No. 627,562. Patented June 27, 1899.

W. WOOD.

PROPELLER.

(Application filed Apr. 27, 1898.)

(No Model.) 3 Sheets—Sheet 1.

Fig. 1.

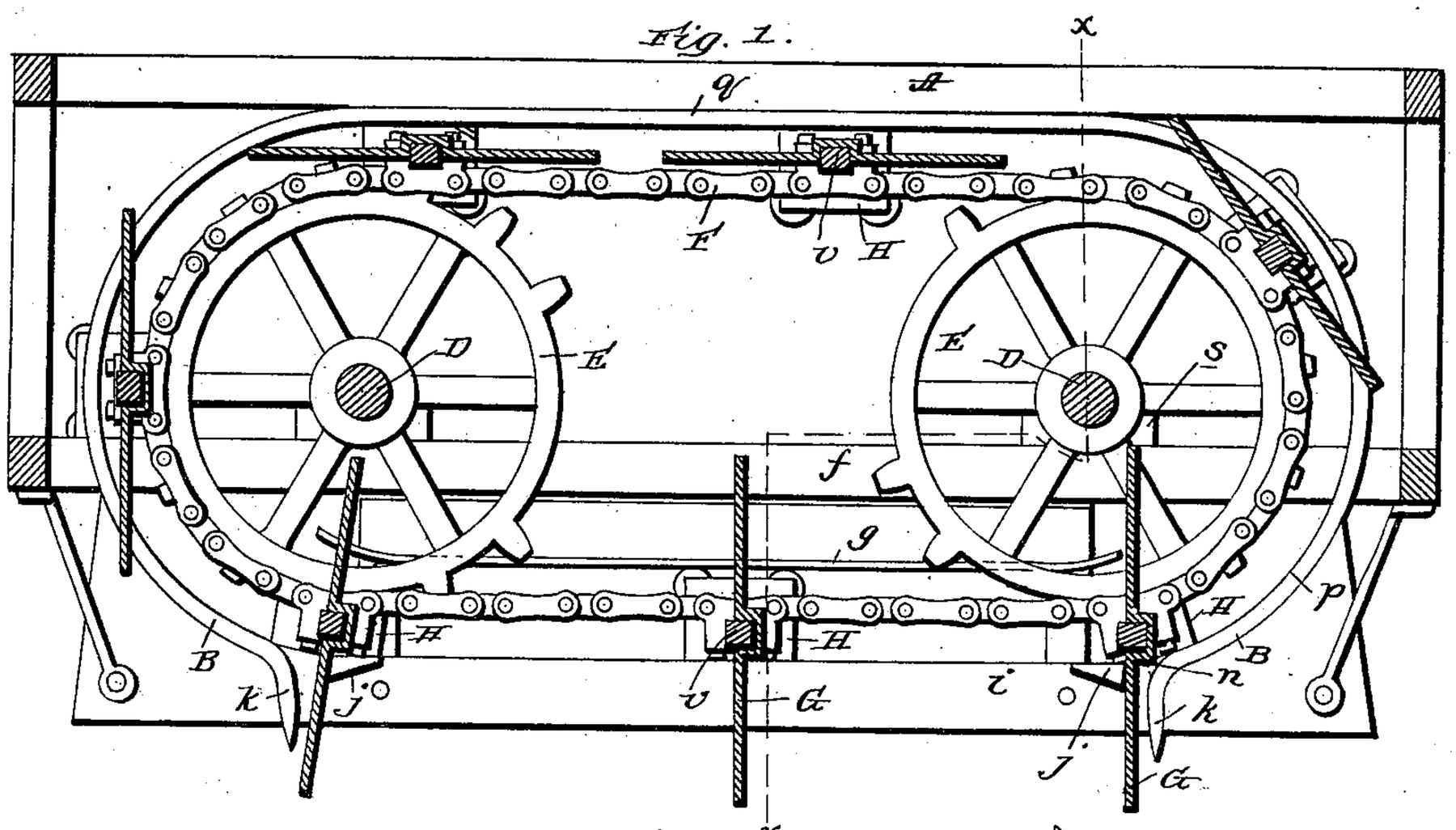
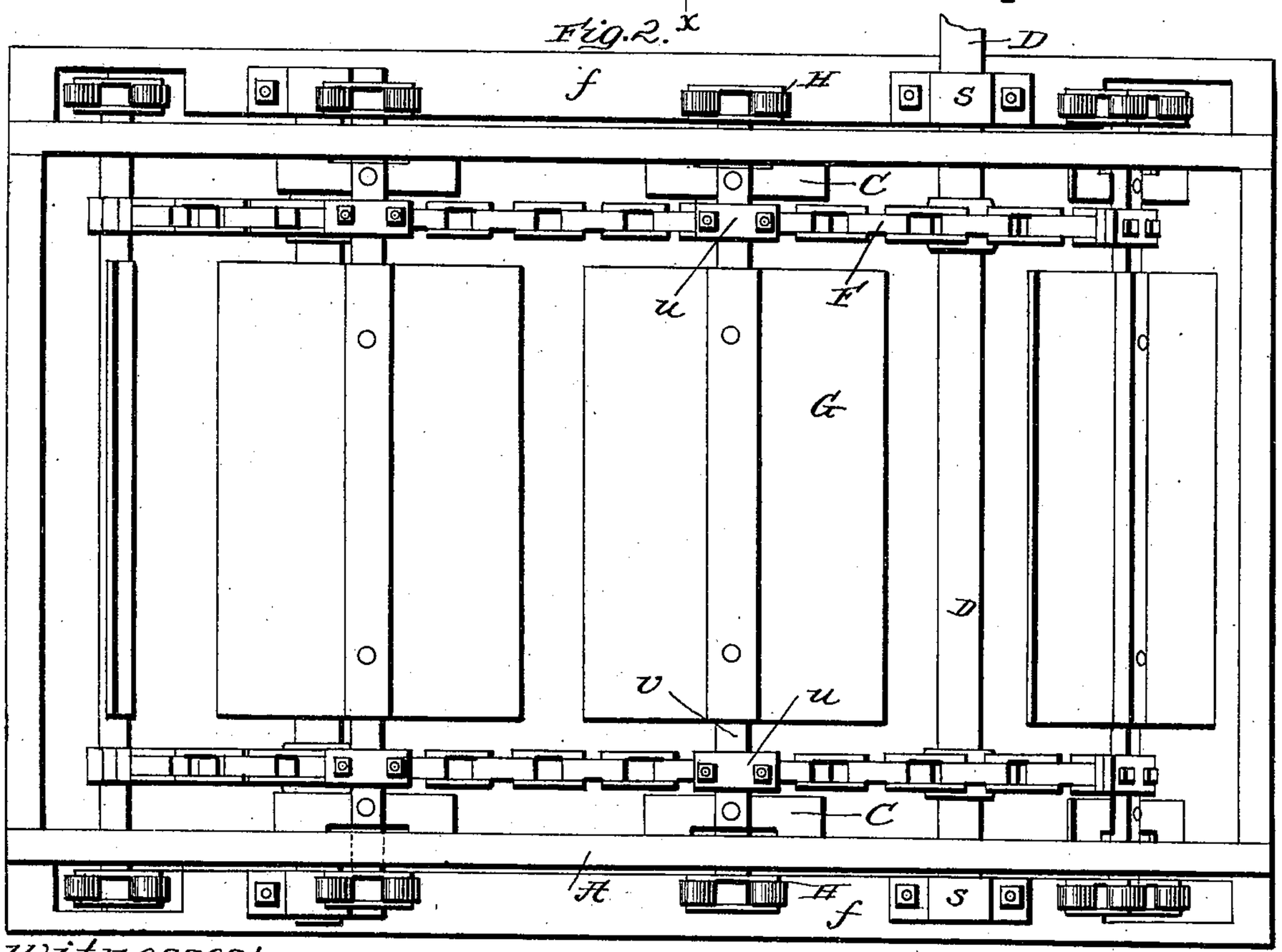


