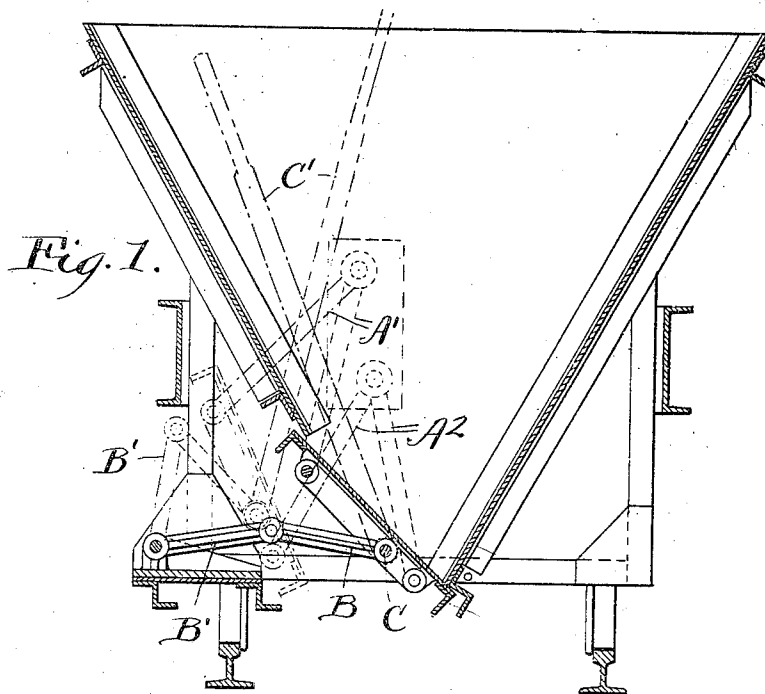
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APPLICATION FILED NOV. 7 1907.

1,011,219.

Patented Dec. 12, 1911.

4 SHEETS—SHEET 1.



Witnesses
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H. P. Sullivan.

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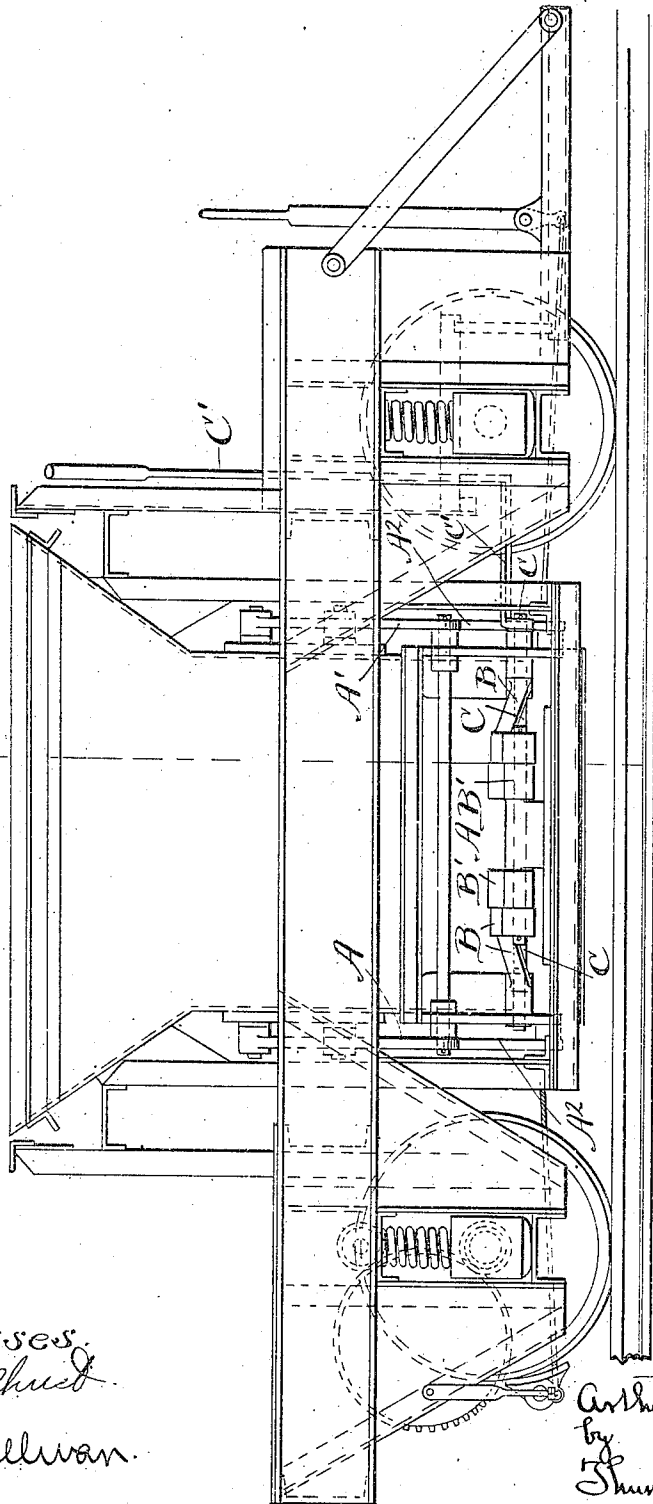
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4 SHEETS—SHEET 2.

