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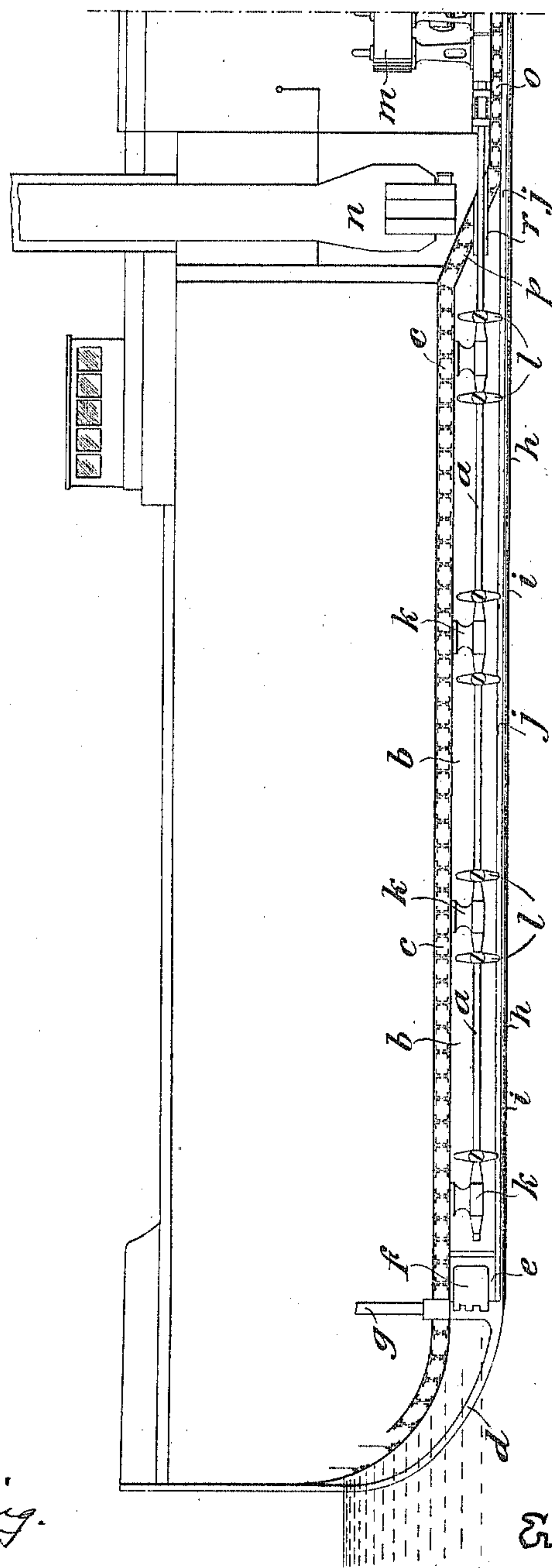
PATENTED APR. 10, 1906.

E. C. ROBINSON.  
VESSEL PROPELLED BY STEAM.

APPLICATION FILED OCT. 23, 1905.

3 SHEETS—SHEET 1.

Fig. 1.



