

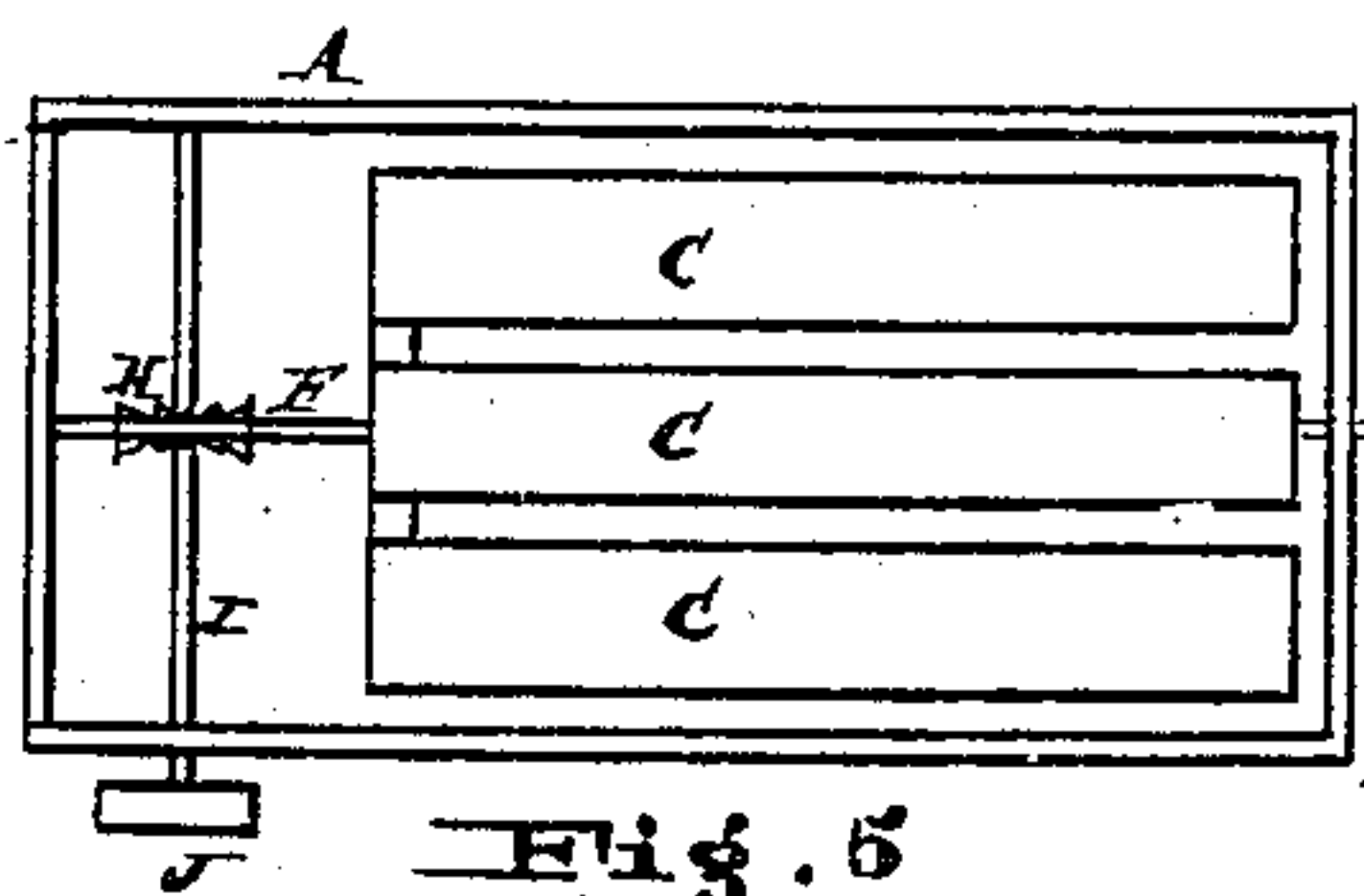
