

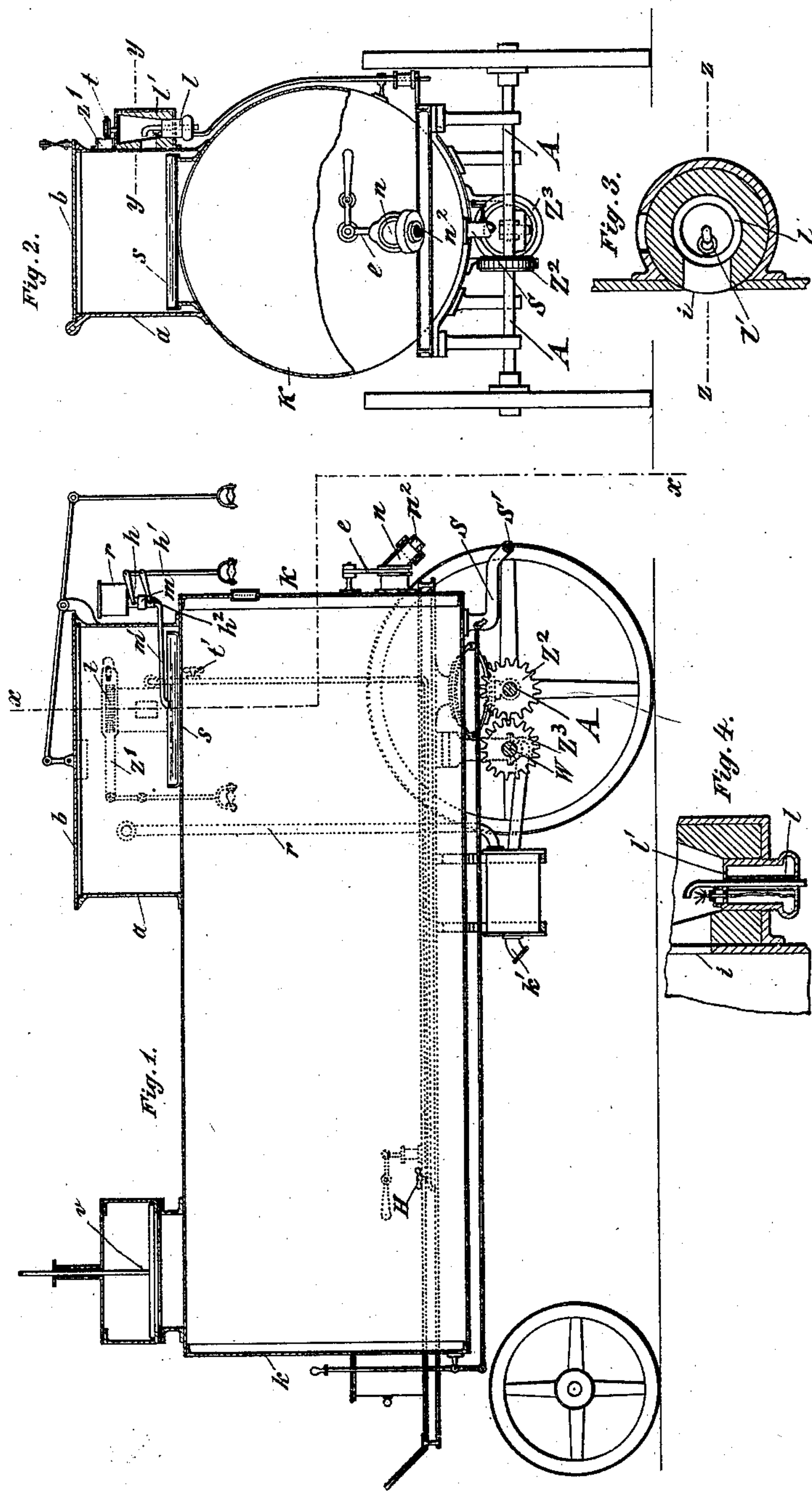
(No Model.)

