

(No Model.)

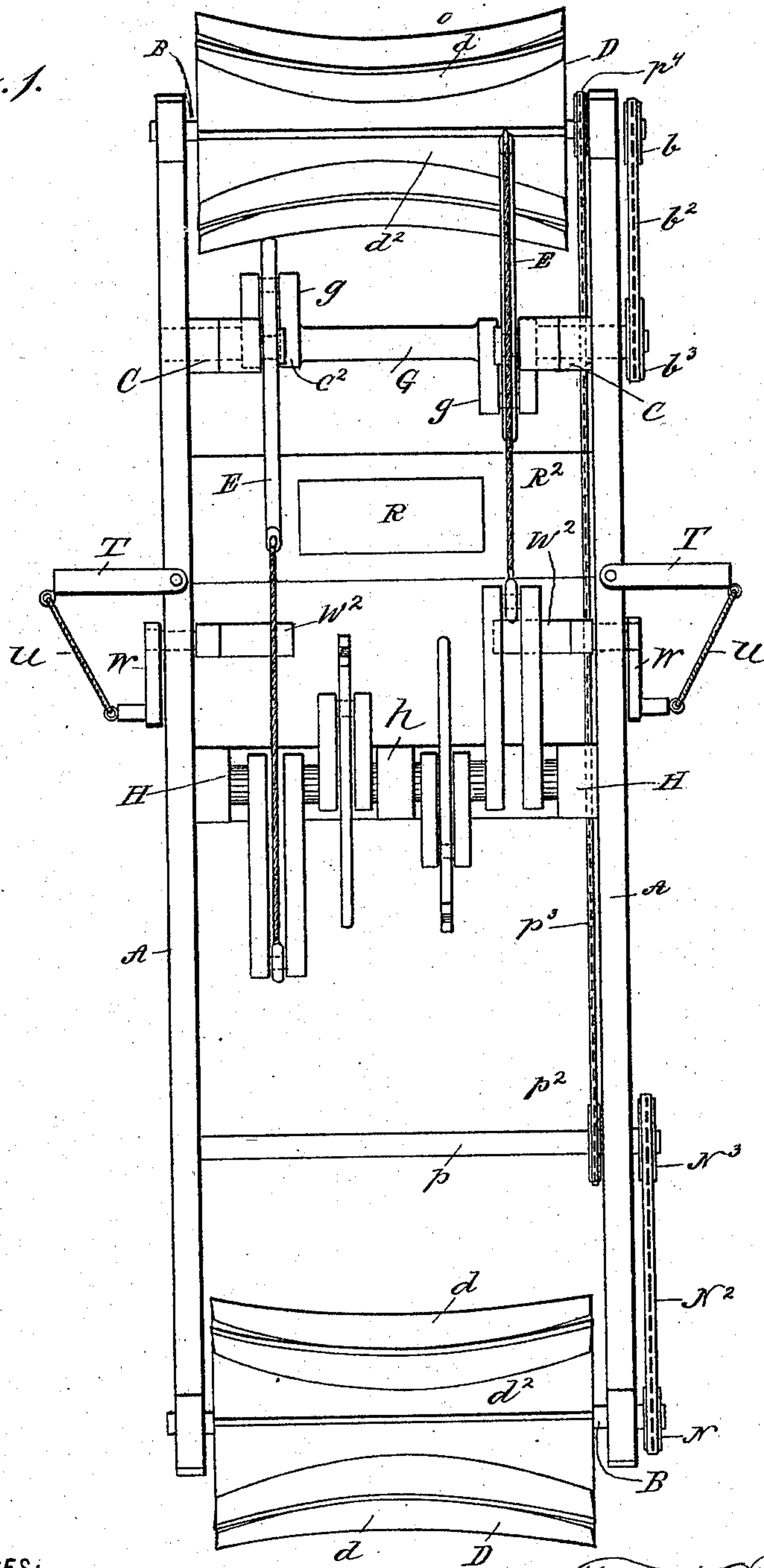
2 Sheets—Sheet 1.

F. DE BORGGRAVE.  
BOAT.

No. 574,083.

Patented Dec. 29, 1896.

Fig. 1.