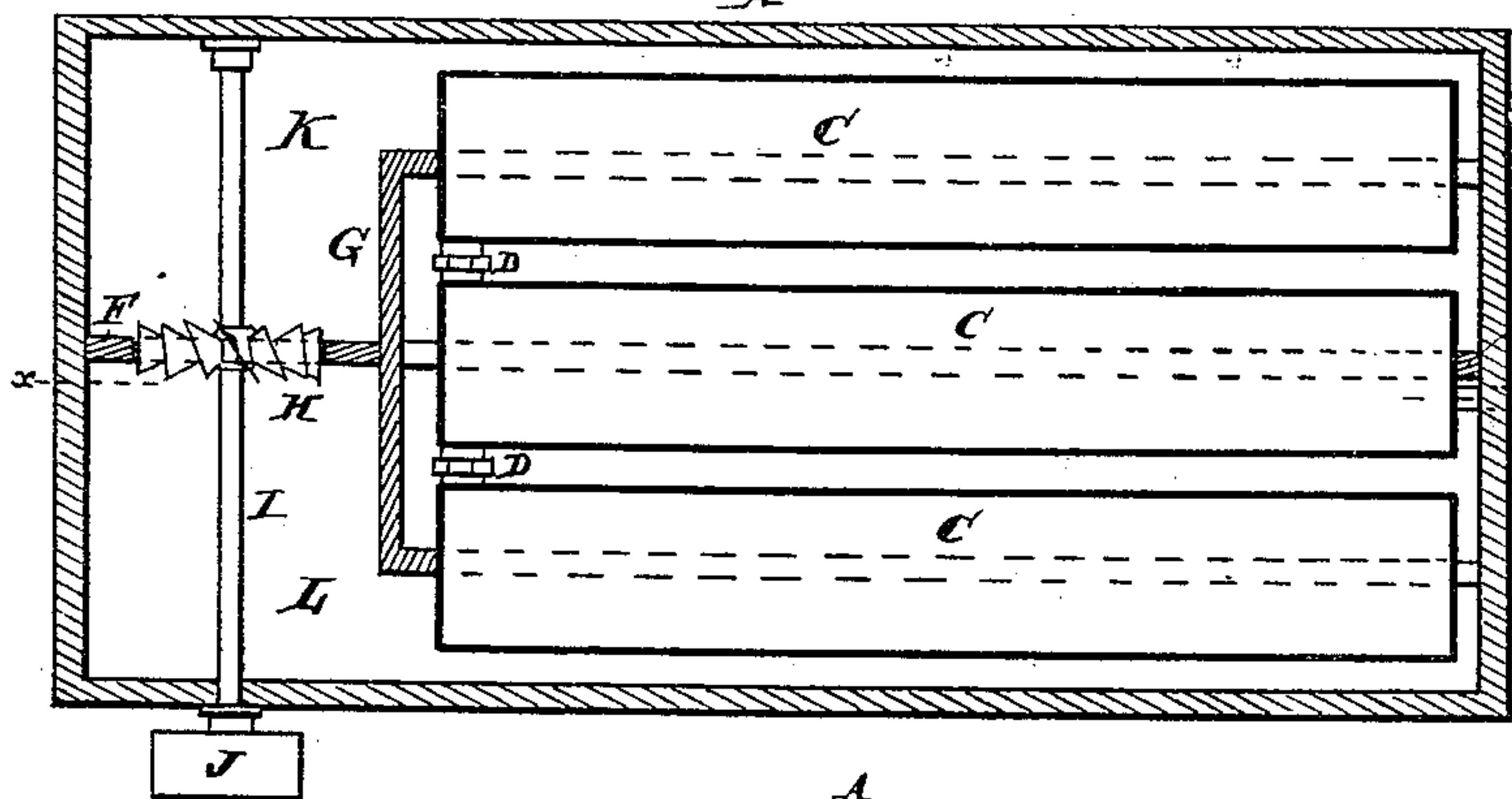
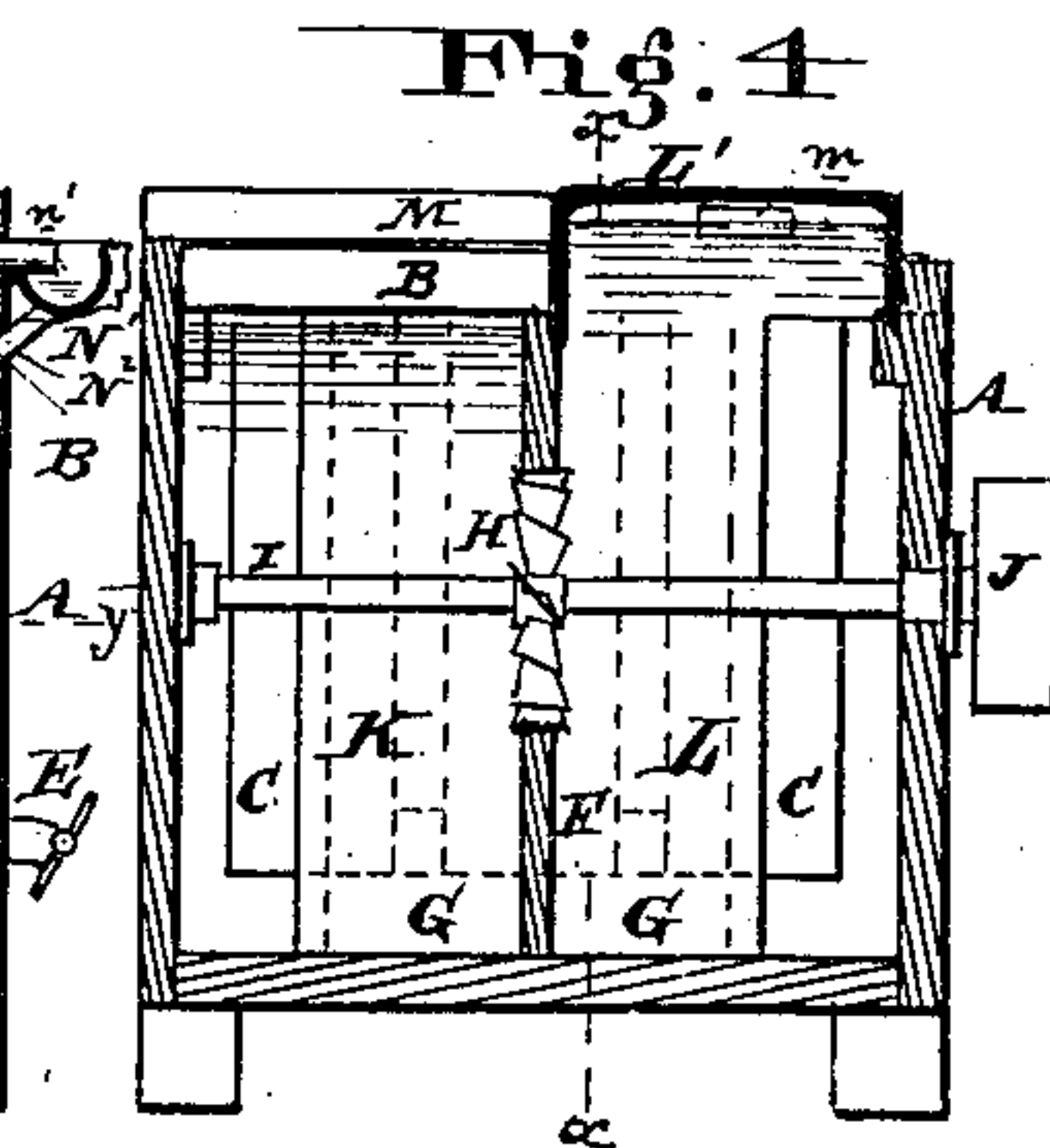
