(No Model.) 4 Sheets—Sheet 1.

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MIXING APPARATUS.

No. 547,725. Patented Oct. 8, 1895.

FIG_4_

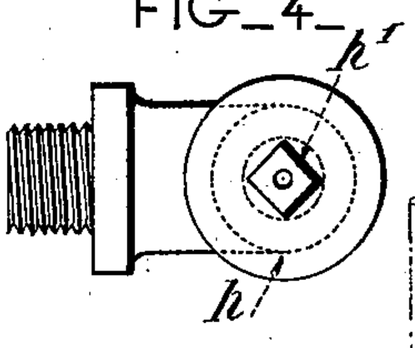


FIG_3_

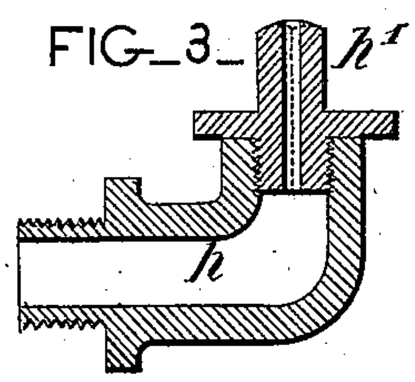


FIG_5_

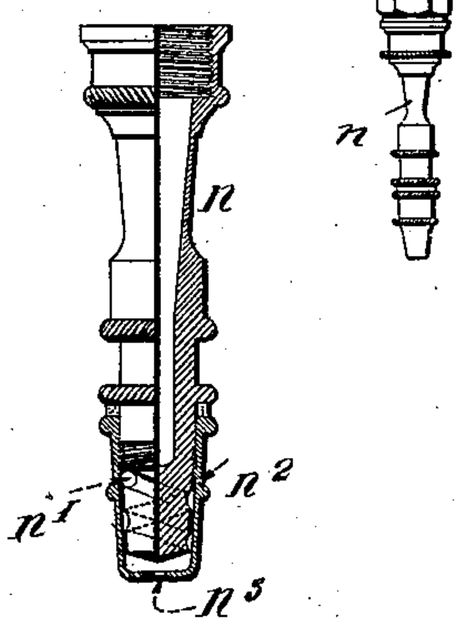
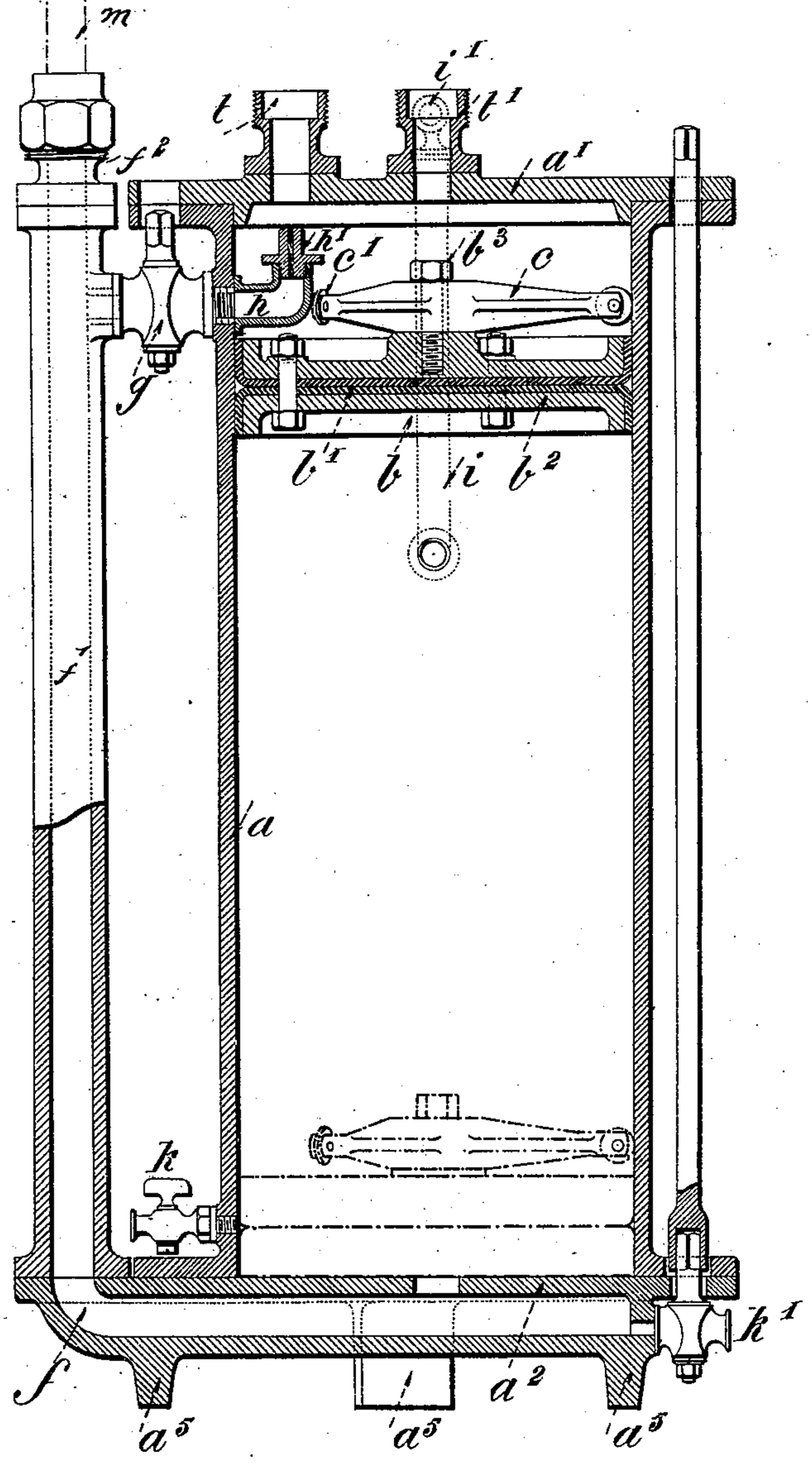


