(No Model.) 2 Sheets—Sheet 1.

J. E. BOYLE.

PERIODICAL FLUSHING TANK.

No. 354,624. Patented Dec. 21, 1886.

Fig. 1.

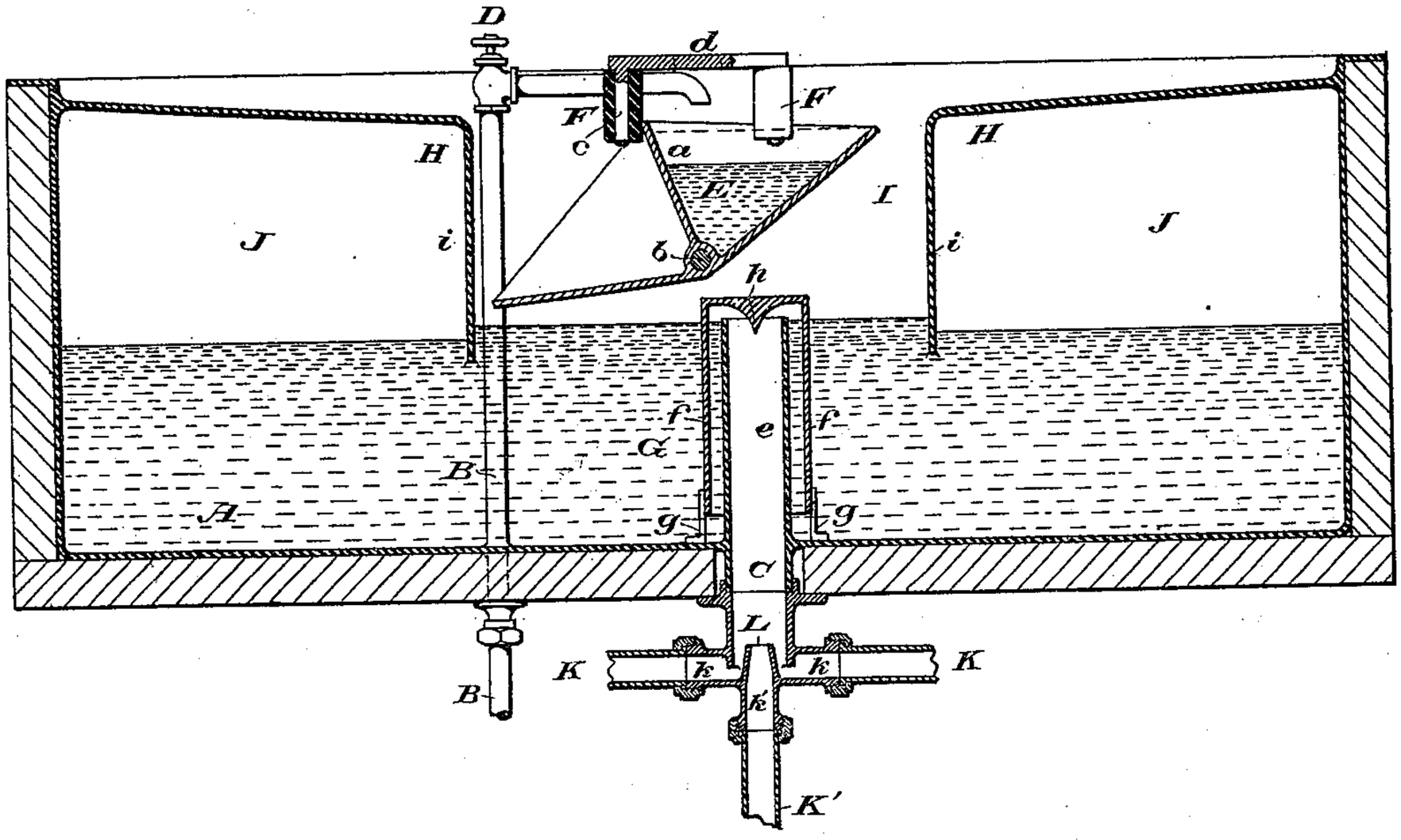


Fig. 2.

