

(No Model.)

C. J. BOUSFIELD.  
SHIP STEERING APPARATUS.

No. 441,638.

Patented Dec. 2, 1890.

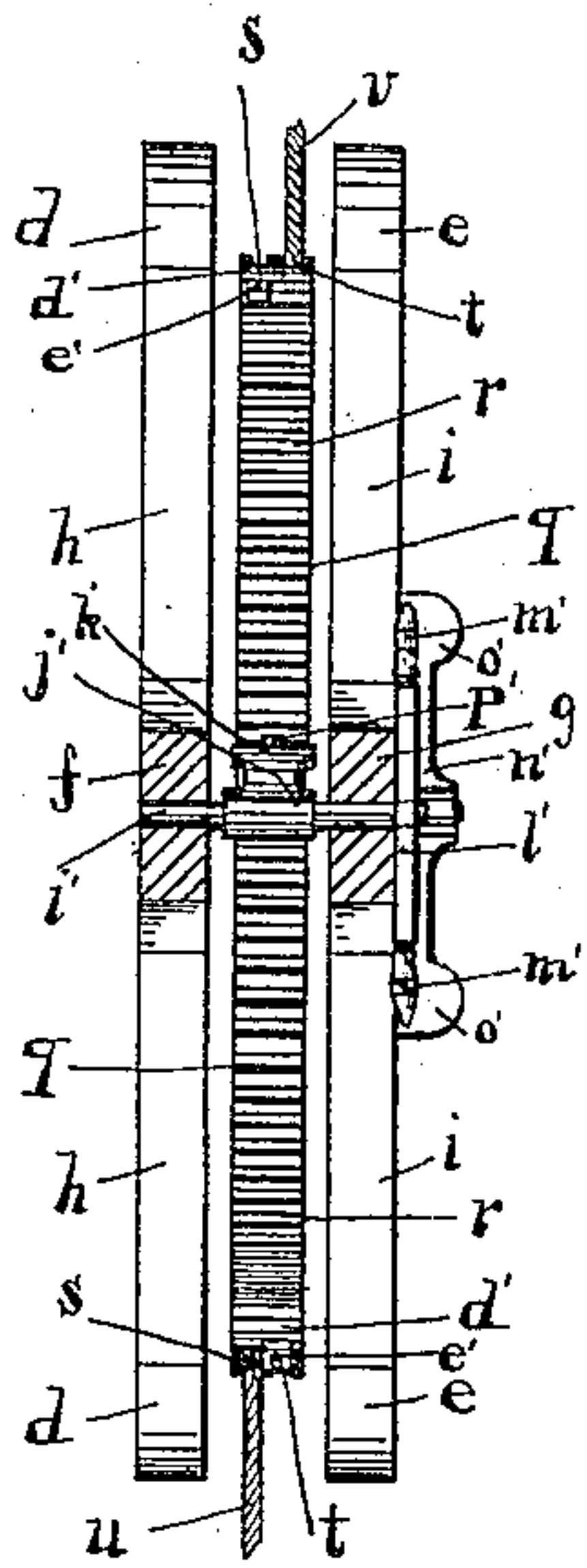


Fig 5.

