

No. 768,248.

PATENTED AUG. 23, 1904.

S. W. VAUGHEN, J. B. McCLURE & A. J. BOYNTON.  
STOCK COLLECTING CAR OR LORRY.

APPLICATION FILED APR. 7, 1903.

NO MODEL.

2 SHEETS—SHEET 1.

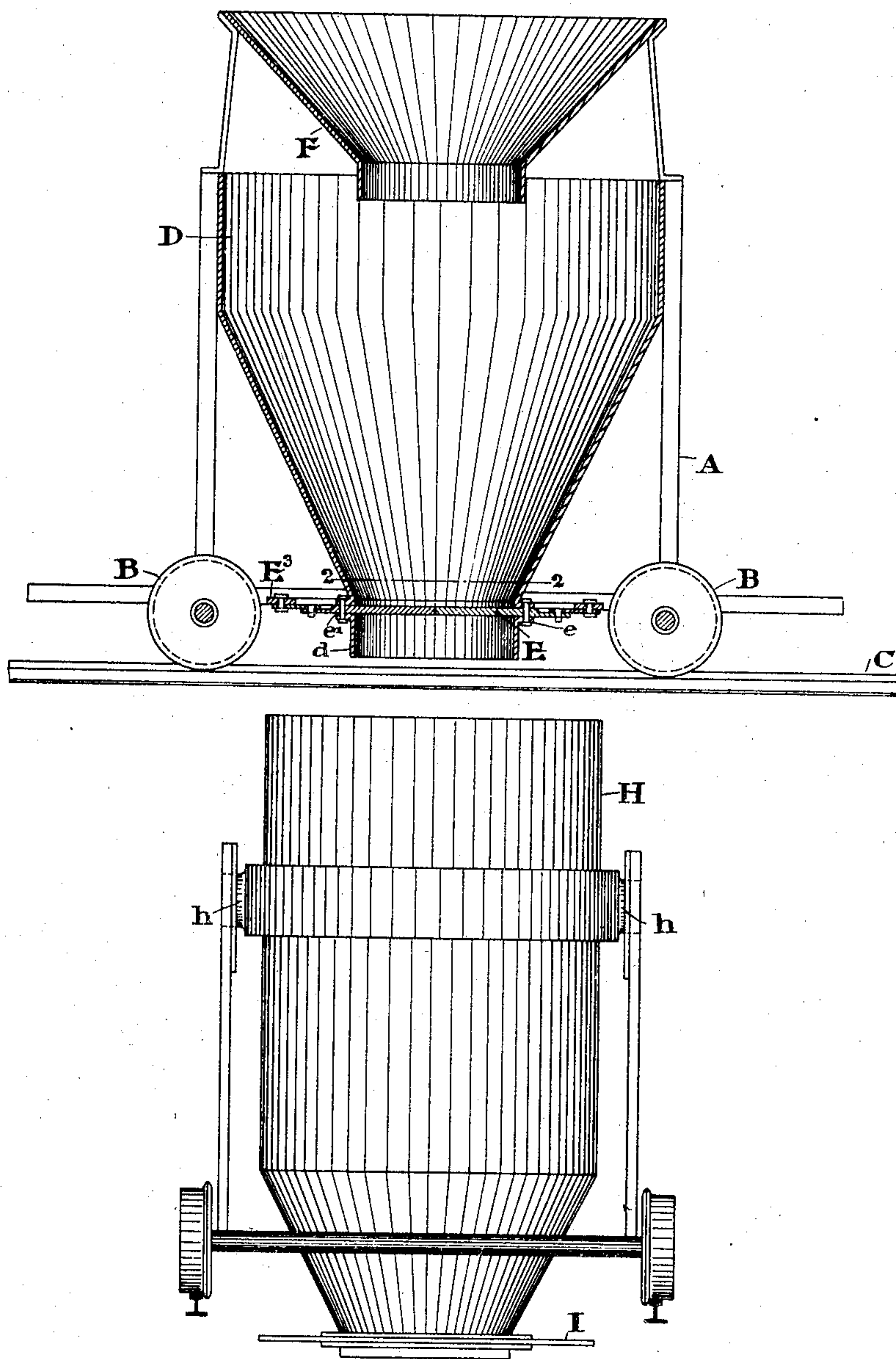


Fig. 1

WITNESSES:  
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Loretto O'Connell

