

(No Model.)

J. H. PIERCE.
WATER WHEEL.

No. 474,098.

Patented May 3, 1892.

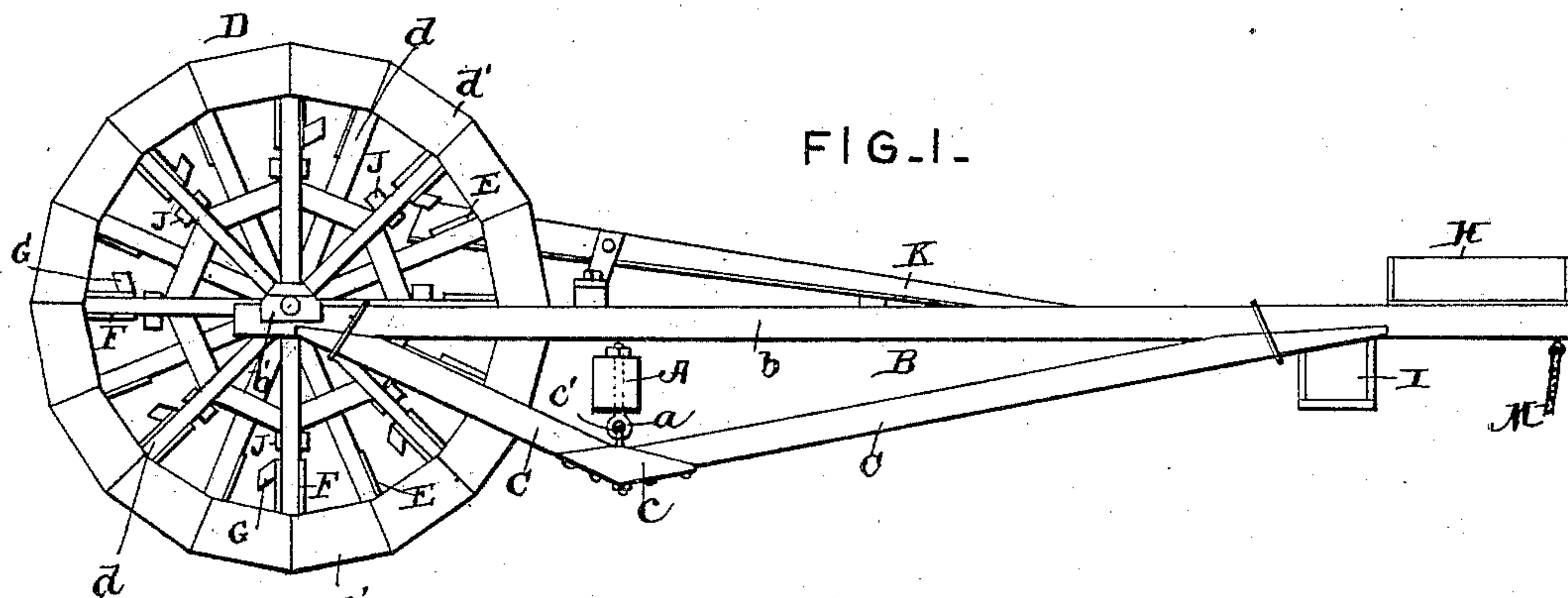


FIG. 1.

