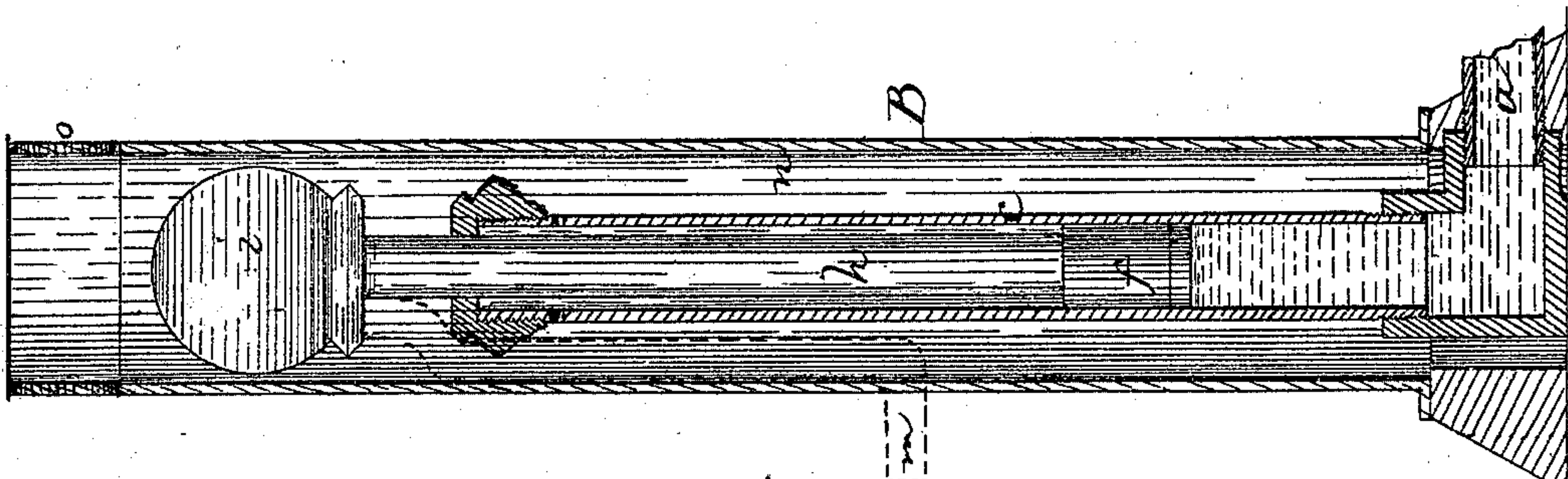
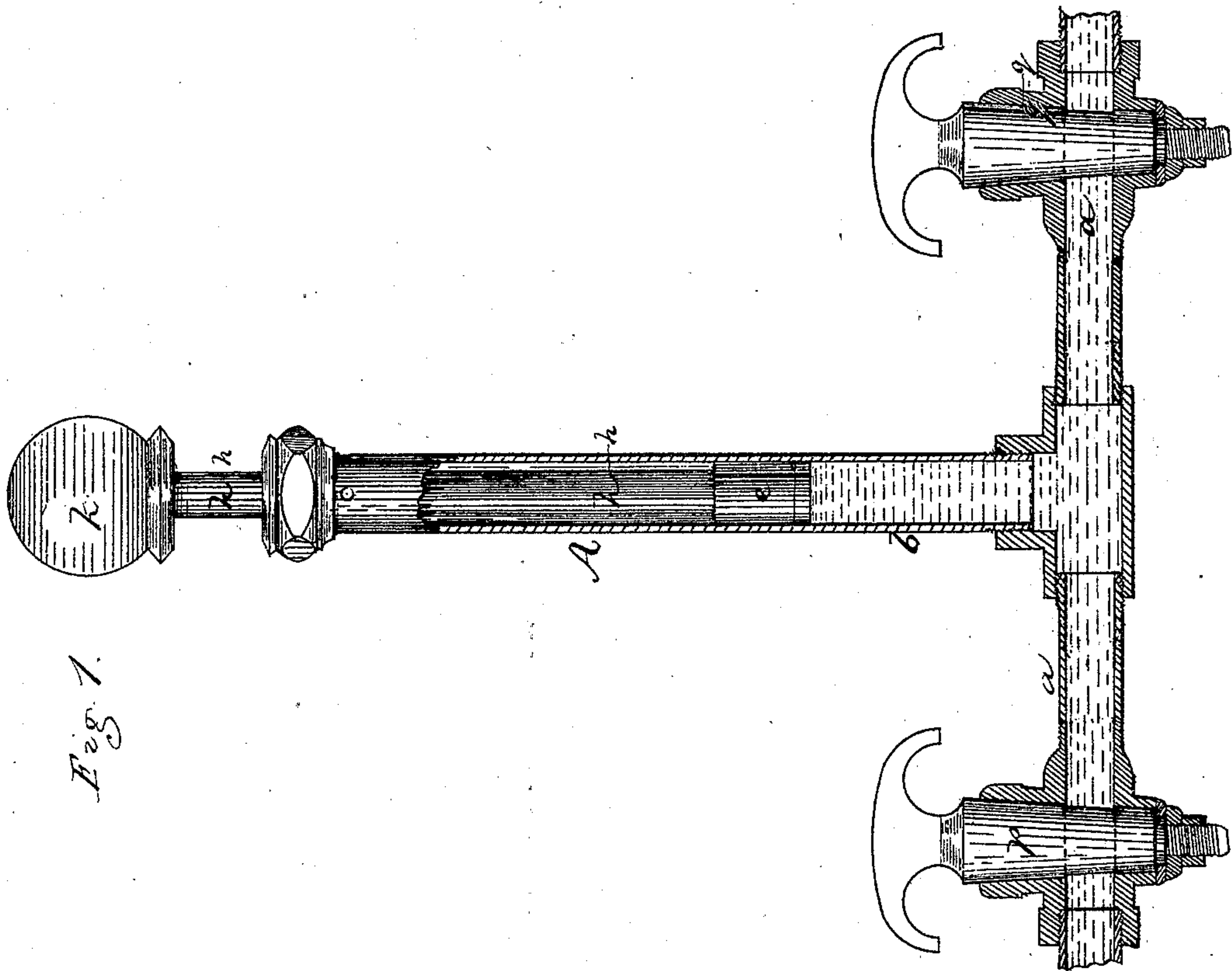
