

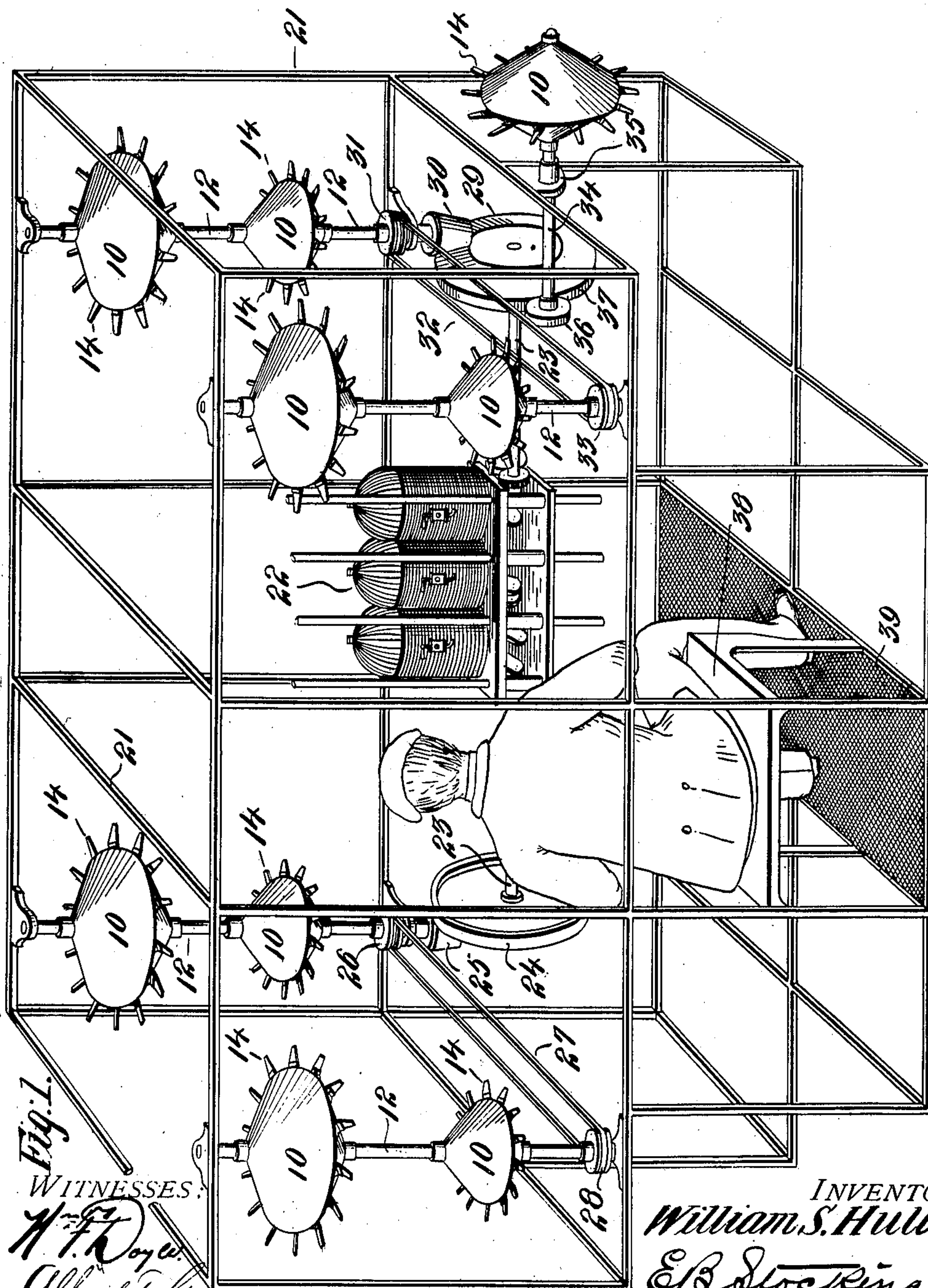
No. 896,833.

PATENTED AUG. 25, 1908.

W. S. HULL.  
PROPELLER.

APPLICATION FILED OCT. 15, 1907.

