

T. C. CHAPPELL.
Vehicle or Vessel for Transporting Corrosive Liquid
and Acid.

No. 218,113.

Patented Aug. 5, 1879.

Fig. 1.

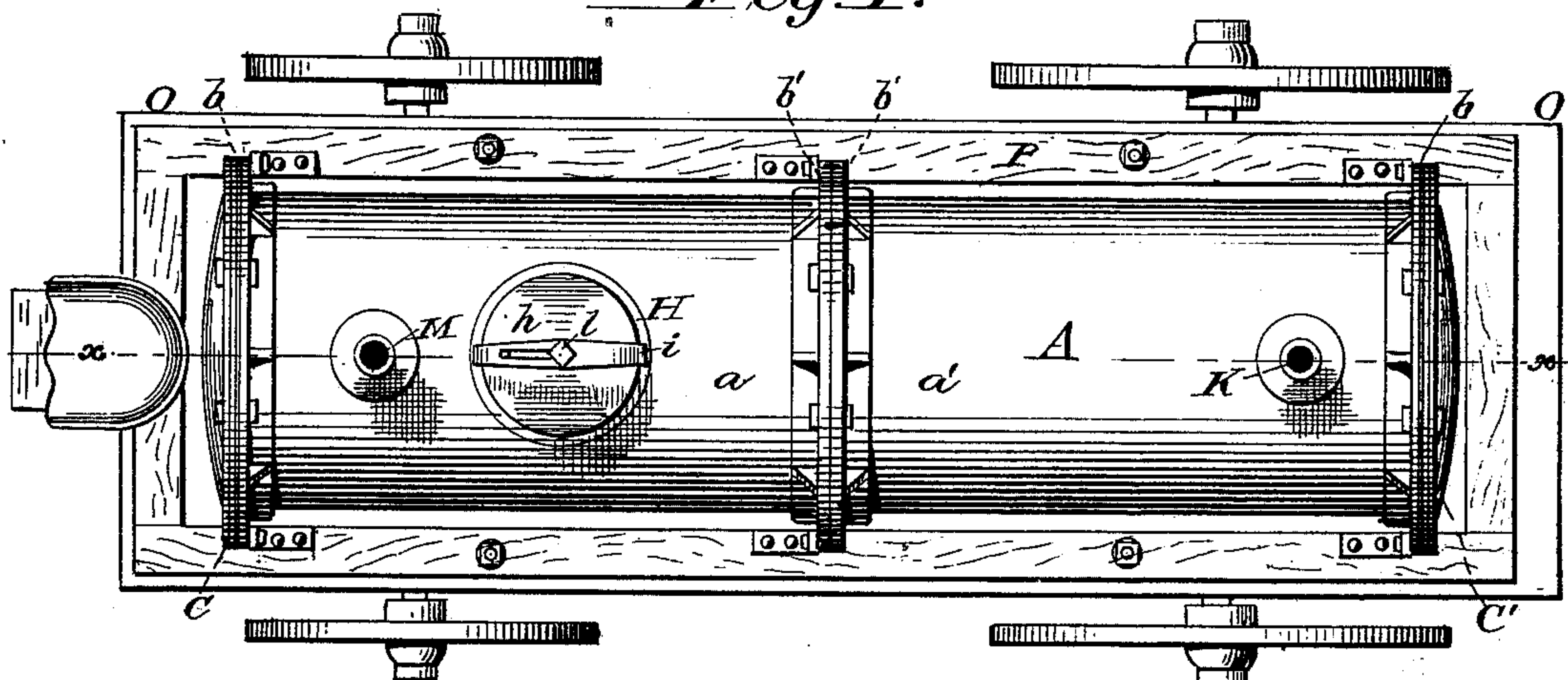


Fig. 2.

