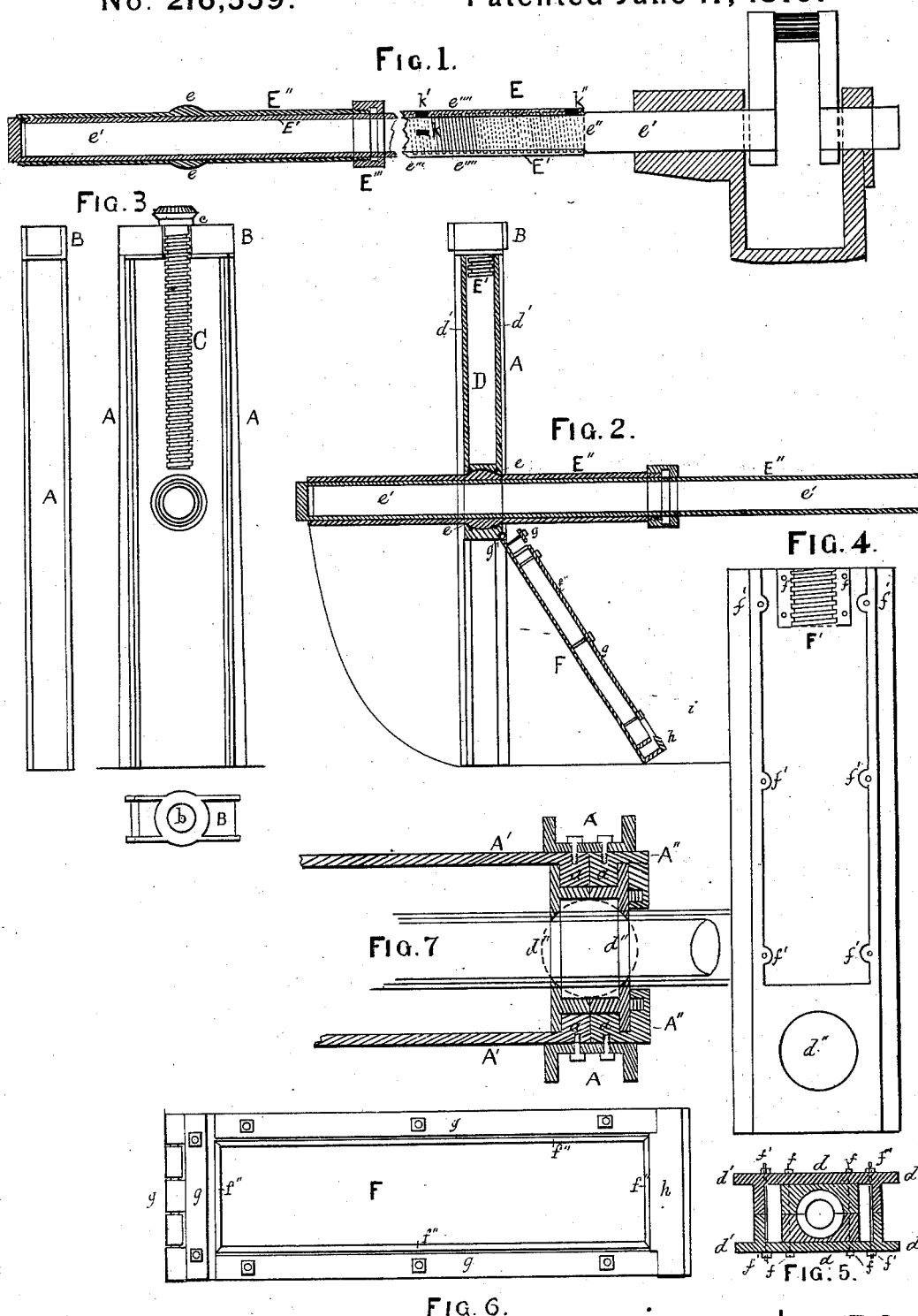


J. W. DILKS.
Raising and Lowering Propellers.

No. 216,559.

Patented June 17, 1879.



WITNESSES
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FIG. 6.

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JOSEPH W. DILKS, OF PHILADELPHIA, PENNSYLVANIA.

IMPROVEMENT IN RAISING AND LOWERING PROPELLERS.

Specification forming part of Letters Patent No. **216,559**, dated June 17, 1879; application filed May 21, 1878.

To all whom it may concern:

Be it known that I, JOSEPH W. DILKS, of Philadelphia, State of Pennsylvania, have invented certain new and useful Improvements in Propellers for Steamboats; and I do hereby declare that the following is a full, clear, and exact description of the invention, which 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 letters of reference marked thereon, which form a part of this specification.

This invention relates to improvements in the method of adjusting the vertical movements in propellers in canal or other steamers; and consists in the manner of constructing the propeller-chamber with water-tight valves, so that, at whatever height the propeller may be, the valves which contain and follow the propeller-shaft in its vertical movements will be water-tight; also, in a peculiar method of elongating the propeller-shafts; and also in the method of elevating and depressing the shaft for light or deep draft of the vessel, all of which will be hereinafter more fully described, and set forth in the claims.

