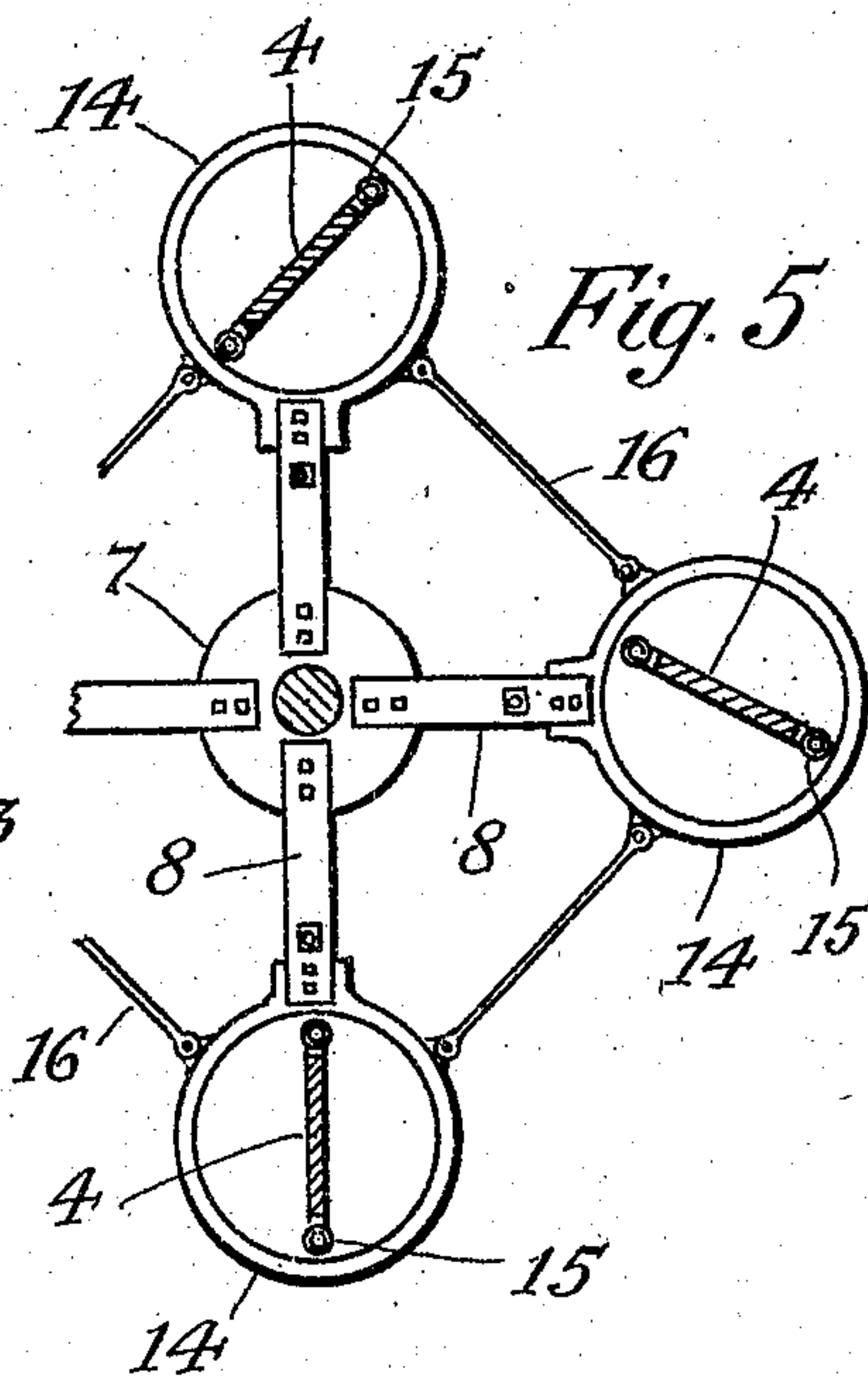