Fig. 3.



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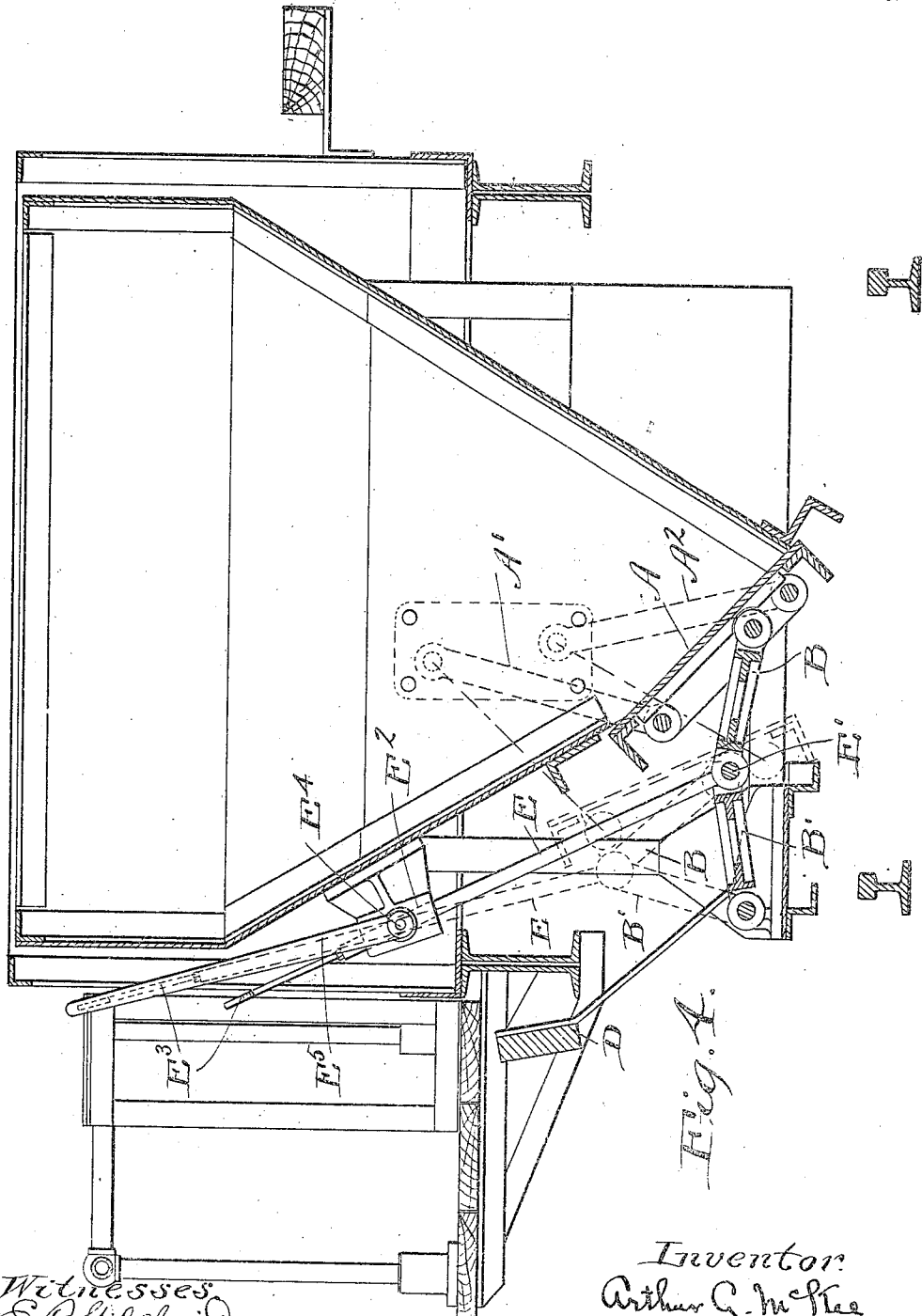
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4 SHEETS—SHEET 3.