FIG_1_



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(No Model.) 4 Sheets—Sheet 2.

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MIXING APPARATUS.

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FIG. 2.

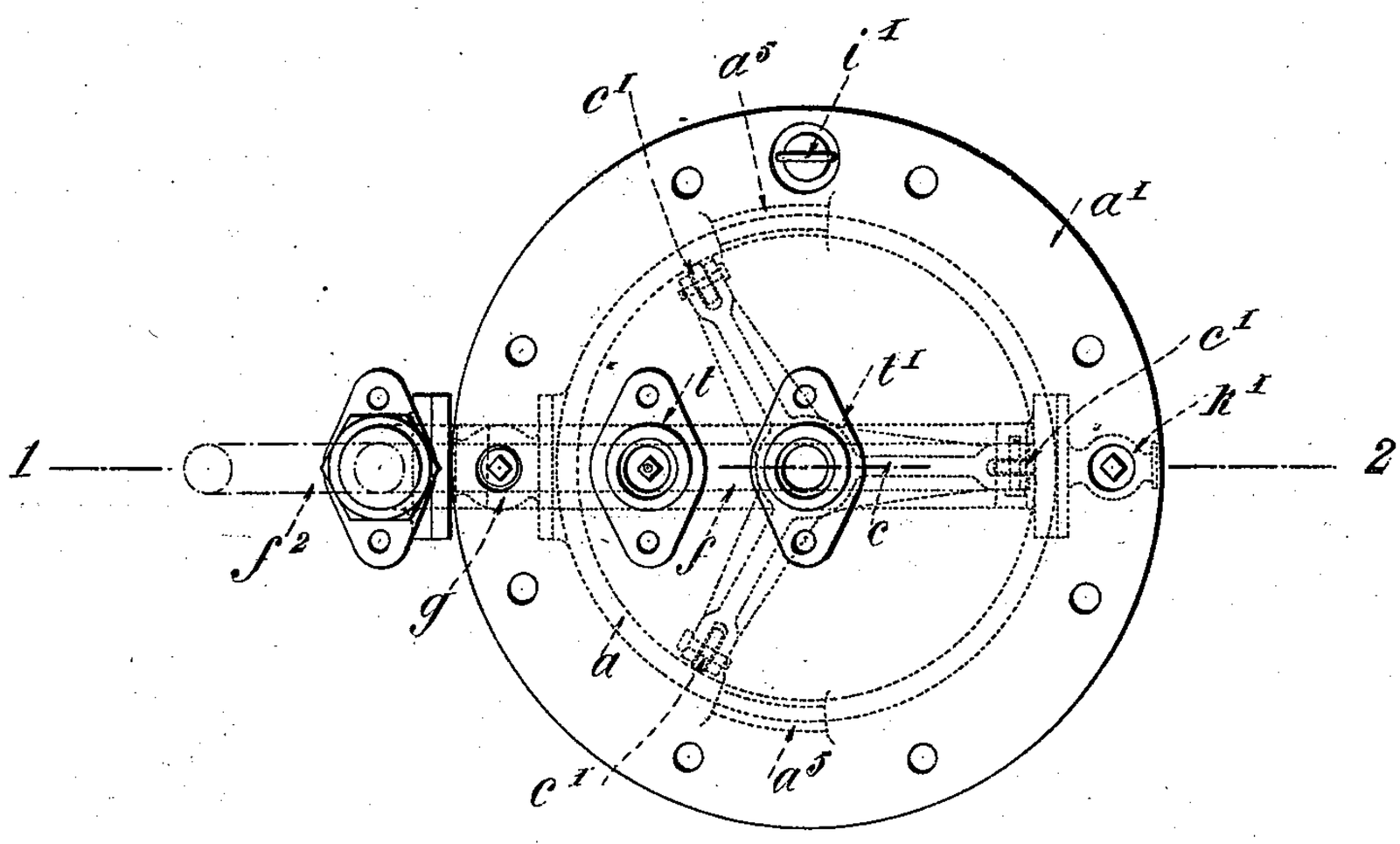
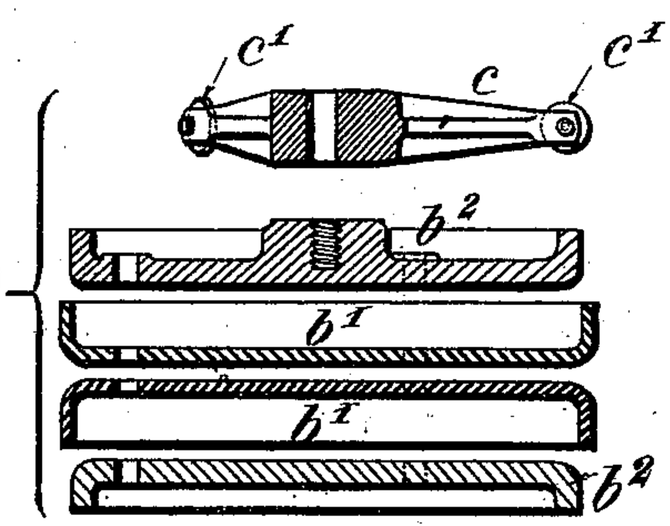


FIG. 9.



