(No Model.)

2 Sheets—Sheet 1.

T. PENNEFEATHER.

PROPELLER FOR VESSELS.

No. 300,888. Patented June 24, 1884.

Fig. 1.

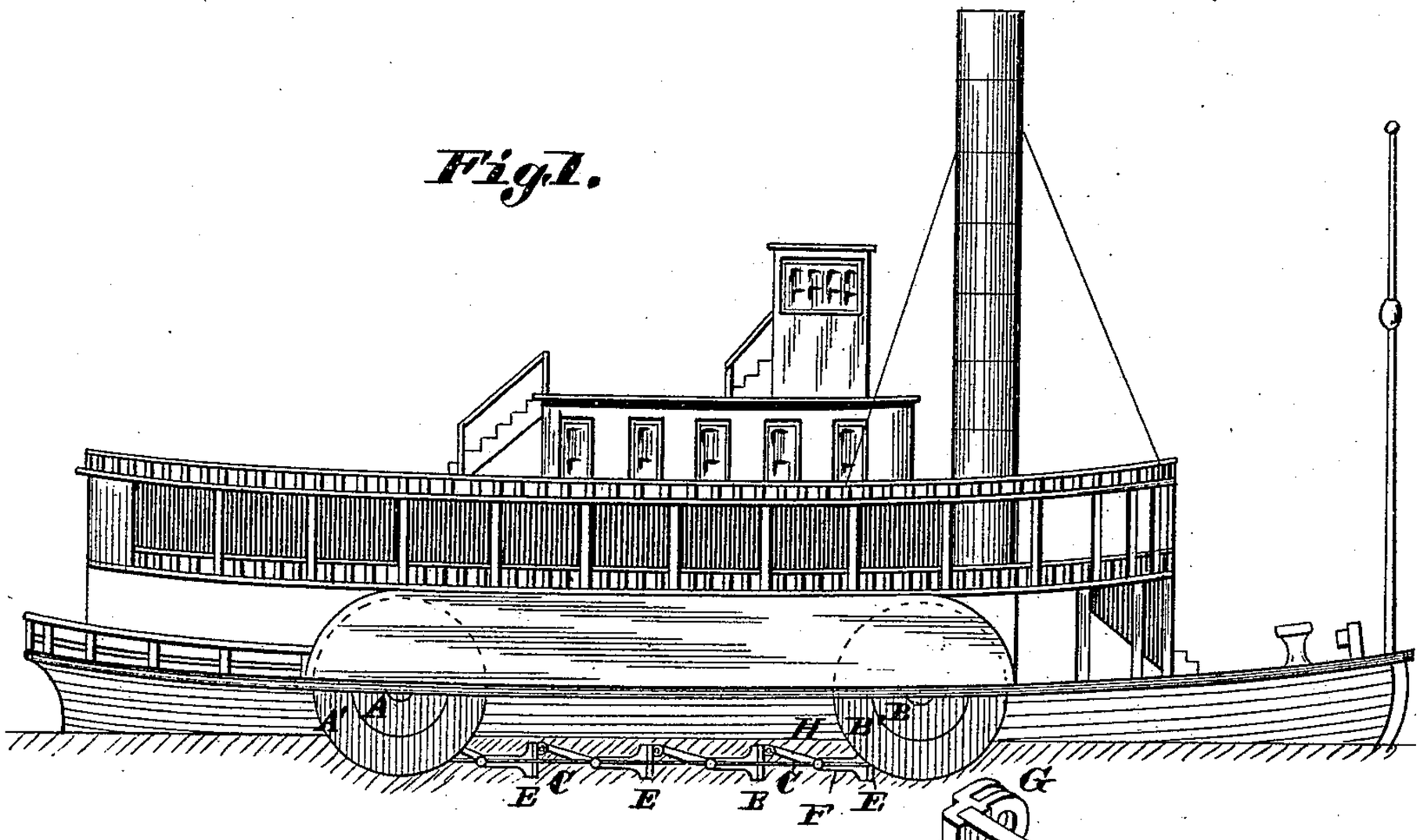

Fig. 2.