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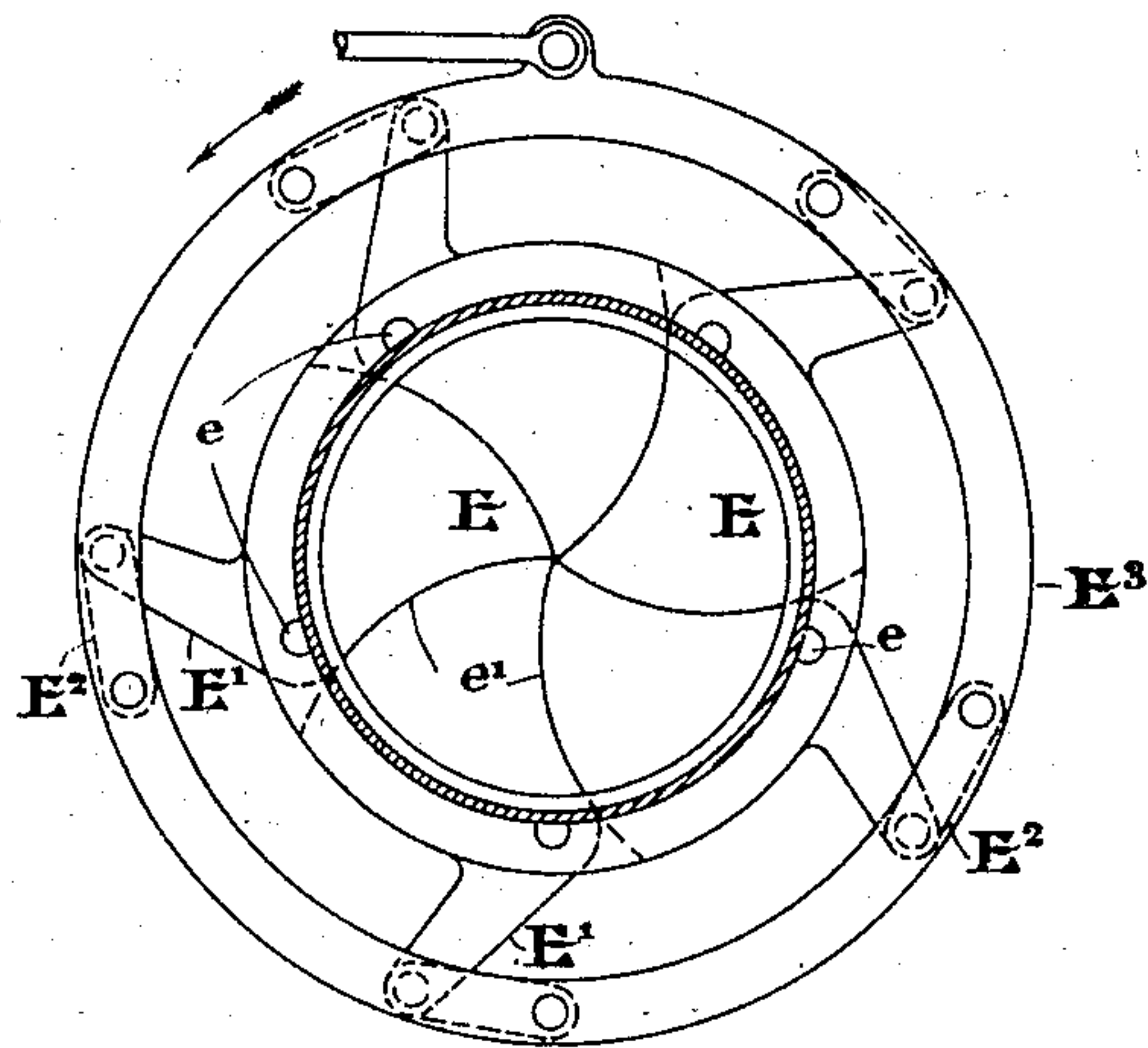