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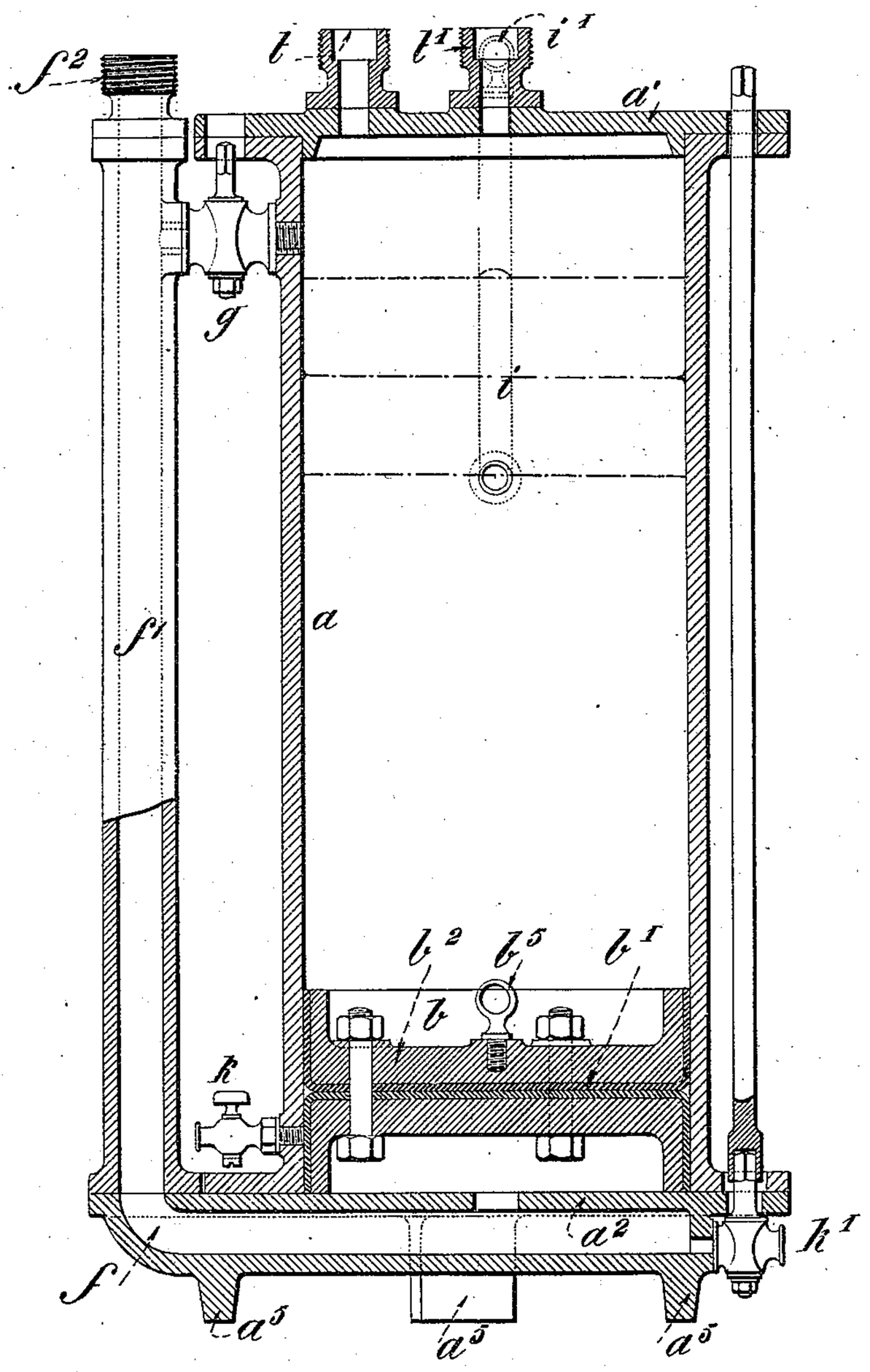
MIXING APPARATUS.

No. 547,725. Patented Oct. 8, 1895.

FIG. 6.



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M. J. E. LAURANS, E. J. B. P. E. JODELAY & J. A. TOURNEL.

MIXING APPARATUS.

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FIG. 7.