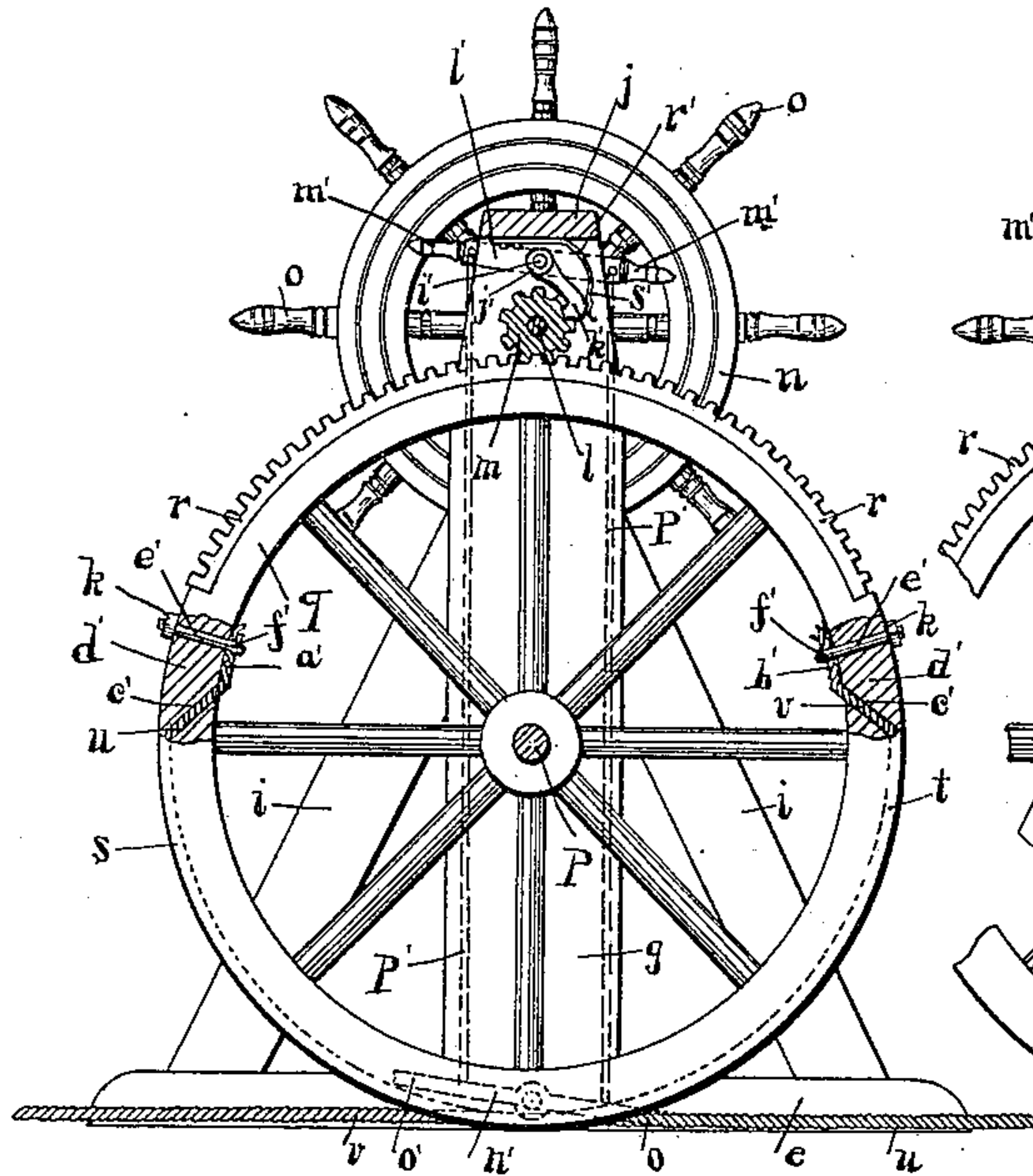


Fig. 3.

