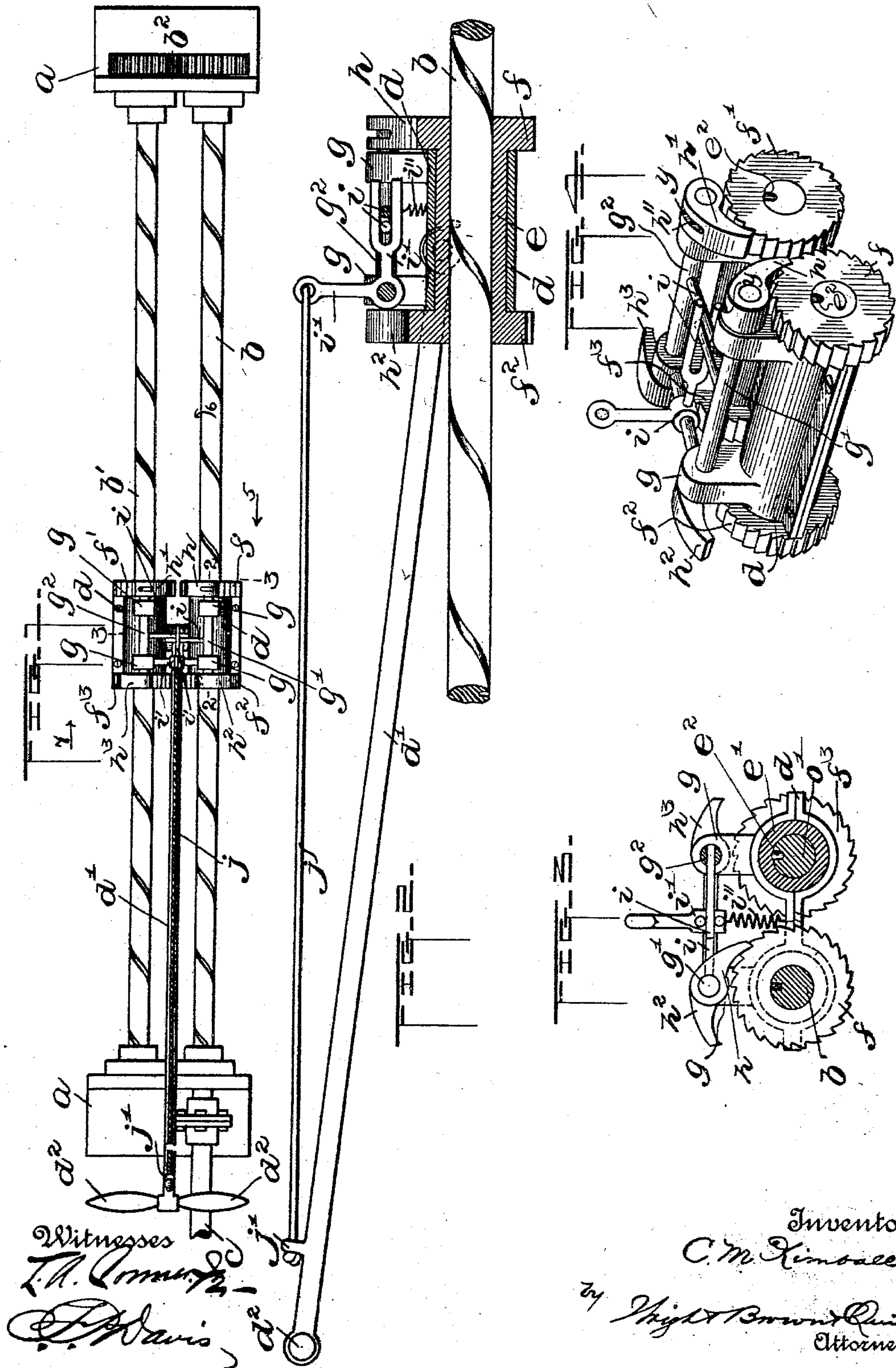


(No Model.)

C. M. KIMBALL.
BOAT PROPELLING APPARATUS.

No. 552,910.

Patented Jan. 14, 1896.



UNITED STATES PATENT OFFICE.

CHARLES M. KIMBALL, OF TOLEDO, OHIO.

BOAT-PROPELLING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 552,910, dated January 14, 1896.

Application filed April 9, 1895. Serial No. 545,097. (No model.)

To all whom it may concern:

Be it known that I, CHARLES M. KIMBALL, of Toledo, in the county of Lucas and State of Ohio, have invented certain new and useful
5 Improvements in Boat-Propelling Apparatus, of which the following is a specification.

The object of the present invention is to provide an improved boat-propelling apparatus which can be effectively operated by persons unskilled in nautical matters and by any
10 number of persons so that their combined strength is utilized.

By my invention revolutions of a propeller are produced by the reciprocations of a cross-head on parallel screw-shafts geared together, the said cross-head carrying sleeves with
15 feathers in the channels of the screws and there being provided conveniently-operated means for reversing the direction of rotation of the propeller.

The essentials of the invention will be found recited in the appended claims.

The drawings which accompany and form part of this specification illustrate an embodiment of the invention.

Figure 1 shows a top plan view of the apparatus. Fig. 2 shows a longitudinal section taken on line 2 2 of Fig. 1. Fig. 3 shows a cross-section taken on line 3 3 of Fig. 1. Fig.
30 4 is a perspective view of the reversible ratchet and pawl mechanism.