Fig. 2

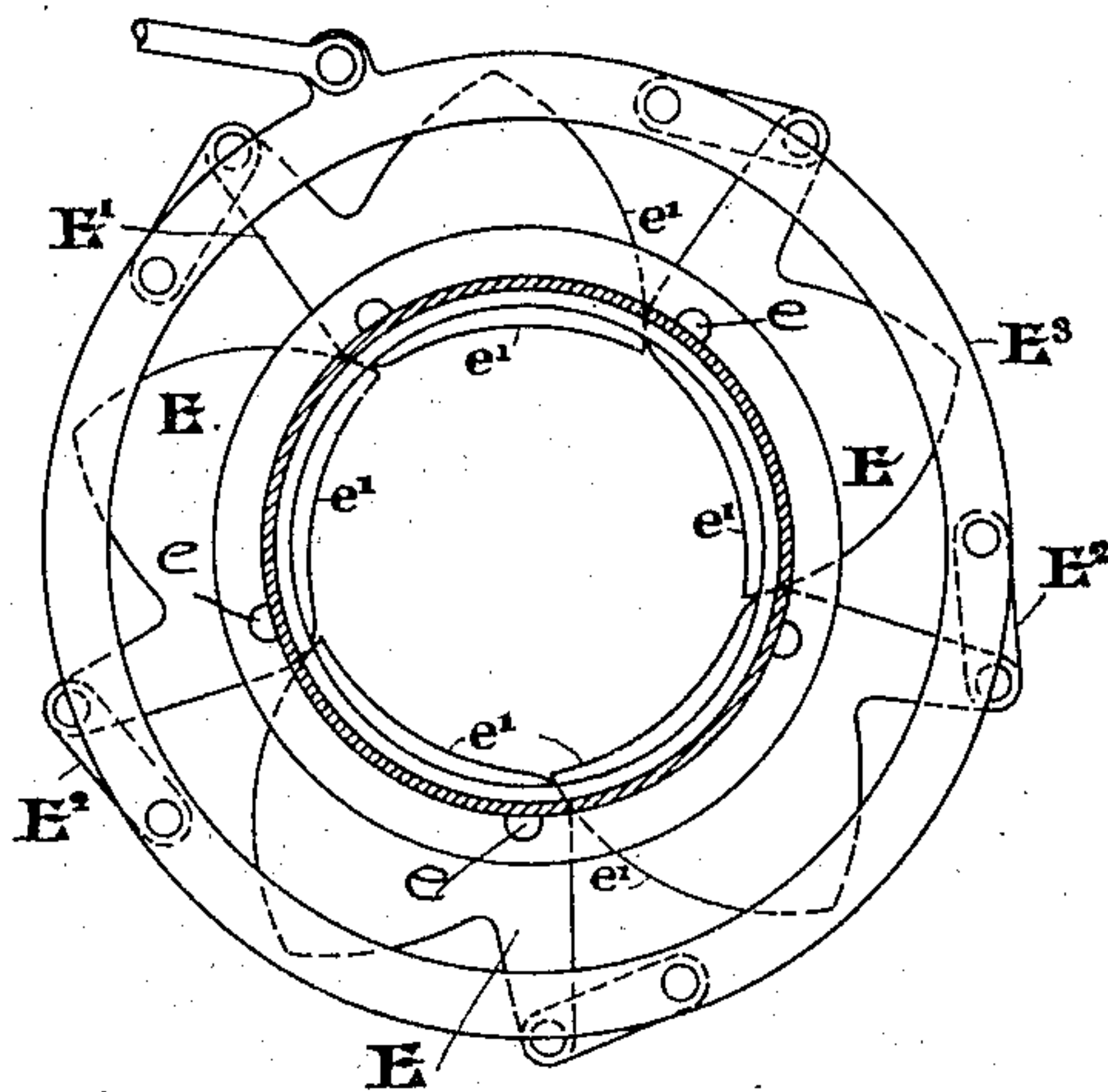


Fig. 3

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# UNITED STATES PATENT OFFICE.

SAMUEL W. VAUGHEN AND JAMES B. McCLURE, OF LORAIN, AND ARTHUR J. BOYNTON, OF ELYRIA, OHIO.

## STOCK-COLLECTING CAR OR LORRY.

SPECIFICATION forming part of Letters Patent No. 768,248, dated August 23, 1904.

Application filed April 7, 1903. Serial No. 151,507. (No model.)

*To all whom it may concern:*

Be it known that we, SAMUEL W. VAUGHEN and JAMES B. McCLURE, residing at Lorain, and ARTHUR J. BOYNTON, residing at Elyria, in the county of Lorain, State of Ohio, have invented a new and useful Improvement in Stock-Collecting Cars or Lorries, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, which form a part of this specification.

Our invention has relation to an improved stock-collecting car or lorry for collecting the stock composing blast-furnace charges from the various bins or receptacles in which it is contained and delivering the same to the skip-car which runs to the top of the furnace.

In our applications Serial Nos. 151,505 and 151,506, both of even date herewith, we have shown that one of the causes of unequal distribution of stock in blast-furnaces is found in the fact that the side-dumping skip-cars commonly used tend in discharging to throw more of the stock to the front or farther side of the furnace, and we have described and claimed a form of car designed to avoid this objection by a construction whereby the stock is dropped centrally through its bottom into the receiving-hopper of the furnace. In order that a car of this character may operate to the best advantage, it is desirable that it shall itself have an equal distribution of stock therein—that is to say, a distribution in which the surface of the stock is either level or which forms a cone whose apex is coincident with the center of the discharge-opening of said car and also in which, as nearly as may be, the different materials composing the stock charge are uniformly admixed both as to size and character. Otherwise the unequal pressure of the stock in discharging will throw more or less of the discharge toward one side of the hopper, and there will be a still further want of uniformity of mixture in the charge.