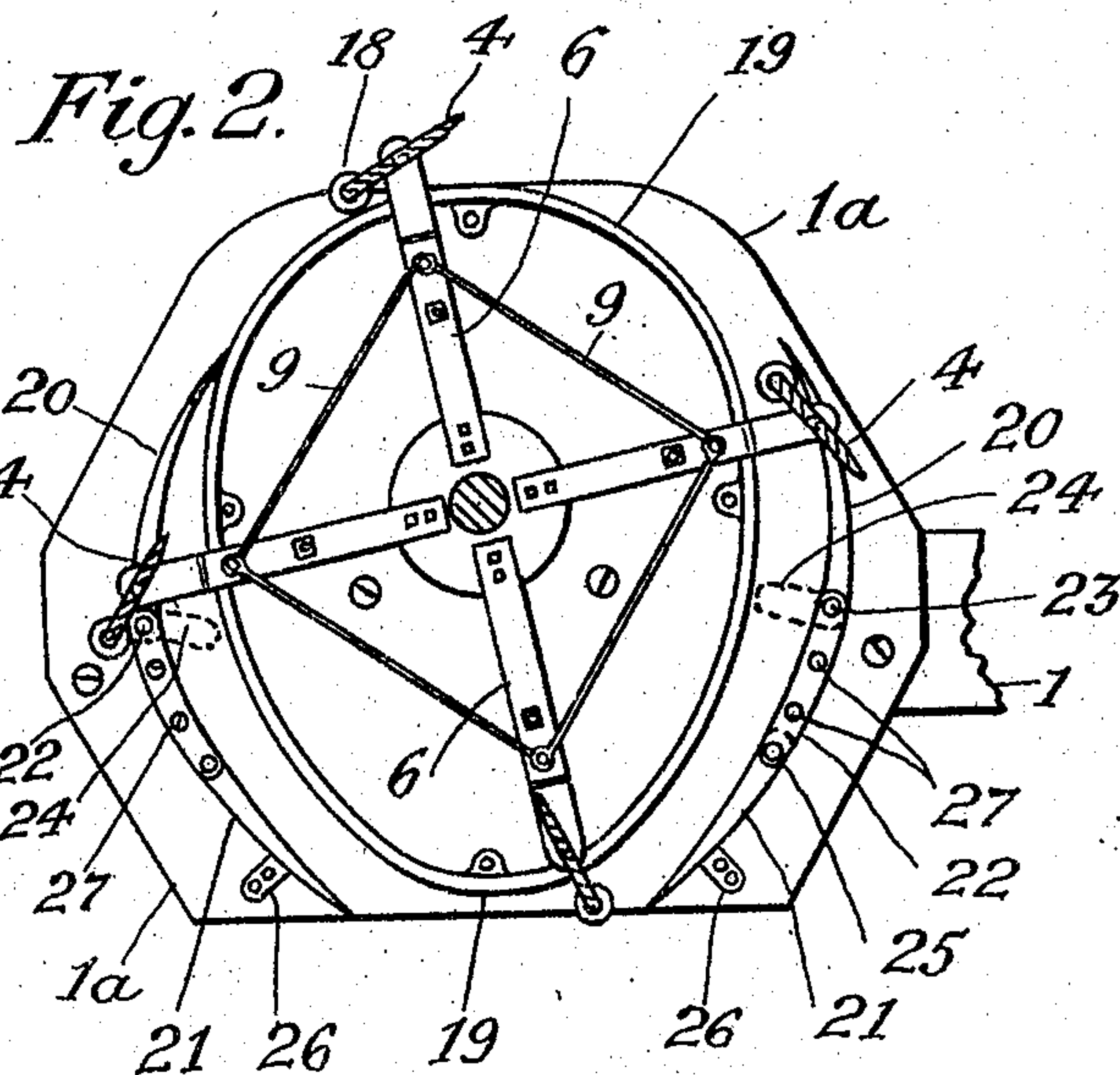
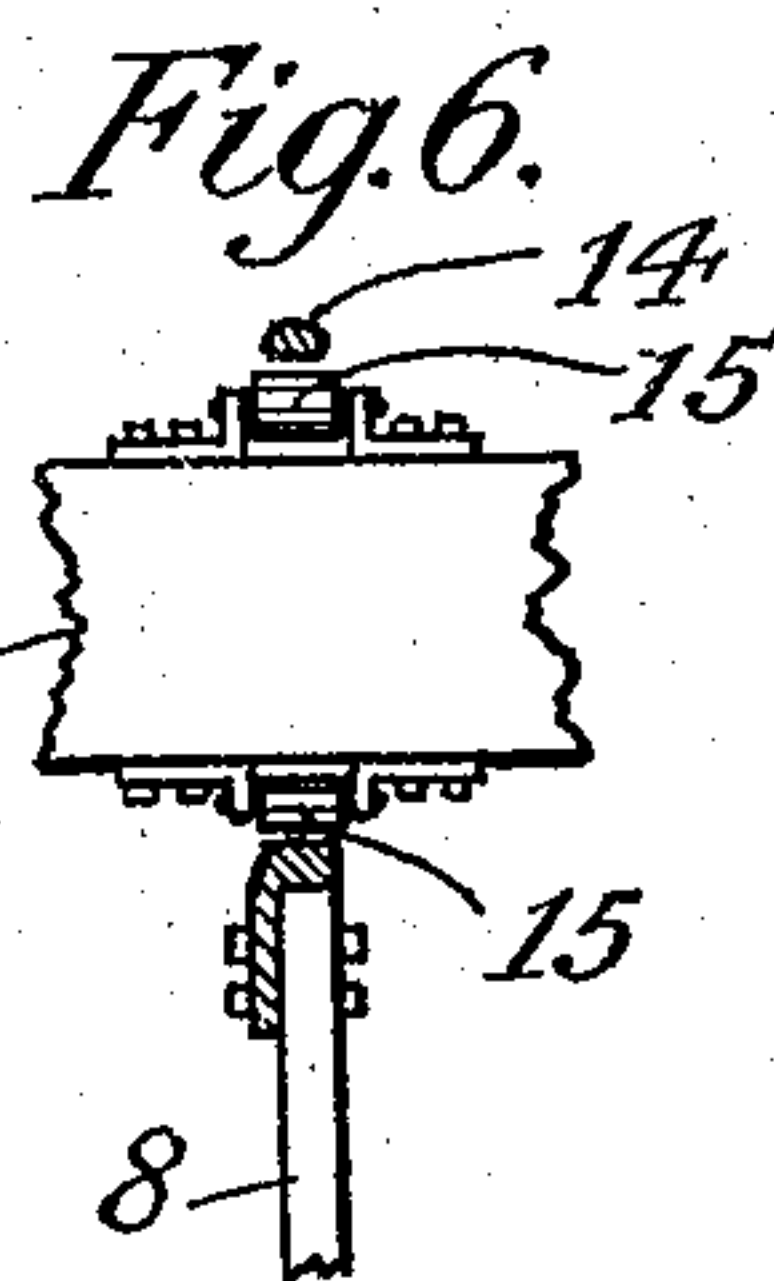
