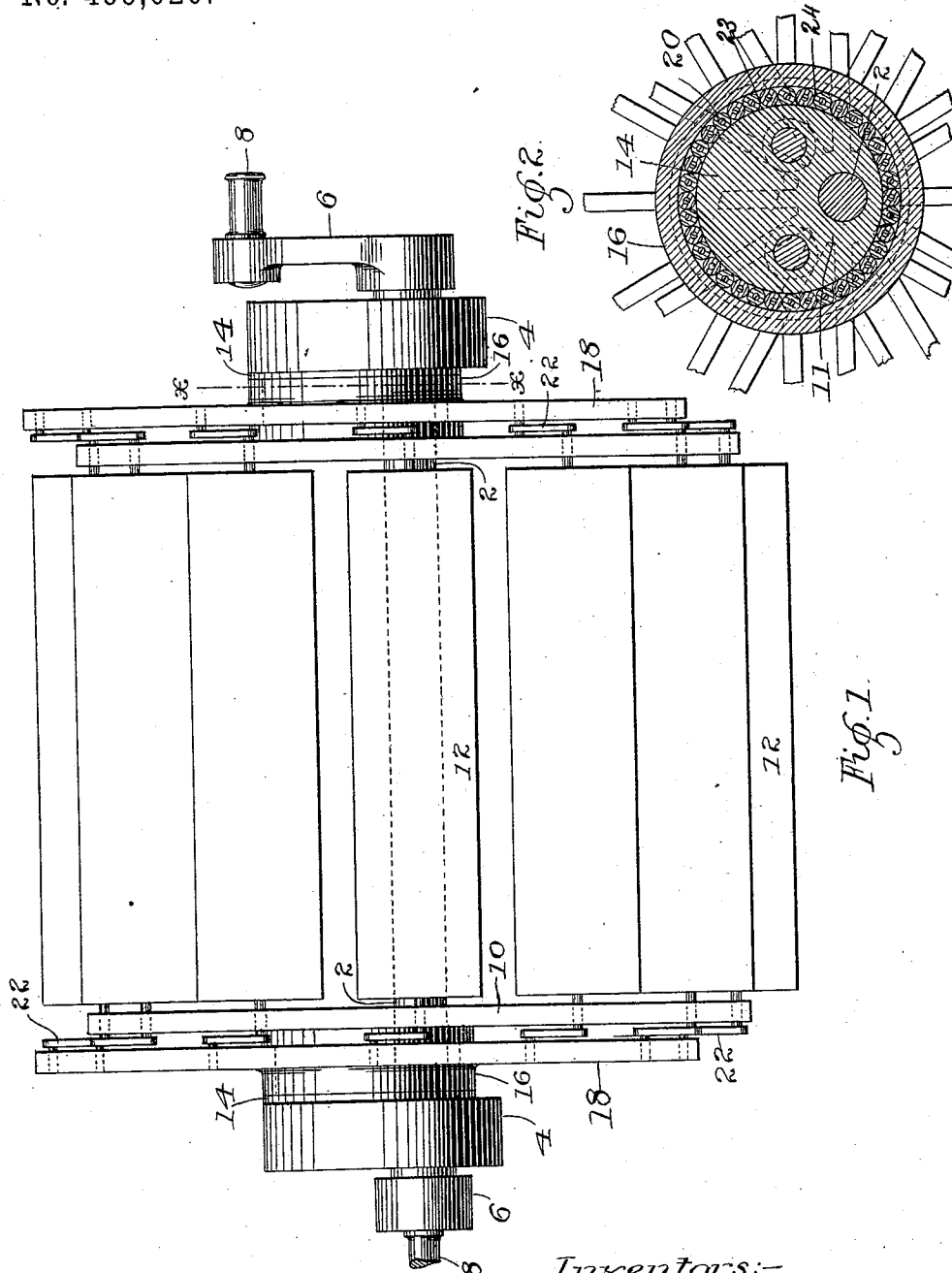


(No Model.)

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

No. 469,020.

Patented Feb. 16, 1892.



Witnesses:
G. L. Caldwell.
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Inventors:-
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UNITED STATES PATENT OFFICE.

FRANK E. PIRRUNG AND HUBERT A. PIRRUNG, OF ST. PAUL, ASSIGNORS OF
ONE-FOURTH TO GEORGE E. TORINUS, OF WHITE BEAR, MINNESOTA.

FEATHERING PADDLE-WHEEL.