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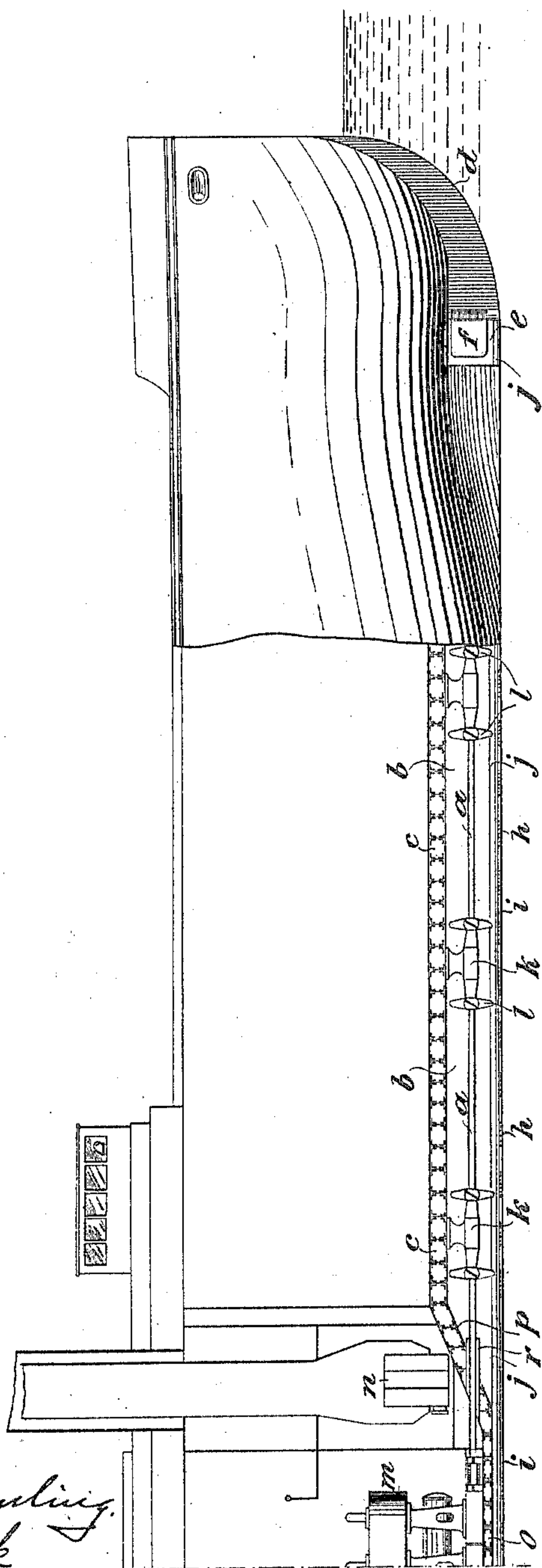
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3 SHEETS—SHEET 2.

Fig. 2.