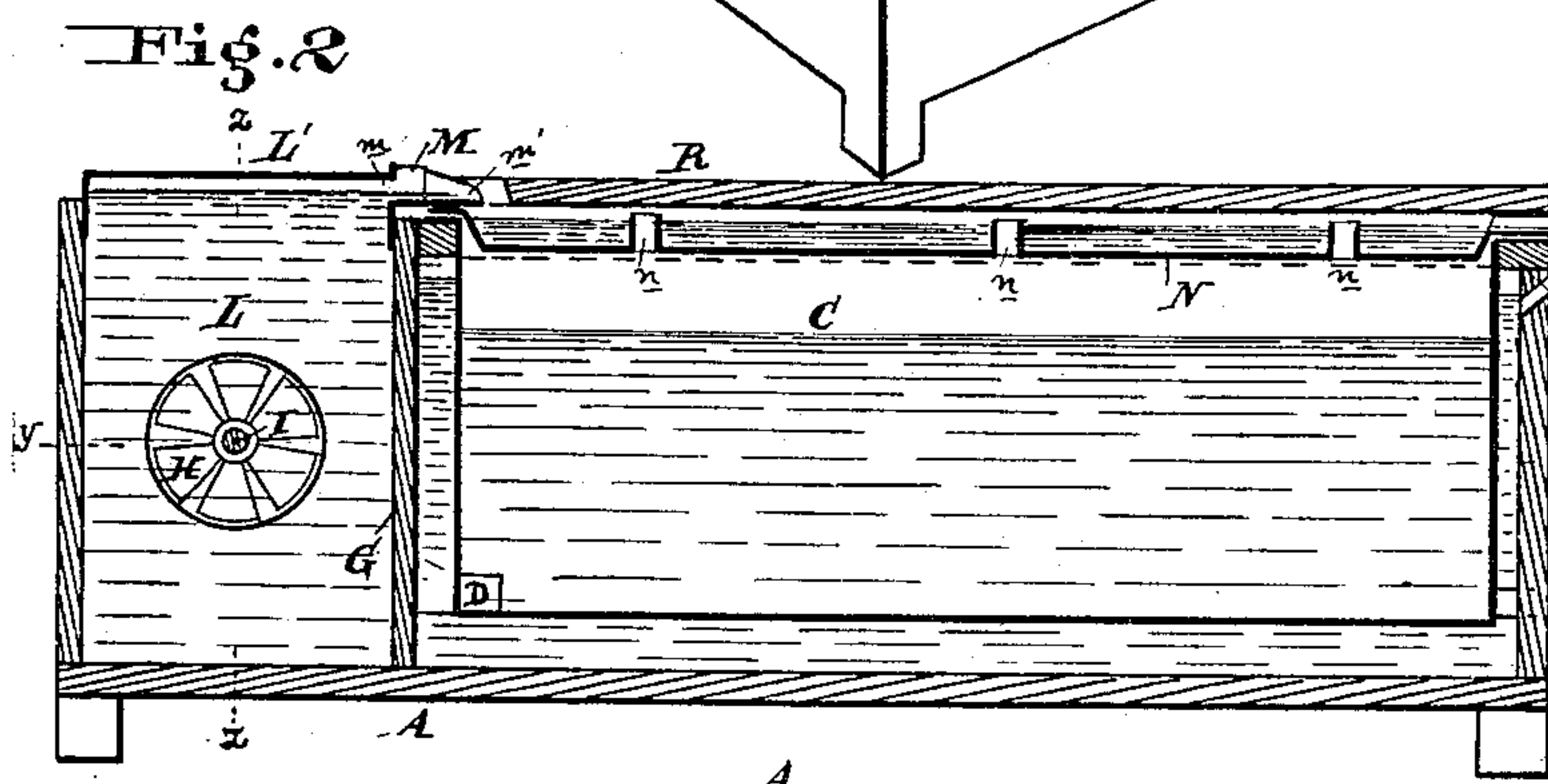