2 SHEETS—SHEET 1.



**Fig. 7.**

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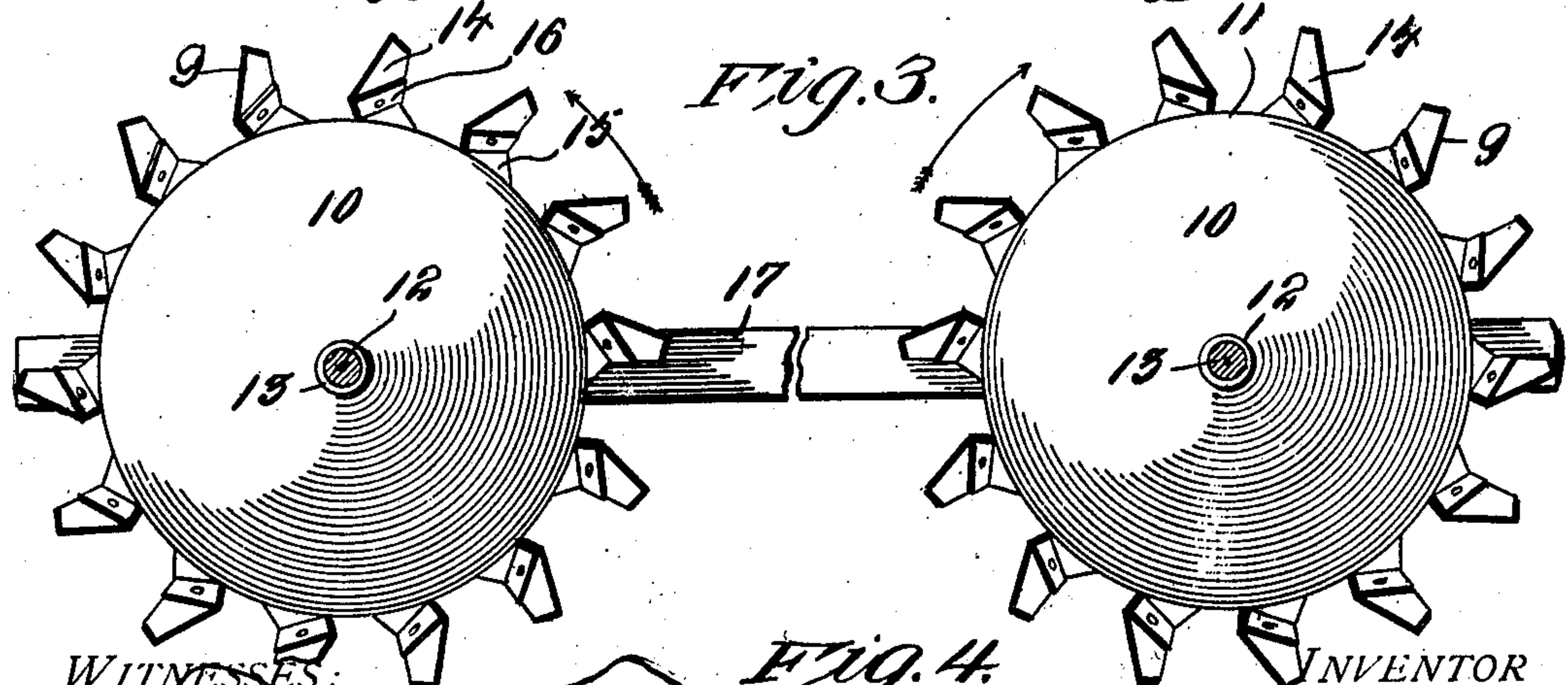
