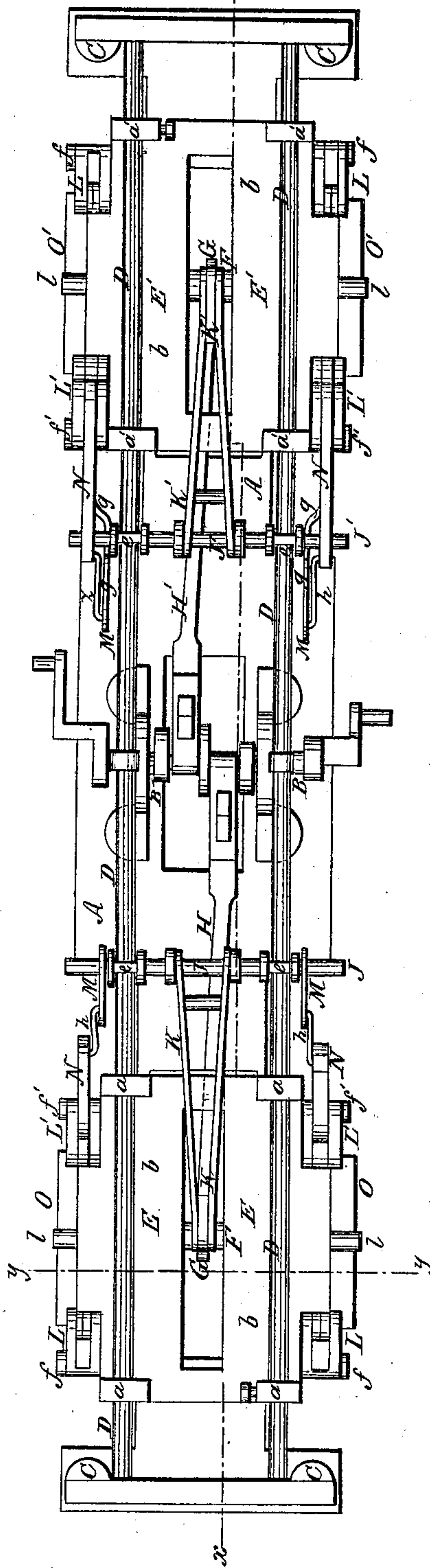


*P. Roberts Sheet 1, 2, Sheets.*  
*Crank Paddle.*

*N<sup>o</sup> 89,435.*

*Patented Apr. 27, 1869.*

*Fig. 1.*



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*P. Roberts. Sheet 2, 2. Sheets.*  
*Crank Paddle.*

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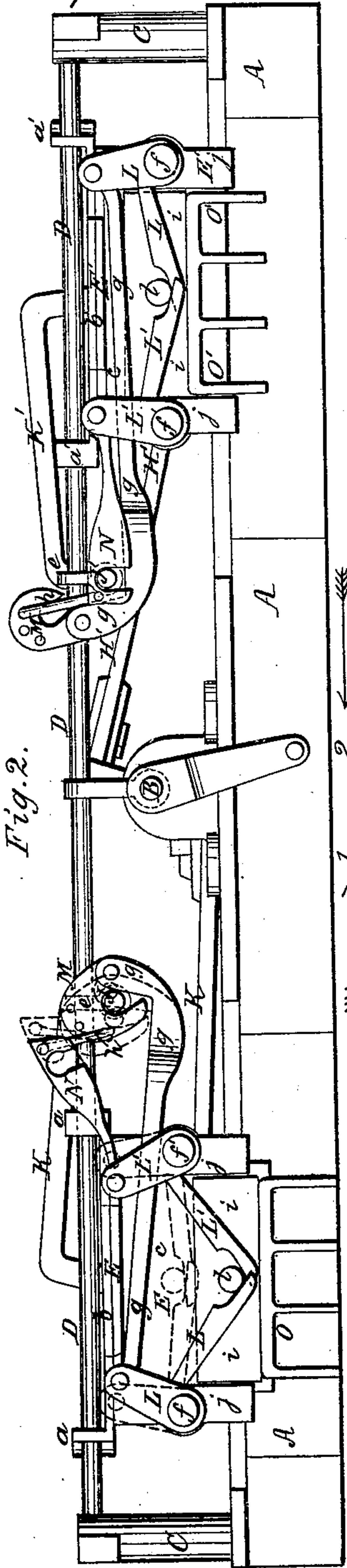
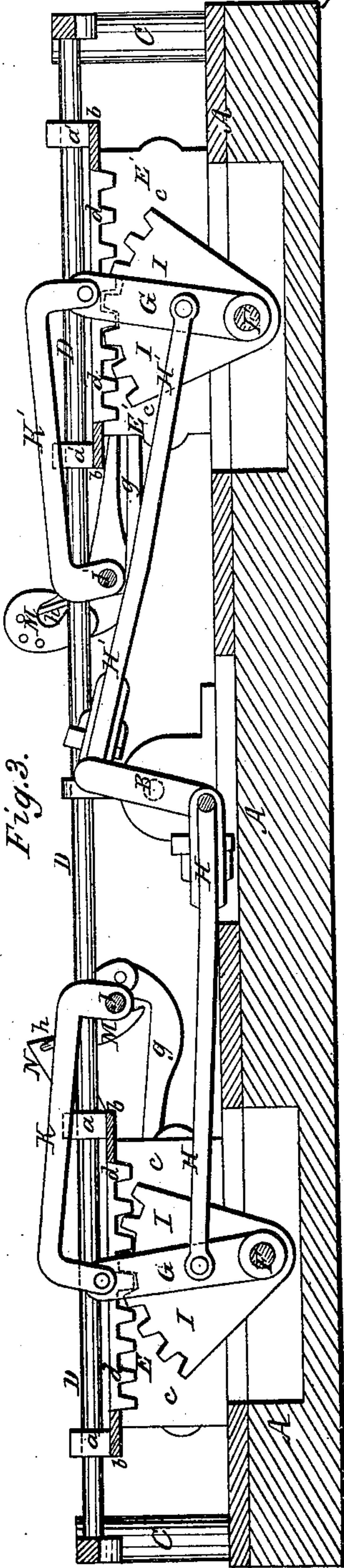