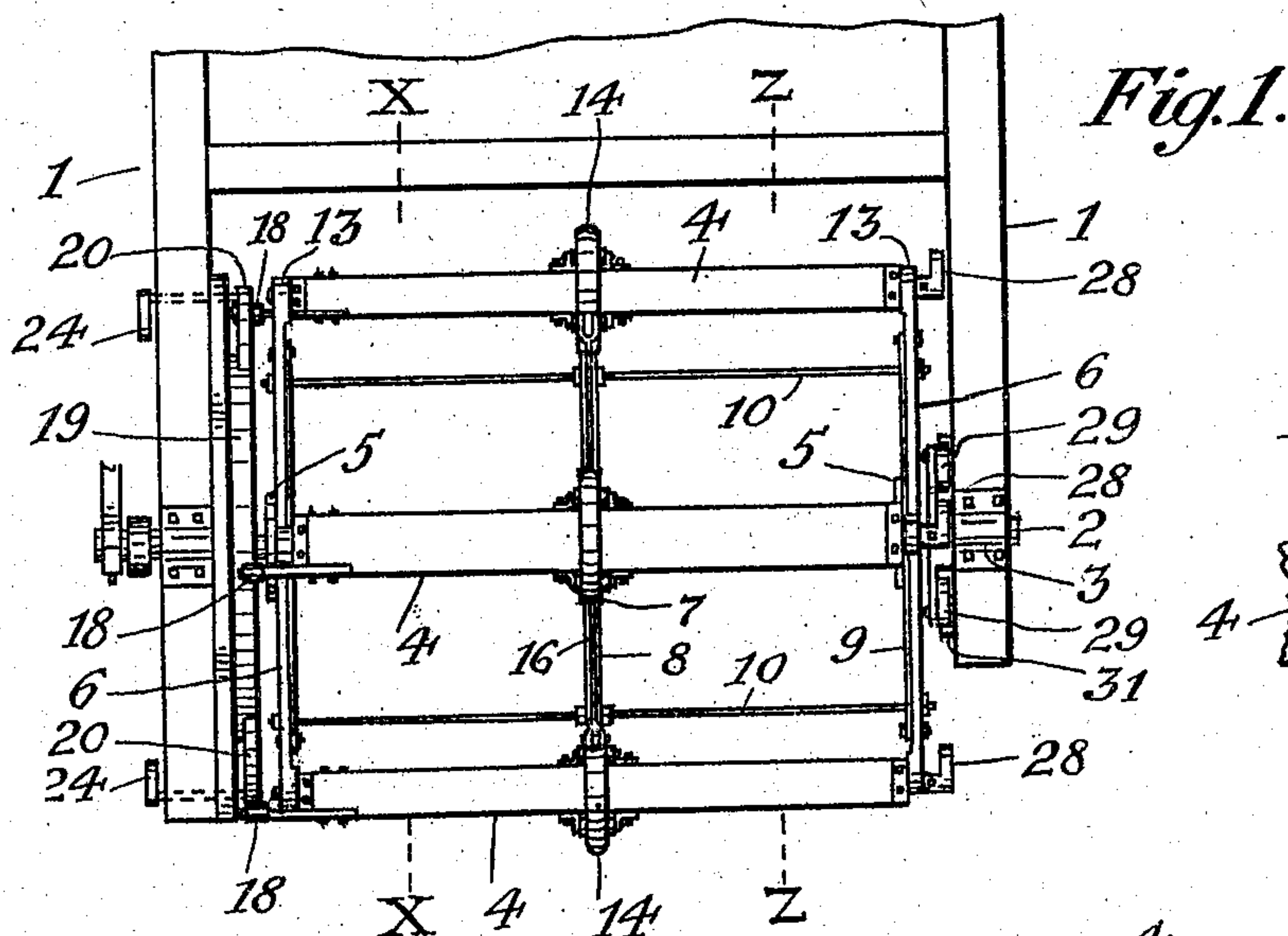