According to the usual practice heretofore the stock is drawn into the collecting car or lorry from the sides of a system of bins and falls into said car at an angle instead of vertically, thus throwing more of the material

toward one side. This car is also discharged at the side into the skip-car standing on its inclined track, which repeats the error and magnifies it, and as the stock is thrown against the front side of the car near the top and rolls off into the bottom there is caused a segregation of lumpy material at the lower end or bottom of the car.

Our present invention is designed to provide a collecting car or lorry in which these evils are remedied, and to this end we provide it with a receiving-hopper into which the stock is discharged from the bin and which acts to partially correct the angular direction of the stock and direct it more nearly vertically into the bucket. We also provide the bucket with a centrally-opening bottom discharge and provide means whereby said bucket may be moved directly over the bucket of the skip-car and its contents discharged vertically into the same, thus avoiding the second error in distribution above described and also correcting largely any then existing error. In this manner we get the material into the skip-car in a satisfactory condition for delivery to the furnace, and by the means described in our said application, by which in discharging the stock from the skip-car into the receiving-hopper of the furnace and from the said hopper into the furnace we continue the process of correction and admixture, we obtain in the furnace a highly satisfactory stock distribution.

Our invention will be better understood by reference to the accompanying drawings, in which—

Figure 1 shows, partly in side elevation and partly in vertical section, our improved collecting car or lorry and its relation to the skip-car. Fig. 2 is a section taken on the line 2 2 of Fig. 1 and showing the centrally-opening discharge valve or diaphragm in its closed position, and Fig. 3 a similar view showing the said valve or diaphragm approaching nearly its full opened position.

The letter A designates the frame of the car, mounted on the trucks B upon a track C.

D is the bucket of the car, having a funnel-shaped lower portion terminating in a cylin-



dricl discharge portion  $d$ , in which is the centrally-opening valve E.

F is a funnel-shaped receiving-hopper supported over the top of the bucket D and arranged to discharge therein.

The valve E is preferably of the character described and claimed in our said application Serial No. 151,505 and shown in detail herein in Figs. 2 and 3. It consists of a circular diaphragm divided on curved radial lines into a number of curved triangular sections, each of which is pivoted at  $e$ , the convex edge  $e'$  of each section being a curve whose center coincides with the center of the pivot  $e$ . Each section has a radially-extending lever-arm  $E'$ , which is connected by a link  $E^2$  with a circularly-movable annulus  $E^3$ . When this annulus is actuated in the direction of the arrow in Fig. 2, the several valve-sections E are swung outwardly on their pivots  $e$ . The opening thus formed is perfectly symmetrical with respect to the vertical axis of the bucket D, and as the sections recede in opening this opening increases in diameter uniformly in all directions. This causes the stock to be discharged vertically into the bucket of the skip-car (shown at H, Fig. 1) and in such a manner that it comes to rest in said bucket with its surface forming a cone whose vertical center coincides with the vertical center of said bucket. The term "centrally-opening" as used herein and in the claims is to be construed as applying only to a valve having this mode of operation as distinguished from those valves formed by hinged or laterally-sliding leaves and in which the opening formed by the recession of said leaves increases in size in one direction only. Valves of this character do not meet the purpose of our invention, since it is impossible by their use to discharge the stock in the proper manner. We do not, however, desire to limit ourselves to the use of the particular construction of valve herein shown and described, as modified forms thereof may be employed.

The track C is so arranged with reference to the skip-car track that when the car H is at the base of the furnace the bucket D may be brought directly over the bucket on said car, as shown in Fig. 1. The skip-car is preferably of the construction described and claimed in our said application, the bucket thereof being hung on trunnions  $h$  and having a bottom discharge controlled by a centrally-opening valve I, similar to the valve E.

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

1. The herein-described stock-collecting car or lorry having its bucket provided with a centrally-discharging receiving-hopper, substantially as described.

2. The herein-described stock-collecting car or lorry, having its bucket provided with a centrally-discharging receiving-hopper, said bucket having a discharge-orifice at its lower end, and a valve controlling said orifice.

3. The herein-described stock-collecting car or lorry, having its bucket provided with a centrally-discharging receiving-hopper, said bucket having a discharge-orifice at its lower end, and a centrally-opening valve controlling the said orifice.

4. A car for blast-furnace stock, having a bucket provided with a discharge-orifice in its bottom, and a centrally-opening valve or diaphragm which controls the said orifice.

5. The combination with a skip-car, of a stock-collecting car or lorry mounted to run over the bucket of the skip-car, and having a centrally-opening discharge-valve in its bottom.

In testimony whereof we have affixed our signatures in presence of two witnesses.

SAMUEL W. VAUGHEN.

JAMES B. McCLURE.

ARTHUR J. BOYNTON.

Witnesses:

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