Fig. 2.



*Fig. 3.*

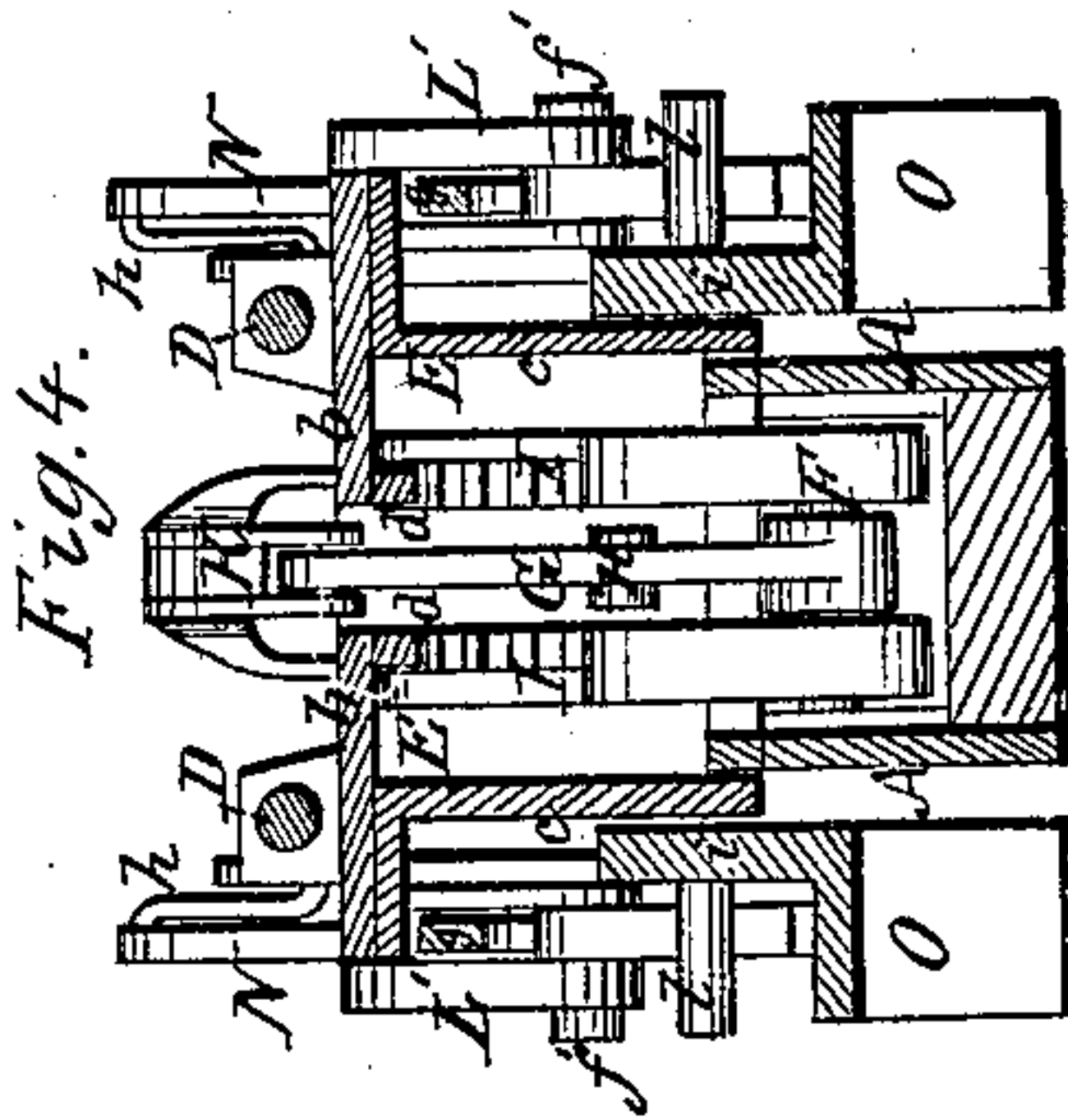


Fig. 4.

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# United States Patent Office.

PETER ROBERT, OF NEW YORK, N. Y.

Letters Patent No. 89,435, dated April 27, 1869.

## IMPROVEMENT IN PROPELLING-APPARATUS.

The Schedule referred to in these Letters Patent and making part of the same.

To all whom it may concern:

Be it known that I, PETER ROBERT, of the city, county, and State of New York, have invented a new and improved Apparatus for Propelling Vehicles; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to make and use the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1, Sheet I, represents a plan or top view of my improved apparatus for propelling vehicles.

Figure 2, Sheet II, is a side elevation of the same.

Figure 3, Sheet II, is a vertical longitudinal section of the same, taken on the plane of the line *x x*, fig. 1.

Figure 4, Sheet II, is a vertical transverse section of the same, taken on the plane of the line *y y*, fig. 1.

Similar letters of reference indicate corresponding parts.

This invention relates to a new machinery for operating the propelling-apparatus of canal-boats, and other kinds of machinery, and also to a new kind of propelling-apparatus for the same.

The invention consists chiefly of a series of floats, or propelling-feet, which are raised and lowered vertically at the end of each stroke, as will be hereinafter more fully described.

The invention also consists in the use of certain machinery for propelling the carriages from which the aforesaid floats, or feet are suspended, and for elevating and lowering the said floats, or feet, at the end and commencement of each stroke.

A, in the drawing, represents the frame of a canal-boat, or other suitable vehicle.

In its middle are the bearings of a horizontal crank-shaft, B, which is revolved by suitable machinery, and which imparts motion to the propelling-apparatus of the vehicle.

