

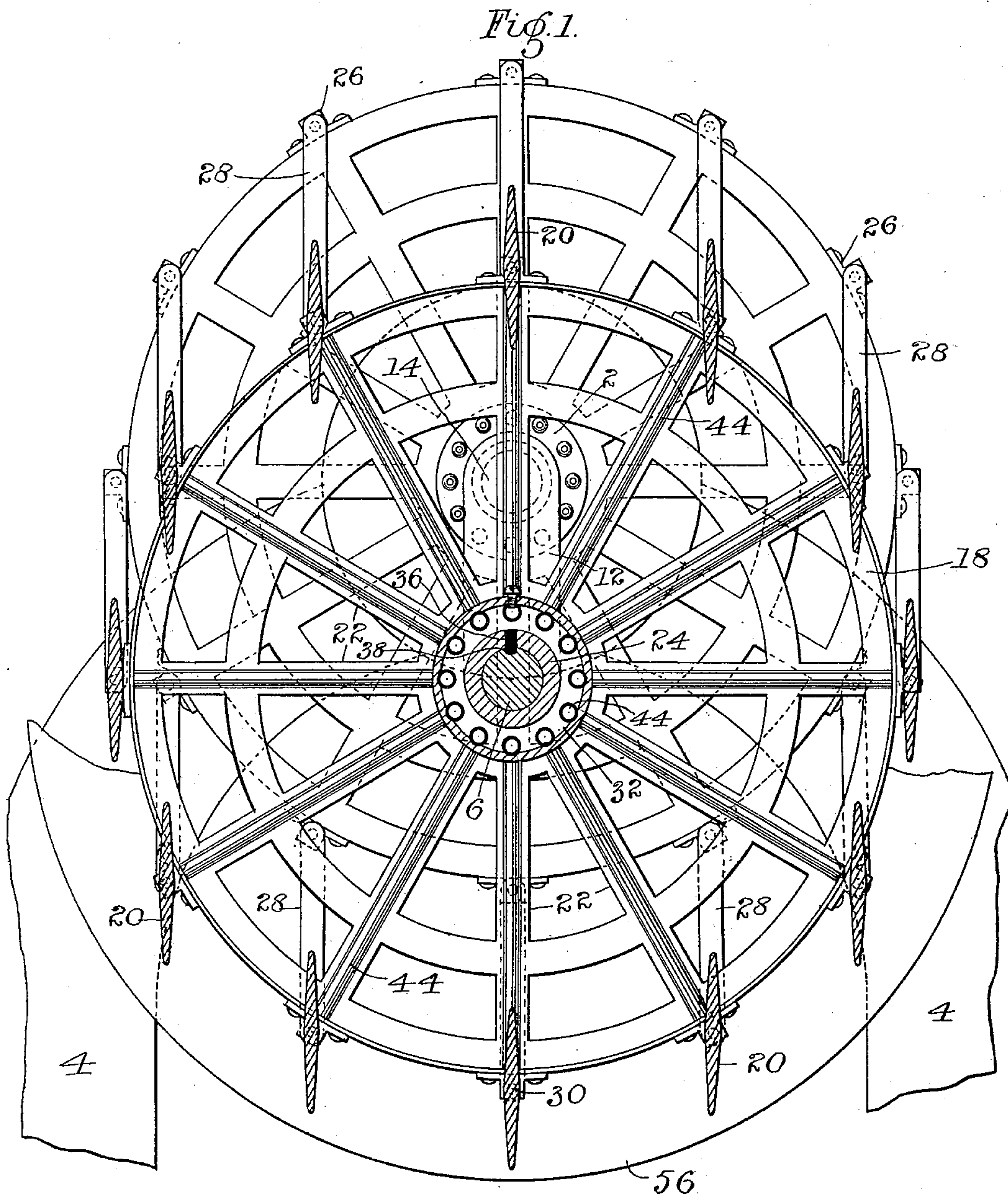
(No Model.)