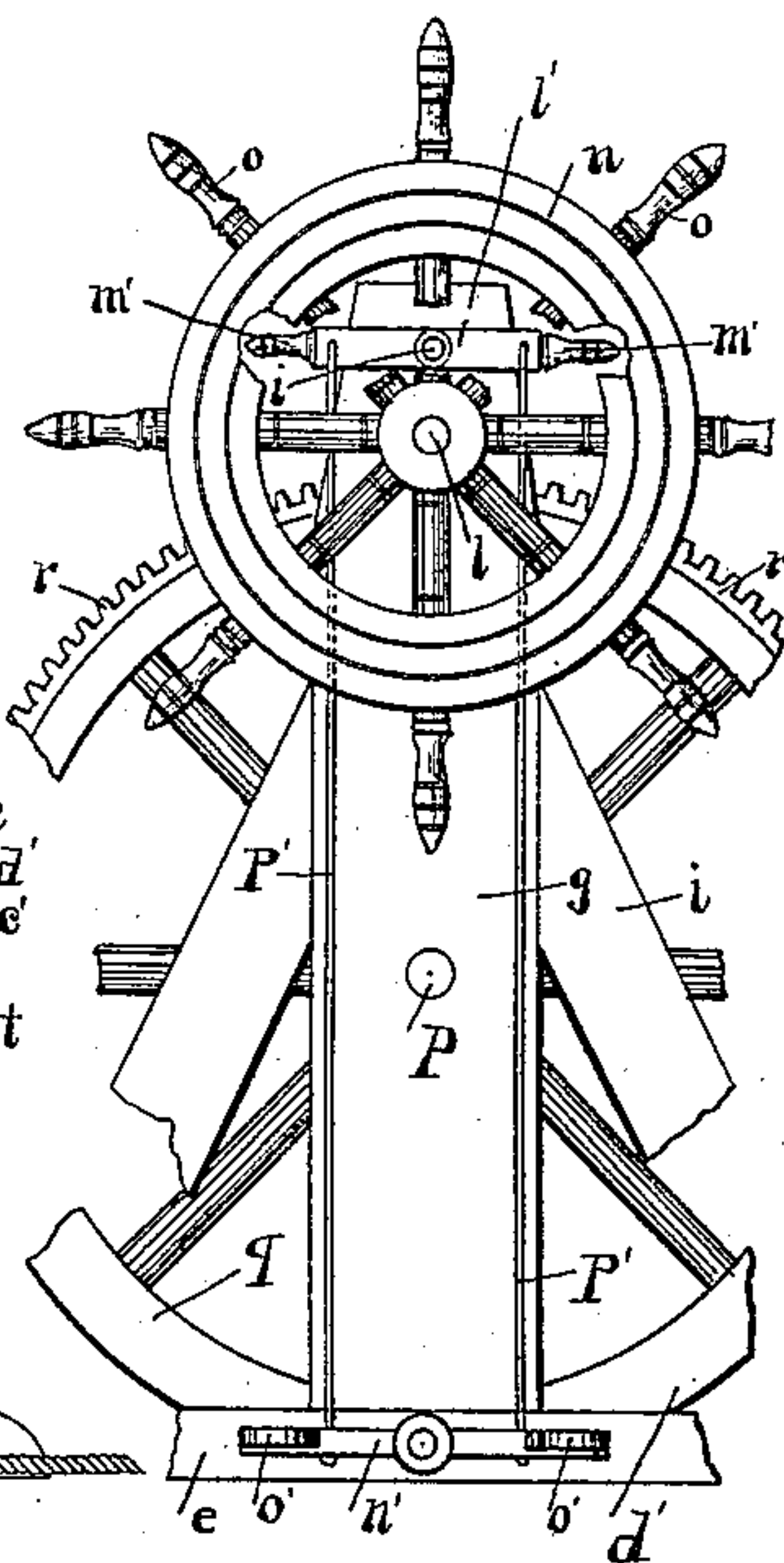


Fig 4.