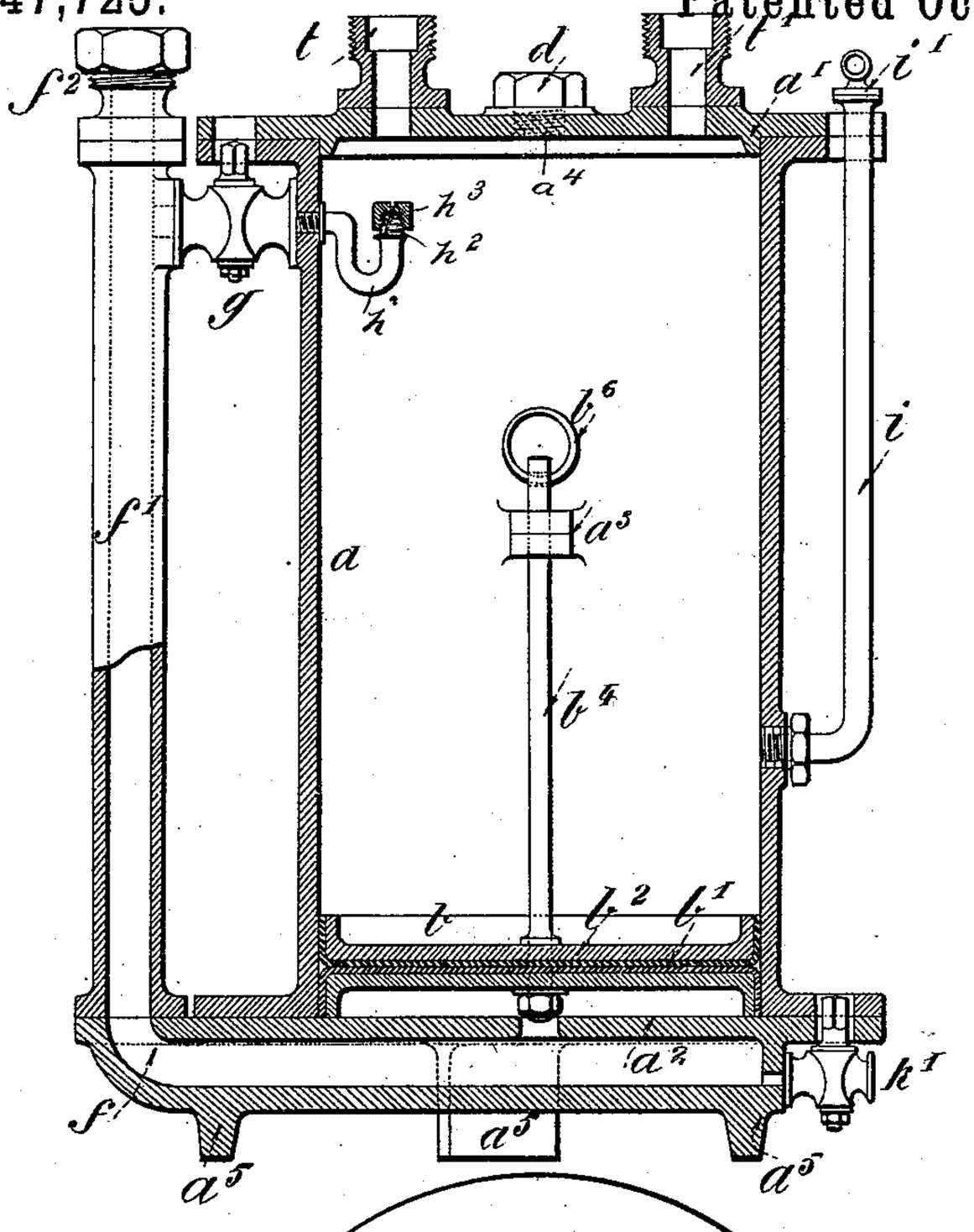