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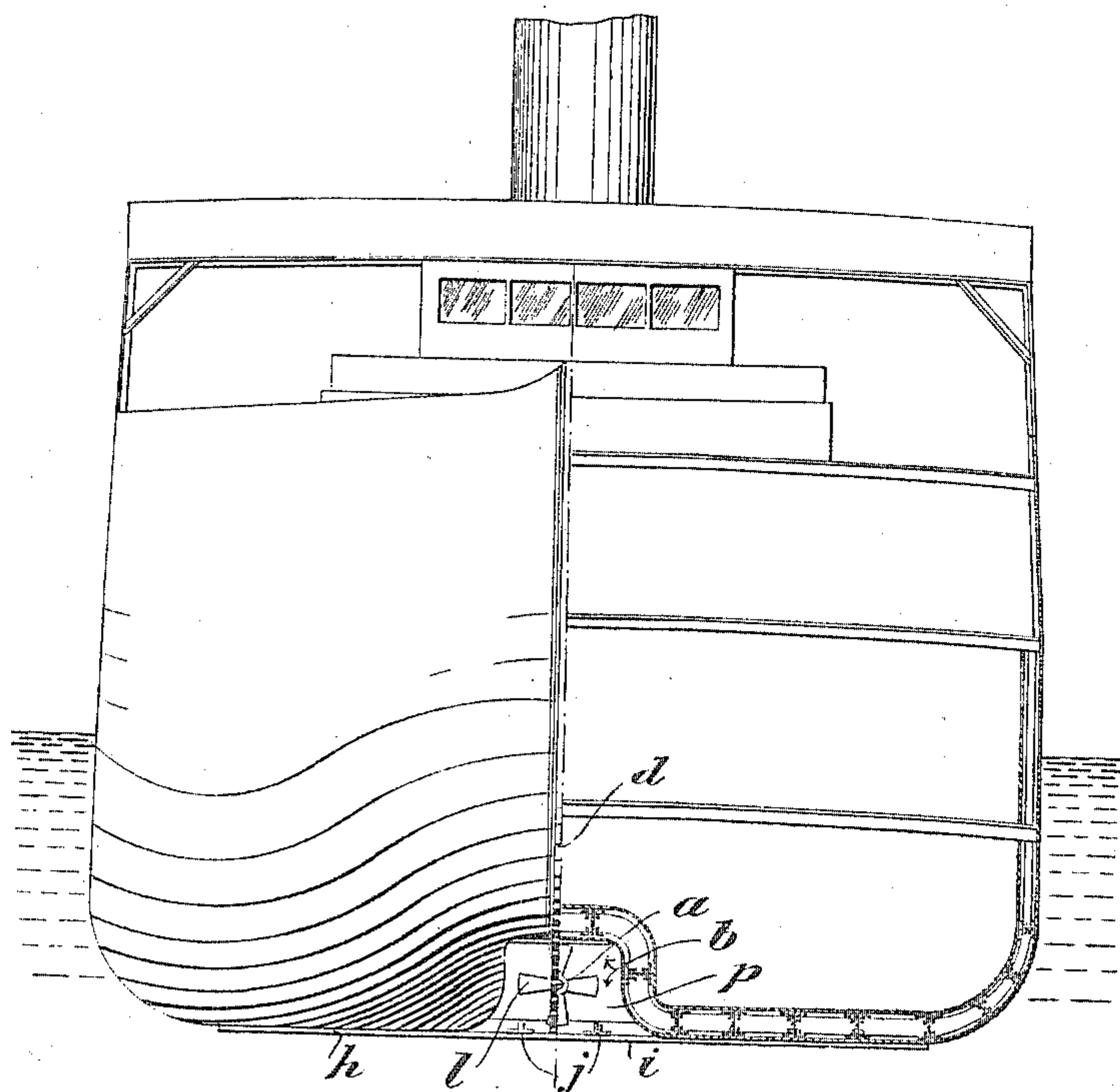
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3 SHEETS—SHEET 3.

*Fig. 3.*



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# UNITED STATES PATENT OFFICE.

ERNEST CHRISTOPHER ROBINSON, OF WEST HARTLEPOOL, ENGLAND.

## VESSEL PROPELLED BY STEAM.

No. 817,519.

Specification of Letters Patent.

Patented April 10, 1906.

Application filed October 23, 1905. Serial No. 283,945.

*To all whom it may concern:*

Be it known that I, ERNEST CHRISTOPHER ROBINSON, a subject of the King of Great Britain and Ireland, residing at West Hartlepool, in the county of Durham, England, have invented Improvements in Vessels Propelled by Steam or other Motive Power, of which the following is a specification.

This invention relates to improvements in navigable vessels of the kind adapted to be propelled ahead or astern and provided with propellers actuated by steam or other motive power and located in a tunnel that extends from end to end of the lower part of the vessel.

In order to effectively protect the propellers and at the same time to allow the water free communication with the tunnel throughout its length, the bottom of the tunnel is formed of suitably-supported metal plates, and there are provided openings throughout the entire length of such bottom. The bottom of the tunnel may be closed with ship's skin plating arranged so as to provide suitable openings at intervals throughout the length of the bottom and strengthened by stout angle or T irons extending from end to end of the tunnel.

To provide suitable accommodation for the motors without materially impeding the flow of water through the tunnel, a portion of the ship's bottom forming the roof of the tunnel is at a lower level than the other portions of the tunnel-roof and is adapted to form the floor of the engine-room or a portion thereof, the end portions connecting the tunnel-roof portion of lower level to the tunnel-roof portions of higher level being each inclined upwardly toward the respective end of the vessel, the propeller-shaft extending through appropriately-packed glands in said inclined walls.