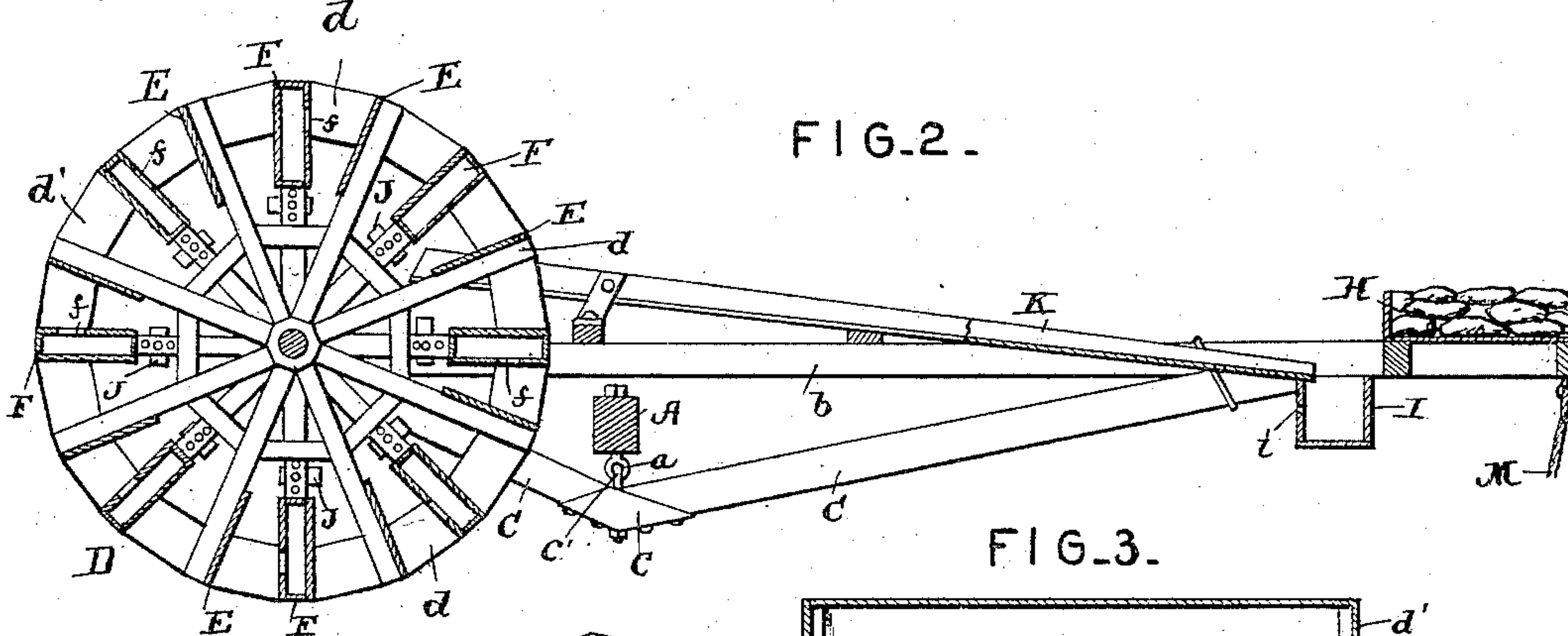


FIG. 2.