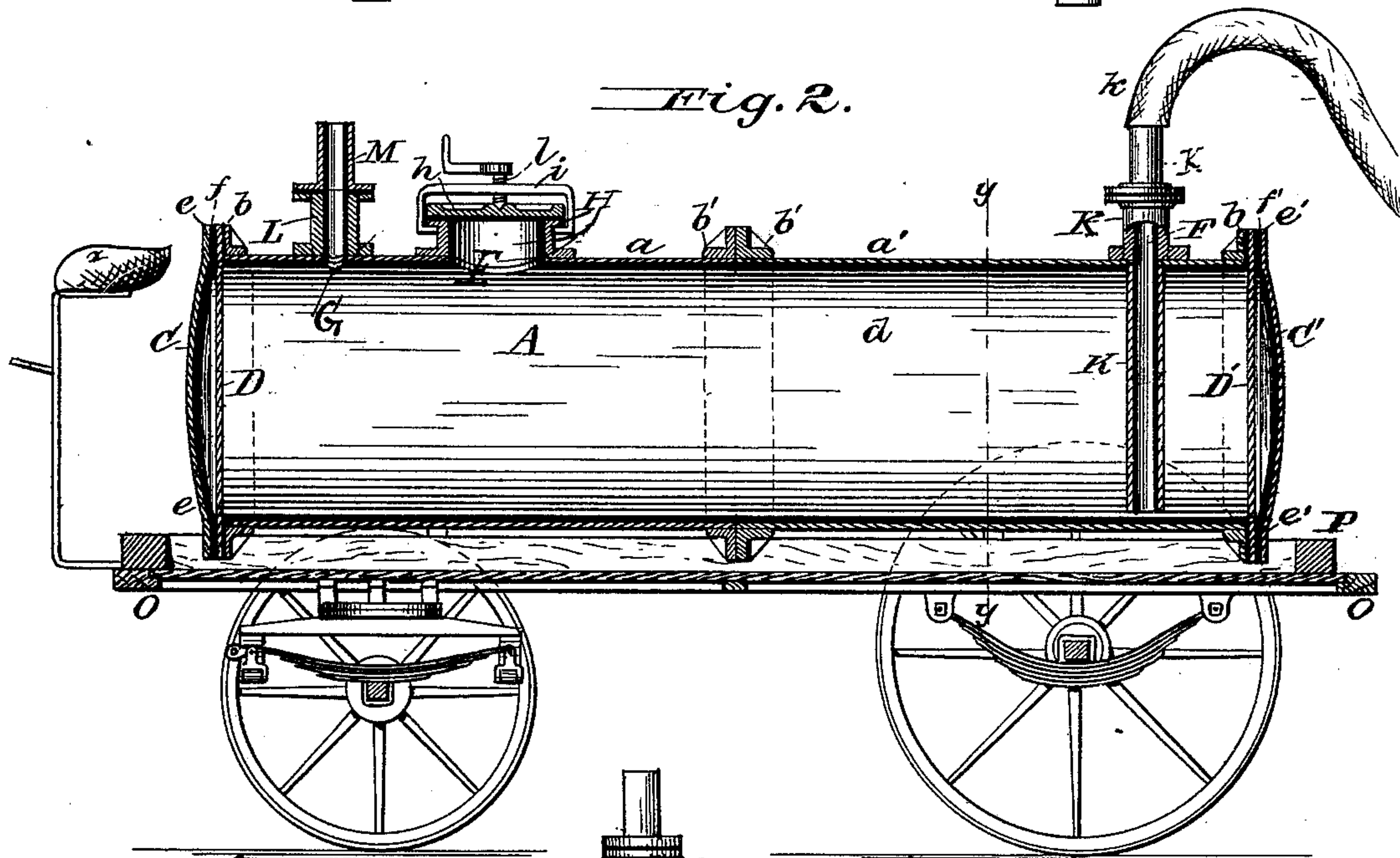


Fig. 3.