2 Sheets—Sheet 1.

F. E. & H. A. PIRRUNG.
FEATHERING PADDLE WHEEL.

No. 464,520.

Patented Dec. 8, 1891.



Inventors:-

Witnesses:-

C. L. Caldwell.

A. Maria Welch.

Frank E. Pirrung,

Hubert A. Pirrung,

per Paul Munroe

Attorneys.

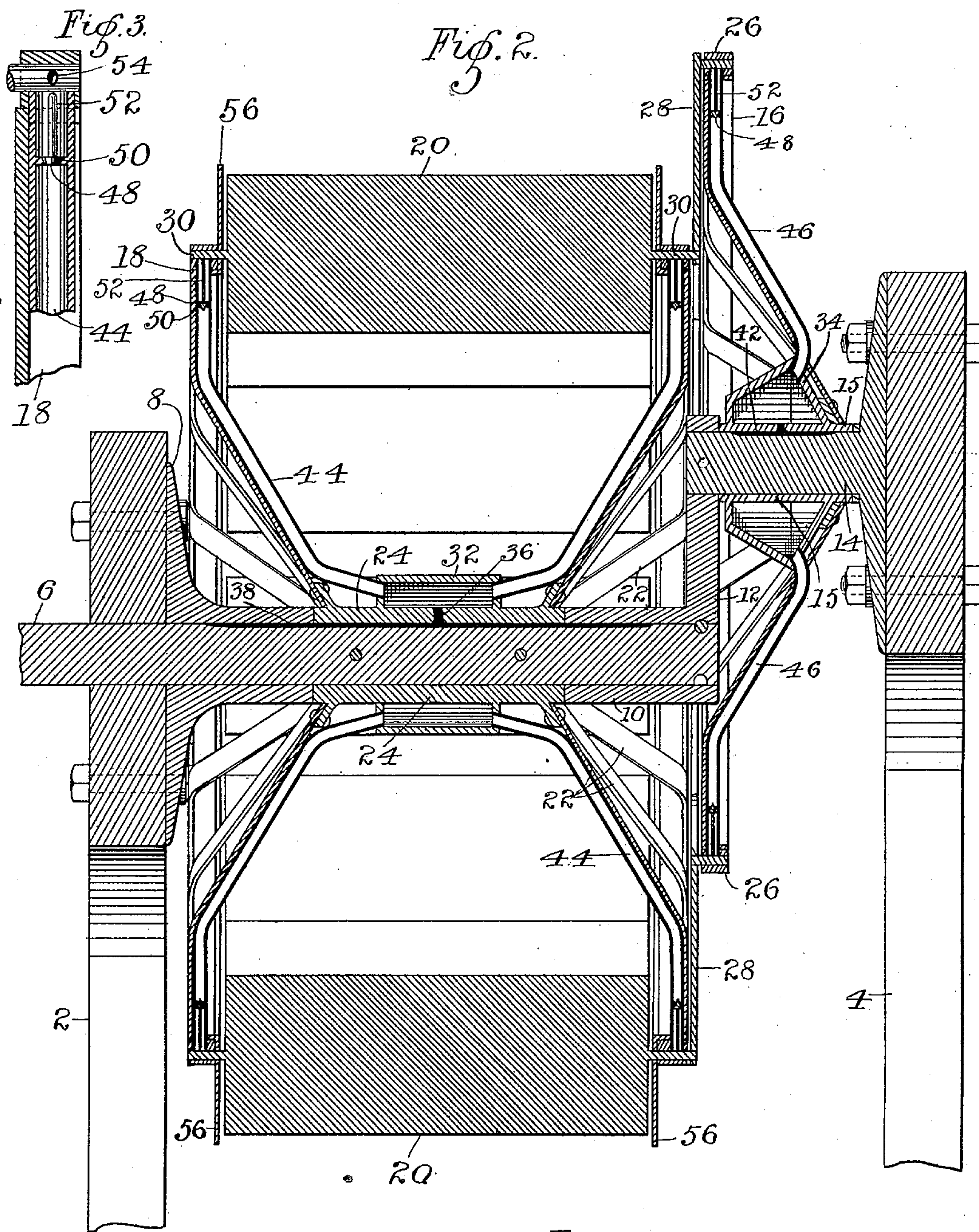
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C. L. Caldwell.