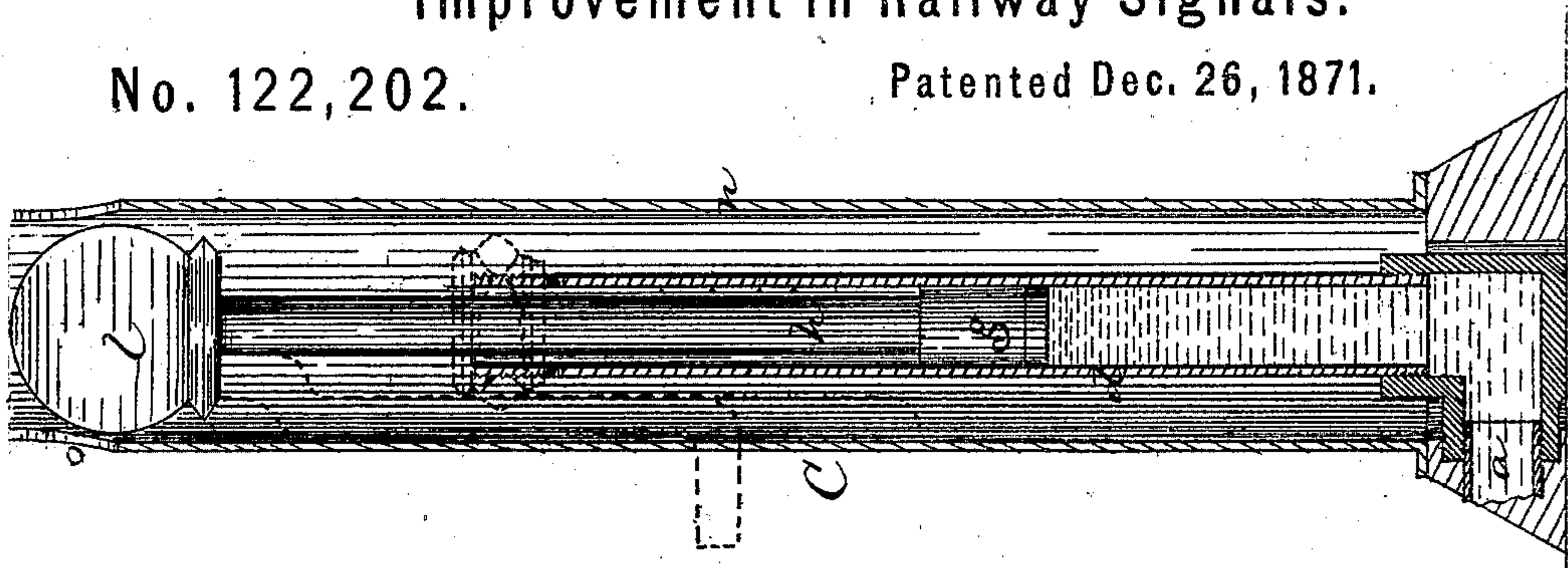