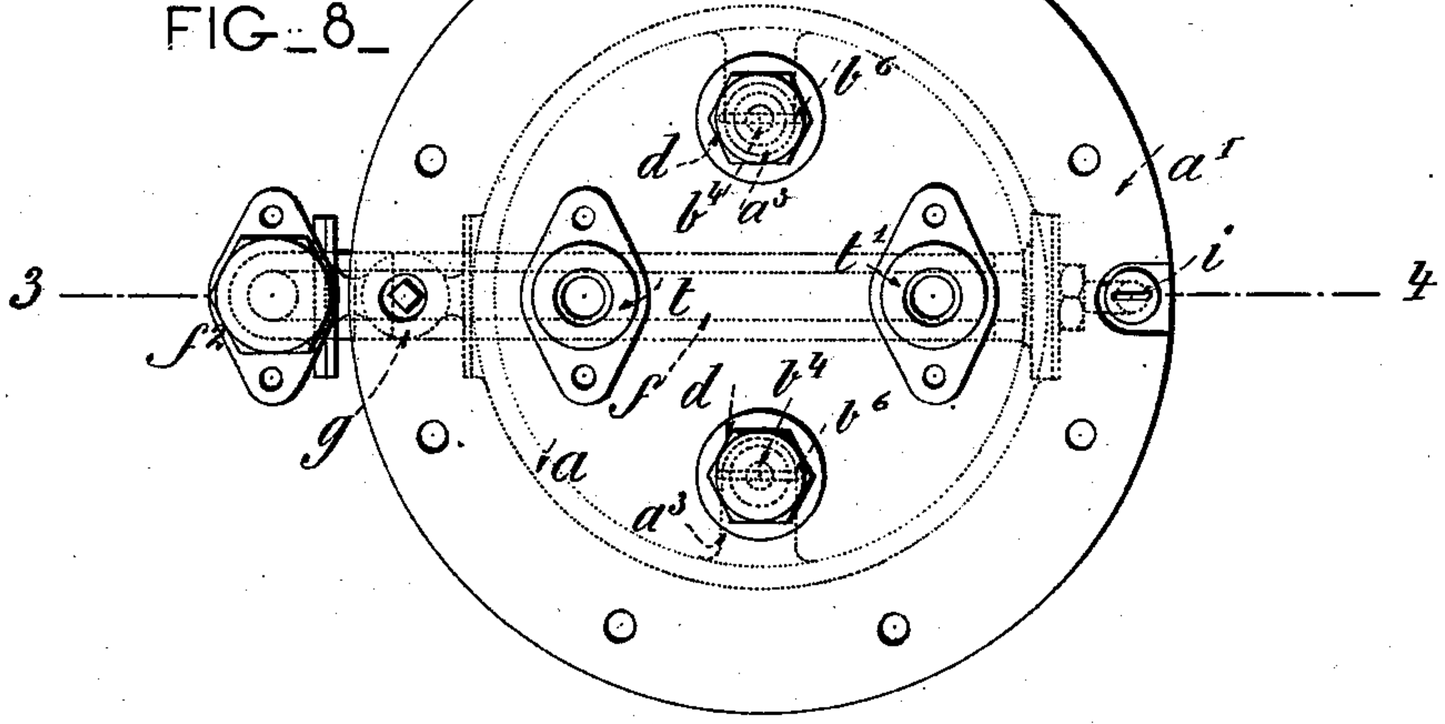