On standards C C, that project from the ends of the frame A, are supported two parallel horizontal longitudinal rods, or bars, D, which are in the same horizontal plane, and which serve as guide-rods for two carriages, E and E', that are, by means of lugs *a* and *a'*, respectively suspended from the said rods, at opposite ends of the frame, as is clearly shown in figs. 1, 2, and 3. Each carriage consists of a slotted top-plate, *b*, and of two vertical side-plates, *c c*, and is, or may be, open at both ends, as in fig. 3.

A longitudinal rack, *d*, is arranged on the under side of the top-plate *b*, on one or both sides of its longitudinal slot, as indicated in figs. 3 and 4.

Near each end of the frame is secured to the same, a horizontal transverse pin, F, which is fixed in its bearings, so that it cannot turn, and which is under and clear of the carriage, as shown.

On each pin F is hung, loose, a bar, G, which is, by means of a rod, connected with the crank-shaft B.

The rod H connects the crank-shaft with the tum-

bler G, which is under the carriage E, and the rod H with the tumbler G of the carriage E'.

On each pin F is, furthermore, hung loose, a toothed segment, I, on each side of the tumbler G, said segments washing into the racks *d* of the respective carriages, as shown.

J J' are two horizontal bars, which are, by means of eyes *e e*, suspended from the guide-rods D, between the two carriages, and which are, by means of rods K K', connected respectively with the tumblers G of the two carriages.

When, by means of the revolving shaft B, the tumblers G are oscillated on their fixed pivots F, they will cause the bars J J' to slide on the guide-rods, and when the said bars find a connection with the carriages, respectively, they will cause them to be moved in a similar way.