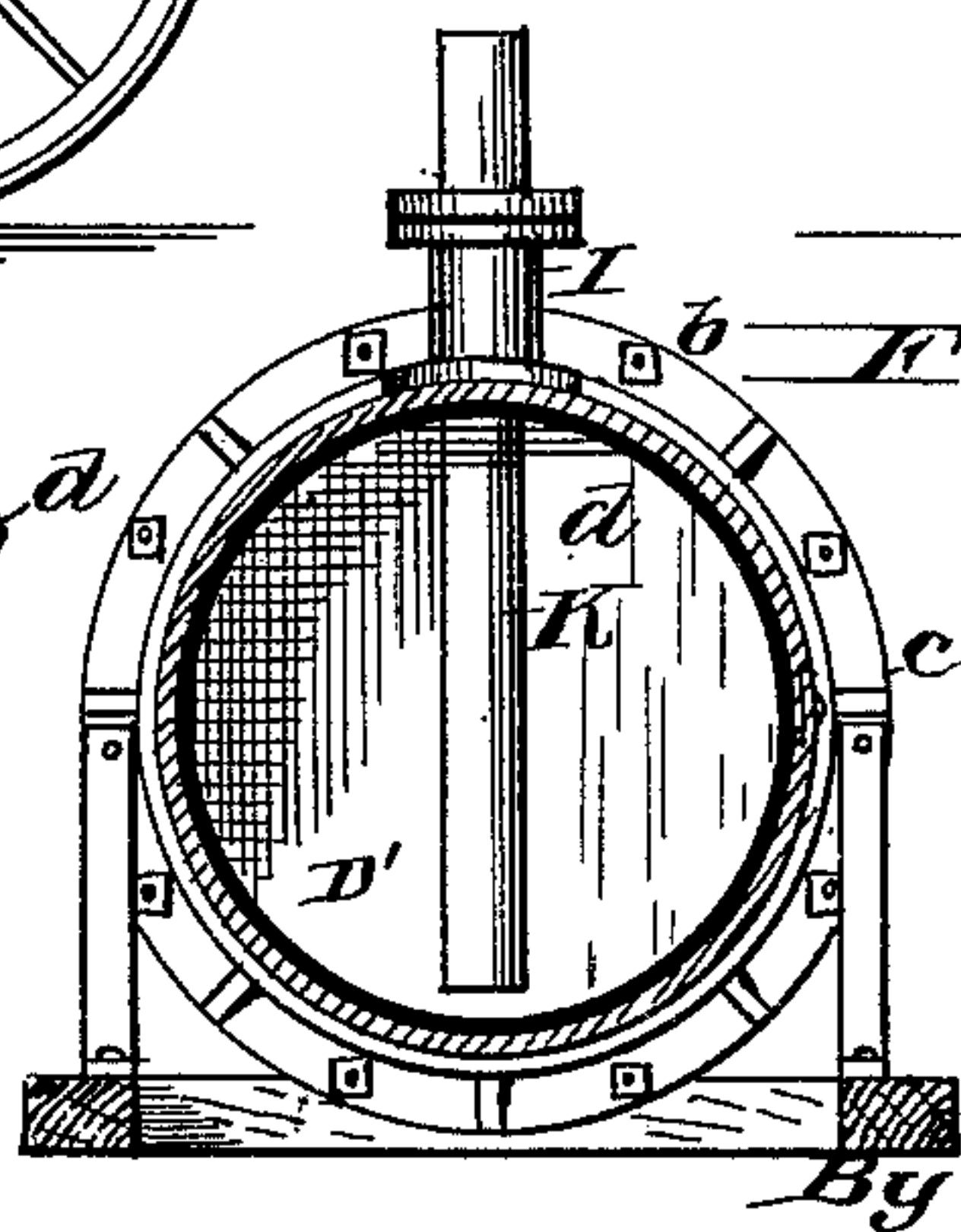
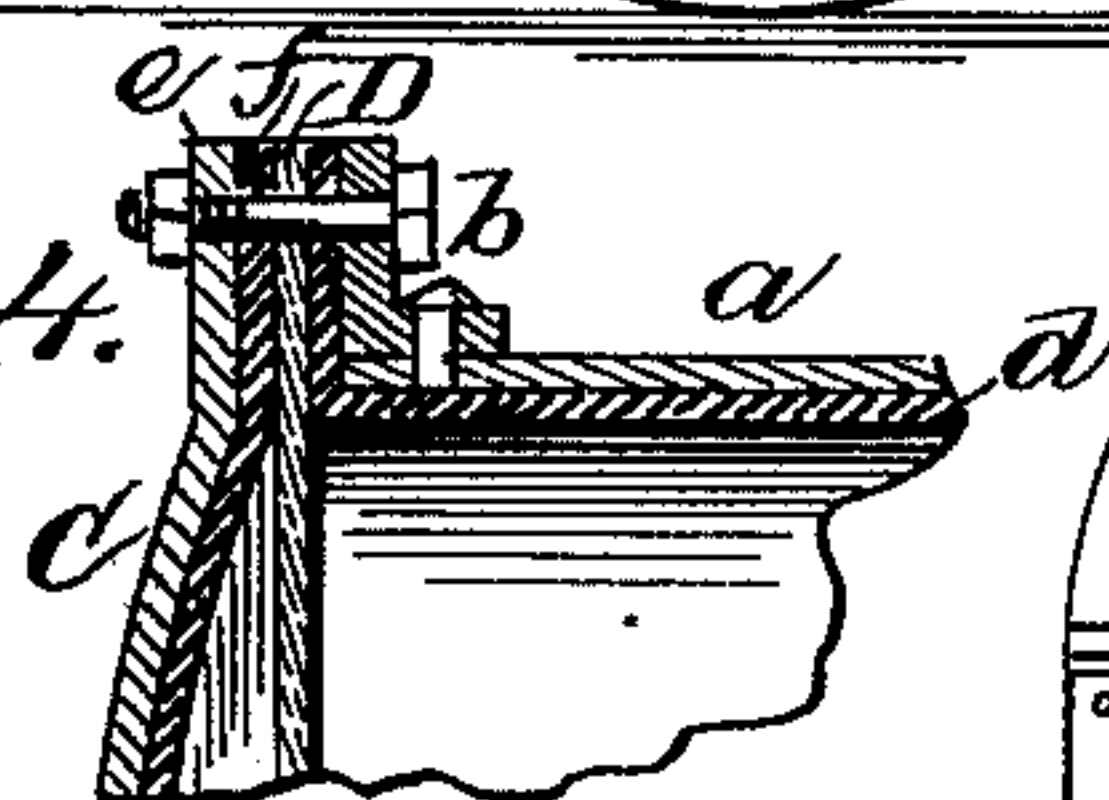