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4 SHEETS—SHEET 4.

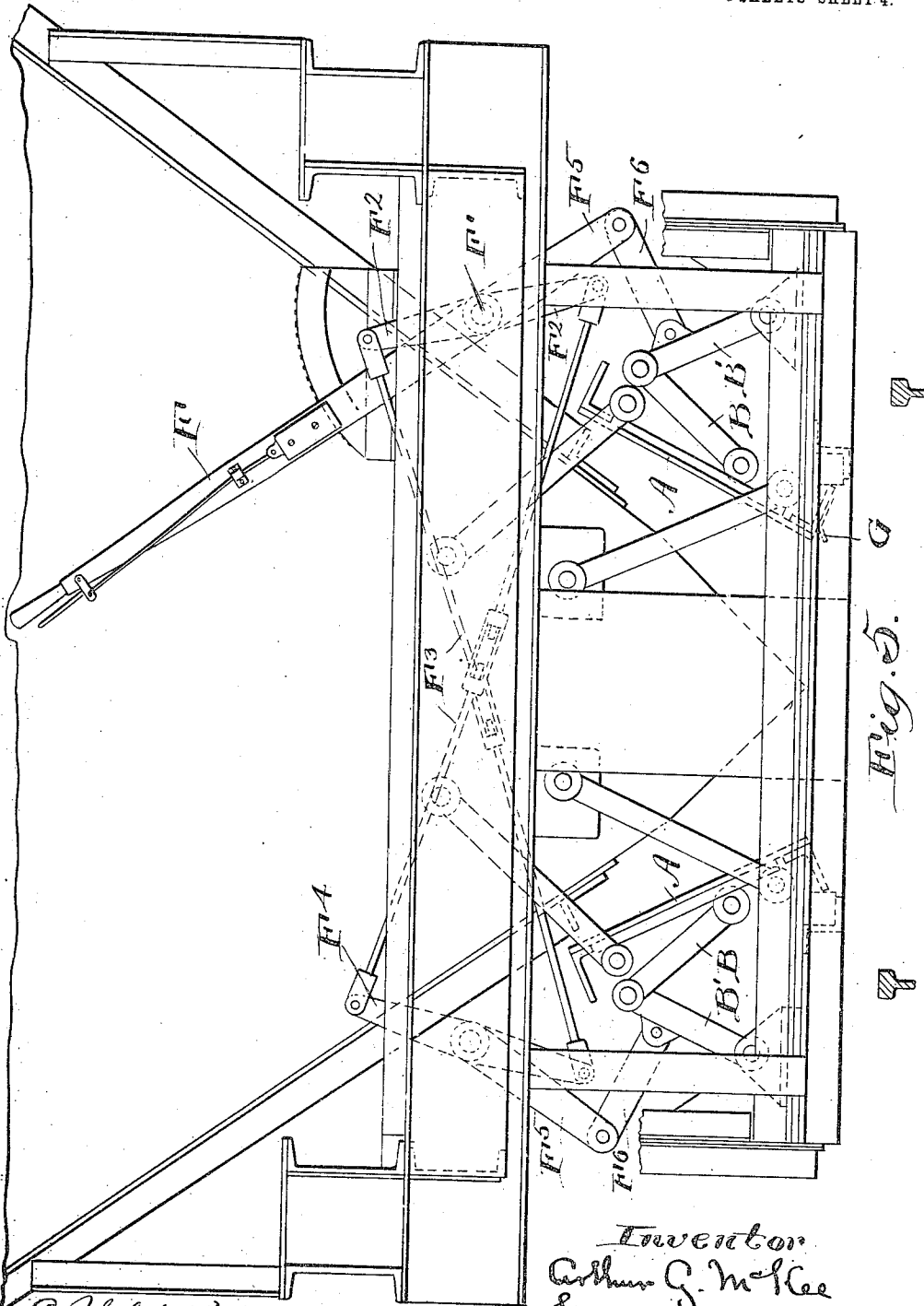


Fig. 5.