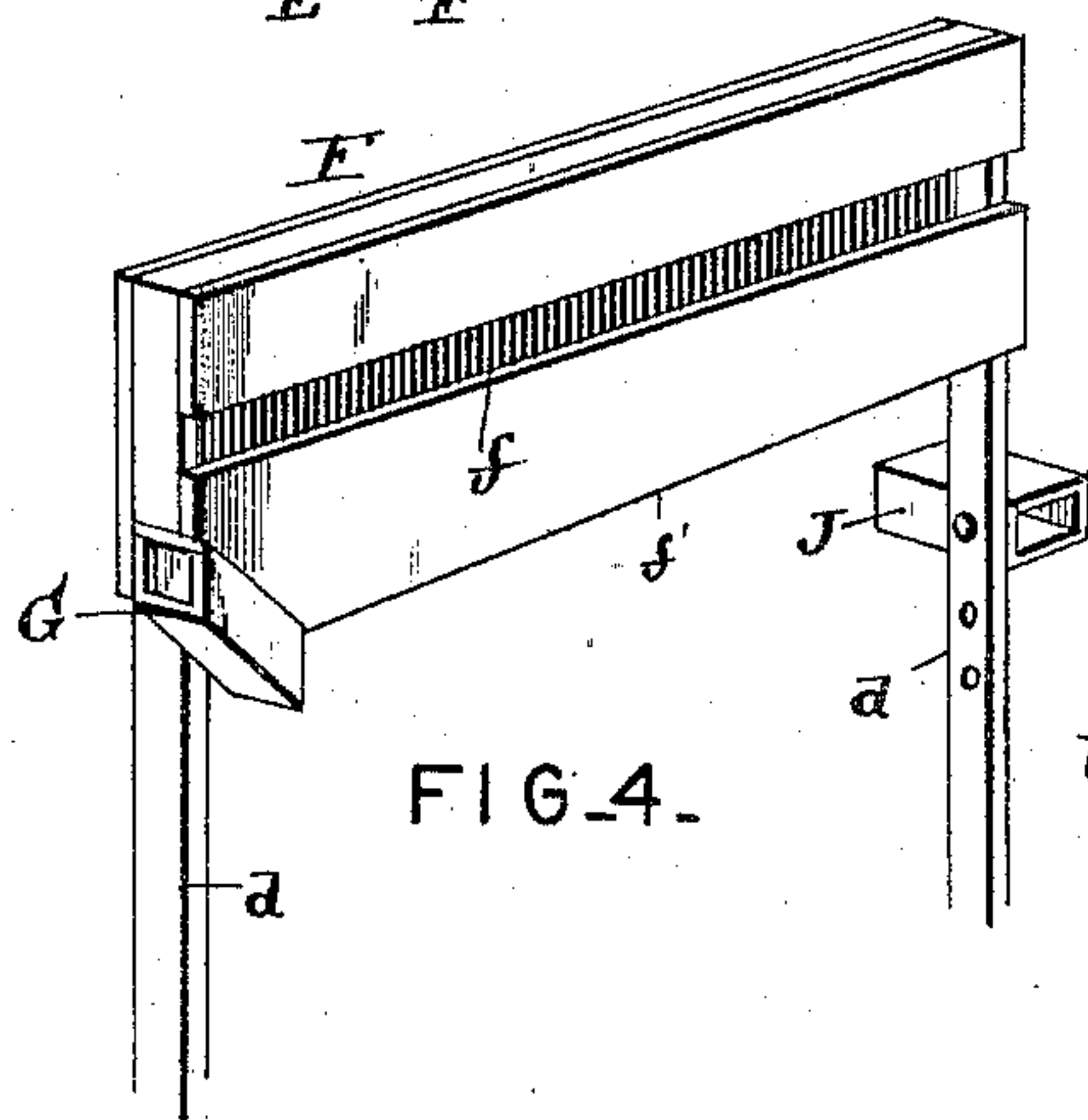


FIG. 4.

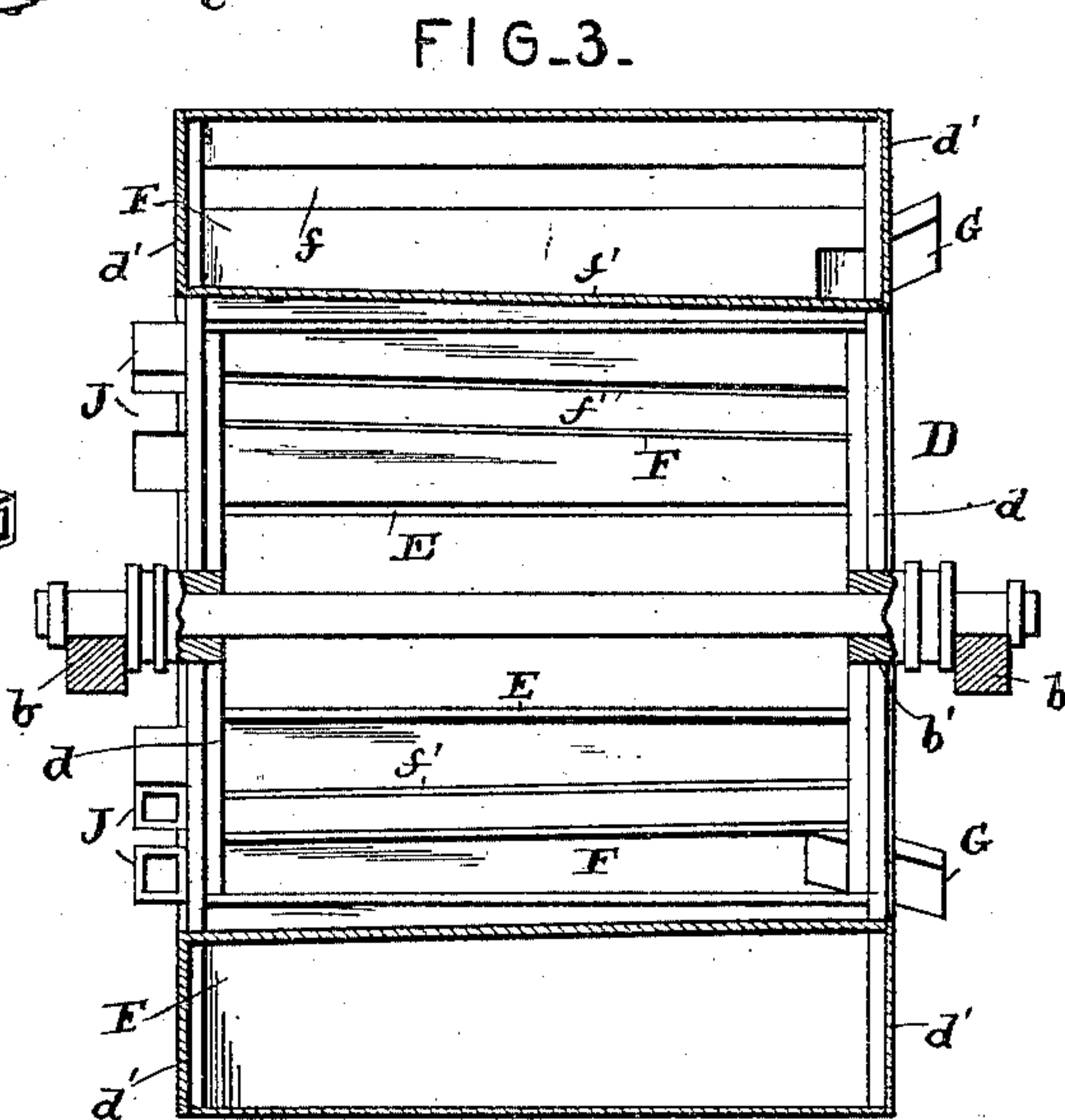


FIG. 3.

