

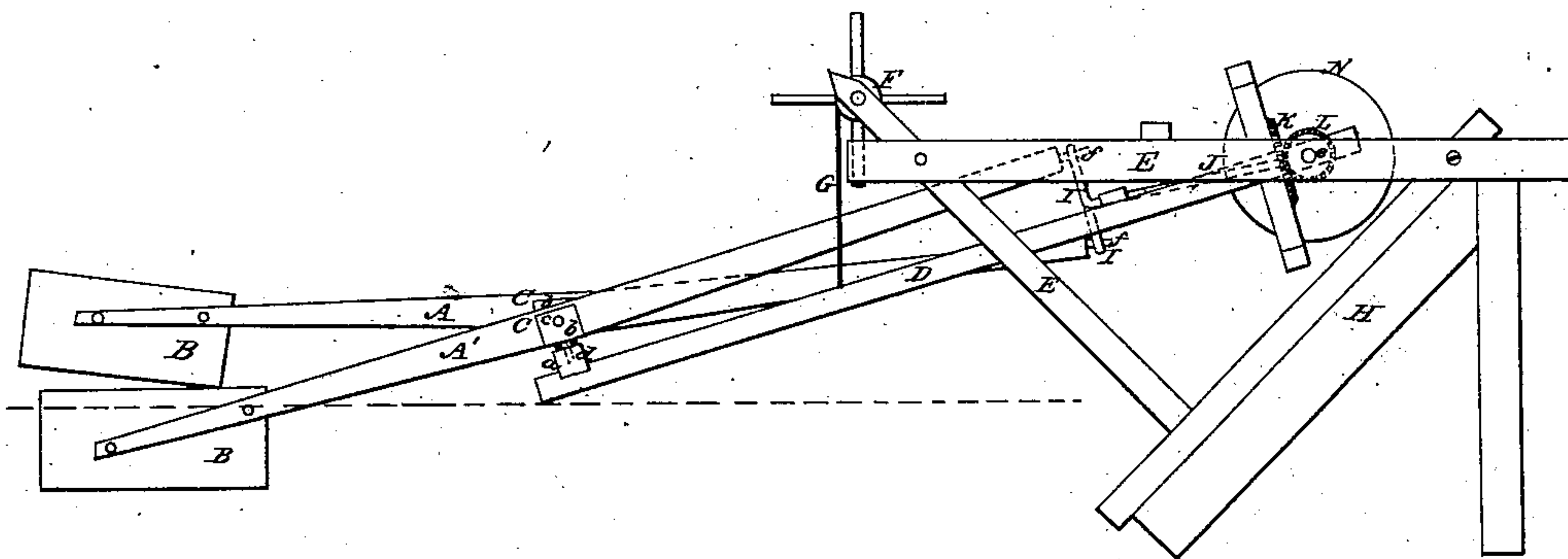
*J. Hardie*

*Water Wheel,*

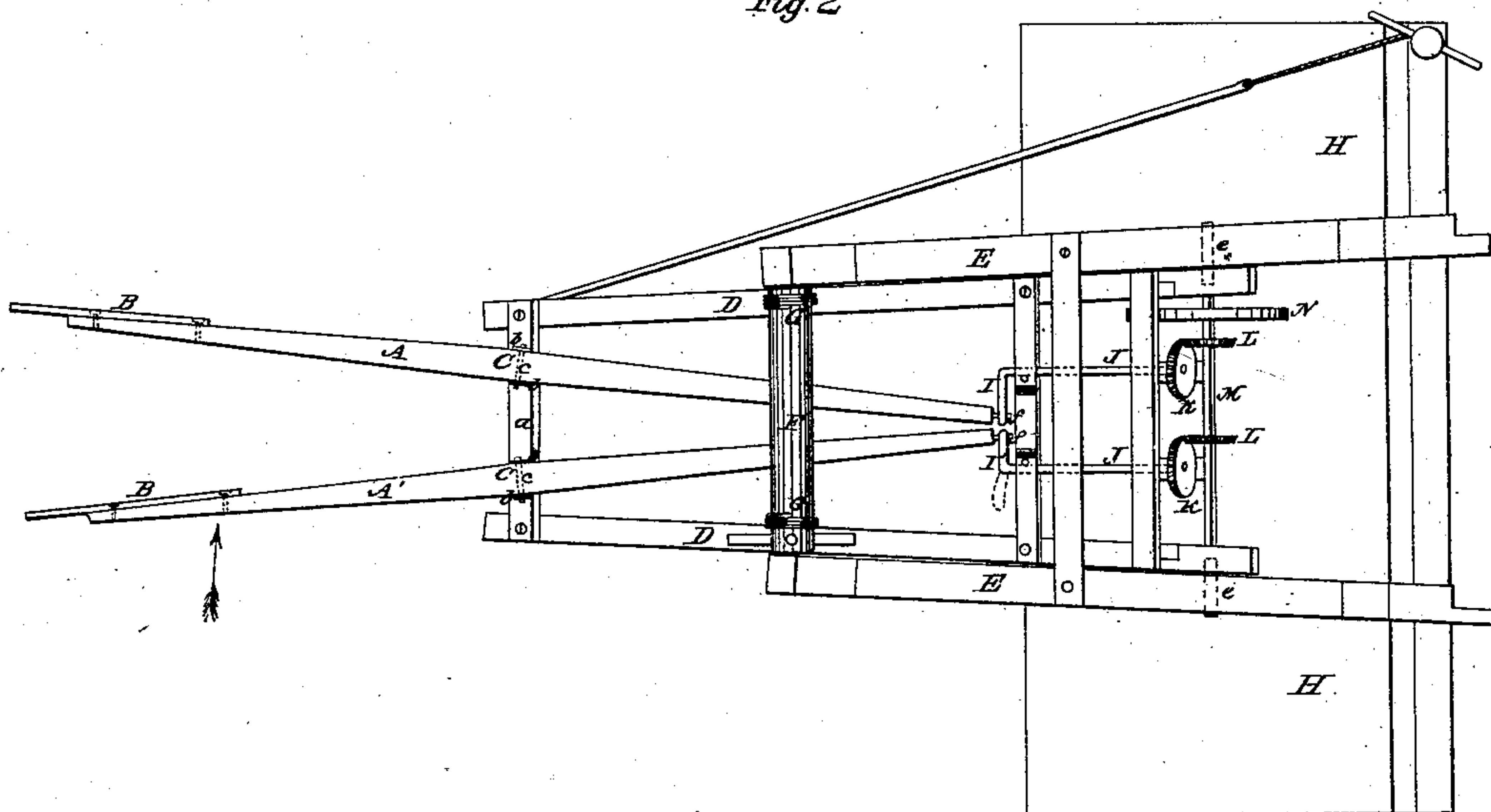
*N<sup>o</sup> 8525.*

*Patented Nov. 18. 1851.*

*Fig. 1*



*Fig. 2*



# UNITED STATES PATENT OFFICE.

JAMES HARDIE, OF VICTORIA, TEXAS.

## PROPELLER OF MACHINERY TO BE USED IN CURRENTS.

Specification of Letters Patent No. 8,525, dated November 18, 1851.

*To all whom it may concern:*

Be it known that I, JAMES HARDIE, of Victoria, in the county of Victoria and State of Texas, have invented a new and Improved  
5 Machine for Employing the Currents of Rivers as a Motive Power; and I do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being  
10 had to the annexed drawings, making a part of this specification, in which—

Figure 1 is a side elevation. Fig. 2 is a plan or bird's eye view.

Similar letters of reference indicate corresponding parts in each of the figures.

The nature of my invention consists in attaching one or more levers at about their centers to a suitable frame overhanging a river or stream, said frame being properly  
20 secured on the bank, in any suitable way, the levers are attached to the frame by universal joints. To the outer ends of the levers floats or blades are attached against which the current acts in a manner which will be hereafter described.

The frame above mentioned is hung upon pivots so that it may be raised or lowered by a windlass or otherwise, and the floats or blades of the levers be at all times properly submerged in the stream. The other or  
30 inner ends of the levers are attached to cranks or connected with toothed wheels in such a manner that power may be applied to any machine designed to be operated.

To enable others skilled in the art to make and use my invention, I will proceed to describe its construction and operation.

A A' represents the levers, and B B the floats or blades attached to the outer ends.

40 C C are the universal joints by which the levers are attached to the cross piece (a) on the end of the frame D, these universal joints are of ordinary construction and will be readily understood by the following description. Each lever A sets between two  
45 plates (b) (b). These plates extend up on the sides of the levers and are united under the lever forming a sort of clasp. A hole is drilled through the plates and lever, through  
50 which a bolt (c) passes. They are thus allowed to vibrate vertically. A rod (d) is attached to the plate underneath the lever and projects downward into the cross piece (a) of the frame D and the levers are thus  
55 allowed to vibrate horizontally.

(e) (e) are pivots on which the frame D

is hung loosely and it will be seen by the drawings that the frame D is hung to an outer or stationary frame E which is to be firmly attached to the shore or banks of the  