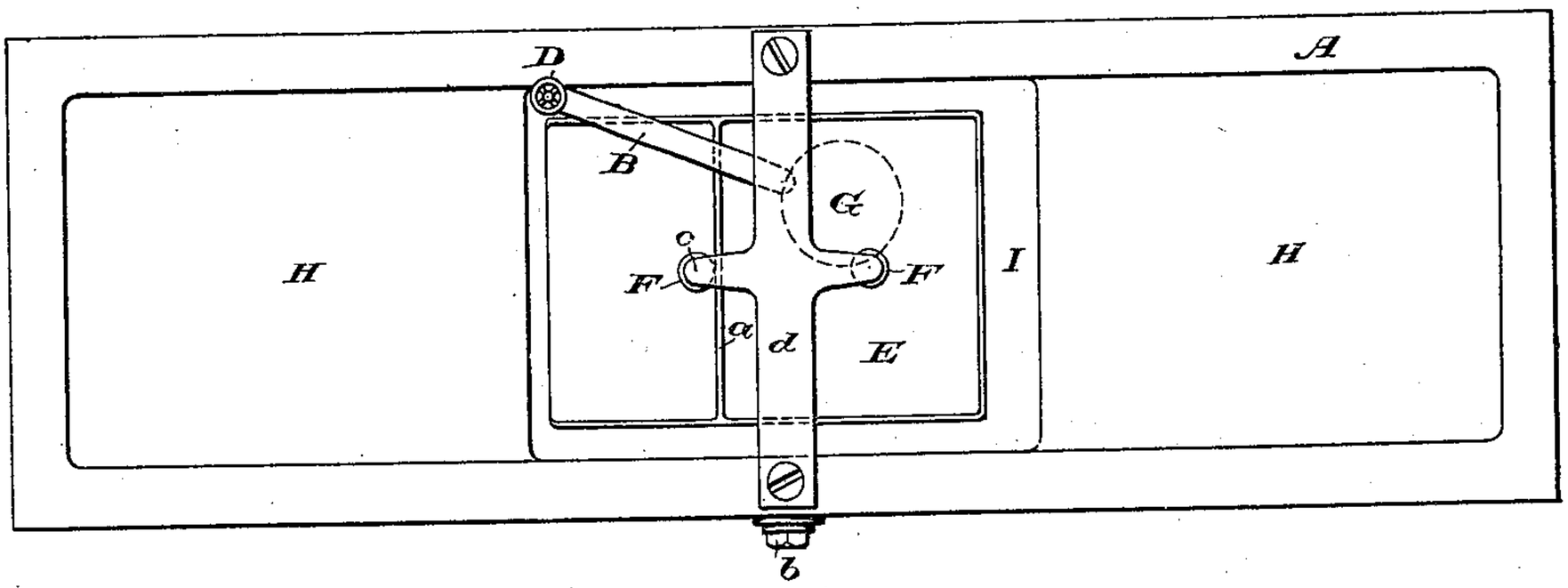
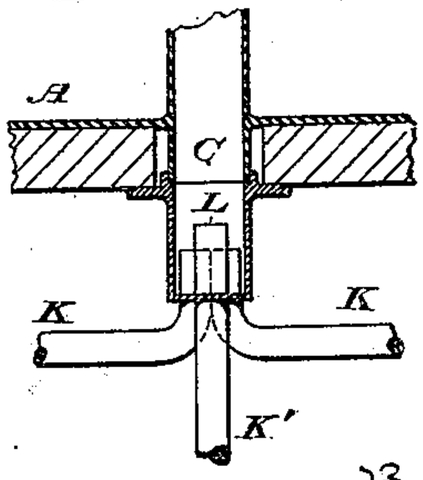


Fig. 3.



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(No Model.) 2 Sheets—Sheet 2.

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Fig. 4.