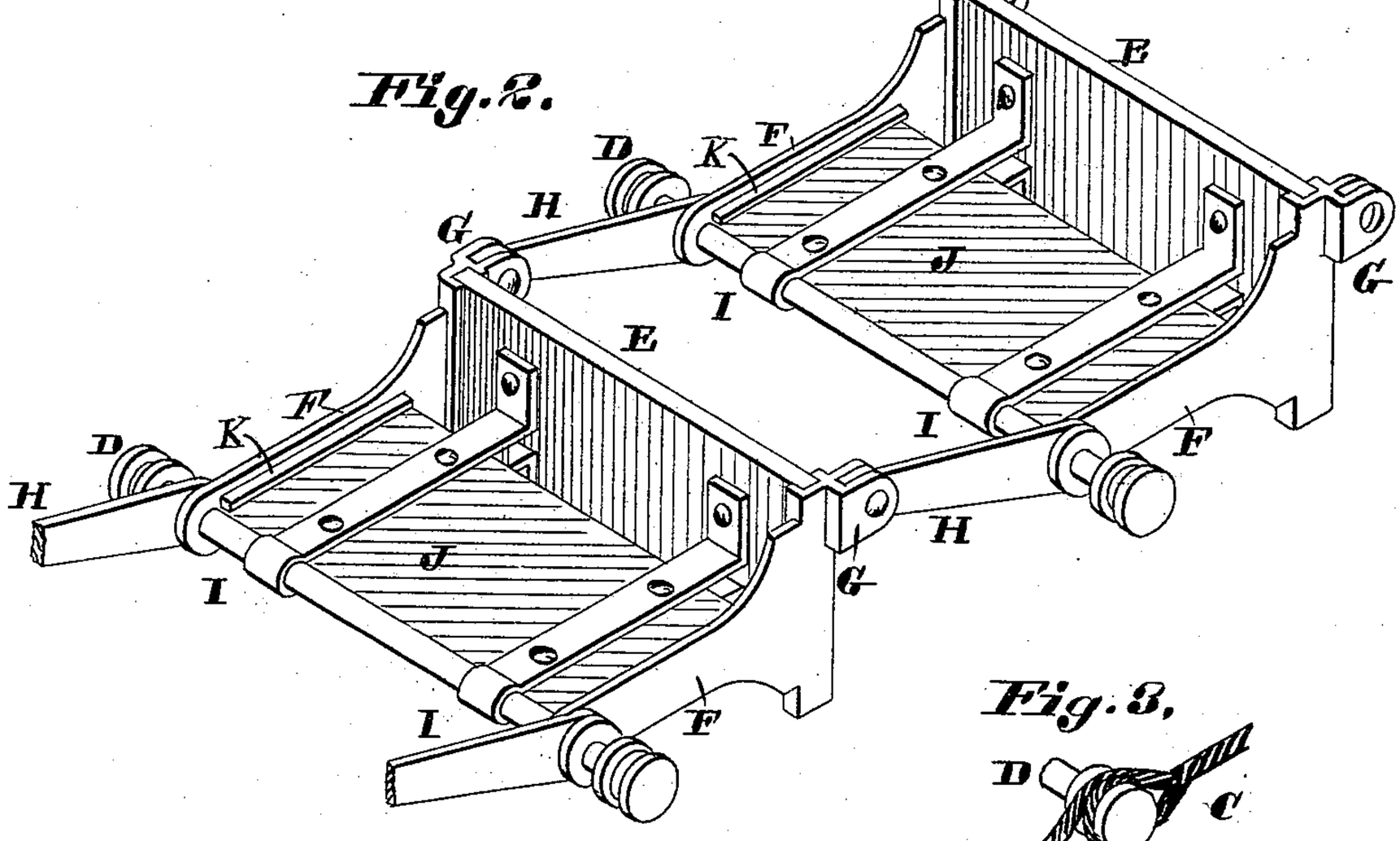

Fig. 3.

Attest:

Charles Pickles

Geo. H. Wheelock.

Inventor:

Thomas Pennefeather

By Knight Bro.

Attys.

(No Model.)

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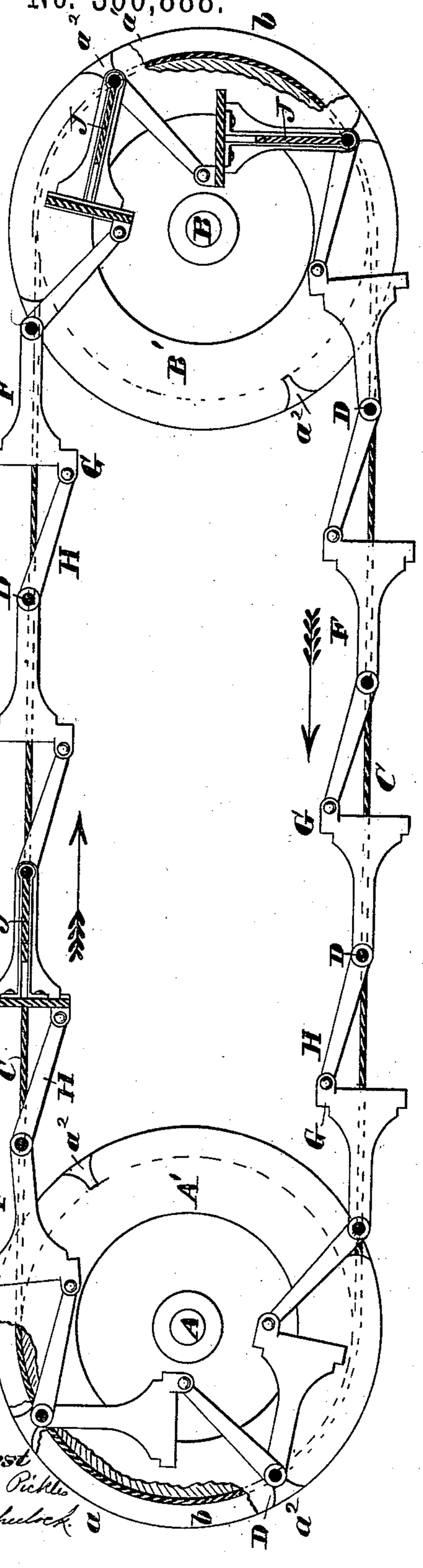