FIG. 8.



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UNITED STATES PATENT OFFICE.

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MIXING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 547,725, dated October 8, 1895.

Application filed March 14, 1895. Serial No. 541,695. (No model.) Patented in France July 17, 1894, No. 240,117.

To all whom it may concern:

Be it known that we, MARIE JOSEPH EMILE LAURANS, EUGENÈ JEAN BAPTISTE PAUL E. JODELAY, and JULES ANDRÉ TOURNEL, citizens of the Republic of France, and residents of Paris, France, have invented a new and Improved Mixing Apparatus, (for which we have obtained Letters Patent in France, dated July 17, 1894, No. 240,117,) of which the following is a full, clear, and exact description.

Our invention relates to apparatus for mixing liquids, and particularly for mixing water with an antiseptic liquid or solution with a view to sprinkling the disinfecting mixture thus obtained on streets, sidewalks, benches, public markets, yards, halls, theaters, sewers, cars, façades of buildings, &c.

Other purposes for which the invention may be used will be stated hereinafter.

The object of our invention is to obtain a mixture of uniform proportions and to utilize the pressure of the water for producing the mixture or spraying the disinfectant.

To these ends our invention consists of certain features of construction and combinations of parts, that will be described presently and pointed out in the appended claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar letters of reference indicate corresponding parts in all the views.

Figure 1 is an elevation of our improved mixing apparatus with parts in section on line 1 2 of Fig. 2. Fig. 2 is a plan thereof. Figs. 3 and 4 are a vertical section and a plan, respectively, of a nozzle and the tube connected therewith. Fig. 5 is partly an elevation and partly a vertical section of a spraying-nozzle. Fig. 6 is a central vertical section of a modification. Figs. 7 and 8 are respectively a sectional elevation and a plan of another modification, the section being taken on the line 3 4 of Fig. 8; and Fig. 9 is a sectional view showing the several parts of the piston represented in Figs. 1 and 2.

The apparatus comprises a receptacle a, which may be of cylindrical or any other suitable form, and is closed at its ends by heads a' a^2. In the cylinder is located a pump-piston b, having packing-rings b', preferably made of leather and having their ends turned over, the said packing-rings being held between two plates b^2, bolted together. The piston b may be guided within the cylinder in various manners. It may be provided with a piston-rod passing through a suitable stuffing-box at the head a', or, as illustrated in Fig. 1, the piston is provided with a spider c, secured centrally to the piston by means of the bolt b^3, the arms of the spider being provided at their outer ends with antifriction rollers or wheels c', which engage the interior wall of the cylinder.