Fig. 4.



Attest:
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UNITED STATES PATENT OFFICE.

THOMAS C. CHAPPELL, OF BALTIMORE, MARYLAND.

IMPROVEMENT IN VEHICLES OR VESSELS FOR TRANSPORTING CORROSIVE LIQUIDS AND ACIDS.

Specification forming part of Letters Patent No. **218,113**, dated August 5, 1879; application filed January 10, 1879.

To all whom it may concern:

Be it known that I, THOMAS C. CHAPPELL, of Baltimore city, in the State of Maryland, have invented certain new and useful Improvements in Vehicles or Vessels for Transporting Corrosive Liquids and Acids in Bulk, of which the following is a specification.

My invention relates to a vehicle or vessel for transporting corrosive liquids and acids in bulk, and belongs more especially to the class of carrying-vessels which are moved about or transported from place to place upon wheels.

The object of my present invention is to overcome the objections incident to the use of vessels or vehicles of small capacity when employed in the transportation of corrosive substances, and to provide a vessel or vehicle for the transportation of such substances in bulk, having the capacities of being readily moved about from place to place, as circumstances require, and of being readily and quickly filled and automatically discharged, while, at the same time, being proof against the corrosive influence of the acid or liquid which it may contain, and perfectly free from all danger of accidental leakage or escape of its contents, my improved apparatus being especially designed for the transportation of corrosive substances in bulk over rough or paved roads from the factory to the place of discharge.

By the employment of a carrier constructed according to my invention all objections heretofore existing to the handling of acids in large quantities are believed to be obviated.

In the accompanying drawings, which represent all my improvements as embodied in one machine, Figure 1 is a plan or top view of so much of my improved apparatus as is necessary to illustrate the subject-matter herein claimed; Fig. 2, a longitudinal central section therethrough on the line *xx* of Fig. 1; Fig. 3, a vertical transverse section through the apparatus on the line *yy* of Fig. 2; and Fig. 4, an enlarged detail sectional view of one end of the apparatus, showing the manner in which the ends of the carrying-vessel are constructed.

The vehicle or vessel in which the corrosive liquid or acid is placed for transportation con-

sists, preferably, of an oblong cylindrical or tubular casing or tank, A, constructed in sections, two preferably, which are firmly and securely united at or about their center by flanges and rivets, or in other well-known ways. This casing or tank is lined or provided upon its interior surface with an acid-proof material, to enable the casing, which I prefer to construct of iron, to resist the corrosive and destructive action of the acid or liquid. This lining is preferably of lead, and is made in one piece or continuous from end to end of the casing, so as not only to protect the interior thereof, but any and all joints therein as well.

The ends of the casing or tank are closed by suitably-shaped head plates or castings C C', preferably of the concavo-convex form shown, and provided with suitable flanges *ee*, which are bolted or riveted to similar flanges formed upon or secured to the casing.

These head-plates are also lined with a substance, preferably lead, capable of resisting the action of the acids; and in order to insure a perfectly tight and secure joint between the said plates and the ends of the cylindrical portion of the casing, I interpose at each end, preferably between said casing and plates, diaphragms D D', of india-rubber or some equivalent material, of suitable size and thickness, as clearly shown in Figs. 2 and 4. These diaphragms, besides insuring a perfect joint between the casing and end plates, serve the important purpose of buffers, acting to receive the force and withstand the weight of the liquid when surging or thrown from end to end of the casing, which surging is occasioned by the jolting or motion of the vehicle during transportation.