R. WEGNER.

SUCTION TANK FOR RAISING LIQUIDS, &c.

No. 553,182.

Patented Jan. 14, 1896.



WITNESSES:
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UNITED STATES PATENT OFFICE.

RICHARD WEGNER, OF NEU BRITZ, GERMANY.

SUCTION-TANK FOR RAISING LIQUIDS, &c.

SPECIFICATION forming part of Letters Patent No. 553,182, dated January 14, 1896.

Application filed August 31, 1894. Serial No. 521,798. (No model.)

To all whom it may concern:

Be it known that I, RICHARD WEGNER, a subject of the King of Prussia, Emperor of Germany, and a resident of Neu Britz, near Berlin, in the Kingdom of Prussia and German Empire, have invented certain new and useful Improvements in Suction-Tanks for Raising Liquids, &c., of which the following is a specification.

This invention relates to an improved suction-tank for raising liquids, the action of which is based on the principle of producing a vacuum in the tank by supplying the same with a gaseous fluid which forms an explosive mixture with the atmospheric air in the tank, and which mixture is then ignited, so as to produce an explosion and thereby a vacuum.

In the accompanying drawings, Figure 1 represents a vertical longitudinal section of my improved suction-tank. Fig. 2 is a vertical transverse section on line xx , Fig. 1. Fig. 3 is a detail horizontal section on line yy , Fig. 2, drawn on a larger scale; and Fig. 4 is also a detail vertical central section on line zz , Fig. 3, of the igniter, also drawn on a larger scale.

Similar letters of reference indicate corresponding parts.

The vessel or tank in which the vacuum is to be produced can be made of cylindrical, rectangular, or other shape, and can be supported in horizontal or vertical position, as desired. It is preferable, however, to make the same in the form of a horizontal cylindrical tank, which is supported on wheels, like a wagon, and which can then be used as a tank for removing night-soil, for blasting, for extinguishing fires, and for other purposes. The tank k is provided at its top part with a casing a , in which is arranged a shallow pan s , to which is supplied a volatile hydrocarbon—such as, for instance, benzine. The volatile hydrocarbon is supplied from a suitable reservoir r , the stop-cock h of which is operated by a lever-rod h' or in any other suitable manner. Below the reservoir r is arranged a measuring-vessel m , by which a determined quantity of the volatile hydrocarbon is supplied to the evaporating-pans. A second stop-cock h^2 connects the measuring-vessel m with a supply-tube m' , which leads

to the pan s , the lever-rod h' being connected with both stop-cocks h^2 in such a manner that by its motion one stop-cock is opened while the other is closed. By this arrangement it is possible to supply always the same required quantity of hydrocarbon to the pan s . The volatile hydrocarbon is evaporated in the tank k and forms, with the oxygen in the air contained in the same, an explosive mixture. This explosive mixture is ignited in any approved manner by means of an igniting-flame, exploding pellets, or electricity. In place of the volatile hydrocarbon a suitable gas or any other substance may be used which is capable of exploding when mixed with air or other gaseous fluid.

The igniter shown in the drawings consists of a lamp l , which is arranged outside of the tank k and the flame of which burns within the cavity above a stop-cock l' . By means of a slot i arranged in the tank k the interior of the same can be placed in connection with the flame of the igniter. For turning the stop-cock l' the spindle of the same is provided with a pinion t , which is engaged by a rack z , (shown in Fig. 2,) so as to facilitate the turning of the stop-cock l' . In Fig. 3 the slot i is shown as being closed by the body of the stop-cock. By turning the stop-cock through an angle of one hundred and eighty degrees the flame is brought into connection with the interior of the tank k by the corresponding bore in the stop-cock and the slot i , so that the explosive gas-and-air mixture can be ignited and exploded. By the explosion the air in the tank k is considerably heated and expanded, so that the pressure relief-valve v and the cover b of the casing a are quickly opened and closed again, so that by the quick cooling off of the gases in the interior of the tank k the required vacuum is immediately produced. By the vacuum in the tank the relief-valve v , as well as the cover b , are held firmly and reliably in closed position, while the quick motion of the same is accelerated by a suitable spring or by gravity.