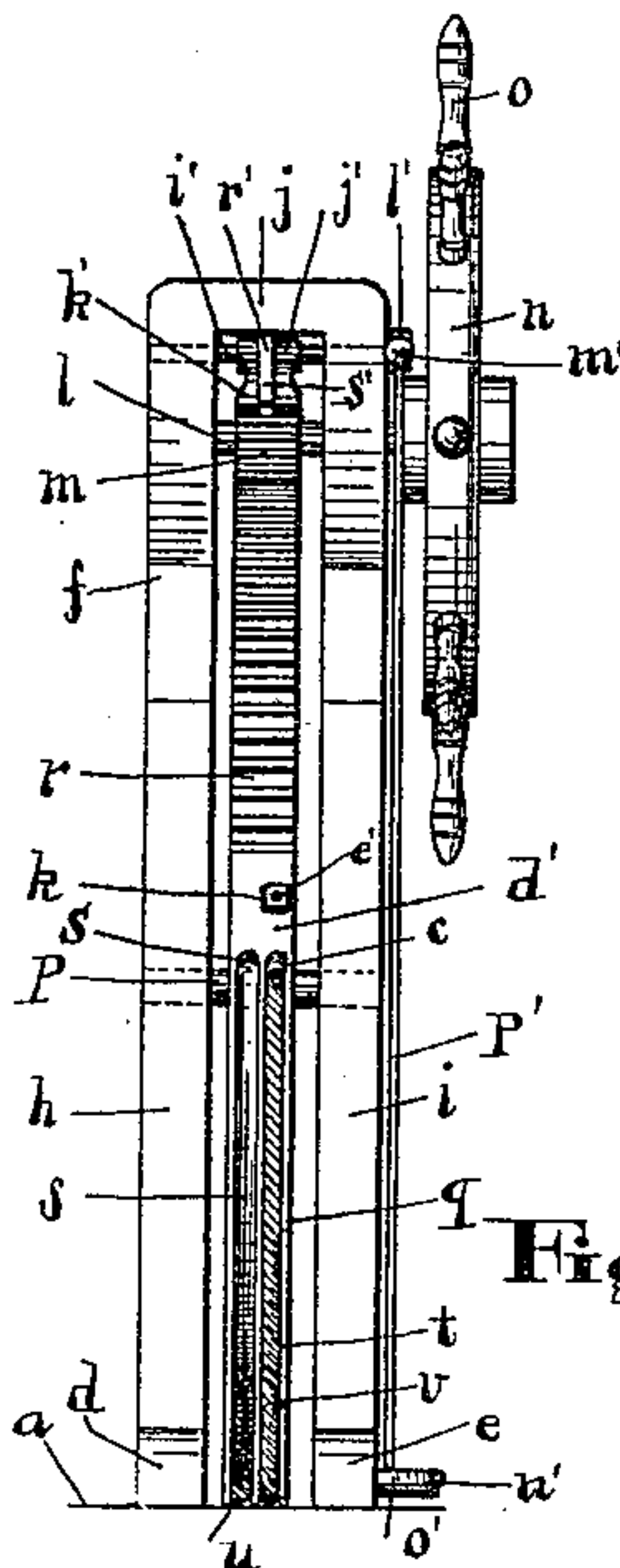


Fig 2.