WITNESSES:

C. Nordford  
C. Gersh

INVENTOR

F. De Borggrave  
BY  
Edgar Tate  
ATTORNEYS.

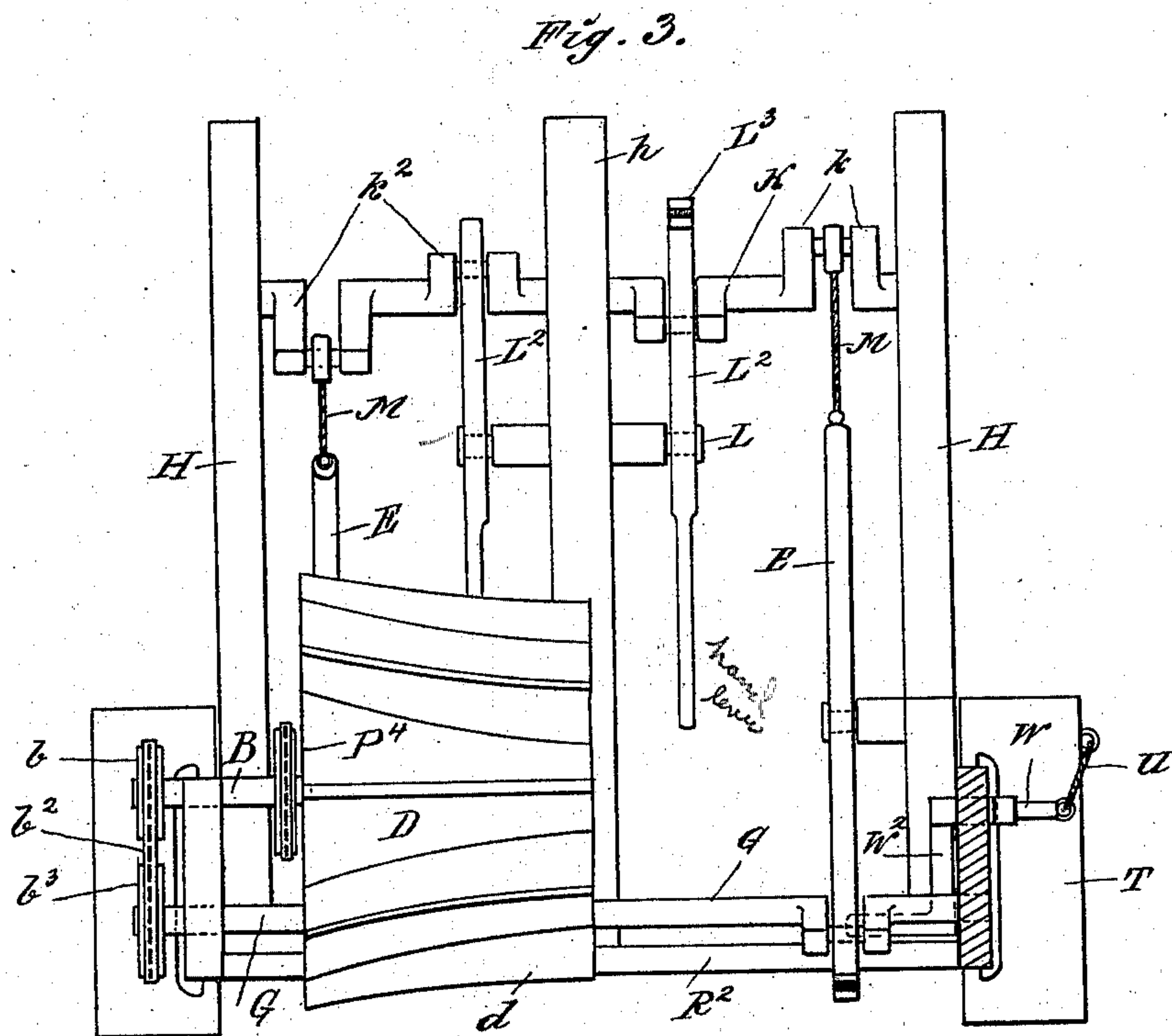
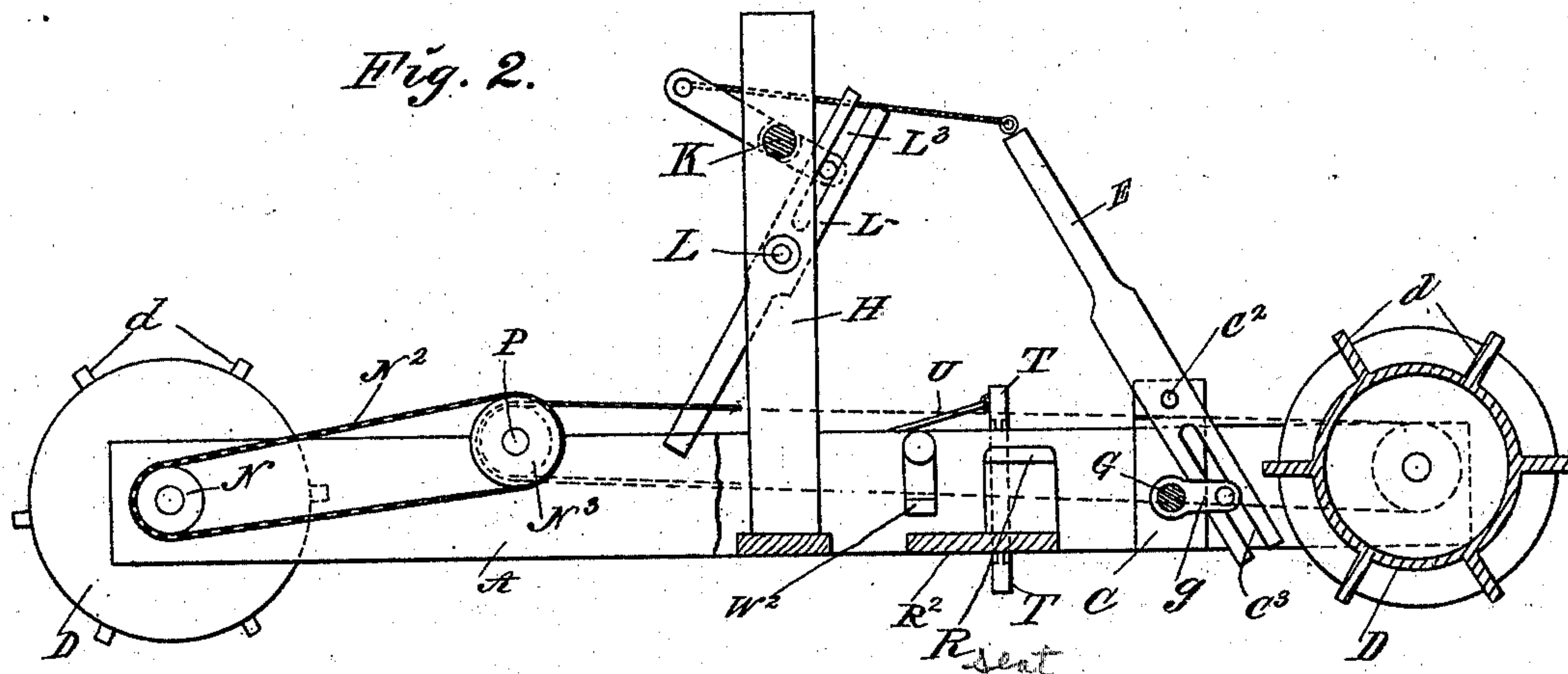
(No Model.)