The upper head of the cylinder a is provided with suitable apertures which permit of the introduction of a hook or other tool for the purpose of lifting the piston b to its upper position by engaging the said hook with the arms of the spider c. The upper head a' is provided with two nipples t t', adapted to receive feed and delivery pipes, respectively, for the water. At its lower end the cylinder a is provided with a connecting-pipe f, with which is connected a pipe f', the upper end whereof may be closed by means of a plug screwed on the elbow f^2. The tube f' is provided near its upper end with a cock g. This cock controls the communication from the pipe f' to the upper part of the cylinder a, which communication is made through the medium of the tube h, having at its inner end a nozzle h', the said nozzle being located beneath the inlet of the feed-nipple t. The interior of the cylinder a communicates with the atmosphere through the medium of a tube i, whose upper end may be closed by means of a screw-stopper i'. Drain-cocks k and k' are provided at the bottom of the cylinder a and the pipe f, respectively.

The apparatus is supported by means of legs a^5, or the lower head a^2 may rest directly on the ground. The nozzle h' has a central opening and is made square in cross-section, as will be seen best in Fig. 4, so that the same key or wrench may be used for turning the said nozzle and the plugs of the valves of the cocks g and k'. The elbow f^2 is adapted to communicate with the flexible delivery-pipe or hose m, having at its end a discharge-nozzle n. This nozzle, in order to produce a fine spray, is provided at its discharge end with

a helical groove n' or a plurality of such grooves, and the nozzle also has a cap n^2, having a discharge-opening n^3 and surrounding the groove n'. It will be observed that the nozzle h' is removably secured to the tube h, so that it may be readily replaced with a nozzle having a discharge-opening of a different size.

The apparatus when used for mixing water with an antiseptic or other liquid is operated as follows: The plugs at f^2 and i' are removed and the piston b is drawn up to its highest position. Then the cock g is closed and the antiseptic liquid or solution to be admixed with the water is introduced through the tube f'. The air escapes through the tube i. Thereupon the plugs at f^2 and i' are screwed upon the tubes f' and i. The cock g is opened and water is turned on, so as to enter the upper compartment of the cylinder a through the nipple t and leave the said compartment through the nipple t'. As the water is admitted under pressure it will cause the piston b to travel toward the connecting-pipe f, and the disinfectant liquid contained below the piston will be forced out through the said pipe f into the pipe f', and from thence through the cock g and the pipe h and nozzle h' to the upper compartment of the cylinder.

It will be readily understood that the amount of disinfecting liquid passing into the upper compartment of the cylinder will depend on the pressure of the liquid entering through the feed-nipple t. The water and disinfecting liquid will therefore be mixed in uniform proportion, and if the pressure of the water varies the amount of disinfecting liquid added to the upper compartment will be automatically varied in a corresponding manner. The mixture escapes through the delivery-nipple t', and it will be noticed that the hose m may be connected to the said delivery-nipple, and the liquid issuing through the spiral groove n' of the spraying-nozzle n will be atomized by the centrifugal action, and thus issue from the opening n^3 in a finely-divided state. The proportion in which the disinfectant is admixed with the water may be regulated by employing different nozzles h'.

When it is desired to produce a spray of an antiseptic liquid or solution without mixing this liquid with the water employed for operating the piston b, the apparatus is manipulated in the following manner: When the piston is at the upper end of the cylinder and the lower chamber of the cylinder is filled with the liquid to be sprinkled, the hose m being connected to the elbow f^2, the cock g is closed and water is circulated through the upper compartment of the cylinder a, entering the same at t and discharging at t'. The piston, partly by its own weight and partly owing to the pressure of the water, slides downward in the cylinder and forces the liquid contained in the lower compartment thereof through the pipes f and f', the elbow f^2, and the hose m to the spraying-nozzle n.

In the modification illustrated by Fig. 6 the spider c has been omitted and the piston b has been provided with flanges of greater length, so as to properly guide it within the cylinder. Eyes b^5 are secured to the upper face of the piston to enable it to be readily raised by means of hooks or like tools.