No. 815,776.

PATENTED MAR. 20, 1906.

E. A. YOUNG.
FEATHERING PADDLE WHEEL.
APPLICATION FILED AUG. 21, 1905.

2 SHEETS—SHEET 1.



Witnesses:
Theo. Lagaard.
H. A. Bowman.

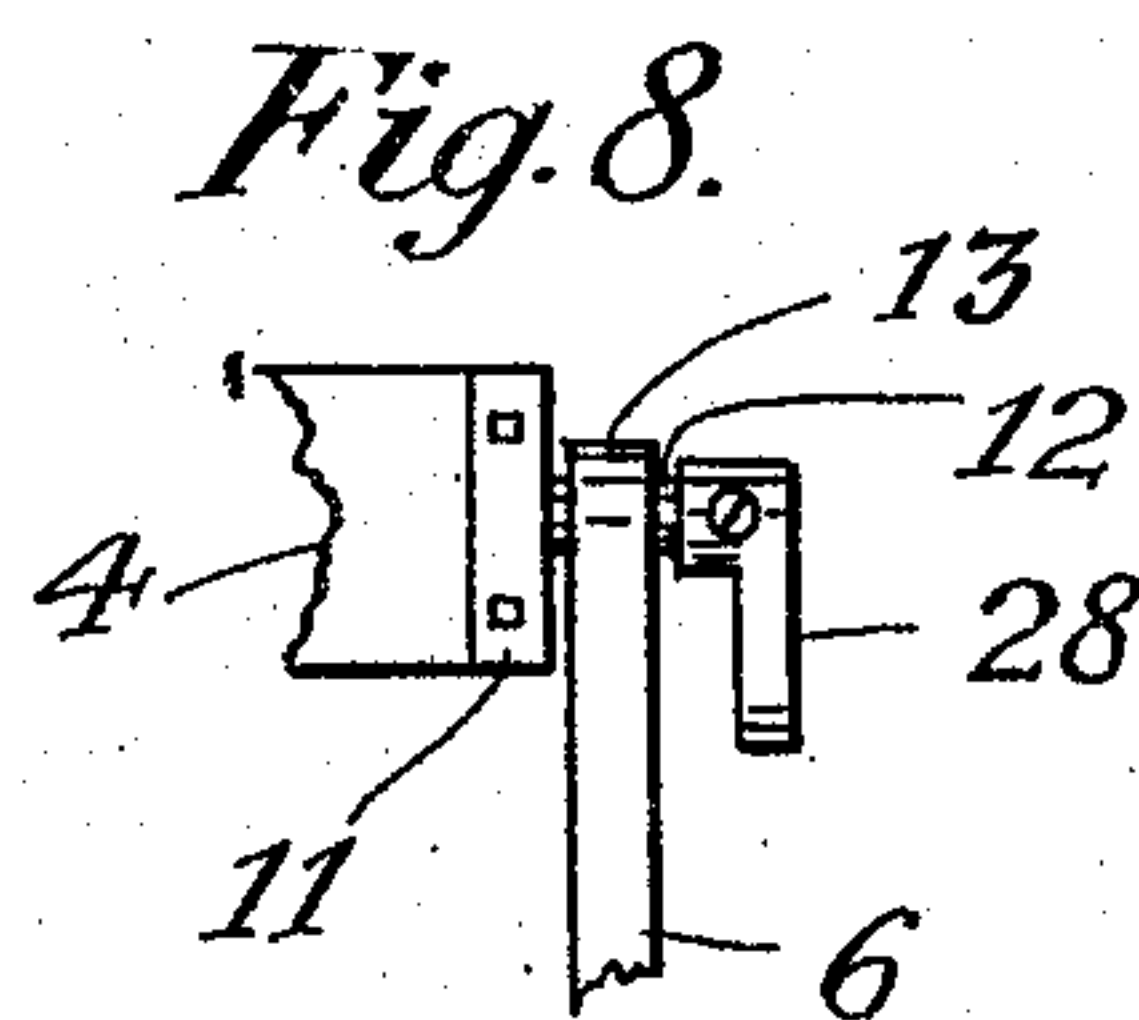
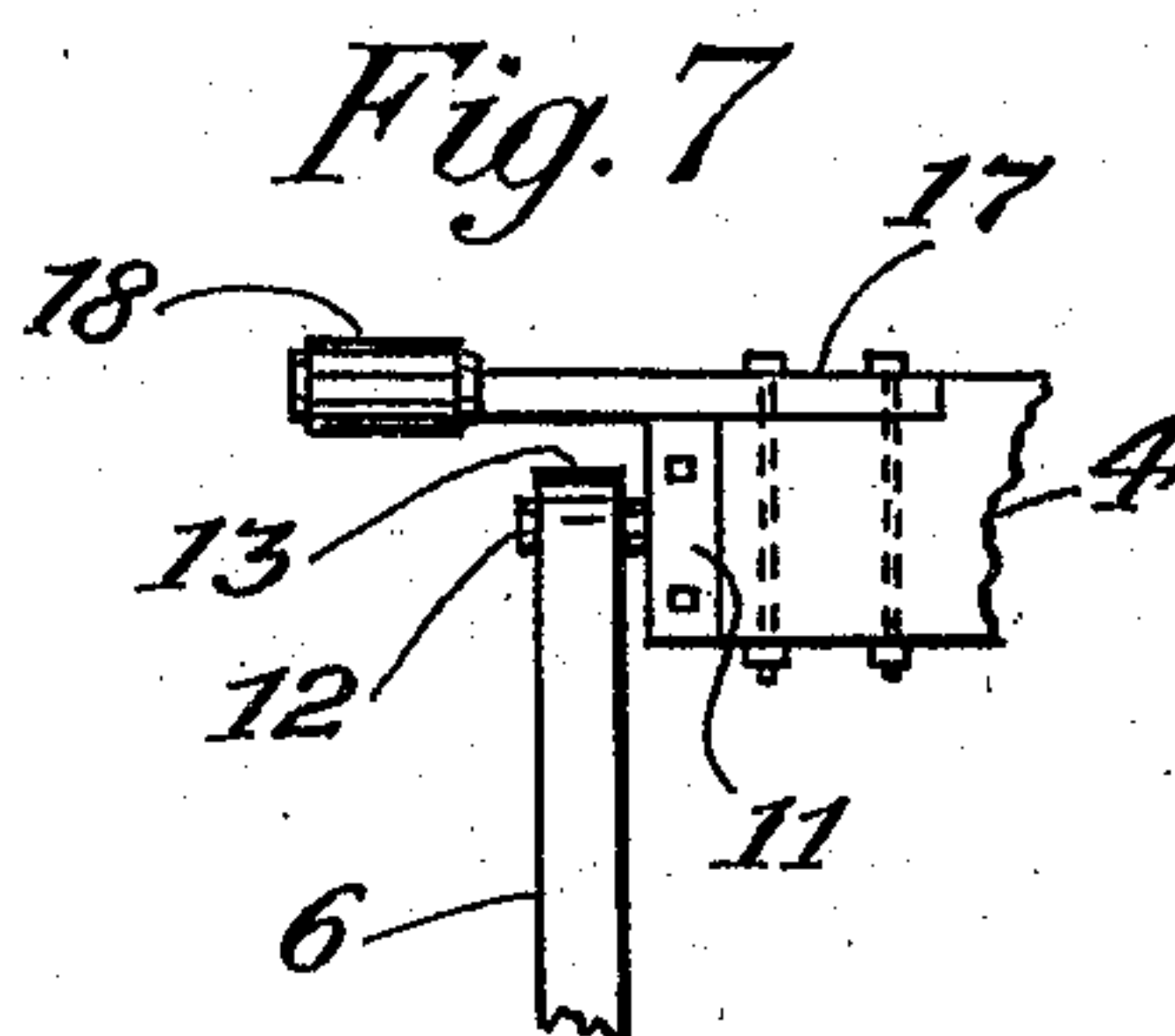