Fig. 2.



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No. 627,562. Patented June 27, 1899.

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(No Model.) 3 Sheets—Sheet 2.

Fig. 3.

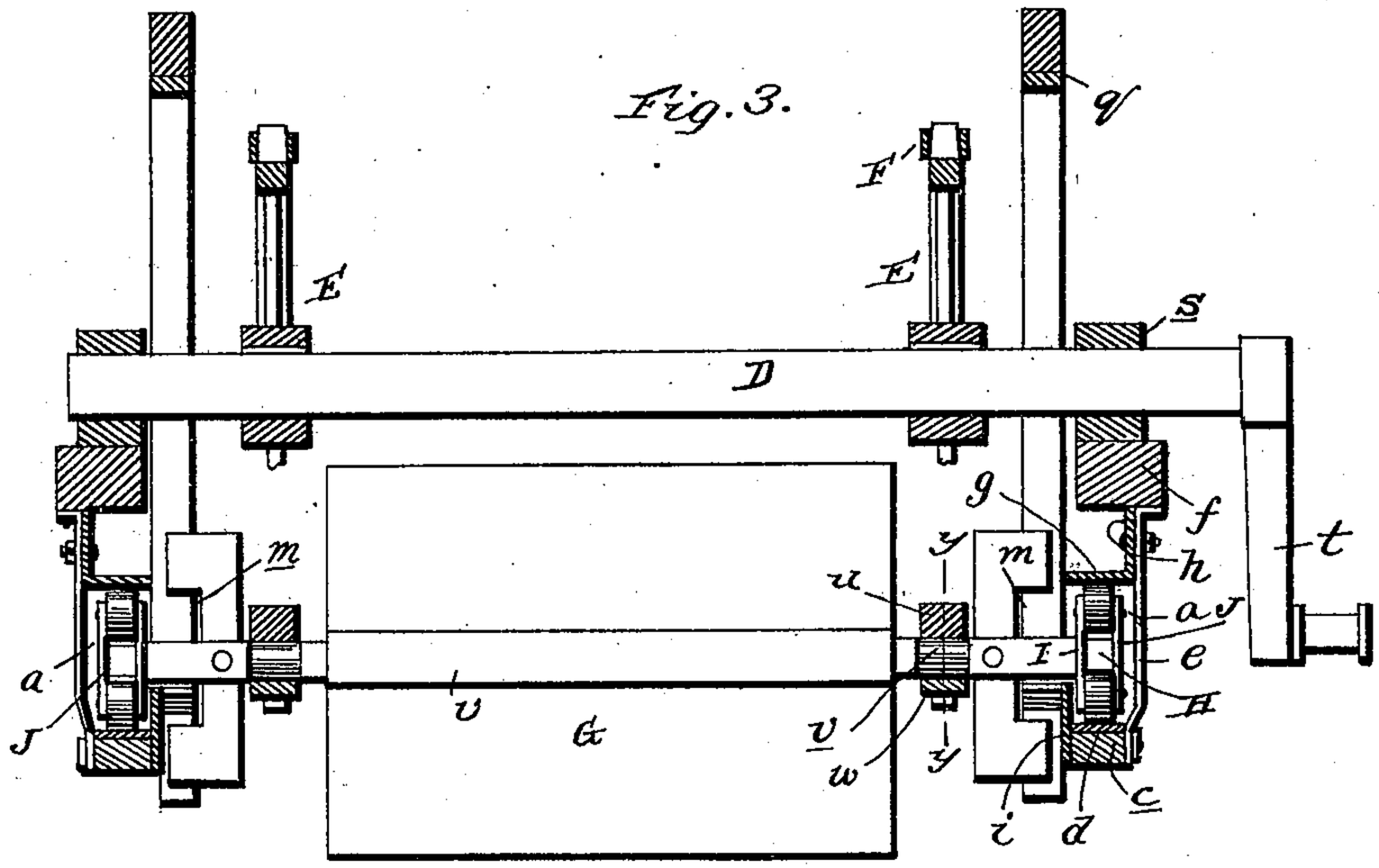


Fig. 4.