The vessel is provided with a rudder at each end, and in order to shield the rudders and provide cut-water ends for the vessel the stem-post or frame at each end of the vessel extends to the bottom of the propeller-shaft tunnel and adjacent to the corresponding mouth of the tunnel has formed in it a suitable opening in which the rudder is adapted to work.

Figures 1 and 2 of the accompanying illustrative drawings together show, partly in central longitudinal vertical section and partly in side elevation, one construction of vessel according to this invention. Fig. 3

shows the vessel partly in end elevation and partly in transverse section.

The vessel illustrated is intended to be propelled ahead and astern, developing the same speed either way.

The propeller-shaft *a* is located in a longitudinally-arranged tunnel *b*, that is formed midway in the bottom of the vessel. The ship's bottom *c*, which (as usual) is double, is arched or bridged to form the roof of the tunnel *b*, Fig. 3, and each stem-post or frame *d* extends below the bottom *c* to the bottom of the tunnel *b*, so forming fine cut-water ends for the vessel.

At a suitable distance from each end of the vessel the corresponding stem-post or frame *d* is formed with an opening *e*, in which works a rudder *f*, the spindle or tailpiece of which passes up the corresponding rudder-tube *g* through the body of vessel to the rudder-head on deck, from which it is worked in the ordinary way. Instead of the rudders extending outwardly toward the ends of the vessel, as is usual, they extend inwardly toward the middle of the vessel. Rudders so arranged are more efficient in their action than rudders arranged to extend outwardly at the extreme ends of the vessel. The ends of the propeller-shaft tunnel *b* terminate at the inner ends of the openings *e*.

The bottom of the tunnel *b* is built in with the ship's skin-plating *h*, transversely arranged openings *i* being provided at intervals along the entire length of the tunnel-bottom, thus leaving the tunnel in free communication with the water. This plate-bottom *h* is strengthened by two stout angle-irons or T-irons *j*, lying fore and aft and riveted to the plates.

The immersed propeller-shaft *b* works in a number of suitable bearings *k*, bolted to the top *c* of the tunnel. The propellers *l* are preferably put on in halves and secured by stout tap-bolts, the number of propellers used varying according to the speed required.

To accommodate the engines *m* and boilers *n*, a portion *o* of the roof of the tunnel adapted to form the floor of the engine-room is at a lower level than that of the remainder, and the end portions *p*, connecting the roof portion *o* of lower level to the roof portions of higher level are inclined upwardly toward the corresponding end of the vessel, the propeller-shaft *b* extending through suitable packed glands *r* in the inclined walls *p*.



Instead of one propeller-shaft two or more may sometimes be provided, the proportions of the tunnel *b* being suitably modified.

It will be seen that in a vessel constructed according to this invention all the propellers are always immersed. They are also shielded from ice and other injurious objects.

What I claim is—

1. A navigable vessel comprising a tunnel that extends from end to end of the lower part of said vessel and is furnished with a bottom consisting of metal plates wherein, throughout the entire length of the tunnel, openings are provided; and extending throughout the entire length of said tunnel, bars or girders that are riveted to and adapted to support said plates, substantially as set forth.

2. A navigable vessel comprising a tunnel that extends from end to end of the lower part of said vessel and is furnished with a bottom formed of metal plates provided with openings throughout the entire length of the tunnel, and with a roof that forms part of the vessel's bottom and is composed of extreme portions, a middle portion located at a lower level than said extreme portions, and, intermediate between said extreme portions and middle portion, walls that are upwardly inclined toward the respective ends of the vessel, substantially as set forth.

3. A navigable vessel comprising a tunnel that extends from end to end of the lower part of said vessel and is furnished with a bottom formed of metal plates provided with openings throughout the entire length of the tunnel, and with a roof that forms part of the vessel's bottom and is composed of extreme portions, a middle portion located at a lower level than said extreme portions, and, intermediate between said extreme portions and middle portion, walls that are upwardly inclined toward the respective ends of the vessel, and extending throughout the entire length of said tunnel, bars or girders that are riveted to and adapted to support said plates, substantially as set forth.