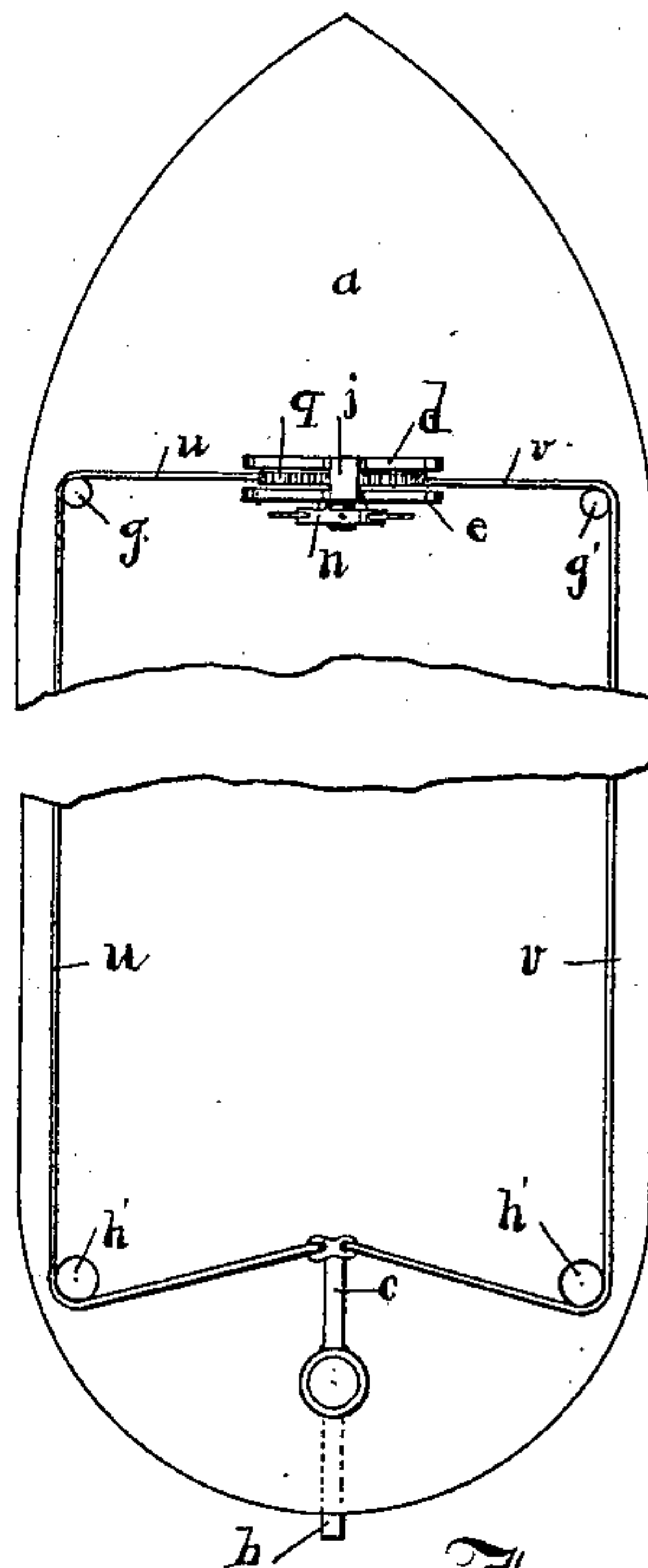


Fig 1.

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# UNITED STATES PATENT OFFICE.

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## SHIP-STEERING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 441,638, dated December 2, 1890.

Application filed May 31, 1890. Serial No. 353,694. (No model.)

*To all whom it may concern:*

Be it known that I, CHARLIE J. BOUSFIELD, a citizen of the United States, residing at Bay City, in the county of Bay and State of Michigan, have invented certain new and useful Improvements in Ship-Steering Apparatus; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

My invention relates to improvements in that class of ship-steering apparatus in which gear-wheels and chains are used as a medium for transmitting movement to the tiller from the steering-wheel; and the invention consists in the novel arrangement and construction of the parts, as I shall hereinafter fully describe, and which will be specifically set forth in the claims of this specification.

The object of the invention is to provide a cheap, compact, and effective apparatus for steering vessels, whereby the rudder may be easily and quickly operated, and whereby sufficient leverage is obtained to easily retain the rudder in a desired position against the force of the waves thereon.

Another object of the invention is to provide a ship-steering apparatus which is compact in form and easily operated, and which may be easily and quickly locked in place, whereby the tiller and rudder may be easily retained in position when desired.

In the accompanying drawings my invention will be found illustrated, and with the same letters of reference indicating similar parts in the several views.

Fig. 1 is a plan view of a vessel with my novel device attached thereto. Fig. 2 is a side view in elevation of my improved steering apparatus. Fig. 3 is a front view of the same, partly sectional. Fig. 4 is a view in elevation of the after side of the steering apparatus, with a portion of the parts cut off. Fig. 5 is a horizontal section of the frame, and showing top or plan view of the locking devices and steering mechanism.

*a* represents the deck of a vessel, *b* is the rudder, and *c* is the tiller arranged in the ordinary way.