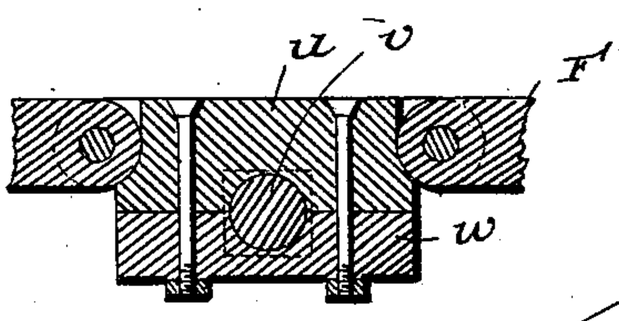
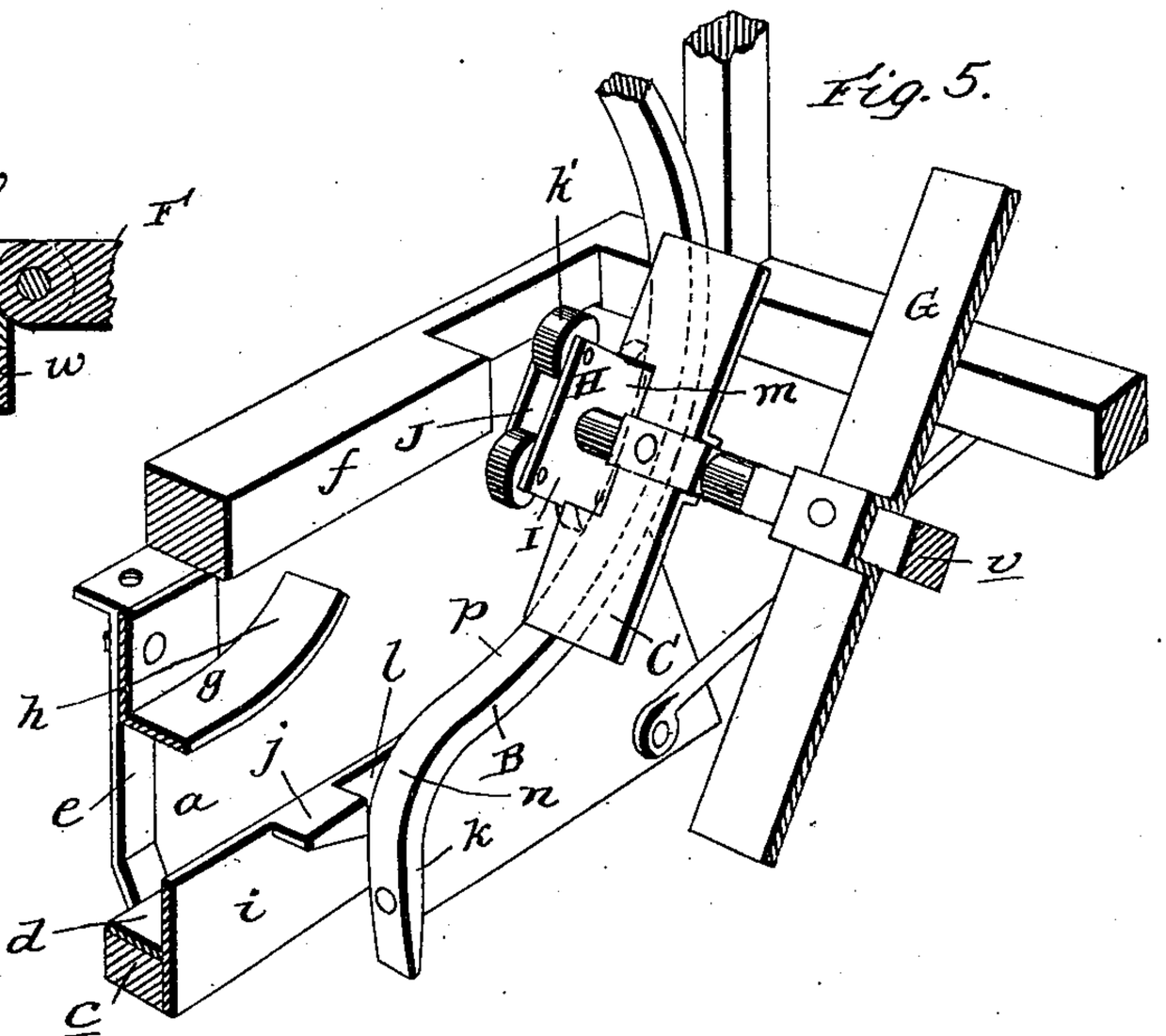


Fig. 5.



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No. 627,562. Patented June 27, 1899.

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PROPELLER.

(Application filed Apr. 27, 1898.)

(No Model.) 3 Sheets—Sheet 3.

Fig. 6.