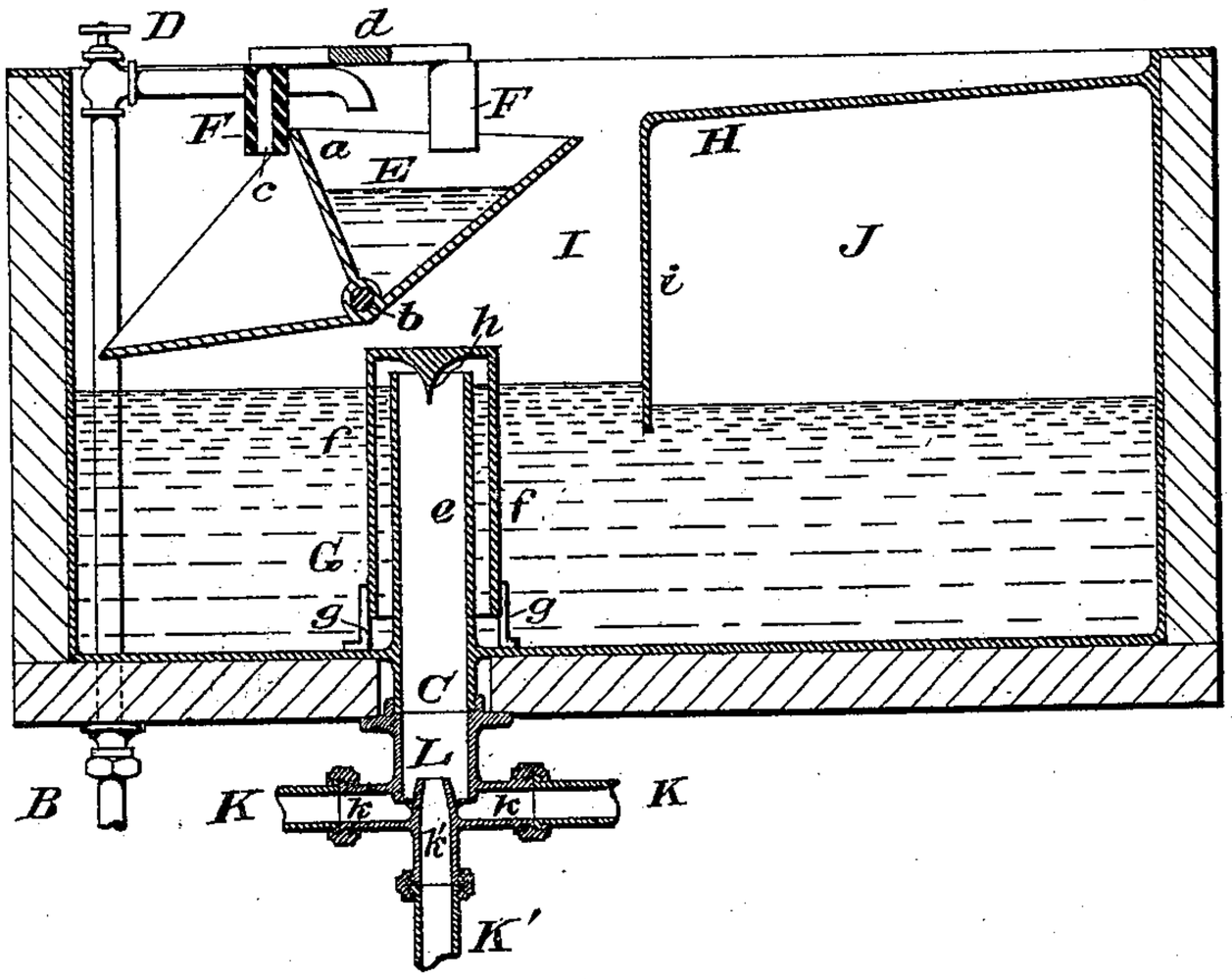
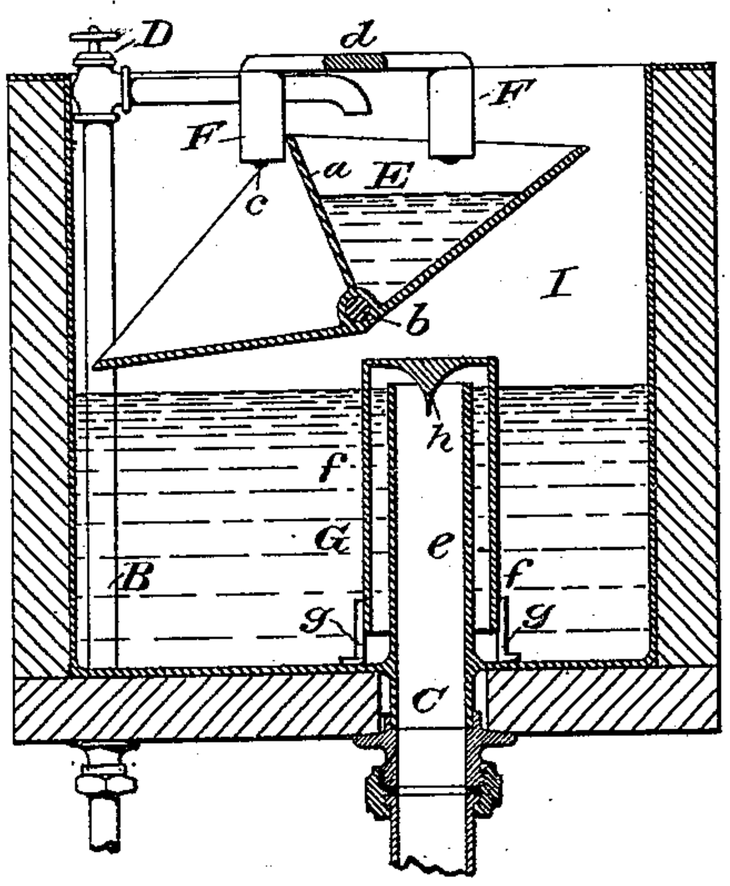