A. W. Van Winkle.

Inventors:-

Frank E. Pirrung,

Hubert A. Pirrung,

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Attorneys.

UNITED STATES PATENT OFFICE.

FRANK E. PIRRUNG AND HUBERT A. PIRRUNG, OF ST. PAUL, MINNESOTA.

FEATHERING PADDLE-WHEEL.

SPECIFICATION forming part of Letters Patent No. 464,520, dated December 8, 1891.

Application filed January 15, 1891. Serial No. 377,827. (No model.)

To all whom it may concern:

Be it known that we, FRANK E. PIRRUNG and HUBERT A. PIRRUNG, both of St. Paul, Ramsey county, Minnesota, have invented certain Improvements in Feathering Paddle-Wheels, of which the following is a specification.

Our invention relates to improvements in feathering paddle-wheels for steamboats, its object being to combine with an improved construction of wheel a firm support for the end of the paddle-wheel shaft and self-lubricating devices for the various bearings; and to this end it consists in forming a wheel with the spokes turned inward from each end and joined to a common hub in the center of the wheel, by which means a common firm support is furnished for all parts of the wheel and extended journal-bearings are secured for the shaft at each end of the hub, the bearing for the end of the shaft being hung from the stationary shaft of the feathering-wheel and standing in the space between bent spokes of the two wheels, and, further, in surrounding the hubs of the paddle and idler wheels with oil-tanks having feed-pipes connecting the same to the various bearings.

Our invention further consists in the construction and combination hereinafter described, and particularly pointed out in the claims.

In the accompanying drawings, forming part of this specification, Figure 1 is a cross-section of our improved paddle-wheel, looking toward the idler or feathering wheel and showing the connections between the periphery of the idler and the paddles of the paddle-wheel. Fig. 2 is a central longitudinal section of the same, showing the arrangement of oil-reservoirs and the feeding-pipes; and Fig. 3 is a detail of one of the pipes, showing the closing-valve in the outlet of the same.

In the drawings, 2 and 4 represent the supports for the shafts of the paddle and feathering wheels; 6, the drive-shaft of the paddle, turning in the bearing-box 8, secured to the support 2, and the box 10, supported by means of the depending bar or hanger 12, rigidly connected to the stationary shaft 14 of the idler 16. This shaft is secured to the support 4 and is parallel but eccentric with the shaft 6. The paddle-wheel 18 is provided with the

paddles 20, arranged between the ends of the paddle-wheel and journaled upon them. The spokes 22 at both ends of the wheel are turned toward the shaft, and are rigidly secured to the common hub 24 at the center of the wheel, which stands between the bearing-boxes 8 and 10. It will thus be seen that the wheel is firmly braced and secured together and long bearings furnished at either end for the driving-shaft.

The idler or feathering wheel is of the same diameter as the paddle-wheel, and their shafts are preferably arranged in the same vertical plane. The periphery of the idler is fitted with bearing-boxes 26, equal in number and in distance apart to the paddles. Journaled in these boxes are the pivots of the bars or arms 28, which are rigidly connected at their outer end to the paddles 20, with the planes of the paddles substantially vertical and parallel with each other, the paddles having their gudgeons 30 journaled in suitable bearings upon the peripheries of the ends of the paddle-wheel. In the construction shown the bars 28 are at all times in a vertical position and parallel with the planes of the paddles, although it is evident that their positions may be varied so long as the shafts 6 and 14 are in parallel, but eccentric with each other. It will thus be seen that as the shaft 6 is rotated, carrying the paddle-wheel with it, the bars 28 serve as pitmen to cause the idler or feathering wheel 16 to rotate synchronously, and by means of the connection between the bars and the paddles the latter are caused to turn in their bearings and to maintain at all times the same vertical position. The object of the connecting-bar 12 is to furnish a support for the inner end of the shaft 6, it being thus practically supported as firmly as though carried through to the opposite support.