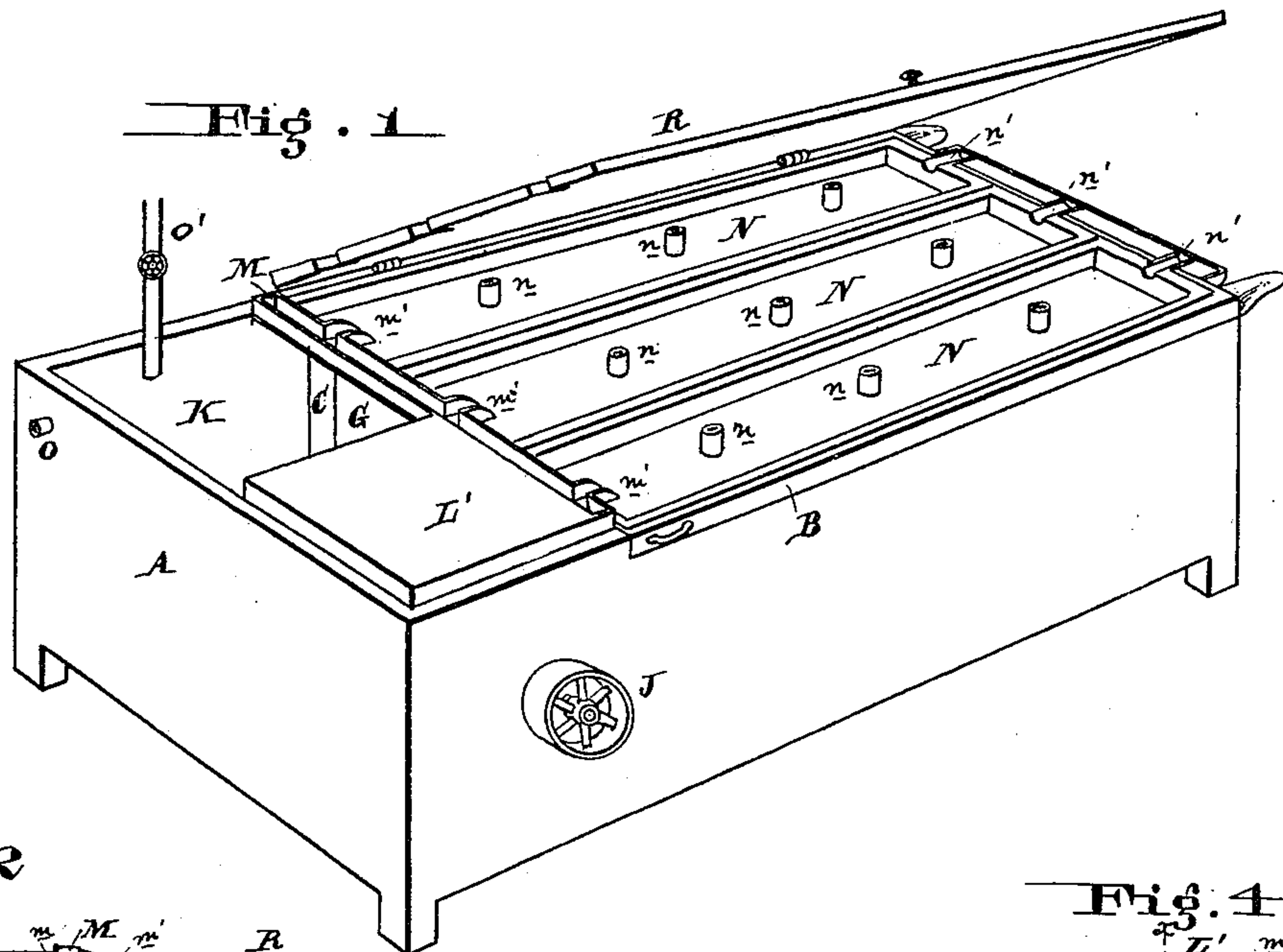
(No Model.)