In the modification illustrated by Figs. 7 and 8 the apparatus is provided with bolts b^4, serving to connect the plates b^2 of the piston and guided in sockets a^3 in the cylinder. Said bolts are provided above the sockets a^3 with eyes or rings b^6, and in the upper head a' of the cylinder are located openings a^4, which are adapted to be closed by plugs d, the said openings serving for the introduction of tools to be used in raising the piston. The tube h is of slightly-different construction from that shown in Fig. 1, being provided with a nozzle h^2 and a screw-cap h^3 thereon, which permits of regulating the amount of disinfectant issuing from the said nozzle.

The apparatus as set forth above can be used for sprinkling streets, sidewalks, buildings, and so on, and in addition thereto may be used for a great many other purposes—such, for instance, as mixing fertilizing liquids for hot-houses, trees, and plants; for producing mixtures for destroying insects, such as liquids containing nicotine; for mixtures to be used for shower-baths, also inhaling and injecting purposes; for liquids to be used for washing, calcimining, and cleaning the walls of houses and the like; for mixtures for the purpose of disinfecting filtering-reservoirs, materials proceeding from buildings pulled down, hospital-rooms, &c.; for the mixture of liquids for cleaning juice in the manufacture of sugar for producing fermentation in distilling processes and in other cases where homogeneousness of the liquid is of importance; for producing fire-extinguishing mixtures; the apparatus, therefore, can be used as a fire-extinguisher; for mixing water with antiseptic substances for flushing bowls, &c.; for atomizing liquids by hydraulic pressure; and for cleaning water by admixing therewith alum in the usual manner, with the difference, however, that by the use of the apparatus a uniform proportion of alum is mixed with the water.

We do not limit ourselves to the particular constructions shown in the drawings, as many modifications might be devised without departing from the nature of our invention. The nipples $t\,t'$, instead of being secured to the head a', may be placed in the cylinder proper, or one of them may be located on the cylinder and the other on the head a'. The cylinder a may be arranged in any position, either horizontal, vertical, or inclined. The connecting-pipes $f\,f'$ may be constructed differently from the arrangement shown, or a

passage-way may be provided in the walls of the cylinder.

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

1. An apparatus for the purposes described, comprising a cylinder adapted to contain the disinfectant or other solution or liquid, and provided with an outlet for the said liquid, a piston having sliding movement in the said cylinder to force the said liquid out therefrom, a water inlet, and a water outlet both located in the cylinder on the opposite side of the piston to the outlet for the disinfectant, substantially as described.

2. An apparatus for mixing liquids, comprising a cylinder, a piston dividing the cylinder into two compartments and fitted to slide therein, one of the compartments having an outlet and a connection therefrom to the other compartment, so that the liquid from one compartment will be discharged into the other compartment by the movement of the piston, a water inlet located in the said second compartment and a water outlet leading from the second compartment, substantially as described.

3. The combination of the cylinder, the pipe connected to one end of the cylinder and provided with a nozzle adapted to discharge into the other end thereof, the piston having sliding movement in the cylinder and a port or nipple arranged in the cylinder opposite the said nozzle, substantially as described.

4. The combination of the cylinder, the pipe connected to one end of the cylinder and provided with a nozzle adapted to discharge into the other end thereof, said nozzle having an adjustable outlet, a port or nipple arranged in the cylinder opposite the said nozzle and the piston having sliding movement in the cylinder, substantially as described.

5. The combination of the cylinder having a water inlet and a water outlet at one end, the piston in the cylinder, the pipe connecting the two ends of the cylinder, the delivery pipe connected to the first-named pipe, and the shut-off means in the delivery pipe and in the connecting pipe between the delivery pipe and that end of the cylinder which is provided with the water inlet, whereby the liquid from one end of the cylinder may be discharged either into the other end thereof or into the delivery pipe, substantially as described.

6. The combination of the cylinder having a water inlet, a water outlet, an air outlet, and a liquid outlet at the opposite end to the water inlet, a pipe connecting the liquid outlet to the opposite end of the cylinder and a slidable piston in the cylinder, substantially as described.

In witness whereof we have hereunto set our hands in presence of two witnesses.

MARIE JOSEPH EMILE LAURANS.
EUGENÈ JEAN BAPTISTE PAUL E. JODELAY.
JULES ANDRÉ TOURNEL.

Witnesses:
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EUGENÈ WATTIER.