C. D. TISDALE.

Improvement in Railway Signals.

No. 122,202.

Patented Dec. 26, 1871.



Witnesses.
Mo. W. Frothingham.
Cherry - Jr -

C. D. Tisdale.
By his Atty.
Crosby & Gould

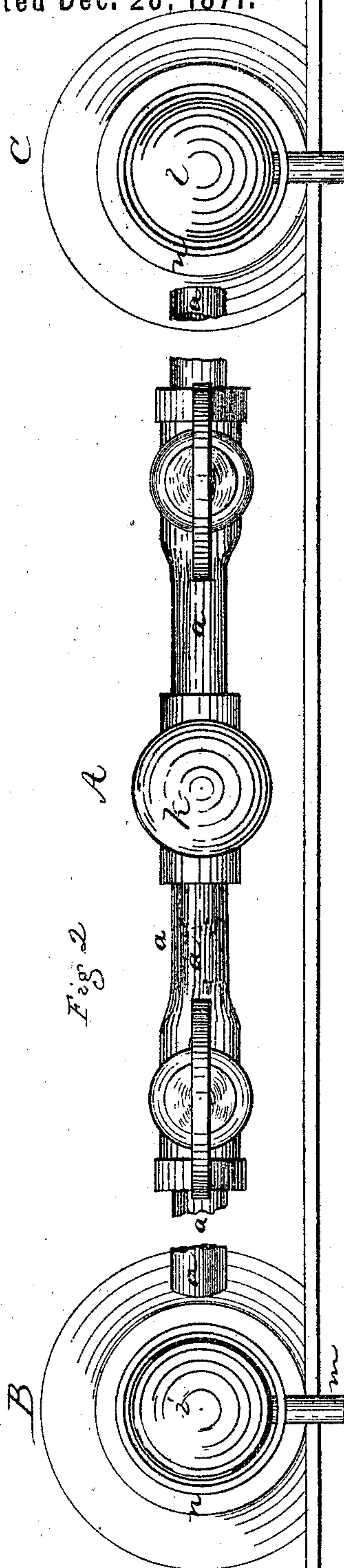
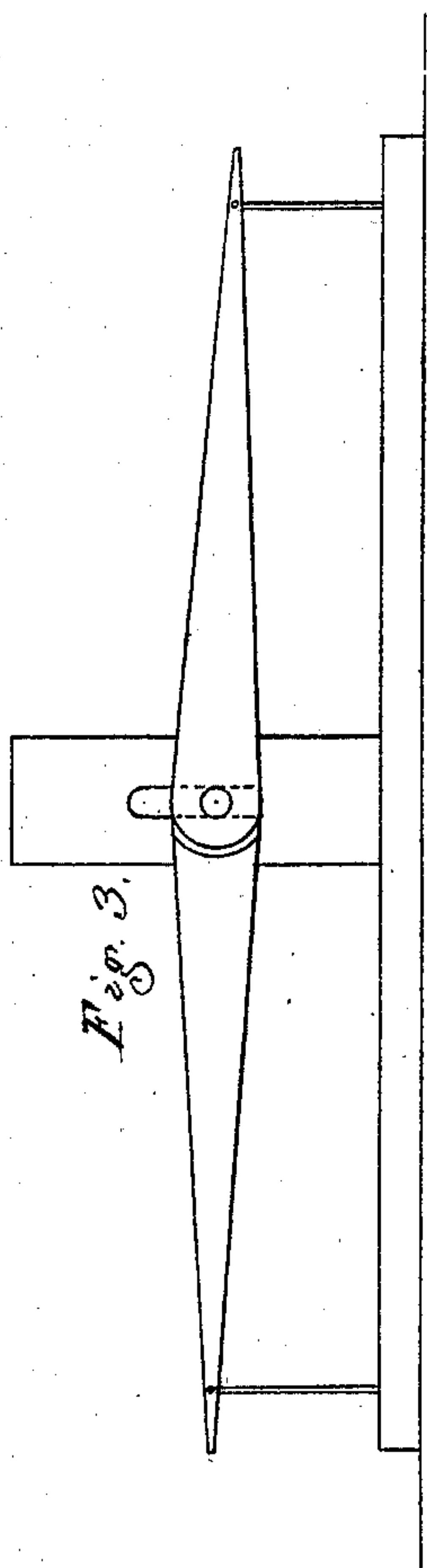
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2 Sheets-- Sheet 2.