M. O. ROBERTS.

MILK COOLER.

No. 273,764.

Patented Mar. 13, 1883.



Attest
L. J. Matos.
Notary

Inventor

Milton O. Roberts

By his atty.

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UNITED STATES PATENT OFFICE.

MILTON O. ROBERTS, OF WORCESTER, PENNSYLVANIA.

MILK-COOLER.

SPECIFICATION forming part of Letters Patent No. 273,764, dated March 13, 1883.

Application filed November 15, 1882. (No model.)

To all whom it may concern:

Be it known that I, MILTON O. ROBERTS, of Worcester, in the county of Montgomery and State of Pennsylvania, have invented an Improvement in Milk-Coolers, of which the following is a specification.

My invention has reference to milk-coolers; and it consists in certain improvements in means to cause a circulation of the cooling-water, and in the construction of the milk-cooler as an entirety, all of which is fully set forth in the following specification and shown in the accompanying drawings, which form part thereof.

In the drawings, Figure 1 is a perspective view of my improved milk-cooler. Fig. 2 is a sectional elevation of same on line *x x*. Fig. 3 is a sectional plan of same on line *y y*. Fig. 4 is a cross-section of same on line *z z*; and Fig. 5 is a plan view, showing a modified arrangement of the means to guide the circulation of the water.