*d* and *e* are bed-pieces which rest upon and are rigidly secured to stationary supports, preferably the deck of the vessel, with a proper space between, and *f* and *g* are forward and aft vertical standards secured by their lower ends to the bed-pieces, and with their upper ends held against a lateral movement by the braces *h* and *i*, while the upper ends are held in position in relation to each other by a cross-piece *j*. Journaled in the upper portion of the standards is a shaft *l*, and a pinion *m* is mounted on the shaft between the standards, while upon the end of the shaft which projects outside of the after standard is mounted a steering-wheel *n*, having spokes *o* projecting outwardly from its periphery in the usual manner.

*p* is a shaft journaled in the standards below the shaft *l*, and upon this shaft and between the standards is mounted a wheel *q*, provided on the upper portion of its periphery with a segment of gear *r*, the teeth of which intermesh with the teeth of the pinion *m*, and the lower or remaining portion of the periphery of the wheel is provided with grooves *s* and *t*, in which rest the tiller chains or ropes *u* and *v*, respectively, the ends *a'* and *b'* of the ropes being passed through openings *c'* in the rim *d'* of the wheel and secured in position by threaded hooks or eyebolts *e'*, which are passed through the rim *d'*, and with their hooked ends *f'* caught over the ends of the tiller ropes or chains and drawn tightly thereon by the nuts *k*, which are passed over their outer threaded ends.

The tiller-ropes are carried over suitable guide-pulleys *g'* and *h'*, and have their opposite ends secured to the tiller *c*, so that on turning the tiller-wheel rotary motion is imparted to the wheel *q* in the opposite direction, winding one of the tiller-chains thereon, while the opposite chain is unwound therefrom, which operates to move the tiller correspondingly in the proper direction for swinging the rudder in the direction in which the wheel is turned.

It is often desirable to secure the rudder in



a stationary position, and to accomplish this a shaft  $i'$  is journaled to the vertical standards  $f$  and  $g$  above the pinion  $m$ , and on the central portion of the shaft is rigidly mounted a pawl  $j'$ , with its free end  $k'$  turned to engage with the teeth of the pinion  $m$  to prevent its turning in either direction, and on the after end of the shaft, which projects beyond the standard, is rigidly secured a cross-bar  $l'$  by its middle, while the outer opposite ends of the cross-bar are provided with handles  $m'$ , and to the lower portion of the standard is pivotally secured by its middle a foot lever or treadle  $n'$ , provided at its opposite ends with bearings  $o'$  for the feet, and  $p'$  are vertical rods with their lower ends pivotally secured to the end portions of the treadle, while their upper ends are pivoted to the end portions of the bar  $l'$ , so that either the bar or the treadle may be oscillated, and a corresponding motion will be imparted by the rods to the other, and a spring  $r'$  is secured by one end portion to the upper cross-piece  $j$ , or to some other convenient portion of the supporting-frame, and the outer free end of the spring is bent at  $s'$  in such form as to bear upon and retain the pawl in engagement with the teeth of the pinion, or to retain the pawl in position when raised from the teeth.

When it is desirable to secure the rudder in a fixed position, the pawl is thrown into engagement with the pinion by oscillating the bar  $l'$  by the hand or by operating the treadle  $n'$  with the foot, as described, bearing downwardly on one end of the treadle or bar serving to oscillate the pawl in one direction, while bearing upon the opposite end of the bar or treadle oscillates the pawl in the opposite direction.

It will be noticed that by placing the parts in the position shown a compact and easily-operated steering apparatus is provided, which can be adapted to small boats or to vessels of larger dimensions, as the leverage obtained by operating the pinion with the segment upon the periphery of the wheel  $q$  is sufficient to permit the tiller to be operated with ease and to retain the tiller in position against the action of waves and strong currents upon the rudder.