On the head of the tank k is arranged a suction-pipe n , which is provided with a gate e . When the gate is opened, the tank k will suck in the liquid by means of a hose or pipe, which is coupled to the suction-pipe, in proportion to the degree of vacuum in the same.

When the liquid is to be removed from the tank *k*, vent is given to the same by placing the ignition-cock into open position. When the gate *e* is then opened the liquid can readily flow out, while the ignition-cock *l'* supplies continuously atmospheric air to the upper part of the tank. The pan *s* is then supplied with a new quantity of volatile hydrocarbon, over which the air that is supplied through the pipe *m'* passes, so that it is evaporated and distributed with the air uniformly through the entire tank *k*.

If desired, the relief-valve *v* and cover *b* can be readily opened by hand when the tank *k* cannot be filled entirely with the liquid, so that the air in the tank can be removed for the purpose of rendering the gas-and-air mixture explosive.

When the tank *k* is to be used for blasting purposes, the same is connected by pipes *S S'* with the place where the blasting has to take place, the pipe *S* being provided with a suitable closing device by which the pipes *S S'* can be connected at will with the interior of the tank *k*.

The vacuum in the tank can also be used for the purpose of propelling the tank, which is accomplished in the following manner: The hind wheels of the wagon are applied to an axle *A*, which is made to rotate in suitable bearings and on which is placed a gear-wheel *Z²*, which meshes with a second gear-wheel *Z³*, the shaft of which receives motion by a pitman connection with the piston of a suitable engine, which consists, like a steam-engine, of a cylinder, a movable piston in the same, and a slide-valve. The pipe *r'*, which corresponds to the exhaust-pipe of a steam-engine, has a stop-cock *t'* and is connected near the ignition-cock *l'* with the tank *k*, and can be closed or opened at will by means of a stop cock or valve *H*. When the tank is evacuated, the pressure of the atmosphere acts on the piston in the cylinder, so that as the pipe *k'*, which corresponds to the supply-pipe of the steam-engine, is connected with the atmosphere the piston is thereby reciprocated and sets the gear-wheel *Z³* in rotary motion, which is transmitted by the gear-wheel *Z²* to the axle of the hind wheels, so as

to rotate the latter and move thereby the tank-wagon forward. If the difference in pressure in front and back of the piston is reduced to about half an atmosphere, the tank is evacuated again, which can be accomplished while the tank-wagon is in motion. The tank-wagon is provided with a seat for the driver and with suitable guiding and brake devices.

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

1. The combination of a suction tank, provided with a valved suction pipe, a shallow evaporating pan disposed in said tank, a reservoir for a volatile hydrocarbon, a valved pipe connecting said reservoir with said pan, and means for igniting the hydrocarbon vapor produced within said tank.

2. The combination of a suction tank provided with a valved suction pipe, a reservoir for a volatile hydrocarbon, a pipe connected to said reservoir and opening into said tank, a measuring device in said pipe, two valves controlling the ingress and egress of the hydrocarbon with reference to said measuring device, means for operating said valves, whereby either is closed simultaneously with the opening of the other, and means for igniting the hydrocarbon vapor produced within said tank.

3. The combination with a wheeled suction tank, provided with a valved suction pipe, of means for supplying an explosive gas to the interior of the tank, an igniting device for exploding the gas and air mixture in the same, an engine on the tank, motion transmitting gear-wheels connected with the piston of the engine, one of said gear-wheels being applied to one of the axles of the tank, whereby the tank-wagon can be propelled by the difference in pressure between the outer atmospheric air and the pressure at the interior of the tank, substantially as set forth.

In witness whereof I have hereunto set my hand in presence of two witnesses.

RICHARD WEGNER.

Witnesses:

MAXIMILIAN MINTZ,
HANS BAUERLIN.