Figure 1 is a section of the propeller-shaft. Fig. 2 is a vertical section through the valves and shaft; Fig. 3, side, end, and plan view of standards; Figs. 4 and 5, side view and section of vertical valve; Fig. 6, side view of bottom valve; Fig. 7, cross-section of Fig. 2.

A A are two standards, of cast-iron, having a gallows-frame, B, on top, through which is a circular hole, b, for the free movements of an elevating-screw, C.

D is a vertical valve, made of two distinct parts, which will now be described. The two plates *d d* have on the inside projecting ribs *d'* a sufficient distance from the edges to give suitable slide-bearings for the "gins" *a a* in the sides of the standards A A, as will be described hereinafter. Through these plates *d* are holes *d'' d'''* for the main propeller-shaft E, to be described. These holes *d'' d'''* are curved inwardly, as seen in section, Fig. 2, around a spherical boss, *e e*, raised on the main shaft. This orifice, with the spherical boss *e e*, forms a ball-and-socket joint, the packing for which is an india-rubber ring in-

serted in a groove in the concave edge of the orifice.

At the upper end of the valve D is inserted a nut, F', which is fastened by screw-bolts *f f*. A half of said nut may be cast upon each side plate; but I prefer the inserted nut to be bolted on, because it may be removed for renewal when worn out. These two halves of the valve are to be secured together by through-bolts *f' f'*.

F is bottom valve, represented in section in Fig. 2 and in plan, Fig. 6. This valve has a packing-frame, *f'' f''*, surrounding it some inches inside of its four edges, and with packing-plates *g g*, screwed up in the usual manner. This valve F is hinged to valve D by a hinged joint at *g'*. The lower end of the bottom valve is provided with a sliding bar, *h*, which, by sliding under the fixed clamps *i* in the sides of the chamber, will hold that end firmly down to the bottom at whatever angle the valve may be placed. The packing around said valve will keep it water-tight in the propeller-chamber. These two valves thus jointed by a hinge and packed properly will admit of the movement of the shaft vertically for any depth without admitting water within the chamber. The vertical valve, by its slides *d' d'*, moves freely up and down between the standards A A by the projecting ribs *a a*, cast or otherwise formed upon the plates A' A'', which form the propeller-chamber, A' being the interior section, and A'' the exterior, as shown in Fig. 7. Proper provision is made for packing every part of the apparatus where water can be admitted.

E is a main propeller-shaft, composed of three essential elements—first, a solid shaft or central core, *e'*, to which is attached the crank worked by the engine. Said crank is arranged in a journal-box frame working on transverse trunnions, so that the propeller-shaft can be revolved at any angle. On this central shaft or core, *e'*, is a hollow shaft, E'', which extends from the shoulder *e''* on *e'* to the extremity, and on which is fastened the propeller, the outer or propeller end being closed. From the inner end, at *e''*, to a certain distance, as at *e'''*, is cut interiorly a screw-thread to match a screw cut upon the central shaft, *e'*, at *e''''*. In the central shaft, *e'*, at *k*, is a key-slot, and at *k'* and *k''* in the hollow

shaft E' are two corresponding key-slots, so that by unscrewing the shaft *e'* or screwing it up the key may be inserted at either of the slots *k' k''* and shorten or elongate the whole shaft, as may be desired. Over these two shafts as a sleeve, E'', on which is a spherical projection, *e e*, as before described, to fit into and work as a ball-and-socket joint in valve D.

At the inner end of sleeve E'' is a packing-ring, E''', formed double, so as to pack the surface joining with the hollow shaft E', and prevent the water from passing between the sleeve and shaft into the chamber. This arrangement of sleeve and ball-and-socket joint permits the vertical adjustment of the propeller and shaft, and also an extension outwardly, also any derangement of the line of the shaft horizontally, and prevents binding of the shaft from any movement or twist of the boat-frame, and consequently relieves the engine from any strain whatever.

C is an elevating-screw, which is operated from above by any convenient method. The lower end of C works in a nut, F', in the upper end of valve D, as before described. The weight of valve D and propeller and shaft will always keep the washer *c* of the screw seated upon the gallows-frame B; but as the screw C is rotated the valve D can be elevated to any height desirable. The screw being loose in the gallows-

frame B permits the valve and screw to be lifted from below should the propeller-blade meet any obstruction, and thus prevent breaking any part of the machinery.

I claim—

1. The combination of the vertically-sliding valve D, having in it an orifice for the main propeller-shaft of spherical form, in combination with a propeller-shaft having upon it a spherical boss to correspond with said orifice, substantially as and for the purpose described.

2. The combination of the vertically-moving valve D, constructed as described, the shaft with spherical boss, and the bottom sliding valve, substantially as and for the purpose described.

3. The propeller-shaft, formed of three distinct sections, consisting of a solid central core with a screw-thread cut thereon, a hollow shaft with internal threaded surface to correspond with the screw on the core, and the exterior sleeve having a spherical boss, all substantially as and for the purpose described.

In testimony that I claim the foregoing as my own I affix my signature in presence of two witnesses.

JOSEPH W. DILKS.

Witnesses:

N. A. LYON,
WM. A. LYON.