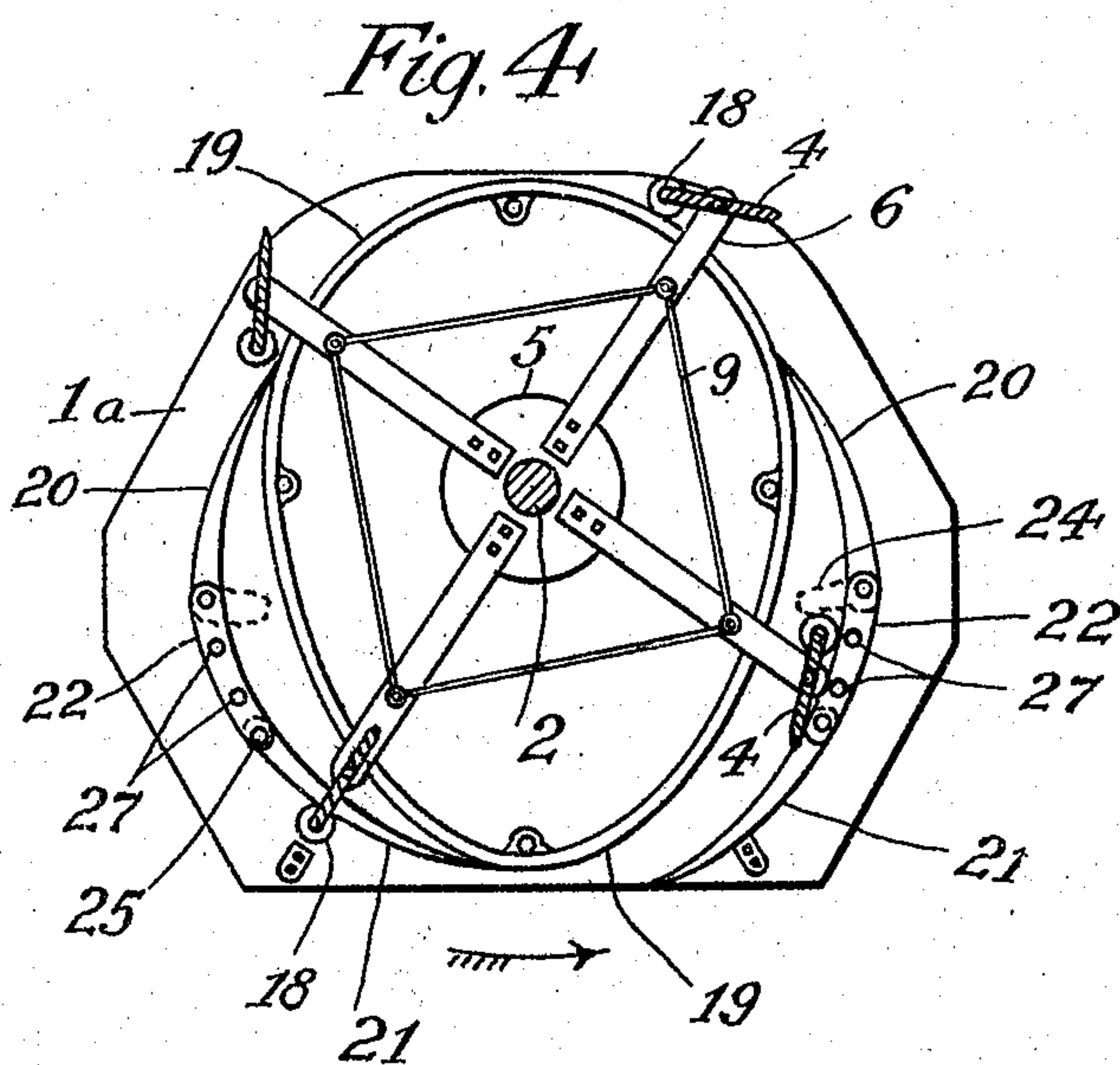
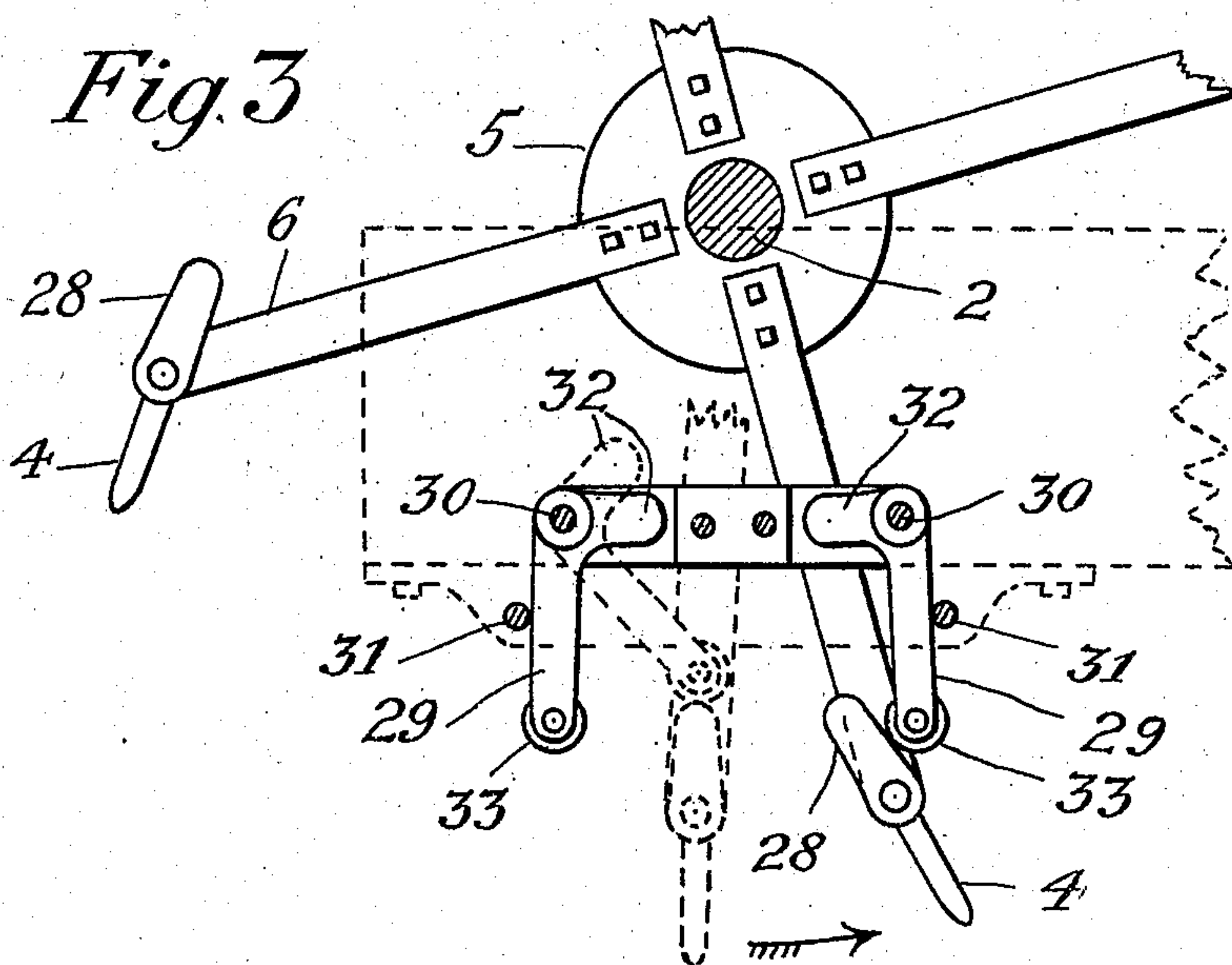
Inventor;
Edwin H. Young.
By P. H. Gunkel
his Attorney.