Fig. 5.



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UNITED STATES PATENT OFFICE.

JAMES E. BOYLE, OF EAST NEW YORK, N. Y.

PERIODICAL-FLUSHING TANK.

SPECIFICATION forming part of Letters Patent No. 354,624, dated December 21, 1886.

Application filed May 22, 1886. Serial No. 202,940. (No model.)

To all whom it may concern:

Be it known that I, JAMES E. BOYLE, a citizen of the United States, residing at East New York, in the county of Kings and State of New York, have invented certain new and useful Improvements in Periodical-Flushing Tanks, of which the following is a specification.

My invention relates to tanks of that class which give a periodical flush, discharging a quantity of water at intervals of one minute or five minutes, or any other predetermined lapse of time. Such tanks are generally used for flushing urinals, for which purpose my invention is most especially designed; but it is equally adapted for flushing water-closets and for other purposes where an intermittent wash is desired.

In the accompanying drawings, Figure 1 is a vertical longitudinal section of my improved tank. Fig. 2 is a plan thereof. Fig. 3 is a fragmentary section showing a modified construction. Figs. 4 and 5 are longitudinal sections corresponding to Fig. 1, and showing modifications.

Referring to the drawings, A designates the tank, which is here shown as constructed of wood lined with sheet lead or copper. B is the supply-pipe, and C the outlet.

The pipe B is provided with a faucet or cock, D, by which to control the flow of water to the tank, and consequently to determine the frequency of the flushing. The discharge end or spout of the pipe B is arranged over a tilting bucket, E, constructed with two compartments. While one compartment is filling the other is empty, and when the first is nearly full the bucket is overbalanced and tilts to the opposite side, dumping the full compartment and bringing the empty one under the spout. Thus the bucket vibrates alternately from side to side at more or less frequent intervals, according as the flow is more or less rapid. The bucket is pivoted on a rod or bolt, *b*, the head of which is seen in Fig. 2, and which may be unscrewed and removed to take out the bucket. Two buffers, F F, are arranged to limit the movement of the bucket, being constructed by slipping rubber tubes over pins *c c*, pendent from a cross-bar, *d*. As the bucket dumps its middle partition, *a*, strikes one of these buffers and is noiselessly stopped.

A siphon, G, is provided to empty the tank. This is constructed preferably, as shown, with an upright tube, *e*, projecting up from the outlet C to the highest water-level, and an inverted cup or bell, *f*, fixed in place over it, being mounted on legs *g g*. The outflowing water passes up through the annular space between the cup and the tube and down the tube to the outlet. At the closed top of the cup *f*, I form a cone or projection, *h*, which partly enters the upper end of the tube *e*. The effect of this device is to displace the air that would otherwise remain there, so that the water flowing into the top of the tube may carry down with it all the air from the upper portion of the bell, and thus facilitate the starting of the siphon.