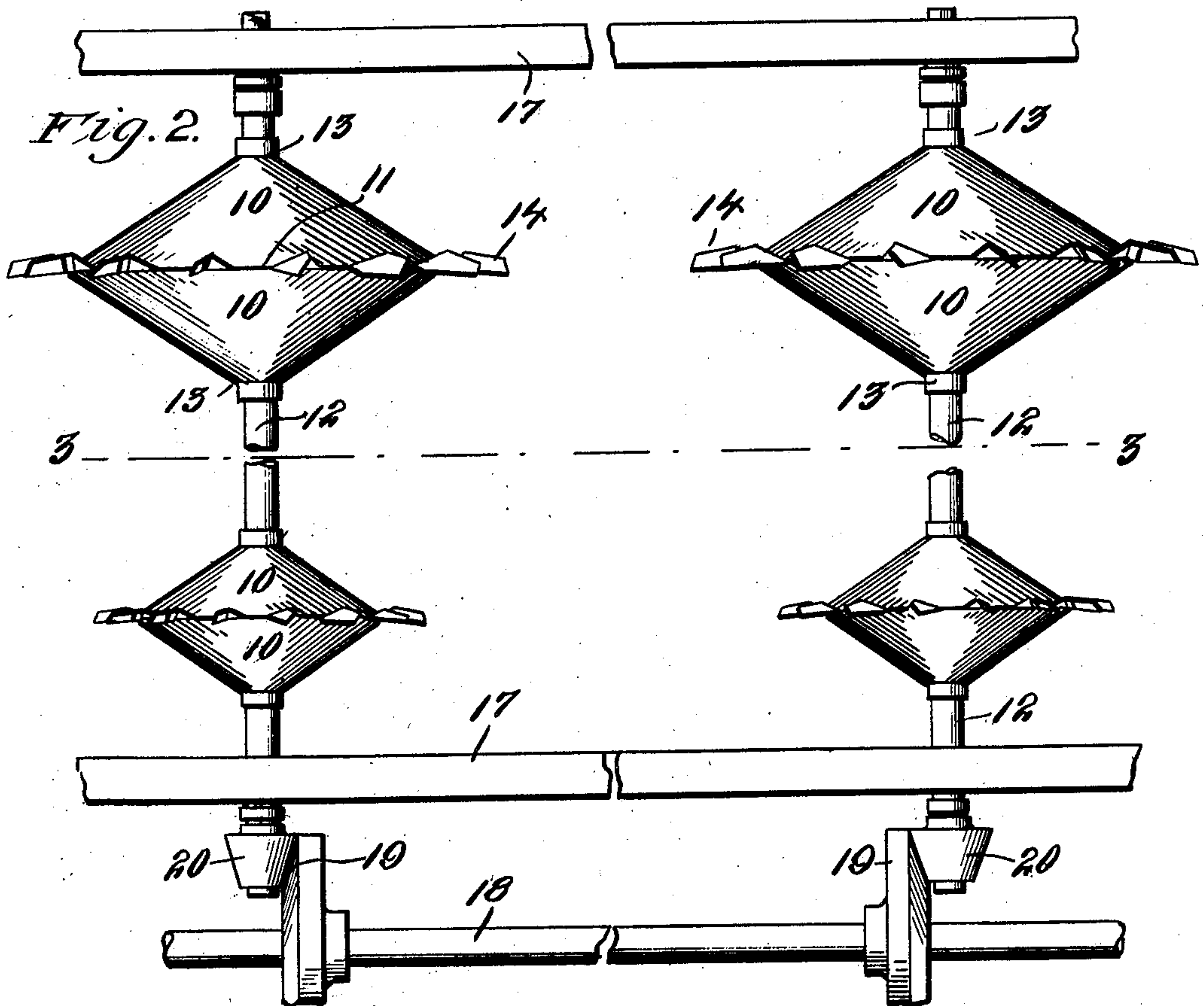
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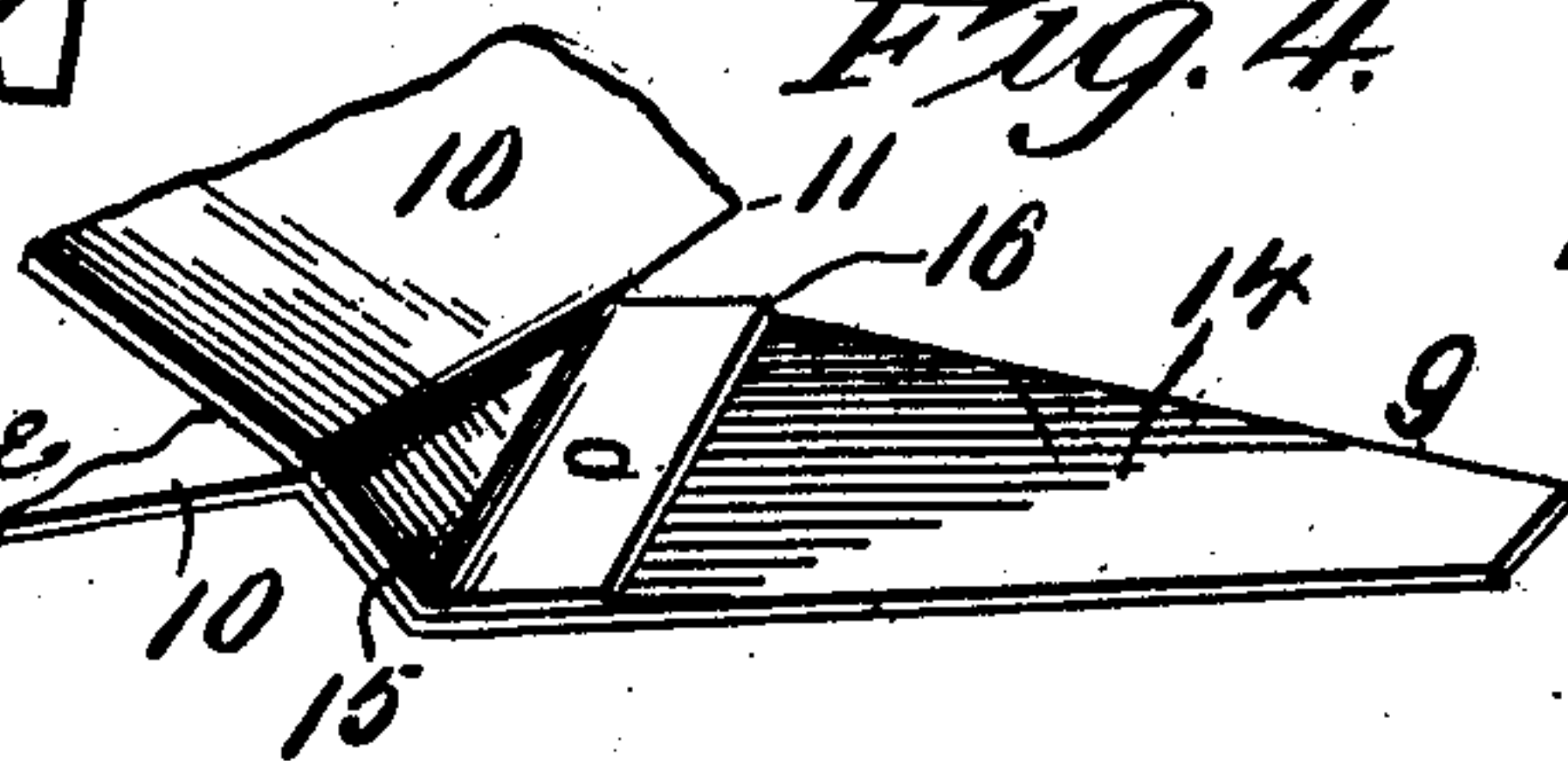
APPLICATION FILED OCT. 15, 1907.