Of course it will be understood that while the wheel  $q$  is shown with the gear-segment extending only over the upper arc of its periphery and with the grooves  $s$  and  $t$  occupying the remaining portion of its peripheral surface, this construction is not altogether necessary, as under some circumstances it would be desirable to provide for a greater leverage by additional sheaves, pulleys, or other suitable contrivances, and the wheel  $q$  could in that case be provided with teeth entirely around its periphery, and by widening the peripheral surface the tiller-ropes could then be carried entirely around the wheel and the action of the parts would be the same.

It will also be noticed that the lower portion of the periphery of the wheel  $q$ , located in a proper position to permit the tiller-ropes to run from the side sheaves across the deck and directly upon the wheel, so that sheaves to turn the ropes upon the winding drum, as are required in common forms of steering devices, are rendered unnecessary and the abrupt bending of the chains or ropes at this point is avoided, so that a smooth and easy movement of the chains is obtained and the expense of the apparatus is reduced.

Having described my improvement, what I claim as my invention is—

1. The combination, in a steering apparatus, of the frame, the shaft  $l$ , journaled on the frame and carrying the pinion  $m$ , and the steering-wheel  $n$ , the shaft  $p$ , journaled on the frame below the shaft  $l$ , the wheel  $q$ , mounted on the shaft  $p$  and provided on the upper portion of its periphery with the segment of gear  $r$ , having its teeth intermeshing with the pinion  $m$ , and provided on the lower portion of its periphery with the grooves  $s$  and  $t$  and having radial openings  $c'$  on opposite sides, the tiller-ropes  $u$  and  $v$ , resting in the said grooves and with their ends passed through the said openings  $c'$  and with their opposite ends secured to opposite sides of the tiller, and the bolts  $e'$ , passed through the rim of the wheel and provided on their inner ends with hooks  $f'$ , caught over the ends of the tiller-ropes and with the nuts  $k$  on their outer threaded ends, substantially as set forth.

2. In a ship-steering apparatus, the combination, with the frame, the shaft  $i'$ , journaled on the upper portion of the frame and carrying the pinion  $m$  and steering-wheel  $n$ , the shaft  $p$ , journaled on the frame below the shaft  $l$  and carrying the wheel  $q$ , provided with a segment of gear  $r$  on its upper portion and engaging with the pinion  $m$ , the tiller-ropes  $u$  and  $v$ , secured by one end to the tiller and with their opposite ends passed from opposite sides beneath and secured to the periphery of the wheel near the ends of the segment, of the shaft  $i'$ , journaled upon the frame above the shaft  $l$  and carrying a pawl  $j'$ , having its free end engaging with the teeth of the pinion, a cross-bar  $l'$ , rigidly secured to the shaft, and a spring for retaining the pawl in position when engaged with or disengaged from the pinion, substantially as set forth.

3. In a ship-steering apparatus, the combination of the frame, the shaft  $l$ , journaled on the upper portion of the frame and carrying the pinion  $m$  and steering-wheel  $n$ , the shaft  $p$ , journaled on the frame below the shaft  $l$  and carrying the wheel  $q$ , having on the upper portion of its periphery a segment of gear  $r$ , engaging with the pinion  $m$ , the ropes  $u$  and  $v$ , with their ends secured to the tiller and with their opposite ends passed from opposite sides beneath and secured to the opposite sides of the periphery of the wheel with



the shaft  $i'$ , journaled upon the frame above  
the shaft  $l$  and carrying the pawl  $j'$ , having  
its free end engaging with the teeth of the  
pinion, a cross-bar  $l'$ , rigidly secured to the  
5 outer end of the shaft, a treadle  $n'$ , pivoted  
to the lower portion of the frame, and the rods  
 $p'$ , with their lower ends pivoted to the treadle  
on opposite sides of its pivot and with their

opposite ends pivoted to the cross-bar  $l'$ , sub-  
stantially as set forth.

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

CHARLIE J. BOUSFIELD.

Witnesses:

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