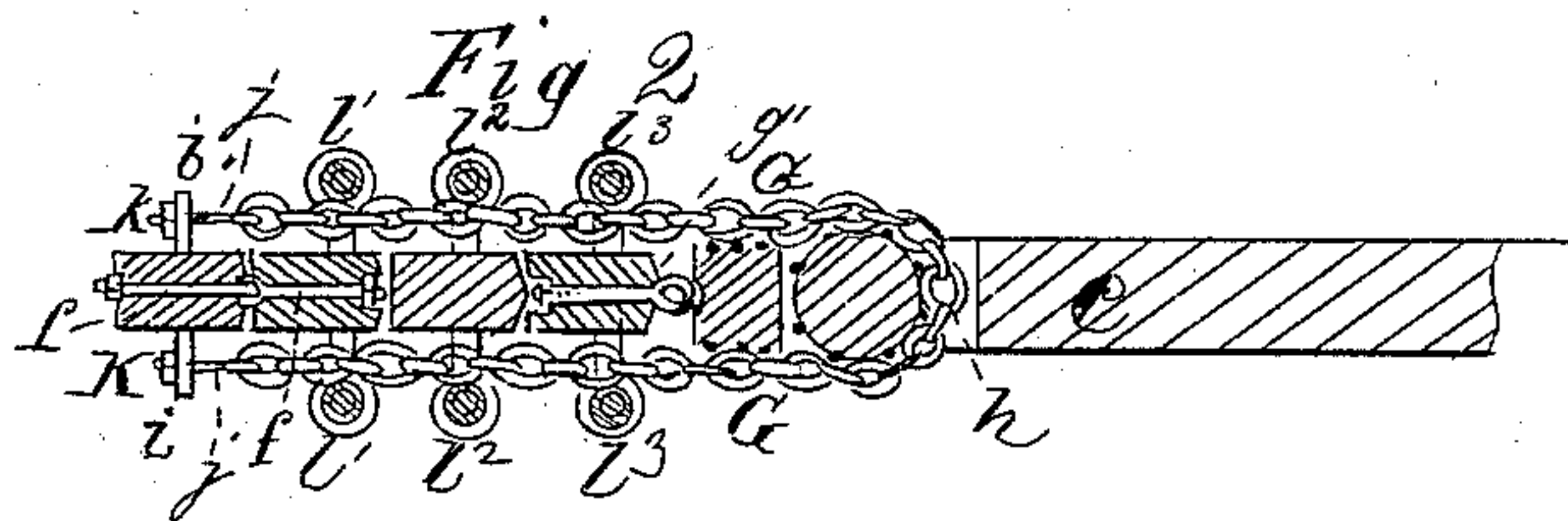
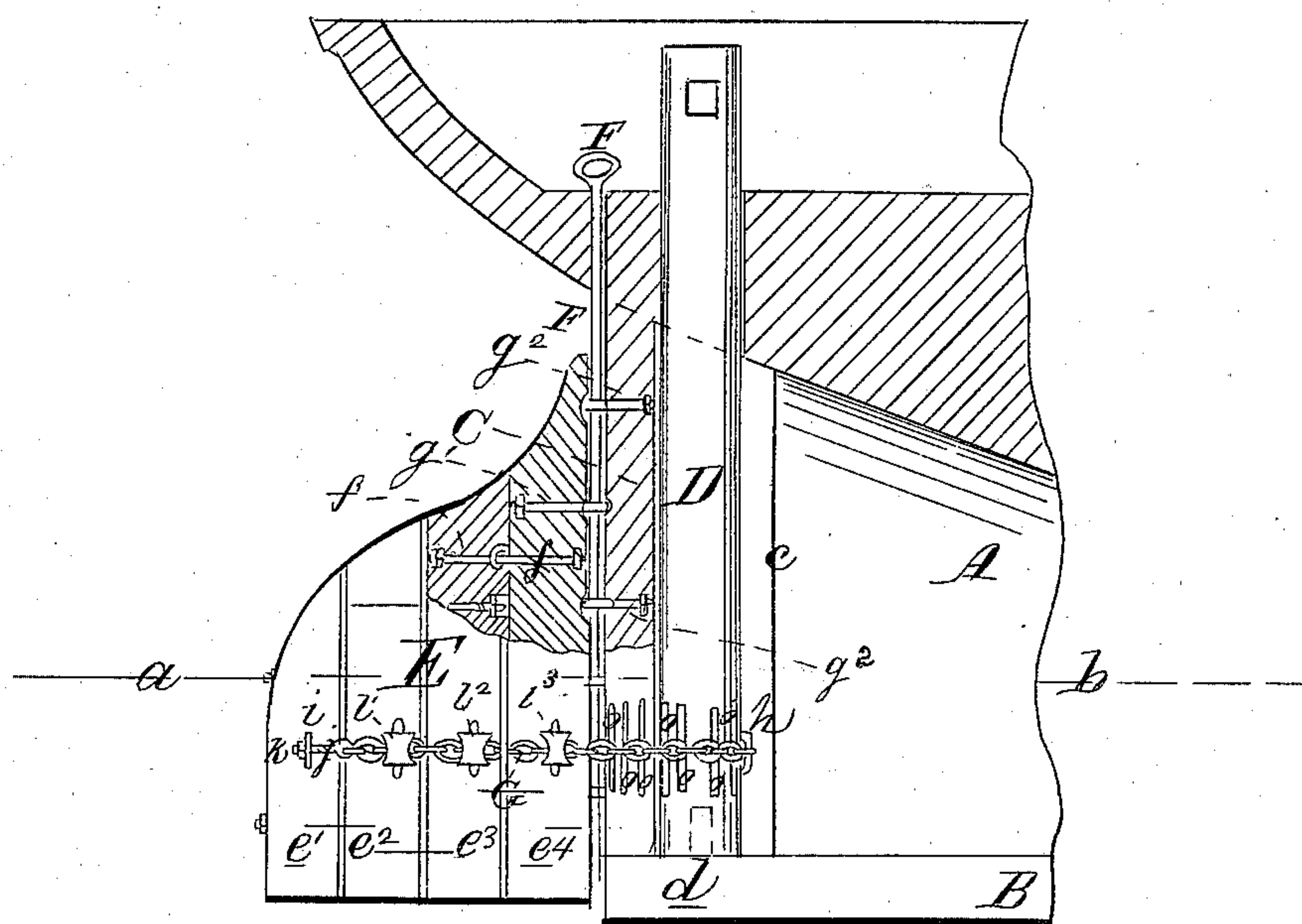


Robin & Burk,
Steering Appar's.