2 SHEETS—SHEET 2.



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# UNITED STATES PATENT OFFICE.

WILLIAM S. HULL, OF JACKSON, MISSISSIPPI.

## PROPELLER.

No. 896,833.

Specification of Letters Patent.

Patented Aug. 25, 1908.

Application filed October 15, 1907. Serial No. 397,536.

*To all whom it may concern:*

Be it known that I, WILLIAM S. HULL, citizen of the United States, residing at Jackson, county of Hinds, and State of Mississippi, have invented certain new and useful Improvements in Propellers, of which the following is a specification, reference being had therein to the accompanying drawing.

This invention relates to a propeller, and particularly to a form having blades at the periphery thereof.

The invention has for an object to provide a novel form of propeller comprising a body portion composed of cones with their bases in contact and having a series of blades disposed at the line of said bases and deflected laterally from a radial line extending outward from the base of said cones.

A further object of the invention is to utilize the gyrostatic action of the body of the propeller in balancing a frame or platform by disposing such propellers at opposite sides thereof and revolving them toward each other.

Another object of the invention is to provide a plurality of the propellers upon each driving shaft, the successive propellers being of decreasing diameter and having blades disposed upon their periphery whereby both the gyrostatic balancing and the propulsion are secured.

Other and further objects and advantages of the invention will be hereinafter fully set forth and the novel features defined by the appended claims.

In the drawings:—Figure 1 shows one application of my invention; Fig. 2 is an enlarged elevation of the propellers arranged in a frame; Fig. 3 is a section on line 3—3, Fig. 2; Fig. 4 is a detail perspective of one of the blades.

Like numerals refer to like parts in the several figures of the drawing.

In the form of propeller here shown, the body thereof is coniform and comprises opposite cones 10 with their bases in contact on a radial line 11 extending at a right angle to the driving shaft 12 of the propeller which passes through the apices 13 of the cones. The propeller blades 14 are disposed on the radial line 11 at the bases of the cones and deflected laterally and diagonally therefrom toward the outer face of the cone so as to form a continuous series of peripherally disposed blades tapered outwardly to present an inclined face in the forward driving action of the propeller.

These propellers may be formed in any desired manner, for instance, of sheet material as shown in Fig. 4, the blade 14 being formed from the edge of one sheet, while the opposite sheet is provided with a bracing flange 15 at the base thereof properly disposed to deflect the blade and having a lip 16 secured to the base of the blade in order to stiffen and brace it. These propellers are capable of application for various forms of propulsion, and are shown in Fig. 2 as having their shaft 12 mounted in the frame 17 and driven from the shaft 18 which is shown as provided with a friction gear 19 in contact with a friction pinion 20 on the shaft 12.