4. A navigable vessel comprising a tunnel that extends from end to end of the lower part of said vessel and is furnished with a bottom formed of metal plates provided with openings throughout the entire length of the tunnel; bars or girders that extend throughout the entire length of said tunnel and that are riveted to and adapted to support said plates; and within said tunnel propellers adapted to be actuated by steam or other motive power, substantially as set forth.

5. A navigable vessel comprising a tunnel that extends from end to end of the lower part thereof and is furnished with a bottom formed of metal plates provided throughout the entire length of the tunnel with openings, and with a roof that forms part of the vessel's bottom, and is composed of extreme portions,

a middle portion located at a lower level than said extreme portions, and, intermediate between said extreme portions and middle portion, walls that are upwardly inclined toward the respective ends of the vessel; within said tunnel a propeller-shaft; propellers on said shaft; and, in said inclined walls, glands through which said shaft extends, substantially as set forth.

6. A navigable vessel comprising a tunnel that extends from end to end of the lower part of said vessel and is furnished with a bottom consisting of metal plates wherein, throughout the entire length of the tunnel, openings are provided; extending throughout the entire length of said tunnel, bars or girders that are riveted to and adapted to support said plates; at each end of said vessel a stem-post or frame that extends to the bottom of said tunnel and has formed in it an opening adjacent to the corresponding mouth of said tunnel; and rudders mounted within said openings in the frame or stem-post, substantially as set forth.

7. A navigable vessel comprising a tunnel that extends from end to end of the lower part of said vessel and is furnished with a bottom formed of metal plates provided with openings throughout the entire length of the tunnel, and with a roof that forms part of the vessel's bottom and is composed of extreme portions, a middle portion located at a lower level than said extreme portions, and intermediate between said extreme portions and middle portion, walls that are upwardly inclined toward the respective ends of the vessel, at each end of said vessel a stem-post or frame that extends to the bottom of said tunnel and has formed in it an opening adjacent to the corresponding mouth of said tunnel; and rudders mounted within said openings in the frame or stem-post, substantially as set forth.

8. A navigable vessel comprising a tunnel that extends from end to end of the lower part of said vessel and is furnished with a bottom consisting of metal plates wherein, throughout the entire length of the tunnel, openings are provided; extending throughout the entire length of said tunnel, bars or girders that are riveted to and adapted to support said plates; at each end of said vessel a stem-post or frame that extends to the bottom of said tunnel and has formed in it an opening adjacent to the corresponding mouth of said tunnel; and rudders mounted within said openings in the frame or stem-post and inwardly turned toward the midship section of said vessel.

9. A navigable vessel comprising a tunnel that extends from end to end of the lower part of said vessel and is furnished with a bottom formed of metal plates provided with openings throughout the entire length of the tunnel, and with a roof that forms part of the



vessel's bottom and is composed of extreme portions, a middle portion located at a lower level than said extreme portions, and, intermediate between said extreme portions and middle portion, walls that are upwardly inclined toward the respective ends of the vessel; at each end of said vessel a stem-post or frame that extends to the bottom of said tunnel and has formed in it an opening adjacent to the corresponding mouth of said tunnel; and rudders mounted within said openings in the frame or stem-post and inwardly turned toward the midship section of said vessel.

10. In a navigable vessel, a propeller-tun-

nel, that extends from end to end of the vessel, metal plates forming the bottom of said tunnel arranged so as to provide openings at intervals throughout the length of the tunnel-bottom, and longitudinally - arranged iron members supporting said plates, substantially as set forth.

Signed at West Hartlepool this 6th day of October, 1905.

ERNEST CHRISTOPHER ROBINSON.

Witnesses:

WILLIAMS ROBINSON,  
JOHN WILLIAM WALTON.