A is the water-tank. B is a frame supported upon the upper rim or edge of the water tank, and carries the tanks or milk-vats C C C, of which I prefer three, the said tanks or vats being connected together at the bottoms by tubular connections D D, to allow the milk and cream to circulate from one vat to another. These vats hang clear of the bottom and sides and leave spaces between themselves for the circulation of water. Divisions G G' cause the water to circulate in a sinuous curve, passing along one side of one of the outer vats, then back between the other side and the adjacent vat, and so on, the cold water starting from a chamber, L, and being received in a chamber, K, these chambers L and K being separated from each other by a division, F, in which is arranged a rotating feed-wheel, arranged, like a screw-propeller, with many blades, the said feed-wheel H being rotated by a shaft, I, and pulley J, or other equivalent means. The compartment or chamber K may act as the ice-box. Fresh water may be admitted by a pipe, O', and the waste may run off by a waste-pipe, O. The chamber L is closed by a case or cover, L', having an aperture, *m*, on one side and close to the top, which opens into a trough, M, provided with spouts *m'*, arranged over the vats C, and adapted

to pass feed-water into pans N, supported above said vats and forming cooling-covers to same. The water in compartment L is caused to rise above the level of that in compartment K by creating a great suction through the agency of the wheel H, the water being more rapidly drawn in than it can escape through the passages around the tank. The pans N are preferably provided with tubular vents *n*, to allow escape of the odors and vapors arising from the milk-vat. The cold water runs off from these pans, by spouts *n'*, into a trough, N', and is conducted back into the tank A by pipe N². I do not confine myself to the exact construction of these troughs, as the water may be conveyed back to the tank by a pipe or aperture direct from the pans, and water may be fed into the pans by pipes direct from chamber K or from main O', if so desired.

R is a wooden cover to cover the pans and vats, and is preferably hinged to frame B.

E is the tap to draw off the milk and cream.

In place of causing the cold water to pass first on one side of the milk-vat and then on the other, coming into contact with only one side at a time, I may dispense with the divisions G G' and bring the division F up against the middle vat, C, as shown in Fig. 5, and then the circulation will be caused to take place in such a manner as to pass down both sides of one of the outer vats and one side of the middle vat, and then return in the opposite direction, but in contact with the remaining side of the middle vat and other outer vat. This is clearly shown.

The divisions G and G' (and F in the case of Fig. 5) may extend along the bottom of the tank to insure more perfect circulation, and also act as a support for the vats C; or, if desired, the bottom of the milk-vats may be provided with ribs to perform the same function.

The circulating propeller-wheel is shown in another pending application of mine, but is claimed in another construction of milk-cooler.

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

1. In a milk-cooler, the combination of a water-tank, a milk-vat, a rotating circulating-wheel, and means for directing the water-currents, so that the water shall be continually

changing its position, and thereby cool the milk in the milk-vat, substantially as and for the purpose specified.

2. In a milk-cooler, the combination of a
5 water-tank, a milk-vat, an ice box or compartment, a rotating water-circulating wheel, and means for directing the circulating water around the outer surface of the milk-vat and cause it to pass through the ice-box before being again acted on by the circulating-wheel,
o substantially as and for the purpose specified.

3. In a milk-cooler, the combination of a water-tank provided at one end with two chambers or compartments, one of which is open on
5 the top and the other of which is closed, means to cause the cold water to be drawn from the open chamber into the closed chamber, one or more milk-vats, one or more cooling-pans arranged over said milk-vats, means to cause the
o water from the closed chamber to flow into said pans, and means to cause the water from said closed chamber to circulate around said milk-vats and back into the ice-box or open chamber, substantially as and for the purpose specified.

5 4. In a milk-cooler, the combination of water-tank A, milk-pans C, connected by tubes D,

chambers K and L, divisions F, G, and G', circulating-wheel H, shaft I, and pulley J, or its equivalent, substantially as and for the purpose specified.

5. In a milk-cooler, the combination of water-tank A, milk-pans C, connected together by tubes D, chamber K, closed chamber L, partition F, circulating-wheel H, shaft I, pans N, having vent-tubes *n*, means to conduct water
35 from chamber L to said pans, and means to conduct the waste-water back into the tank from said pans, substantially as and for the purpose specified.

6. The combination of water-tank A, milk-vats C, chambers K and L, divisions F, G, and G', circulating-wheel H, shaft I, pans N, having vents *n*, means to conduct water to and from pans, and cover R, substantially as and
45 for the purpose specified.

In testimony of which invention I hereunto set my hand.

MILTON O. ROBERTS.

Witnesses:

D. MORGAN CASSELBURY,
F. BARBUR.