When a plurality of propellers are used on a single driving shaft their efficiency is increased by successively reducing the size thereof so that the action of the blades upon one does not affect the remaining propellers in a direct line therewith.

When the propellers are mounted at opposite sides of the frame, as shown in Fig. 2 the bodies thereof when revolving at a high speed produce a gyrostatic balancing and comprise a circular rotating plane forming a gyrostact with propelling blades at its periphery. This balancing and propulsion may be very advantageously utilized for aerial navigation, and a means for mounting the propellers for that purpose is shown in Fig. 1 where the main frame 21 may be composed of any desired light material, and the shafts 12 carrying the cones 10 and blades 14 mounted thereon in vertical planes and at opposite sides thereof. They may be geared in any desired manner to revolve toward each other and at an equal speed, for instance, by means of the gas engines shown at 22 which are connected to the driving shaft 23 having a friction disk 24 secured to the end thereof and being in contact with the cone 25 on one of the driving shafts 12. This shaft is supplied with the pulley 26 over which belt 27 extends to a similar pulley 28 upon the parallel shaft at the same side of the frame. The opposite end of the shaft 23 is also provided with a friction disk 29 in contact with the cone 30 carried by the driving shaft 12 at that end of the frame. This shaft has thereon pulley 31 over which belt 32 extends to pulley 33 on the parallel shaft 12. If it be desired to utilize the propeller in a horizontal plane it may be accomplished by means of the arrangement shown at the right of Fig. 1 where the shaft 34 is disposed in a bearing 35 and car-



ries a friction wheel 36 adapted to bear upon the periphery 37 of the driving disk 29. The frame may be formed of any desired material or configuration, and the seat 38 may be disposed thereon adjacent to a platform 39 these parts only being generally illustrated in relation to the propeller.

In the operation of the invention, the propeller is adapted for rapid and economical propulsion of all kinds of conveyances and to act either upon air or water. The construction thereof embodying a coniform body having the radially disposed blades is such as to produce the maximum driving capacity when revolving at a high speed, and also a form in which the conical surfaces direct the air to the blades, and owing to their small surface the entire area travels at practically a uniform speed with the pressure substantially the same throughout. A very high speed can thus be secured without excessive strain or resistance on the shaft. The friction of the air passing over the surface of the disk or cone is greatly reduced, and the propeller may be conveniently formed from plates of sheet material riveted together and the blades braced in that manner.

The diagonal disposition of the blades from a radial line extending peripherally of the base of the cone causes the air to be discharged backward and outward therefrom so as not to strike the successive propellers on the same shaft and for securing the maximum force from the series of propellers disposed at intervals on said shaft. When such a series is used it is desirable that the front propeller be of greatest diameter, and the remaining of successively less diameters so that the front propellers will not discharge against the rear. It will also be observed that the rapid rotation of the propellers in opposite directions produces a gyrostatic force which maintains and balances the frame or platform on which they are mounted thus preventing displacement thereof during the driving action. The small propelling blades upon the body produce the maximum force for a given area, power and speed of rotation, and the invention therefore comprises a gyrostatic propeller.

Having described my invention and set forth its merits, what I claim and desire to secure by Letters Patent is:—

1. A propeller comprising a body formed of oppositely disposed cones with their bases in contact, and blades at the bases of said cones and deflected laterally therefrom at one side and extended radially to said bases and diagonally to the radial line thereof.

2. A propeller having a body composed of oppositely disposed cones of sheet metal, the base of one cone being extended and deflected as a blade, and the base of the opposite cone extended to reinforce said blade.

3. A propeller having a body formed of cones with their bases in contact, and blades inclined laterally to a radial line from the base of said cones, one edge of said blade being tapered from its base outwardly.

4. A propeller having a body formed of cones with their bases in contact, a blade disposed at said base and inclined laterally to a radial line extending therefrom, the area of said blade decreasing from its base to its free end.

5. In a propeller, a driving shaft, a plurality of coniform bodies having peripherally disposed blades, said bodies being of successively less diameter.

6. In an air ship, a frame having on opposite portions a plurality of horizontally disposed gyrostatic bodies of successively less diameter and each provided with propeller blades at their peripheries, and means for revolving said blades in opposite directions.

7. In an air ship, a frame provided with driving shafts at opposite portions thereof horizontally disposed, coniform gyrostatic bodies mounted on said shafts and provided with small propeller blades secured at the periphery thereof, and means for revolving said blades in opposite directions and at a uniform speed.

In testimony whereof I affix my signature in presence of two witnesses.

WILLIAM S. HULL.

Witnesses:

C. A. THOMSON,  
J. C. HOOD.