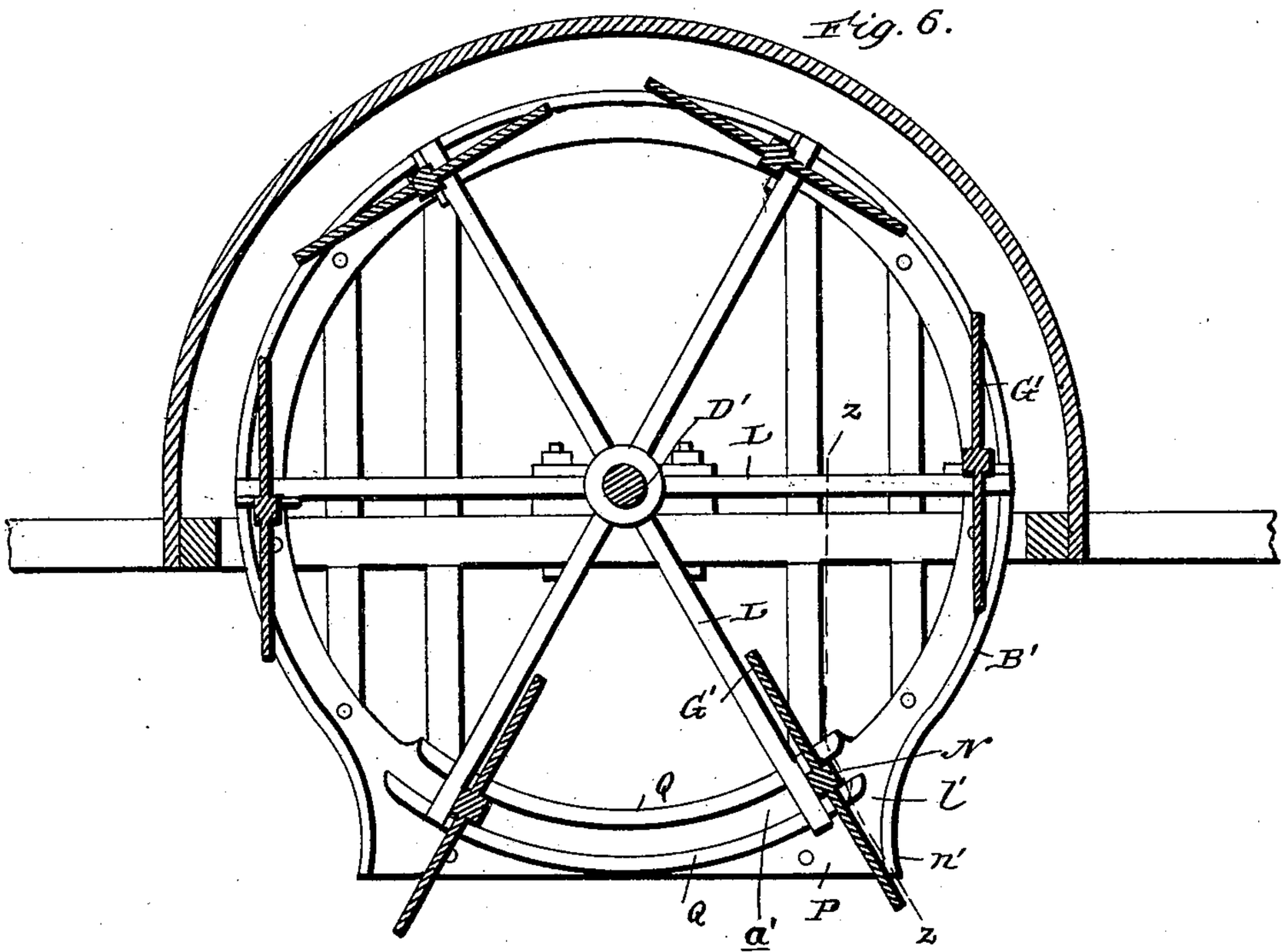