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2 SHEETS—SHEET 2.



Witnesses
Theo. Laguard.
H. A. Bowman.

Inventor
Edwin A. Young
By P. V. Funckel
his Attorney.

UNITED STATES PATENT OFFICE.

EDWIN A. YOUNG, OF MITCHELL, SOUTH DAKOTA.

FEATHERING PADDLE-WHEEL.

No. 815,776.

Specification of Letters Patent.

Patented March 20, 1906.

Application filed August 21, 1905. Serial No. 275,023.

To all whom it may concern:

Be it known that I, EDWIN A. YOUNG, a citizen of the United States, residing at Mitchell, in the county of Davison and State of South Dakota, have invented certain new and useful Improvements in Feathering Paddle-Wheels, of which the following is a specification.

My invention relates to paddle-wheels for propelling vessels.

The objects of the invention are to so construct and arrange the paddles or floats that they will enter and leave the water edgewise, and thereby avoid loss of power; to provide means for causing the paddles to be held in working position during the proper periods of their revolutions and means for tripping them to permit them to feather at the proper times, and generally to improve and simplify the construction and operation of the propelling mechanism, to the end of saving power and increasing the speed of the vessel. The improvements for accomplishing these objects are illustrated in the accompanying drawings, in which—

Figure 1 is a plan view of a paddle-wheel provided with my improvements. Fig. 2 is a transverse sectional elevation on the broken line xx of Fig. 1, viewed from the right, and showing the lower paddle at the place of tripping. Fig. 3 is a similar view from the left on the line zz , showing the relative positions of the paddles and tripping devices at the moment the tripping is effected. Fig. 4 is a similar view showing the positions of the paddles after they have passed somewhat beyond the positions shown in the preceding views. Fig. 5 is an enlarged transverse section of Fig. 1 on the broken line zz , looking toward the right, and showing the middle guides and supports for the paddles. Fig. 6 is a detail view, partly sectional, of one of the guides shown in Fig. 5. Fig. 7 is a detail view of the left-hand end and connections of one of the paddles of Fig. 1, and Fig. 8 is a similar view of the right-hand end of the paddle and connections.

In the drawings, 1 designates the supporting frame or beams, 2 the wheel-shaft mounted in journal-boxes 3, and 4 the paddles. For convenience of illustration only four paddles are shown, but any desirable number may be employed in use. The shaft 2 is driven in the usual way, and it is not deemed necessary to show or describe such means.

On the shaft 2, near its ends, are hubs 5, in

which the radial arms 6 for supporting the ends of the paddles are socketed or to which they may be fastened in any other way. On the middle of the shaft is a similar hub or collar 7, to which are fastened the radial arms 8 for carrying the supports and circular guides for the middle portions of the paddles. The arms 6 on the respective hubs 5 may be connected by tie-rods 9 and with the arms 8 by the longitudinal rods 10.

On the ends of the paddles are bolted or otherwise secured castings 11, provided with outwardly - extending spindles 12, arranged in line with the axes of the paddles, and these spindles are journaled in bearings 13, formed at the extremities of the arms 6, so that the paddles normally are free to rotate on their end bearings.

The middle supports consist of rings or circular guides 14, attached to the ends of the arms 8, and encircling the paddles. Each paddle has secured on its opposite sides within its guide-ring antifriction-rollers 15. These guide-rings serve to support the middle portions of the paddles, while the rollers permit the paddles to turn freely within the rings. The rings are connected to one another by tie-rods 16.