Witnesses

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JOSEPH H. PIERCE, OF GLENWOOD SPRINGS, COLORADO.

WATER-WHEEL.

SPECIFICATION forming part of Letters Patent No. 474,098, dated May 3, 1892.

Application filed September 19, 1891. Serial No. 406,270. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH H. PIERCE, a citizen of the United States, residing at Glenwood Springs, in the county of Garfield and State of Colorado, have invented a new and useful Water-Wheel, of which the following is a specification.

This invention relates to current water-wheels, being designed for use to elevate water; and the invention has for its object to provide a counterbalanced current-wheel which will not only effectively elevate water, preferably for irrigating purposes, but will also be so constructed as to be raised out of the way of the slightest obstruction—such as logs or other drift—floating down the stream and coming in contact therewith; and with these and other objects in view, which will be readily apparent, the invention consists in the novel construction hereinafter more fully described, illustrated, and claimed.

In the accompanying drawings, Figure 1 is a side elevation of an irrigating water-wheel and trussed frame constructed in accordance with my invention. Fig. 2 is a longitudinal sectional view of the same. Fig. 3 is a transverse section through the wheel. Fig. 4 is a detail in perspective of one of the paddle-boxes.

Referring to the accompanying drawings, A represents a heavy beam constructed of suitable material and of suitable dimensions to support the weight of the machine and has depending therefrom the eyebolts *a*, to which is connected the trussed balanced frame B. The said frame B comprises the parallel bars *b*, provided at one end with the bearing-box *b'* and trussed by the under trussed bar C, connected at their angle meeting-points by the angle-castings *c*, provided with eyes or hooks *c'*, which engage the eyes of the supporting-beam A, which is supported from the bed of the stream by cribs or on suitable piles. Said beam, passing between the parallel arms of the frame and the trussed bars, provides a pivotal connection with said frame, that allows the same to easily swing thereover.

The manner of supporting the frame may be reversed by allowing the whole weight to be fulcrumed upon the top of said supporting-beam; but the construction described is

preferably used by me. Journaled in the boxes *b'*, located upon the short arms of the balanced frame, is the current-wheel D, the parallel sides of which are constructed in the usual manner, having the braced radial spokes or arms *d*, connected together at their outer ends by the connecting-plates *d'*. Interposed between the outer ends of the sides of the wheel are the alternately-arranged paddles E and the paddle water-boxes F, which under the action of the current revolves the wheel and elevate the water in a manner to be described. The said paddle-blades are of the ordinary construction; but the intermediate paddle-boxes are constructed with inclosing walls forming an inclosed water-space, the said boxes being rectangular in shape and of the same depth as the alternate flat stationary paddle-blades; but are provided in one side thereof with the longitudinal inlet-openings *f*, which may be of any desired width, according to the amount of water to be accommodated by said boxes. From the inner sloping bottoms *f'* and the ends of said boxes and at one side of the wheel project the discharge-spouts G, which project through the spokes upon one side of the wheel and are set at such an angle that the water will be retained and held by the boxes and carried by the revolving wheel until the flume or box is reached where it is desired to discharge the elevated water and carried to the irrigating-ditches upon the bank of the stream or for any other purposes that may be desired, the said discharge-flume not being illustrated in the drawings. The opposite ends of the fulcrumed frame B support in any suitable manner the weight-boxes H and I respectively, the upper box being supported directly upon the ends of said frame and is designed to be filled with rock or other weight to counterbalance the weight of the wheel, the said box I being located slightly in front of and to one side of the upper box H and is also designed to be filled sufficiently with weighted material, in order that the combined weight of the long lever end of the frame, the weighted boxes, and the water which is led to the box I will evenly counterbalance the said current-wheel, so that the same will rise upon the slightest

contact with obstruction, and will thus be kept from injury, the said balancing also providing for always keeping the wheel in its proper position in the water when sufficiently deep, so that it may always accurately discharge the elevated water carried thereby, thereby necessarily compensating for rises and falls of the water.