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UNITED STATES PATENT OFFICE.

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1,011,219.

Specification of Letters Patent.

Patented Dec. 12, 1911.

Application filed November 7, 1907. Serial No. 401,051.

To all whom it may concern:

Be it known that I, ARTHUR G. MCKEE, a citizen of the United States, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented a certain new and useful Improvement in Cars, of which the following is a full, clear, and exact description.

The object of the present invention is to provide an improved car with a bottom discharge, having suitable construction which shall permit it to be readily and completely emptied of its load while entailing the minimum of effort on the part of the operator.

A particular purpose has been to arrange the mechanism for operating the door controlling the opening through which the load is dumped.

In cars of this class there have heretofore been employed closures which were either so heavy and hard to move as to make it difficult for a single man to operate them or else so slow in action as to render their use undesirable.

Certain prior arrangements have been provided whereby the door upon release is left free to swing open under the impulse of its own weight and the weight of the load above it, a construction which results in the door being thrown violently upon some part of the car, with the consequent warping or breaking of parts. With this prior construction in which the door swings open by its own weight, a considerable task is imposed upon the operator to subsequently close the same since the weight of these doors is great, as well known to those skilled in the art. I have, however, devised an arrangement whereby the door may be instantaneously released and opened by the operator with small effort and the door allowed to move entirely back and away from the opening so as to allow the material free passage from the car, and by which the door is closed easily and without the use of great force. I further have provided a mechanism for operating the door which shall hold it securely in its closed position against the pressure of the load above.

Referring to the accompanying drawings, which illustrate certain embodiments of my invention,

Figure 1 is a cross section of a bottom discharge car, the operating mechanism for the

door being shown in dotted lines for both the closed and open positions. Fig. 2 is an end view of the car shown in Fig. 1. Fig. 3 is a side view of the car shown in Figs. 1 and 2. Fig. 4 is a cross section of a car provided with a modification of the operating mechanism for opening and closing the door. Fig. 5 is an end view of a portion of a car provided with a pair of doors which are connected together so as to be simultaneously operated.

The car itself may be of any desired construction, though preferably it should be of the form shown—that is provided with converging downwardly sloping side walls, one or both of which may be shortened so that the lower or V point of the car is formed by either a single door and one side wall, or by a pair of doors, such as shown in Fig. 5. Obviously, with such construction, when the door is moved away from its closed position, the car may be completely emptied.

It will be noted that in the various embodiments of my invention shown the doors A are each suspended from the car by means of a pair of links A' A² at each end which are pivotally connected to the doors and to the ends of the car. These links are secured to the car and to the door at such points as to give the door, when opening, a path of movement such that the center of gravity of the door and its appurtenant parts shall rise from the point at which it is when the door is in closed position. This is a feature of structure which obtains in every form of my construction, and which is had with every modification of operating mechanism by which the door may be opened or closed. By reason of the door being suspended in this manner, it would, of course, require some effort to open the same, since the pull of gravity would be in such a direction as to cause it to normally swing to a closed position, and inasmuch as doors and their parts are very heavy, it should be seen in constructing these cars that the rise of the center of gravity is not too great. The weight of the load in the car, however, is a factor to be taken into consideration, since this load will tend to swing the car open until sufficient space is given for the material in the car to fall therefrom: and, as this load is normally quite heavy, means should, as a matter of fact, be provided to hold the door

firmly closed. The means which I employ for this last named purpose is, preferably, toggle links B B', such as shown in the various figures, which have great capacity for

resisting thrust pressures.