No. 98636.

Patented Jan. 4. 1870.

Fig. 1



Witnesses:
W. S. Sprague
Jas. I. Day

Inventors:
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per Attorney
Thos. S. Sprague

United States Patent Office.

THOMAS ROBIN AND CHARLES E. BURK, OF SHEBOYGAN, WISCONSIN.

Letters Patent No. 98,636, dated January 4, 1870.

IMPROVEMENT IN SHIPS' RUDDERS.

The Schedule referred to in these Letters Patent and making part of the same

To whom it may concern:

Be it known that we, THOMAS ROBIN and CHARLES E. BURK, of Sheboygan, in the county of Sheboygan, and State of Wisconsin, have invented a new and useful Improvement in Ships' Rudders; and we do declare that the following is a true and accurate description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, and being a part of this specification, in which—

Figure 1 is an elevation of the stern of a ship, fitted with our improved rudder, the hull and rudder being partially in section, to better show their construction and arrangement.

Figure 2 is a horizontal section, on the line *a b*, in fig. 1.

Like letters refer to like parts in each figure.

The nature of this invention relates to an improvement in the construction and method of attaching and operating rudders for steering steam and sail-vessels, and consists in the peculiar construction of the rudder, which is hinged to the stern-post by a bolt extending down through the deck, and in operating the same by means of a chain secured to the rudder-post, which is otherwise independent of it, and is stepped in the shoe of the keel, in a space between the stern-post and the dead-wood of the stern of the hull, the whole operating in such a manner as will enable the ship to steer easily, and answer her helm smartly, when put hard over, as hereinafter more fully shown and set forth.

In the drawings—

A represents the stern of a vessel's hull, and B the keel.

C is the stern-post, flat on its rear face, and has its lower end supported by an extension of the keel, forming the shoe *d*.

D is a rudder-post, stepped on the shoe, a space being left between the stern-post and the dead-wood *e*, of the stern of the hull, for that purpose. The rudder-post extends up through the deck, and is rotated in the usual manner.

E is a sectional and partially-folding rudder, composed of four or more vertical leaves or sections of wood, *e*¹, *e*², *e*³, and *e*⁴, hinged together by the pintles *f*, adjusted by proper nuts on their outer threaded ends, as shown.

The front edges of the sections are chamfered each way from the centre, while the back edges are left square.

The forward section, *e*¹, of the rudder, is hinged to the stern-post by a rod, *F*, passing through its pintles, *g*¹, and through similar pintles, *g*², in the stern-post.

The rod *F* is passed down through an opening in the deck, as shown.

The pintles *g*¹ and *g*² are adjusted and secured in position by proper nuts on their threaded ends, the

forward edge of the stern-post and rear edge of the section *e*⁴ of the rudder having appropriate recesses for the reception of said nuts.

G is a chain, whose centre link is secured to the front of the rudder-post by a staple, *h*.

The ends of this chain terminate in threaded bolts *j*, passing through openings in a plate, *i*, projecting from the sides of the section *e*¹ of the rudder, where they are secured by a nut, *k*.

By means of this nut, the slack of the chain may be taken up, when necessary.

*l*¹, *l*², and *l*³, are metallic rollers, revolving on staples secured to the sections *e*¹, *e*², and *e*⁴ of the rudder. Under these rollers the chain passes.

o are metallic wear-plates, secured to the stern and rudder-posts, to avoid damage by the friction of the chain on their surfaces.

The action of our rudder may be explained as follows:

The rudder being "amidship," as shown in the drawings, by partially rotating the rudder-post D, in either direction, the opposite end of the chain, exerting a strain on the section *e*¹, rotates it on its pintle until its chamfered edge strikes the after edge of the section *e*², which rotates until its chamfered edge strikes the rear edge of the section *e*³, which rotates until it strikes the rear edge of the section *e*⁴, which turns on the pintle-rod F, until its chamfered edge abuts against the rear edge of the stern-post, by which time the helm and rudder are hard over, the rudder not standing at a right angle to the keel, but describing an arc of a circle in that direction; the water being held in the hollow part of the rudder, until the greatest resistance can be obtained from it against the last section of the rudder. It will be noticed that the last section of the rudder is turned first, enabling the vessel to answer quickly, when but a slight change in her course is required, as the last section is "hard over" before the second section moves.

What we claim as our invention, and desire to secure by Letters Patent, is—

1. The jointed sectional rudder E, as described, hinged to the stern-post, and operated by an independent rudder-post, substantially as herein specified.

2. The independent rudder-post D and chain G, in connection with the rollers *l*¹, *l*², and *l*³, bolts *j*, nuts *k*, and plates *i*, arranged and operating substantially as described and for the purposes set forth.

3. The pintle-bolt F, when extended up through the deck, for shipping and unshipping the rudder when necessary.

THOMAS ROBIN.
CHAS. E. BURK.

Witnesses:

NATHAN COLE,
WM. H. BURK.