The letter *a* designates suitably-constructed base-supports having bearings for two like parallel screw-shafts *b* and *b'*, which are connected together at one end by gears *b*², and one of which is coupled to the propeller-shaft *c*. The grooves or channels of the two shafts *b* and *b'* extend in the same direction, and both shafts are embraced by a cross-head *d*, with
40 which there is pivotally connected a handle-bar *d'* equipped with handles *d*². Sleeves *e* and *e'* are journaled in the cross-head and surround the shafts, and these sleeves have feathers *e*² projecting into the channels of the
45 screw-shafts. The sleeves carry ratchets *f*, *f'*, *f*², and *f*³ at their ends, and the two ratchets of one sleeve are reversely set, and each two confronting ratchets are reversely set. (See Fig. 4.)

50 The cross-head is formed on the upper side with lugs *g* which constitute bearings for rock-shafts *g'* and *g*², carrying pawls *h*, *h'*, *h*², and

*h*³ for engagement with the ratchets *f*, *f'*, *f*², and *f*³, respectively. The two pawls on one shaft project from opposite sides thereof and
55 when one is engaged with the ratchet at one end of one sleeve the other is disengaged from the ratchet at the other end of that sleeve. The rock-shafts have inward projecting arms *i*, and there is pivoted to the cross-head a bell-
60 crank lever *i'*, one arm of which extends under said arms *i* and to the other arm of which there is attached a cord *j*. This cord extends to within a short distance of the handles *d*² and is confined by a keeper *j'* on the handle-
65 bar *d'*.

The operation may be described as follows: Considering the pawls *h* and *h'* to be engaged with the ratchets *f* and *f'*, as clearly shown in Fig. 4, the occupant or occupants of the
70 boat take hold of the handles *d*² and by moving them forward and back reciprocate the cross-head *d*. When said cross-head is moved in the direction of the arrow 5 in Fig. 1, the screw-shaft *b* will be rotated in the direction
75 of the arrow 6 by reason of the engagement of the feather of sleeve *e* in the channel of the screw-shaft. It is to be noted that the pawl *h* locks the sleeve against rotation in a direction its engagement with the screw would tend
80 to turn it. The other sleeve is, however, free to turn on its screw-shaft, for its ratchet *f'* is set reversely to the ratchet *f* and the pawl *h* does not prevent rotation of the sleeve. When, however, the motion of the cross-head is re-
85 versed—i. e., when it moves in the direction of the arrow 7, Fig. 1—the sleeves of course tend to rotation in a direction opposite to that before produced, and the pawl *h'* then locks the sleeve *e'*, causing it to drive the shaft *b'*,
90 whereas the sleeve *e* turns loose. The result is the same as before as to direction of rotation of the shaft *b*, for this shaft receives its motion through the gears *b*² from the shaft *b'*.

To reverse the revolution of the propeller
95 the cord *j* is pulled, which produces movement of the bell-crank lever *i'* and consequent turning of the rock-shafts *g'* and *g*². This turning of said rock-shafts throws the pawls *h* and *h'* out of engagement with the
100 ratchets *f* and *f'* and the pawls *h*² and *h*³ into engagement with the ratchets *f*² and *f*³. It will be understood that under this adjustment just the opposite effect will be produced to

that before described in the operation of the apparatus.

It is to be observed that in the operation of my apparatus a steady movement of the propeller is obtained, for there is always a driving connection between the cross-head and the propeller-shaft through one screw or the other. The motion can be reversed very quickly, for the operator has simply to pull the cord *j* which is close at hand.

The horizontally-extending member of the bell-crank lever *i* is forked or bifurcated to embrace the arms *i*, and a spiral spring *i'* is attached at one end to the fork and at the other to the cross-head and exerts itself to hold the pawls *h* and *h'* in engagement with their respective ratchet-wheels, so that when the cord *j* is released this spring will restore the parts to their normal positions. The pawls *h* and *h'* are preferably slotted, as shown at *h''*, to receive pins *y* projecting from the rock-shafts, the object of this construction being to allow the pawls sufficient independent movement to take them over the teeth of the ratchets without producing motion in the rock-shafts.

What I claim as my invention is as follows:

1. Boat-propelling apparatus comprising parallel screw-shafts, gears connecting the same, a cross-head embracing said screw-shafts, means for reciprocating said cross-head, sleeves journaled in the cross-head and

having feathers engaging the channels of the screws, reversely set ratchets on said sleeves, double pawls for engaging said ratchets, and means for reversing the pawls, substantially as described.

2. Boat-propelling apparatus comprising parallel screw-shafts, gears connecting the same, a cross-head embracing said screw-shafts, means for reciprocating said cross-head, sleeves journaled in the cross-head and having feathers engaging the channels of the screws, two reversely set ratchets on each sleeve, double pawls for engaging said ratchets, and means for reversing said pawls, substantially as described.

3. Boat-propelling apparatus comprising parallel screw-shafts, gears connecting the same, a cross-head embracing said shafts and having a handle-bar by which to reciprocate it, sleeves journaled in said cross-head and having feathers in the channels of the screws, reversible detent mechanism controlling the sleeves, and means for reversing said detent mechanism, having its operating member carried by the handle-bar of the cross-head.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, this 20th day of March, A. D. 1895.

CHARLES M. KIMBALL.

Witnesses:

F. M. DOTSON,

THOS. PULFORD.