The diaphragms or buffers thus prevent the corrosive substance from acting on the head-plates with force which might have a tendency to loosen said plates, as also to destroy their protective lining by its constant motion.

The casing or tank, as thus constructed, is bolted or secured in an open or skeleton casing-frame, P, so as to be permanently connected therewith, which frame in turn is mounted upon and secured temporarily to the wheel or carrying frame O, which may be of any suita-

ble well-known construction, said wheel-frame being provided with a driver's seat in the usual manner.

The sectional casing or tank, by being permanently and securely bolted to a frame, is given additional strength, while capable of being readily removed from the wheel or carrying frame when desirable for repairs without necessitating the dismemberment of the parts other than separating the two frames, which capacity, owing to the necessity of preserving absolutely tight joints in all the parts subject to the corrosive action of the acids or liquids, is very desirable.

The inlet and outlet openings or orifices for filling and discharging the cylindrical vessel or tank are arranged upon the upper side, to avoid the necessity of using valves or stop-cocks, which would be comparatively useless, as far as preventing leakage is concerned, in an acid-conveyer constructed as described, and also to prevent the liquid or acid from jolting out by the motion of the vehicle.

The inlet feed-opening E is of sufficient size to permit of the rapid filling of the vessel, and also to afford a view of the interior thereof, in order to observe the rise of the liquid in the vessel, and enable the operator to stop or determine the flow when the vessel has been sufficiently charged. A suitable indicator, however, may be employed to show the amount of acid in the vessel. This opening is surrounded by a raised flanged collar, H, secured to the outside of the casing, and suitably lined or rendered acid-proof, the collar or opening being closed when desired, or during transportation, by a suitable acid-proof covering plate or lid, *h*, which is held firmly to its seat by a suitable clamp-frame, *i*, and set-screw *l*, of well-known construction.

In addition to the feeding-inlet opening, I preferably provide the cylinder with an inlet opening or orifice, G, for the entrance of air to compel the discharge of the liquid, when necessary, through the discharge-opening, hereinafter to be mentioned, either by the use of a forcing-pump or automatically by atmospheric pressure upon the principle of the siphon, as may be desirable or necessary. This air-opening G is surrounded by a tube or collar, L, provided with a pipe, M, for attaching the force-pump, if such is used, both tube and pipe having an acid-proof lining. The said collar and pipe also prevent accidental jolting out or escape of the acid, which might occur were the opening in the cylinder not provided therewith.

It will be obvious that but one inlet-opening is necessary in order to constitute both the feed-opening and the orifice for the admission of air when discharging; but I prefer the construction described.

The outlet or discharge opening F is preferably located at the end of the cylinder opposite that provided with the inlet-opening. This opening F is surrounded by an outlet pipe or tube, K, which is either constructed of acid-proof material—for instance, of lead—or is provided with an acid-proof coating and lining, and descends from the top nearly to the bottom of the cylinder, as clearly shown in Figs. 2 and 3. This pipe is fixed in the cylinder, and is extended or continued outside the casing to a suitable distance by means of the fixed tube I, which is acid-proof, and affords ready means for attaching the discharge hose or pipe *k*, which leads from the acid-receptacle to the point of discharge. If this point of discharge be below the level of the cylinder or tank, it is obvious that the liquid or acid may be automatically discharged by atmospheric pressure upon the siphon principle, while if the point of discharge be above, as, for instance, in the second story of a building, a force-pump should be employed.

I claim—

1. The combination, substantially as hereinbefore set forth, of the casing, the flanged head or end plate thereof, and the interposed diaphragm, whereby a tight joint is insured and injurious action of the corrosive substance upon said plate caused by its motion in the casing prevented.

2. The combination, substantially as hereinbefore set forth, of the casing, its protective lining, the head-plates, and the diaphragms interposed between said casing and plates at the opposite ends of the casing.

3. The combination, substantially as hereinbefore set forth, of the cylindrical casing, its end or head plates, the protective lining thereof, the inlet and outlet openings located at the top of the casing, and the acid-proof outlet-pipe leading from near the bottom of the casing to the outlet or discharge opening, in which it is fixed, so as always to be in position while extending above said opening, for the purpose described.

4. The improved vehicle or vessel for transporting corrosive substances or acids, consisting of the wheel-frame, the casing, its protective lining, the diaphragms or buffers interposed between the ends of the casing and its head-plates, and the inlet and outlet openings, whereby acid may be safely transported in bulk and readily discharged.

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

THOS. C. CHAPPELL.

Witnesses:

GEO. H. HEMMICK,
CHARLES A. DAVIS.