The segments I, when arranged as shown, do not serve to impart motion to the carriages, as they are loose on their pins F, and not connected with the driving-gear. They only steady the motion of the carriages. They may, however, by cross-pins, be connected with the tumblers, so as to receive motion directly from the same, when they will also impart motion to the carriages.

If this last-mentioned connection is used, it will be necessary to let the said connecting-pin pass through a slot of the tumbler, so that the tumbler may have a short independent motion, at the end of each stroke, to give a similar short motion to its bar J J', for the purpose hereinafter set forth.

L L' are two bell-cranks, pivoted by pins *f* and *f'*, respectively, to both sides of each carriage, so that each carriage will have two pair of such levers L L', as shown in fig. 1.

The lever L is the outer, and L', the inner one on each carriage.

To the short arm of the outer lever L, is pivoted a bar, *g*, which is, with its inner end, pivoted to a plate, M, said plate being, by means of a link, *h*, also connected with a bar, N, which is pivoted to the short arm of the inner lever L'.

The bar N has a hook formed at its end, and the plate M is also hook-shaped, or notched, so that either can be fitted upon the end of the bar J or J', as shown.

O O' are two pairs of floats, consisting of four, or more or less, transverse vertical plates, suspended from a sliding plate, *i*, which is arranged between vertical guides *j j*, formed on the sides of the carriages.

The floats O O' are on the two sides of the carriage E.

A pin, *l*, projects from the plate *i* of each float, and rests on the long arms of the two levers L L', so that the float is thus supported by the said levers L and L'.

The operation is as follows:

When the tumblers G G are oscillated in opposite directions, they cause, by their connecting-rods K K', the bars J J' to slide on the guides D, and by the bars



motion is imparted to the carriages and floats in the following manner:

The carriage E has its plates M hooked over the end of the rods J, while the bars N of the carriage E' are hooked over the ends of the rod J, as in fig. 1. The bar J is thus connected with the outer levers L of the carriage E, while J' is in connection with the inner levers L' of E'.

As the two bars J J' are always equidistant from the shaft B; that is to say, as they will move simultaneously toward and away from each other, they will stand both close together at the end of one, and far apart at the end of the next stroke.

While they move toward each other, they will both draw on their respective connections g and N, and, consequently, the upper ends of the lever L of the carriage E will be pulled in, so that their lower ends will be swung down to lower the floats O. On the carriage E', the bars N will, during the same stroke, pull on the levers L', so as to raise their lower ends to elevate the floats O', as is clearly shown in fig. 1.

During the reverse-stroke, the bar J will be drawn toward the carriage E, and will push the upper ends of L out to raise their lower ends, and to raise the float O, while on the carriage E', the pushing against the bars N will lower the lower ends of L', to let down the floats O'.

The floats are raised and lowered only at the end of each stroke, and move in a horizontal direction during the strokes. Thus, during the inward move of the carriage E, the bar J will pull the rods g, and will thereby drag the carriage E along, and keep the floats O down.

At the end of the inward stroke, the float is still down, but as soon as the bar J is by the reversed motion of the tumbler G moved outward the least bit, the rods g will be pushed to raise the lower ends of the levers L, as shown by red lines in fig. 1, whereby the floats O are raised. Not till then will the carriage E commence to move outward. The floats are thus lifted

and dipped, while they are not moving longitudinally, which is of great advantage, as much power is saved thereby.

The motion can be reversed, by reversing the couplings of the rods J and J'; that is, by connecting J with the bar N of E, and J' with g of E'. Then the floats would be down, while moving in the direction of the arrow 2, fig. 2, while they are, when connected as shown, lowered while moving in the direction of the arrow 1.

I claim as new, and desire to secure by Letters Patent—

1. Raising and lowering the floats, or propelling-devices O O', vertically, at the end of each stroke, when the horizontal motion has entirely ceased, as specified.

2. The levers L L', for raising and lowering the floats, when pivoted to the sides of the carriages, substantially as herein shown and described.

3. Connecting the levers L L' by means of the rods g and N, and by the plate M, with the sliding bars J J', substantially as herein shown and described, so that thereby the desired motion can be imparted to the floats, as set forth.

4. The bars J J', when connected with the driving-mechanism, to receive reciprocating motion, so that they may at once impart horizontal and vertical motion to the floats, as specified.

5. The carriages E E', when arranged so that they carry the floats O O' in a horizontal direction, while they cannot interfere with the vertical motion of the same.

6. The combination, with each other, of the levers L L', bars g N, link h, plate M, and bar J, all arranged and operating substantially as described, so that, by their means, the motion of the floats can be reversed.

PETER ROBERT.

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