For the operation of the toggle links I may provide, as shown in Fig. 1, a shaft C through the end of that toggle link B which is pivotally connected to the door, which shaft is keyed to the toggle link and is also keyed to an operating lever C' on the outside of the car at one end thereof, as shown in Figs. 1, 2 and 3. In Fig. 2 the position of the operating lever is shown as that in which the door is closed, when the lever is swung to the right from the position shown in Fig. 2 the toggle will be broken and the door permitted to be pushed open under the weight of the load therein, which opening movement will, of course, be assisted to whatever extent is necessary by the operator, through the medium of the aforesaid lever. This lever may, of course, be provided with suitable catches to hold it in either its extreme or intermediate positions. When it is desired that the door shall be closed, the mere release of the operating lever will permit the toggle link to straighten out under the tendency of the door to swing downward,—the structure being, as above stated, such that the center of gravity of the door and its appurtenant parts is at its lowest position when the door is closed. Thus, it is possible for these very heavy structures to be handled with ease by a single man without any sacrifice of effectiveness as a closure or the free full opening of the door is made to permit a rapid discharge of the contents of the car. To one familiar with the massiveness and cumbersome character of the apparatus these advantages will appear to be of great value.

In the form of operating mechanism shown in Fig. 4, I show the use of the counterweight D rigidly connected with the link B' of the toggle farther from the door, so hung as to tend to break the toggle joint and thereby assist the operator in the first movement of opening the door. For the purpose of breaking the toggle in this structure, I have provided a draw rod E pivotally connected to the pin E' of the toggle knuckle, which rod passes upward through a guiding and retaining bracket E² on the side of the car,—a handle E³ being secured into the upper end of the rod to afford convenient means for the operator to draw the same upward in order to effect the breaking of the joint. In order to lock the parts in any desired position, a quick acting screw E⁴ having an operating lever E⁵ on the end thereof is mounted in the side of the guide bracket in such position that it may be forced against the side of the draw rod and bind it in place.

In the modification shown in Fig. 5 a pair of doors form the V point of the car, and in this modification, as in the others, the doors are each suspended on supporting links, as before described. The operating toggles in this case are manipulated by a single hand lever F mounted on and keyed to a shaft F' on the car frame, to which shaft is also keyed a rocking lever F² having pivotal cross rod connection F³ with a similarly mounted rocking lever F⁴ on the opposite side of the car. Rigidly connected with each of the shafts on which the aforesaid rocking levers F² F⁴ are keyed, is a short projecting arm F⁵ having a link F⁶ connecting the end thereof with one of the toggle links,—the various parts being properly arranged so as to cause both doors to move open simultaneously.

It will be noted that at the lower end of one of the doors I provide an angularly disposed lip G, placed so as to extend across the line of juncture of the lower edges of the two doors, and thus check the material in the event of an imperfect alinement of the meeting edges which might permit fine particles to seep out between the doors.

Whatever may be the modification of the operating connections, however, it will be seen that a closure constructed according to my invention will be capable of sustaining any probable load and yet be capable of being swung clear of the discharge opening so as to permit a free passage of the contents of the car therethrough, and this with comparatively little effort on the part of the operator and without imposing upon the operator the necessity of exerting himself unduly to close the doors. These and other advantages flowing from the arrangement of parts will be obvious to those skilled in the art.

Having described my invention, I claim:—

1. In a car having slanting sides and an opening in one of said sides near the bottom thereof, a door for closing said opening, links pivoted to each end of the door and to the end of the car body, said door being so hung that it closes by its own gravity.

2. In a car having slanting sides and an opening in one of said sides near the bottom thereof, a door for closing said opening, links pivoted to each end of the door and to the end of the car body, said door being so hung that it closes by its own gravity; means for securing said door, said door being operable to be opened by the load when the securing means is released.

3. In a car having a discharge opening at the lower end thereof, a door for said opening, a pair of links secured by one of their ends to each end of the door and at their other ends pivoted upon the ends of the car body, a toggle lever secured at one of its ends to the door and at its opposite end

to a fixed part of the car, and means for holding the said toggle thereby to hold the door in closed position.

4. In a car having a discharge opening at
5 the lower end thereof, a door for said opening suspended and controlled by a pair of links at each end pivotally connected near its respective sides, said links being connected to allow the door an outward movement
10 away from the opening, said door being hung so that its center of gravity is raised during its initial opening and final closing

movement, mechanical means for moving the door inward and outward, and a counterweight for said door located to counteract 15 a portion of the load upon the operating connections.

In testimony whereof, I hereunto affix my signature in the presence of two witnesses.

ARTHUR G. McKEE.

Witnesses:

A. C. NELSON,

L. ROSS ELLETT.