Fig. 4.

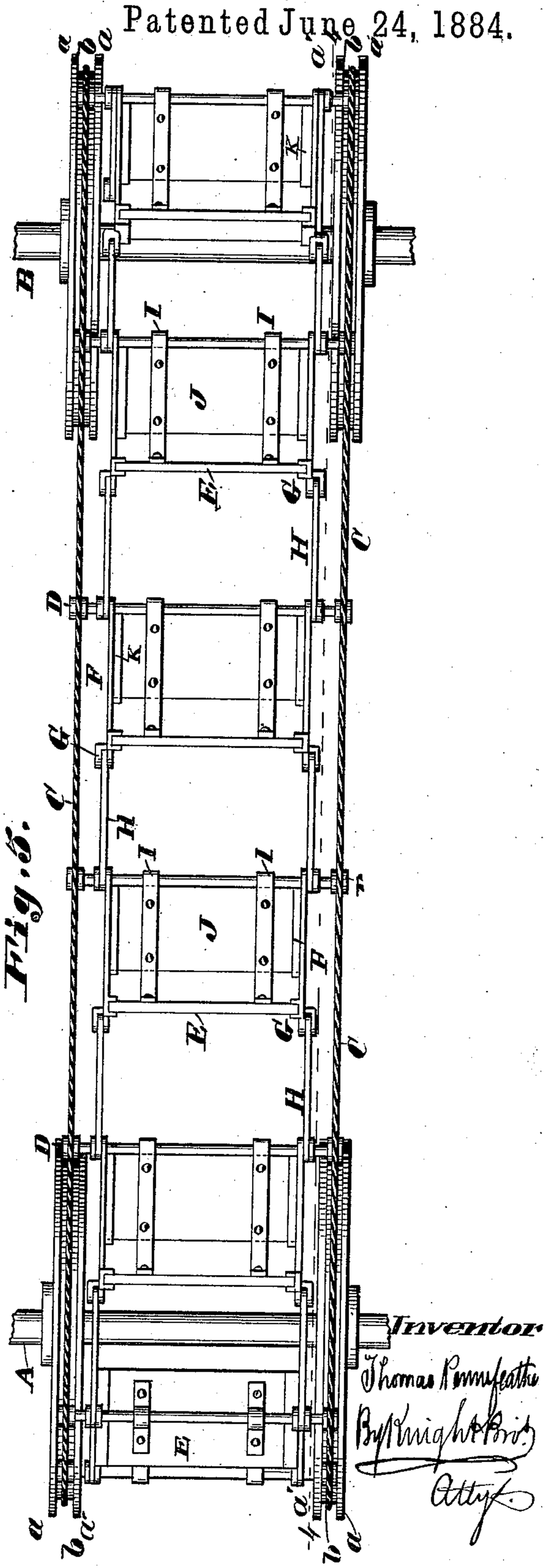

Fig. 5.

Attest
Charles Pickles
Geo. Wheelock.

Inventor
Thomas Pennefeather
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UNITED STATES PATENT OFFICE.

THOMAS PENNEFEATHER, OF ST. LOUIS, MISSOURI.

PROPELLER FOR VESSELS.

SPECIFICATION forming part of Letters Patent No. 300,888, dated June 24, 1884.

Application filed August 7, 1883. (No model.)

To all whom it may concern:

Be it known that I, THOMAS PENNEFEATHER, of the city of St. Louis, in the State of Missouri, have invented a certain new and useful Improvement in Propellers, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification.

Reference is made to claims for statement of invention.

Figure 1 is a side view of a river-steamboat with my improved propeller applied thereto. Fig. 2 is a perspective view showing two sections of the propeller connected together. Fig. 3 is a detail perspective showing the connection of a transverse bar of the propeller to the endless cable. Fig. 4 is a longitudinal section at 4 4, Fig. 5. Fig. 5 is a top view of the propeller.