2 Sheets—Sheet 2.

F. DE BORGGRAVE.  
BOAT.

No. 574,083.

Patented Dec. 29, 1896.



WITNESSES:

*C. V. Norton*  
*C. Grant*

INVENTOR

*Felix De Borggrave*

BY

*Edgar Tate*  
ATTORNEYS.



# UNITED STATES PATENT OFFICE.

FELIX DE BORGGRAVE, OF JERSEY CITY, NEW JERSEY.

## BOAT.

SPECIFICATION forming part of Letters Patent No. 574,083, dated December 29, 1896.

Application filed March 17, 1896. Serial No. 583,498. (No model.)

*To all whom it may concern:*

Be it known that I, FELIX DE BORGGRAVE, a citizen of Belgium, and a resident of Jersey City, in the county of Hudson and State of New Jersey, have invented certain new and useful Improvements in Boats, of which the following is a specification, reference being had to the accompanying drawings, forming a part thereof, in which similar letters of reference indicate corresponding parts.

This invention relates to pleasure-boats and similar vessels, and the object thereof is to provide an improved motor power for such vessels which is adapted to be operated by hand, a further object being to provide a motor for vessels of this class which is simple in construction and operation and by which great speed can be obtained.

The invention is fully disclosed in the following specification, of which the accompanying drawings form a part, in which—

Figure 1 is a plan view of a portion of a vessel provided with my improved propelling mechanism; Fig. 2, a central longitudinal section thereof; and Fig. 3, a rear end view, parts thereof being cut away and others shown in section.

In the practice of my invention I provide a boat or vessel the body portion or hull of which consists of two longitudinal parallel side plates A, which may be composed of any desired material, care being taken to select material as light as possible, and mounted in each end of said side plates is a shaft B, on each of which is placed a hollow float D, which is approximately cylindrical in form, and each is provided with radial longitudinal plates or wings  $d$ , the outer edges of which are preferably slightly inwardly curved or concave, and the body portions of the revoluble floats D are also preferably inwardly curved, as shown at  $d^2$ , so that the central portion thereof is of less diameter than the ends thereof.

It will be understood that the revoluble floats are rigidly connected with the shafts on which they are mounted, and the shaft B, at the stern of the boat, is provided outside of one of the side bars A with a sprocket-wheel  $b$ , on which is mounted a drive-chain  $b^2$ , which passes over a corresponding sprocket-wheel  $b^3$ , which is mounted on a crank-shaft

G, which extends transversely of the boat and which is provided with two cranks  $g$ , and secured to each of the side bars A are vertical standards C, through which the shaft G passes, and these standards are provided at their upper ends with shafts  $C^2$ , on each of which a lever E is mounted, and said levers are each provided with oblong open slots  $C^3$  at their lower ends, in which the cranks  $g$  work.

Secured centrally of the side bars A are other standards H, and arranged centrally between the standards H is a similar vertical standard  $h$ , and mounted in the upper ends of the standards H and  $h$  is a compound crank-shaft K, which is provided with two cranks  $k$  on one side and two similar cranks  $k^2$  on the other side, and mounted in the central standard  $h$  is a shaft L, on the opposite ends of which are mounted levers  $L^2$ , the upper ends of which are provided with longitudinal open slots  $L^3$ , which operate in connection with the inner cranks on the shaft K, and secured to the outer cranks on said shaft are ropes, chains, or straps M, which are also secured to the upper ends of the levers E.

Mounted on the end of the shaft B of the revoluble float D, at the bow of the boat, is a sprocket-wheel N, on which is mounted a drive-chain  $N^2$ , which passes over a similar sprocket-wheel  $N^3$  on the end of a shaft  $p$ , on which is a sprocket-wheel  $p^2$ , and passing over the sprocket-wheel  $p^2$  is a drive chain, belt, or cord  $p^3$ , which passes backwardly to the stern of the boat and over a sprocket-wheel  $p^4$ , which is mounted on the shaft B of the revoluble float D at the stern.

Placed about midway between the crank-shaft G and the vertical standards H and  $h$  is a transverse seat R, and below which is placed a transverse board or foot-rest  $R^2$ , and secured or hinged to each side of the boat are steering plates or rudders T, to the outer sides of which are connected ropes, chains, or cords  $u$ , which are also connected with the cranks W, which are mounted on shafts which extend through the side bars A, and are provided with cranks  $W^2$  at their inner ends, and by means of which the steering plates or rudders T may be operated by the feet.

The operation will be readily understood from the foregoing description when taken in



connection with the accompanying drawings and the following statement thereof: The party operating or propelling the boat sits upon the seat R and grasps in each hand the lower end of one of the levers L<sup>2</sup>, and alternately moves said levers back and forth. This operation causes a corresponding movement of the levers E, and these levers revolve the shaft G, which in turn revolves the revoluble float D at the stern of the boat, the revolution of the shaft on which the float D at the stern of the boat is mounted revolving the shaft p by means of the chain or belt p<sup>3</sup>, and the shaft p revolves the float D at the bow of the boat through the agency of the chain N<sup>2</sup> and the sprocket-wheels N and N<sup>3</sup>. This operation propels the boat forward, as will be readily understood, and by means of this mechanism great speed may be obtained.