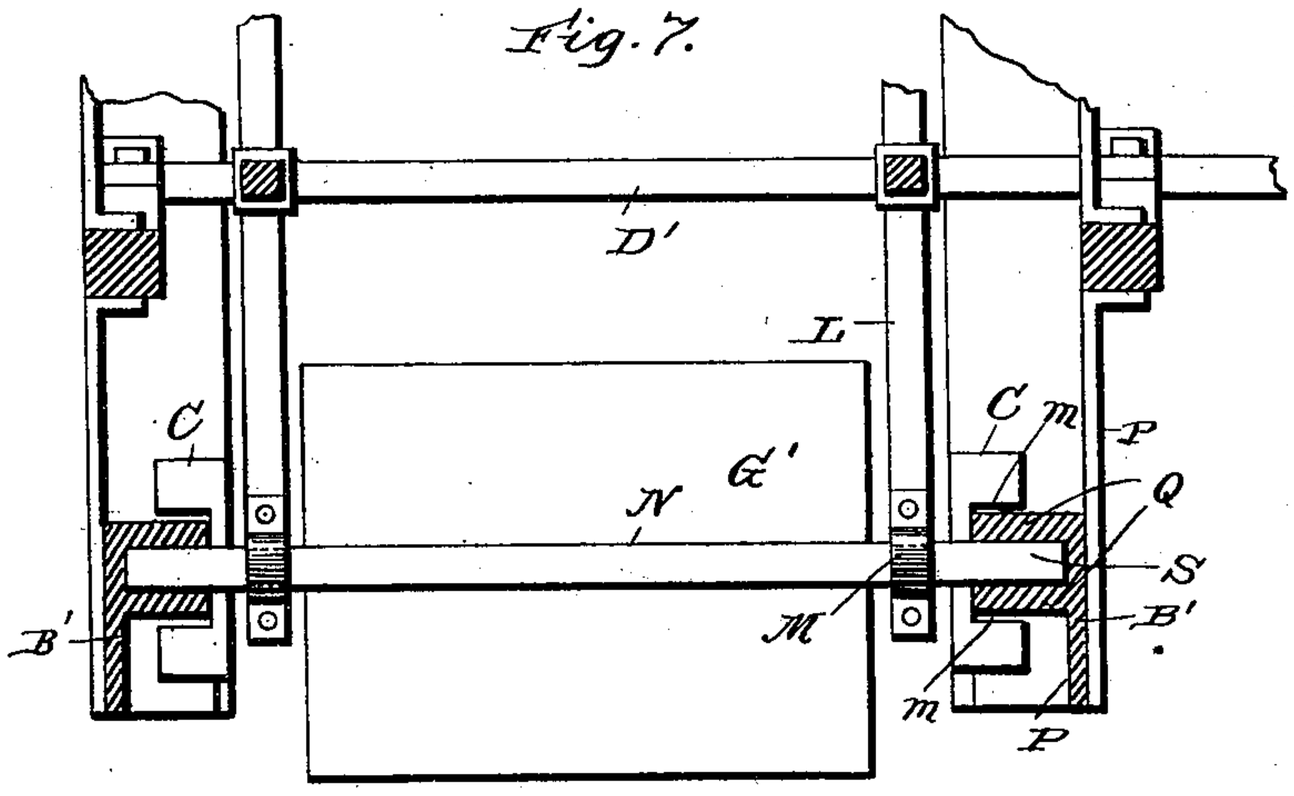