On the outer edge of one end (the left-hand end, as shown in Fig. 1) of each paddle is attached a bar 17, which extends beyond the paddle and carries at its extremity an antifriction-roller 18. A plate or frame 1^a, secured to the beams or framework 1, is provided with a fixed guideway 19 of somewhat oval shape, slightly pointed toward the lower end to serve as the inner guide for the rollers 18. At the outside of this path of travel of these rollers are upper and lower movable guides 20 and 21, respectively, which are connected to intermediate fixed guide-sections 22. The upper members 20 are pivoted, as at 23, and have counterweights 24, which cause them to gravitate to close the pathway, as indicated in Fig. 4 or at the left in Fig. 2, and an ascending paddle-roller 18 moves the guide 20 outward to clear the pathway, as indicated at the right in Fig. 2. The lower members 21 are pivoted, as at 25, to the part 22 and gravitate of their own weight to contact with stops 26 to keep the lower pathway normally open, as shown in Fig. 2. These guides may be adjusted by pivoting them in any of the holes 27 shown in the part 22. At the other ends of the paddles (the right in Fig. 1) the spindles 12 ex-

tend beyond the arms 6 and have rigidly secured to them wipers or tripping-arms 28, and on the frame 1 at that end of the wheel are two pendent catches or trips 29 for engaging the wipers 28. The trips 29 are pivoted at 30 to swing freely, but adjustable stops 31 are so placed on the frame as to prevent outward swinging movement beyond practically vertical position, and they are weighted by inward arms 32, adapted to hold them normally in position against the stops. On the lower ends of the trips are rollers 33, against which the wipers 28 contact in their movements.

In operation when the wheel is revolved in the direction indicated by the arrows the rollers 18 of the descending paddles will ride successively on the outer surfaces of the guides 19, 20, 22, and 21, thereby presenting each succeeding paddle edgewise as it enters the water, turning it gradually as it descends, and holding it substantially flatwise during its lower movement and until it reaches the point of beginning its ascent. In this movement the wiper 28 will engage the left-hand trip 29 and without resistance swing it inward from the position shown by full lines to that shown by dotted lines in Fig. 3; but when the wiper contacts with the second trip the stop 31 will prevent the trip from swinging and the movement of the wiper over the face of the trip-roller 33 will serve to swing the wiper, and thereby turn its axis and the paddle to which it is fast. This latter movement results in so turning the paddle as to bring its guide-roller 18 in position to enter the open way between the guide members 19 and 21, and the further revolution of the wheel will cause the contact of the guide-roller with the outer guides to turn the paddle substantially edgewise as it ascends. If the direction of revolution of the wheel is reversed, the mode of operation of the devices will be the same as that described.

Having described my invention, what I claim, and desire to secure by Letters Patent, is—

1. In a feathering paddle-wheel, the combination with a shaft and a series of axially-pivoted paddles revolved thereby, of guiding devices for controlling the feathering movements of the paddles in their descent, tripping devices for starting the feathering movements for the ascent and guiding devices for directing the further edgewise movements of the paddles, substantially as set forth.

2. In a feathering paddle-wheel, the combination with a shaft and a series of axially-pivoted paddles revolved thereby, of guiding devices for causing the paddles to enter and rise from the water edgewise and for turning

them flatwise and so maintaining them during their working movements, and tripping devices for returning them to edgewise position at the end of their working movements, substantially as set forth.

3. In a feathering paddle-wheel, the combination with a shaft and a series of axially-pivoted paddles revolved thereby, of guide-rollers and wipers carried by the paddles, guides with which the rollers engage to cause the paddles to enter the water edgewise, turn to flatwise working positions and emerge edgewise, and a trip with which the wipers engage to turn the paddles from flatwise positions at the end of their working movements, substantially as set forth.

4. In a feathering paddle-wheel, the combination with a shaft and a series of axially-pivoted paddles revolved thereby, of guide-rollers on the outer edges of the paddles at one end of the wheel and wipers on the axes of the paddles at the other end of the wheel, guides with which the rollers engage to cause the paddles to enter the water edgewise, turn to flatwise working positions and emerge edgewise, and a trip with which the wipers engage to turn the paddles from flatwise positions at the end of their working movements, substantially as set forth.

5. In a feathering paddle-wheel, the combination with a shaft and a series of axially-pivoted paddles revolved thereby, of guide-rollers on the outer edges of the paddles at one end of the wheel and wipers on the axes of the paddles at the other end of the wheel, a fixed oval-shaped guide and at its opposite sides upper and lower gravitating guide members with which the rollers successively engage to cause the paddles to enter the water edgewise, turn to flatwise working positions and emerge edgewise, and a trip with which the wipers engage to turn the paddles from flatwise positions at the end of their working movements, substantially as set forth.

6. In a feathering paddle-wheel, the combination with a shaft and a series of axially-pivoted paddles revolved thereby, of radial arms providing bearings for the paddle-axes, supports for intermediate portions of the paddles consisting of guide-rings within which the paddles turn on roller-bearings, and radial arms connected to the shaft for carrying the guide-rings, substantially as set forth.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, this 10th day of August, 1905.

EDWIN A. YOUNG.

Witnesses:

L. S. BUFFINGTON,
P. H. GUNCKEL.