In order to furnish means for lubricating the bearings, we arrange around the hubs 24 and 15 of the paddle and feathering wheels oil receptacles or reservoirs 32 and 34, in which may be stored a sufficient quantity of oil for lubricating the bearings for any desired period. An opening 36 leads through the hub 24, connecting the reservoir 32 with a groove 38 in the shaft 6, by means of which the oil is carried into contact with the bearing-surfaces of the journals of the shaft, a similar

opening 40 connecting the reservoir 34 with a groove 42 in the shaft 14. The bearings on the peripheries on the paddle and feathering wheels, in which are journaled the pivots of the arms 28 and the gudgeons of the paddles 20, may also be connected with the reservoirs by means of pipes or tubes 44 and 46, through which the oil is conducted to the bearing-surfaces. These pipes may be fitted at their outlets with self-closing valves 48, having seats 50 in the tubes, the valves being kept closed by the bearing-contact of their stems 52 upon the gudgeons, the gudgeons being each provided with a depression or groove 54 on one side, into which the valve-stem drops with each rotation of the wheel, thus opening the valve and allowing a small quantity of oil to flow out of the pipe. Any other preferred means may, however, be employed to control the flow of the oil from the pipes to the bearings.

The paddle-wheel is preferably provided with guards 56, extending beyond the outer edge of the paddles, so as to protect them from injury from obstructions in the water or on the bed of the stream.

We claim—

1. In a device of the class described, the combination of the paddle-wheel having a central hub of less length than the wheel, inturned spokes connecting said hub with the rims of the wheel, a driving-shaft rigidly secured in said paddle-wheel hub, an idler or feathering wheel eccentric with and equal in diameter to the paddle-wheel, having its hub outside the plane of the wheel, a fixed bearing-shaft for said hub, an inwardly-extending bearing 10 for the end of the driving-shaft, carried by hanger 12, extending down from said fixed shaft, and bars pivotally connected to the rim of the feathering-wheel and rigidly connected to the paddles of the paddle-wheel, substantially as and for the purposes set forth.

2. In a device of the class described, the combination of a paddle-wheel having its outer

end projecting beyond the end of the hub, a feathering-wheel, a stationary shaft projecting beyond the end of its hub and adjacent to the end of the paddle-wheel, upon which said idler-wheel is journaled, a hanger 12 upon the end of said shaft, an inwardly-extending bearing 10, carried by said hanger, and a drive-shaft for said paddle-wheel, journaled in said bearing, substantially as described.

3. In a device of the class described, the combination, with the hubs of the paddle and idler wheels, of oil-reservoirs surrounding said hubs, and conduits connecting said reservoirs with the bearings of said wheels and with the bearings of the paddles and their arms, substantially as and for the purposes set forth.

4. The combination, with the paddle-wheel having its outer end projecting beyond the end of its hub, a driving-shaft secured in said hub and projecting beyond the same, an idler-wheel of equal diameter and eccentric with the paddle-wheel adjacent to its outer end and having its rim extending beyond the end of its hub, a stationary journal-shaft for said idler-wheel, a journal-box for the driving-shaft, carried by said stationary shaft, oil-reservoirs upon the hubs of said wheels, and conduits connecting reservoirs with the bearings of said wheels, substantially as described.

5. In a device of the class described, the combination of the paddle-wheel, its driving-shaft, the feathering-wheel, its stationary shaft, and an inwardly-extending bearing 10, carried by a hanger depending from the stationary shaft, offset therefrom, and supporting the journal of the driving-shaft, substantially as and for the purposes set forth.

In testimony whereof we have hereunto set our hands this 5th day of December, 1890.

FRANK E. PIRRUNG.

HUBERT A. PIRRUNG.

In presence of—

T. D. MERWIN,

A. MAE WELCH.