The endless propeller is carried on two wheels, A′ B′, at each end, supported on shafts A and B, either of which may be the drive-shaft. A will be assumed to be the drive-wheel, and the shaft B, with its wheels B′, to be driven by the cables of the propeller. The cables are represented at C. I prefer to make them of steel wire, but do not confine myself to this or any particular material or construction. Chains of any suitable construction might be used. These cables are made endless, either being each in one piece or in a number of sections connected together in any suitable manner. The wheels A′ and B′ are all of similar construction, having peripheral flanges *a a′*, between which is a groove, *b*, receiving the cable. The inner flange, *a′*, has gaps a^2, formed in the edge, for the reception of the transverse bars D, serving at intervals to connect the two cables together, and also to support the buckets on the cables. The buckets are shown at E, extending nearly from cable to cable, there being sufficient space to prevent the buckets from coming in contact with the wheels. At each end of the bucket is an arm, F, whose ends are hinged to one of the bars D, so that the bucket is capable of oscillatory movement on the rod. At the inner corners of the buckets are ears G, connected by rods or links H with the next cross-bar, to which the aforesaid arms of the bucket are connected. Thus each bucket is connected to two contiguous cross-bars D—to the first by two arms extending at right angles to the bucket from the middle of each end and by links connected to two ears at the corners. In addition to the arms F, there are strap-arms I, extending from the face of the bucket to the same bar to which the arms F are connected, the connection with the bar being a strap-joint, allowing the oscillatory movement of the bucket, as aforesaid. The strap-arms embrace a plate or board, J, which is thus always at right angles to the bucket and forms an efficient guide to steady the bucket in its passage through the water.

K are cleats or strips on the inner sides of the arms, between which the ends of the plates or guide-buckets J are securely held.

It will be seen that the buckets enter and leave the water with their faces almost vertical, and travel aft in this position. To explain this movement: It will be seen that as the cable takes the curve of the wheel in passing over it the contiguous bars D approach each other, and the angle between the links H and the bucket becomes more acute, so that the bucket is carried inward toward the shaft B. Then, as the bucket approaches the water and the part of the cable to which the bucket-arms F are attached leaves the lower part of the wheel, the bars D to which the bucket is connected separate, and the bucket is moved edgewise into the water as the angle between the links H and bucket becomes more obtuse, and the bucket consequently approaches the periphery of the wheel. The action is reversed at the drive-wheels A′, when the approach of the two bars to which the bucket is connected (as the cables are curved over the wheels) causes the bucket to be lifted edgewise from the water as it approaches the shaft.

I have shown the propeller upon one side of the vessel and extending about half the length of the hull; but I do not confine myself to any particular position or length. The propeller might be used centrally along the middle of the boat, in place of one on each side, and may be made of any length desired.

It will be seen, by reference to Fig. 4, that the buckets J enter the water edge first, and consequently cause no splashing, and are in position to cause the propulsion of the boat until the bucket E, following, enters the water.

The buckets J form a very effectual brace to the arms F.

I claim as my invention—

1. In a propeller, the combination of endless cables, cross-bars secured to the cables, and buckets each having arms hinged to one cross-bar, and links hinged to the bucket and to the next cross-bar, the buckets being supported independently of the cables by the cross-bars, as set forth.

2. In a propeller, the combination of endless cables, cross-bars secured to the cables, buckets independent of the cables, each having arms hinged to one cross-bar, and links hinged to the bucket and to the next cross-bar, and wheels to support the cables and cross-bars, the bending of the cables in passing over the wheels forcing the buckets inward by shortening the distance between the cross-bars, as set forth.

3. In a propeller, the combination of paired wheels at front and rear, each pair of wheels mounted on a single shaft to turn together, each wheel having two flanges forming a groove, the inner flange having openings, cables in the grooves, cross-bars received by the openings, and buckets between and hinged to the cross-bars, the buckets arranged to feather between the wheels in passing around the shafts, as set forth.

4. In a propeller, the combination, with a bucket, E, of the guide-bucket J, secured at right angles thereto, as set forth.

5. The combination of cross-bars D, bucket E, arms F, having ears G at their inner corners and hinged to one cross-bar, and links H, hinged to the ears and to the next cross-bar, as set forth.

6. The combination of cross-bars D, buckets E, secured to one cross-bar by arms F, having ears G at their inner corners and cleats K on their inner sides, links H, hinged to the ears and to the next cross-bar, and guide-buckets J, secured between the cleats on the arms, as set forth.

7. The combination of cross-bars D, bucket E, arms F, securing the bucket to one cross-bar having ears G, links H, hinged to the ears and to the next cross-bar, guide-bucket J, and strap-plates I, bracing the buckets and guide-buckets to a cross-bar, as set forth.

THOMAS PENNEFEATHER.

Witnesses:
SAML. KNIGHT,
GEO. H. KNIGHT.