Located upon the spokes of the wheel on the opposite side thereof to that from which the discharge-spouts project is a series of regulating-buckets J, which are radially adjustable upon the side of the wheel to assist automatically to balance the wheel when the water is sufficiently deep, and thus compensate for the rising and falling of the same, said buckets being designed to discharge the water carried thereby when the same is of a sufficient depth to cause said buckets to dip into the slanting trough or flume K, which slants from near the top of one side of the wheel to the inner weight-box I, into which the water is carried, and thus lends additional weight, whereby the wheel will be elevated and kept in its proper position in the water without deference to the fluctuations thereof, provided the water remains sufficiently deep to cause the buckets J to dip, said weight-box I being further provided with a suitably-located vent *i*, through which the superfluous water is discharged, and thus prevents an overbalancing and permits the same amount of water to always be present in said box to evenly balance the wheel and keep it the same depth in the water. The said flume or trough is of any ordinary suitable construction and is held and braced upon the frame by means of the supporting-braces L or other suitable means.

Securing-ropes M may be secured to the weighted end of the fulcrumed frame and may be used to hold the wheel at any depth desired in the water when necessitated by a shallow depth of water which will not permit the regulating-buckets to dip, and the said regulating-buckets must be then so adjusted on said wheel as to compensate for the rising of the water, so that the same may be kept in its proportionate position in the water.

The construction and operation of the herein-described current water-elevating wheel, used especially for irrigating purposes, is now thought to be apparent without further description. It is also to be noted that the wheel proper is to be constructed of iron, while the frame-work of the motor is preferably constructed of tubular iron to insure strength and durability and also simplicity and ease in assembling the various parts; but, as stated, any suitable material may be conveniently used for constructing the motor.

It is to be noted that when the water is sufficiently deep the water-wheel dips sufficiently deep therein to cause the buckets J to dip and carry the water to the flume K, thence to the vented box I. Under such a condition the water-wheel is thus always kept at the

same depth in the water, and by means of having the vent or overflow *i* located at a suitable point the counterbalancing is made approximately accurate. Now suppose that the stream in which the motor is used is comparatively shallow at times. In such event, for example, the buckets J are placed three feet from the outer rim of the wheel, at which point they would not dip water. Now the opposite end of the lever-frame is fastened by means of the ropes M, so that the wheel would run, say, within four inches of the bottom of the stream. If the water should suddenly rise more than three feet, said buckets J would at that point dip and carry water to the flume, thence to said vented box, which would then become sufficiently weighted to counterbalance the wheel and keep it to its proper depth in three feet or more of water without the use of the ropes M or other devices for keeping the wheel in proper position.

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

1. In a water-elevator, the combination, with suitable bearings, of the current-wheel journaled in said bearings and provided with alternately-arranged stationary paddle-blades and paddle water-boxes, said boxes having a longitudinal inlet-opening in one face thereof, and angularly-disposed discharge-spouts projecting from one end of said boxes without one side of said wheel, substantially as set forth.

2. In a water-elevator, the combination, with a supporting sill or beam, of a trussed frame fulcrumed to said beam, a current-wheel journaled at one end of said frame and provided with alternately-arranged stationary paddle-blades and paddle water-boxes having a longitudinal inlet-opening in one face thereof, and angularly-disposed discharge-spouts projecting from one end of said boxes without one side of said wheel, and weighted boxes secured to the opposite end of said fulcrumed frame and counterbalancing said wheel, substantially as set forth.

3. In a water-elevator, the combination, with a supporting-beam, of a trussed frame fulcrumed to said beam, a current-wheel journaled at one end of said frame and provided with alternately-arranged stationary paddle-blades and paddle water-boxes having inlet and discharge openings, a series of regulating-buckets radially adjustable upon one side of said wheel, weighted counterbalancing-boxes supported upon the other end of said fulcrumed frame, the inner and lower of said boxes being provided with an overflow-vent, and a flume located slanting over and upon said trussed frame and connecting the discharge of said regulating-buckets with said weight-box having the vent-opening, substantially as set forth.

4. In a water-elevator, the combination, with suitable bearings, of the current-wheel journaled in said bearings and provided with

alternately-arranged stationary paddle-blades
and paddle water-boxes, said boxes having a
longitudinal inlet-opening in one face thereof;
sloping or slanting bottoms, and angularly-
5 disposed discharge-spouts projecting from one
end of said boxes without one side of said
wheel and at the farthest end of said slanting
bottom, substantially as set forth.

In testimony that I claim the foregoing as
my own I have hereto affixed my signature in 10
the presence of two witnesses.

JOSEPH H. PIERCE.

Witnesses:

J. G. PEASE,
GEO. EDINGAR.