The operation of the steering-plates T will be readily understood, and either of said plates may be extended at right angles to the sides of the boat or folded adjacent thereto simply by operating the crank W<sup>2</sup>, which may be done by the feet.

The rudders being hinged to the sides of the boat and the end being connected by cords u with lateral projections on the end of crank W, which is journaled to the shaft W<sup>2</sup>, the said rudders T are held in a position at right angles to the sides of the boat or plates A when the end of the crank W is farthest from said rudder T. When the crank W<sup>2</sup> is operated by the feet, the tension of the cord will be relaxed, thereby allowing the rudder T to form a more acute angle relatively to the side of the boat, and the crank W, thereby being completely revolved in the direction of the rudder T, will admit of the said rudder being folded flatly against the side of the boat or plate A. It will be understood in connection with this mechanism that the operator is facing the stern of the boat, and the force of the water against the rudder T will always prevent them being folded against the plates A, except as above stated, or their radial movement, except in one direction, may be prevented by any other method.

My improved motor for boats is simple in construction and operation and comparatively inexpensive, and is well adapted to accomplish the result for which it is intended, and it is evident that changes in and modifications of the construction herein described may be made without departing from the spirit of my invention or sacrificing its advantages, and I reserve the right to make all such alterations therein and modifications thereof as fairly come within the scope of the invention.

The entire boat and the propelling mechanism may be made of any desired material, care being taken to select material as light as possible; and,

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

1. In a boat, the combination of side plates or bars, between each of the ends of which is mounted a revoluble float, having longitudinal plates or wings secured thereto, a sprocket-wheel mounted on the shaft of the revoluble float, at the stern, and in operative connection with the revoluble float at the bow, a crank-shaft mounted in front of the stern float, and provided with two cranks, suitable standards arranged at the central portion of the boat and provided with a crank-shaft, each side of which is provided with two cranks, suitable levers pivoted above the crank-shaft, at the stern of the boat, and provided with slots at their lower ends which operate in connection with the cranks formed thereon, said levers being connected at their upper ends with two of the cranks on the crank-shaft at the central portion of the boat, and suitable levers mounted below said last-named crank-shaft, and provided with slots in their upper ends which operate in connection with the other cranks formed on said last-named crank-shaft, the crank-shaft near the revoluble stern float being in operative connection with the shaft thereof, substantially as shown and described.

2. In a boat, the combination of a frame consisting of suitable side bars at each end of which is mounted a revoluble float provided with longitudinal wings or plates, the shafts of said revoluble floats being in operative connection by means of suitable sprocket-wheels, and belts or bands, and means for revolving said floats, consisting of a crank-shaft mounted in front of the stern float, and in operative connection with the shaft thereof, suitable levers pivotally supported above said crank-shaft, and provided with slots in their lower ends which operate in connection with the cranks formed thereon, the upper ends of said levers being connected with cranks formed in a suitably-supported central crank-shaft, said central crank-shaft being also provided with other cranks, and suitable levers pivotally supported thereunder, and provided with slots in their upper ends which operate in connection therewith, substantially as shown and described.

3. In a boat, the combination of a frame consisting of suitable side bars at each end of which is mounted a revoluble float provided with longitudinal wings or plates, the shafts of said revoluble floats being in operative connection by means of suitable sprocket-wheels and belts or bands, and means for revolving said floats, consisting of a crank-shaft mounted in front of the stern float, and in operative connection with the shaft thereof, suitable levers pivotally supported above said crank-shaft, and provided with slots in their lower ends which operate in connection with the cranks formed thereon, the upper ends of said levers being connected with cranks formed on a suitably-supported central crank-shaft, said central crank-shaft being also provided with other cranks, and suitable levers pivotally



supported thereunder, and provided with slots  
in their upper ends which operate in connec-  
tion therewith, said boat being also provided  
with a seat, and with steering-plates at the  
5 sides thereof, which are adapted to be oper-  
ated by the feet, substantially as shown and  
described.

In testimony that I claim the foregoing as

my invention I have signed my name, in pres-  
ence of the subscribing witnesses, this 14th 10  
day of March, 1896.

FELIX DE BORGGRAVE.

Witnesses:

C. GERST,

M. A. KNOWLES.