Fig. 7.



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UNITED STATES PATENT OFFICE.

WILLIAM WOOD, OF BANTA, CALIFORNIA.

PROPELLER.

SPECIFICATION forming part of Letters Patent No. 627,562, dated June 27, 1899.

Application filed April 27, 1898. Serial No. 679,034. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM WOOD, a citizen of the United States, residing at Banta, in the county of San Joaquin and State of California, have invented new and useful Improvements in Propellers, of which the following is a specification.

This invention relates to propellers for vessels; and it has for its objects to obtain an increased speed by a minimum amount of power in operating the propeller; to obtain a direct thrust motion for the blades and present the same broad and flat to the water instead of a glancing stroke; to reduce the size of the wheels, and consequently lessen the friction and power required for operation, and to so construct and arrange the parts that any desired number of paddles or blades may be brought into operation at the same time and presented to the water edgewise and drawn from the water in a similar position.

Other objects and advantages will appear from the following description and claims when taken in conjunction with the annexed drawings, in which—

Figure 1 is a longitudinal vertical sectional view of my improved apparatus, showing the same supported in a suitable framework. Fig. 2 is a plan view of the same with the crank or driving shaft partly broken away. Fig. 3 is a sectional view taken in the plane indicated by the dotted line *x x* on Fig. 1. Fig. 4 is a sectional view taken in the plane indicated by the dotted line *y y* on Fig. 3. Fig. 5 is an enlarged perspective sectional detail view. Fig. 6 is a vertical cross-sectional view of a construction showing a single wheel and may be considered a modification of the main construction, and Fig. 7 is a broken sectional view taken in the plane indicated by the dotted line *z z* of Fig. 6.

Referring by letter to said drawings, and more particularly to Figs. 1 to 5, inclusive, A indicates a framework which may be of elongated rectangular form or circular and may be a part of the framework or wheelhouse at the sides or stern of a vessel, according to the location or position in which it may be desirable to place my improvements. This framework has provided longitudinally and on opposite sides a guideway *a* to receive stay-blocks. As the ways on each side are similar, a description of one will suffice for both. These ways may comprise a horizontal beam *c*, and this beam may be faced with a metallic wear-plate *d* on its upper side, or the base may be formed of a metallic beam or otherwise suitably constructed and may be sustained in position by hangers *e*, depending from the horizontal beam *f* of the framework, or other suitable means. Above the beam *c*, parallel therewith and at a suitable interval, is a strip or bar *g*, which may be held in position by being secured to the hangers *e* or otherwise fastened and has its ends turned upwardly, as shown at *h*, for a purpose which will presently appear. On the inner side of this way and secured to the beam *c* I provide a vertically-disposed strip or bar *i*, which may extend the full length of the way, and in fact project a sufficient distance from each end thereof. On the inner side of this bar or strip *i* and at a point adjacent to the ends of the way I provide a lug *j*, as shown in Figs. 1 and 3 of the drawings, as will be hereinafter more fully described.

B indicates a flange which is formed on or secured to the inner side of the plate *i* and which is designed to coöperate with plates C, carried by the shaft of the paddles, in feathering the same. These flanges, there being one at each end of the way, have a vertically-depending branch *k*, which may extend slightly below the strip or bar *i*, and are arranged at a distance from the lugs *j*, so as to form a passage *l* for the entrance of the feathering-plates C. It will be observed that the lugs *j* are of a less width than the flange B, and the feathering-blades are cut out centrally on their inner edges, as shown at *m*, so as to straddle the lugs in passing the same. The flanges present curved shoulders *n*, and from this point they have sweeping curvatures *p*, which extend outwardly and upwardly, as shown, and merge into a straight flange which extends horizontally at the top of the framework, as shown at *q*, so as to hold the paddles in proper position during their entire revolution, or at least the upper half thereof.

Journaled in suitable bearings *s* are two transverse shafts D, one or both of which may terminate in a crank-arm *t*, as shown in Fig. 3 of the drawings, for the connection of any suit-

able power mechanism. Fixed to these shafts are two sets of sprocket-wheels E, and these sprocket-wheels are connected in pairs by endless chains F. A suitable number of the links of these chains are provided with bearings *u*, and in these bearings are journaled transversely-disposed shafts *v*, which may be held in position by means of clips *w* and bolts or other suitable fastening devices. These shafts are designed to turn freely in the bearings of the chains, and they have rigidly secured to them blades G. The feathering-plates C are also rigidly secured to these shafts and in the same plane as the blades or paddles G, so as to move therewith. The ends of the shafts project beyond the flanges B and into the ways *a*, where they are provided with fixed blocks H, which are designed to stay the blades G in a vertical position during action in the water and may assist in presenting them edgewise to the water, as will presently appear. These blocks may be composed of a solid piece of material of substantially rectangular form, so that their flat sides may travel upon the track or wear-plate *d* of the ways *a;* but in order to make them light and strong and reduce the friction to a minimum I prefer to make the blocks of two plates I and J, placed vertically side by side, and fix them to the angular ends of the shafts *v* and to place in the corners of said plates rollers *k*, which may project sufficiently beyond the plates to contact with the base or track of the ways and take up unnecessary friction during operation. These rollers are of course designed to turn freely in the plates, and in some cases should they strike the upwardly-curved ends *h* of the plate or flange *g* they will cause no damage or injury to the parts.