The tank A is of considerable length, and is fitted with partitions H H, extending from the opposite ends at or near the top toward the middle, and then turning down at *i i*, and terminating at a level a short distance below the upper end of the tube *e*. The portions *i i* of these partitions are so close together as to leave only sufficient room for the movement of the bucket E. As the water enters and is intermittently dumped from the bucket, it fills the tank A from end to end until its level rises to the bottom edges of the vertical portions *i i* of the partitions H H. The air in each of the spaces J J inclosed by these partitions then becomes confined, and acts as a cushion to resist the further rise of the water-level under it. As more water enters its level rises higher in the space or chamber I between the two walls *i i* than in the chambers J J, as shown, owing to its being compelled to compress the air in J J. Each bucketful of water that is dumped into the tank consequently raises the level in the chamber I proportionally higher than it would have raised the level in an open tank. The proportions should be such that when the water-level reaches nearly to the top of the tube *e*, as shown, so that the water is on the point of overflowing, the next bucketful that is dumped will raise the level about half an inch, or sufficiently to cause a full outflow through the siphon. The siphon is thus started rapidly, and its thorough action is insured. It rapidly draws the water from the tank until the vacuum is broken by the lowering of the water-level to the bottom of the cup *f*.

The effect of the partitions H H is to con-

tract the upper part of the tank, so that when the water rises above the partitions its surface area is reduced considerably. If it be reduced to one-third its original area, the water dumped from the bucket will raise the level three times as high at each dumping; hence, to raise the level a given amount—say one-half inch—the bucket need have only one-third the capacity that would otherwise be necessary. The bucket is consequently proportioned to the area of the space I, irrespective of the flushing capacity of the tank. The quantity of water discharged at each flush is determined by the total capacity of the tank, and is varied by making the tank longer or shorter without altering the proportions of the space I or the bucket or siphon. The space or chamber I may have sufficient capacity, if the walls *i i* were carried down to the bottom, to flush one urinal or one closet. In such case, if only one urinal were to be flushed, the tank would be shortened to this capacity, as clearly shown in Fig. 5. The partitions H H are not necessary in this construction, that feature of my invention being here omitted.

If two urinals are to be supplied, the tank will be made of double length and one end will be provided with the partition H, as shown in Fig. 4. If three are to be flushed, the tank will be made of triple length and two partitions H H will be provided, as shown in Fig. 1; or the one partition H in Fig. 4 may be made of greater length to cover a double area. The effect in either case is the same. If a capacity of more than three flushes is desired, the tank may be elongated corresponding at either end, or otherwise increased in capacity.

The tank shown in Figs. 1 and 2 is designed to flush three urinals and to be placed directly over the middle one of the three. From the outlet C three delivery-pipes, K K K′, lead to the urinal-bowls. The pipes K K lead to each side horizontally, and the pipe K′ leads directly downward. These are all joined or coupled to three branches, *k k k′*, projecting from a tube, L, which is fastened to the bottom of the tank and forms a continuation of the tube *e*. To secure an equal division of the water between the three pipes and prevent the middle pipe from drawing or siphoning the water from the others, I extend the middle branch, *k′*, up into the tube L above the outlet therefrom to the branches *k k*, as shown in Fig. 1, thereby forming a trap or seal of sufficient dip. This construction effects an equal distribution of the water to the three pipes. When only two pipes are used, one of the branches may be blind-capped, or an ordinary T-joint may be substituted for the three-armed connection shown. When only one pipe is used, the connection is made as shown in Fig. 5. Fig. 3 shows a modification of the connection for three pipes, the middle pipe projecting above the others.

I claim as my invention—

1. The combination of tank A, partition H therein, inclosing air-chamber J and serving to reduce the effective area of the upper part of the tank, siphon G, for emptying said tank, with its bend projecting up into said reduced portion, a dumping-bucket, E, arranged to discharge into said reduced portion, and an inlet-spout discharging into said bucket, substantially as set forth.

2. The combination of a tank, A, a siphon, G, a dumping-bucket, E, constructed with two compartments divided by a partition, *a*, a cross-bar, *d*, and buffers F F, depending therefrom, substantially as set forth.

3. The combination of a tank, A, a siphon, G, and a tube, L, leading from its outlet, and having one or more lateral branches, *k*, and a downward branch, *k′*, the latter formed to enter the tube *l* and project therein above the outlets to the lateral branches, thereby forming a seal to prevent the siphoning of water from the lateral branches, substantially as set forth.

In witness whereof I have hereunto signed my name in the presence of two subscribing witnesses.

JAMES E. BOYLE.

Witnesses:

ARTHUR C. FRASER,

GEORGE H. FRASER.