SPECIFICATION forming part of Letters Patent No. 469,020, dated February 16, 1892.

Application filed January 22, 1891. Serial No. 378,727. (No model.)

To all whom it may concern:

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

Our invention relates to improvements in feathering paddle-wheels for boats, its object being to provide a paddle-wheel carried upon
10 a shaft extending through the wheel and journaled in bearings at each end of the wheel and fitted at each end with a crank for a connecting-rod and to arrange feathering-wheels at both ends of the paddle-wheel connected
15 to the paddles, so as to hold them at all times in a vertical position.

To this end our invention consists in the construction and combination hereinafter described, and particularly pointed out in the
20 claims.

In the accompanying drawings, forming part of this specification, Figure 1 is an elevation of our improved paddle-wheel, showing the arrangement of the driving-shaft and
25 the feathering-wheels; and Fig. 2 is a detail cross-section of the eccentric-bearing for one of the feathering-wheels, taken on line $x x$ of Fig. 1 and looking toward the paddle-wheel, showing the relative position of the eccentric
30 and driving-shaft, the hub of the paddle-wheel being shown by dotted lines.

In the drawings, 2 represents the driving-shaft of the paddle-wheel, journaled in suitable supports 4 at either end of the wheel and
35 having cranks 6 and crank-pins 8 at both ends for the connecting-rods, as ordinarily constructed and arranged.

Rigidly secured upon the shaft 2, intermediate of its bearings, is the paddle-wheel 10,
40 having the hubs 11 and the paddles 12 journaled in the rim of each end of the wheel. Between the paddle-wheel and each support 4 is a fixed eccentric or pivot-post 14, secured to the support 4, through which the shaft 2
45 passes and in which it may be journaled. Upon this eccentric is journaled the hub 16 of the feathering-wheel 18, which is of the same diameter as the paddle-wheel. This feathering-wheel may be provided, if desired,
50 with anti-friction rollers 20 to diminish the friction between its hub and the eccentric 14,

the post 14 being reduced in diameter, so as to form a cavity 23, in which the friction-rollers will lie, beneath the inner circumference of the hub 16 and the periphery of the reduced portion of the post, the larger portion
55 of the post forming a side wall 24 to assist in holding the friction-rollers in place, the inside face of the hub 16 constituting the other wall, as will be apparent.

Pivotally connected to the periphery of the feathering-wheel are the links or arms 22 of the same number as the paddles 12 and rigidly connected at their other ends, respectively, to them. It will thus be seen that as
60 the shaft 2 is rotated, carrying the paddle-wheel with it, the arms 22, connecting the paddles with the feathering-wheels, cause the feathering-wheels to rotate synchronously with the paddle-wheel and serve, also, to hold
65 the paddles at all points in their rotation with the paddle-wheel at the same angle. By this improved construction the driving-shaft of the paddle-wheel has firm support at each end of the paddle-wheel and the position of
70 the paddles is controlled by feathering-wheels at each end, thereby constituting a strong, simple, and durable apparatus.

We claim—

1. In a feathering paddle-wheel, the combination, with suitable supports having the paddle-wheel shaft journaled therein, of fixed
80 eccentrics secured to the inner faces of said supports and having a common axis with said paddle-wheel shaft, feathering-wheels of the same diameter as the paddle-wheel, located between the ends of the paddle-wheel and said supports and formed with hubs fitting around
85 said eccentrics to turn thereon, roller-bearings between said eccentrics and said hubs, and links pivotally connected at one end to the rim of the feathering-wheel and rigidly connected at the other end to the paddles of the
90 paddle-wheel, substantially as described.

2. In a feathering paddle-wheel, the combination, with suitable supports having the paddle-wheel shaft journaled thereon, of fixed
95 eccentrics secured to the inner faces of said supports and having a portion of their diameter reduced to form a cavity to receive the friction-rollers, feathering-wheels of the same
100 diameter as the paddle-wheels, located be-

tween the paddle-wheels and said supports
and having hubs fitting around the reduced
portion of the fixed eccentrics; friction-rollers
fitting in the cavity between the feathering-
5 wheel hubs and the fixed eccentrics, and links
connecting the feathering-wheel with the
paddles of the paddle-wheel, substantially as
and for the purposes described.

In testimony whereof we have hereunto set
our hands this 10th day of January, 1891.

FRANK E. PIRRUNG.
HUBERT A. PIRRUNG.

In presence of—
T. D. MERWIN,
A. MAE WELCH.