In operation it will be seen that when motion has been imparted to one or both of the shafts D the sprocket-wheels will be driven at a speed corresponding with the power applied and the chains will move in a course either to the right or left, as may be desired. As the plates C come to the entrance *l* between the lugs *j* and the shoulder *n* of the flange B at either end of the frame the lower portions of said plates will strike the lugs so that the blades G will be presented to the water edgewise and then quickly turned into a vertical position, so as to present their full flat faces to the action of the water until they reach the opposite end of the frame, where the plates C will contact with the depending terminals *k* of the flanges B and feather the blades, the flanges B or the continuation *q* thereof serving to hold the blades in such feathered position until they are again brought to the water's edge or surface. While the plates C serve to feather the blades, the blocks on the ends of the blade-shafts also aid in performing this operation, although said blocks are intended to stay the blades after they have been feathered or turned into a vertical position.

In Figs. 6 and 7 of the drawings I have shown a construction employing a single wheel, and instead of using a chain I journal the blades G′ on the spokes L, as shown at M, so that they may turn freely in their bearings, and I project the ends of the shafts N of said blades so as to extend beyond the spokes, as better shown in Fig. 7. In this construction I have a flange B′ and a plate P. The shafts N are also provided with feathering-plates C, which are cut away centrally on their inner sides at *m*, so as to straddle two curvilinear parallel flanges Q at the lower portion and on the inner sides of the plates P. These flanges Q, which are arranged parallel and in a curvilinear manner, the lower one of which, if continued, would serve with the flange B′ in forming a circle, are so arranged as to form a curvilinear passage or way *a′* between them of angular form in cross-section to receive the angular ends or stays S of the shaft N. I have shown the ends of these shafts N free from rollers, and such construction will answer for light wheels or propellers; but in heavy build of propellers I would provide the ends of the shafts with stay-blocks such as shown in the main construction and arm them with rollers at each corner, so as to reduce the friction to a minimum. In the operation of this construction as the wheel revolves and the blades are withdrawn from the water the plates C contact with the flange B′ and turn the paddles in their bearings and hold them in such positions until they are again ready to enter the water. As the plates C come to the entrance *l′* between the shoulder *n′* and the end of the lower flange Q said plates will strike the lower flange Q, so that the blades G′ will be presented to the water edgewise and then quickly turned, when the angular ends or stays of the shafts N enter the guideway formed by the flanges Q and hold the blades in such position so that they present their full flat faces to the water until the opposite end of the guideway is reached. By virtue of this there is no concussion incident to the entry of the blades or paddles into the water, and in leaving the water the blades or paddles do not lift any water, both of which are important advantages. Power is applied to the shaft D′ in a manner similar to that of the shaft or shafts D.

Having thus described my invention, what I claim is—

1. In a propeller, the combination with a suitable frame, a guideway arranged at the lower portion of the frame and formed by upper and lower walls, and a flange fixed with respect to the frame and having the terminal shoulders or depending portions so arranged that passages are afforded between them and the ends of the walls of the guideway; of a movable blade-carrier, shafts journaled in the carrier and having angular stays adapted to enter and move in the guidway, blades or paddles fixed on said shafts, and the feathering-plates fixed on said shafts and arranged

to be engaged by the flange and also by a portion of the lower wall of the guideway; said plates being cut out as indicated by *m*, substantially as and for the purpose set forth.

2. In a propeller, the combination of a frame, a flange secured thereon and having an upper horizontal portion and circular end portions terminating in depending portions or shoulders, a horizontal guideway interposed between the depending ends of shoulders of the flange and so arranged that passages are formed between its ends and said ends of the flange, fixed lugs *j* arranged adjacent to said passages, shafts journaled in the frame and carrying sprocket-wheels, chains taking around said wheels, shafts journaled in the chains, blades or paddles fixed on said shafts, feathering-plates also fixed on the shafts and arranged to be engaged by the flange and lugs *j* and stay-blocks also fixed on the shafts and movable in the guideway, substantially as specified.

3. A frame or support having ways *a* with bars or plates *g* lugs *j*, and flanges B; in combination with endless movable chains carrying propeller-blades, plates C secured to the shafts of said blades to coöperate with the flanges in feathering the blades, and blocks secured to the ends of the shafts and carrying friction-rollers to stay the blades in vertical position while in the water, substantially as specified.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

WILLIAM WOOD.

Witnesses:
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