60 stream which is represented by H. On this stationary frame E is placed the windlass F around which ropes or chains G pass that are attached to the movable frame D and by this means the frame D is raised or lowered  
65 as the height of the stream varies and the floats or blades B B at all times properly submerged.

I, I, are cranks to which the ends of the levers A A are attached, pins (f) (f) on the  
70 levers passing through the ends of the cranks as seen more particularly in Fig. 2. These cranks are attached to and form part of the shafts J, J, to the ends of which the toothed wheels K K are affixed. The shafts  
75 J, J, have their bearings on the cross pieces and other parts of the frame D, as seen in fig. 2.

L, L, are pinions hung on the shaft M, said pinions meshing into the toothed  
80 wheels K, K.

N, is a fly wheel also attached to the shaft M.

It will be seen that the gearing just described as well as the levers are all attached  
85 to and move with the frame D, when it is raised or lowered.

The operation is simple. The frame D is properly adjusted by means of the windlass F and the floats or blades B, B, submerged.  
90 Fig. 1 shows about the position of the frame D and levers A A when the machine is ready for operation, the dotted line X X representing the water line. We will suppose the current of a river running in the  
95 direction indicated by the arrow fig. 2, it acts upon the blade of the lever A' till the crank I' is brought around to the position shown by the dotted lines making half a revolution, the current then acts upon the  
100 blade of the lever A which also makes half a revolution and brings back the lever A' above the surface of the water to its original position ready to be again acted upon by the current, it will be seen that the fly wheel N  
105 is necessary to carry the cranks past their centers, and if one lever is only used the fly wheel by its momentum would throw the lever back the half revolution of the crank after being moved forward by the current.  
110 The shafts J J and toothed wheels K K being made to revolve by the alternate motion



of the levers A A a continuous motion is given to the shaft M as will be readily seen, and power may be applied from it to any machine.

5 I do not confine myself to the exact mode of gearing herein described as many modifications of the same may be used and answer equally well. But

10 What I claim as my invention and desire to secure by Letters Patent is—

The application for the purpose specified of one or more levers A' A with the floats or blades B B at their lower ends against

which the current acts, said levels being attached at about their centers to an adjustable frame D by an universal joint C as described, the upper ends of the levers being attached to cranks I, I, by which, through any suitable gearing motion is communicated to the shaft M substantially as described. 15 20

JAMES HARDIE.

Witnesses:

G. W. WRIGHT,  
JOEL T. CASE.