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Witnesses { Mo. W. Frothingham.
C. Henry Jr.

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UNITED STATES PATENT OFFICE.

CHARLES D. TISDALE, OF BOSTON, MASSACHUSETTS, ASSIGNOR TO HIMSELF
AND SAMUEL SHACKELL, OF SAME PLACE.

IMPROVEMENT IN RAILWAY SIGNALS.

Specification forming part of Letters Patent No. 122,202, dated December 26, 1871.

To all whom it may concern:

Be it known that I, CHARLES D. TISDALE, of Boston, in the county of Suffolk and State of Massachusetts, have invented an Improvement in Operating Signals, &c.; and I do hereby declare that the following, taken in connection with the drawing which accompanies and forms part of this specification, is a description of my invention sufficient to enable those skilled in the art to practice it.

My invention relates to an improved method of operating railway signals from points more or less remote. The invention consists, primarily, in combining with the signal to be raised or lowered a piston working in a cylinder and supported upon liquid contained therein, the cylinder being connected by a tube extending to the point at which the raising or lowering of the signal is to be effected, at which point the tube or a cylinder connected therewith contains another piston resting upon the liquid, with which the whole length of tube is charged, so that, by downward pressure upon the piston at the operating point, the piston-supported signal or other object, however distant, will be simultaneously raised and made conspicuously visible, while, by raising said piston, the signal or other object will be correspondingly lowered. By my invention signals upon railroads are arranged at certain distances apart, and to be operated by the train or engine so that a signal shall be raised by a passing engine, and then lowered by the same engine as it passes the next signal and by the act of raising said second signal, and so on, the respective signals being at a distance apart equal to such distance apart as trains may safely run; or similar signals in each direction may be operated from a station, so that at any delay to a train at a station, signals may be raised at a suitable distance therefrom in either direction, to give timely notice for the arrest of approaching trains.

The drawing represents a hydraulic or liquid-containing tube and signal mechanism, combined or connected with a railway.

A represents the point at the station at which there may be located a signal; B and C, points at suitable distances from such station in each direction at which to locate safety-signals. *a* denotes the tube extending alongside the track and buried at a suitable depth. At the station-point A a vertical tube, *b*, extends up from said tube *a*, and at

the points B and C are similar vertical tubes *c* *d*. The horizontal tube is charged with a suitable liquid, and in each of the vertical tubes is located a piston, *e*, *f*, or *g*, supported by and upon the liquid, a rod, *h*, extending up from each piston and having upon its top a signal-ball, lantern, or other signaling-object, *i*, *k*, or *l*. By depressing or by raising either one of these signals, one or both of the others will be raised or lowered. Suppose a train to be passing the point B. By a suitable projection from the engine the signal *i* will be raised; as, for instance, an incline or lifter attached to the engine may pass under a projection, *m*, and raise the signal-rod. The weight of the piston in the cylinder *d* will then cause it to descend, (as the liquid in the cylinder lowers,) and as the engine passes the signal C, which is located at a distance from B equal to the distance apart at which trains can safely run the signal at B will be raised and the signal at A lowered. The reverse of these operations may bring the signals into position; as, for instance, the signal may be a red ball or other easily-distinguishable object, surrounded by a stationary tube, *n*, having an opening or openings, *o*, and depression of the rod by the passing engine may be made to bring the ball opposite to the opening or into position to be seen by an approaching train, depression of the next signal-rod bringing its signal into position, and bringing the former one into concealed position. One signal may be used without the other, the signal being brought into position by the passing engine, as described, and thrown from position by the mechanism operated by the engine to raise or lower a piston-rod at the proper distance from the signal at which it is to be concealed. In either case the liquid-charged tube and the pistons for communicating the motion through the agency of the liquid and the pressure of the pistons thereon, is to be the means of operating the signal. To operate either or both of the signals from the point A, the vertical tube *b* is provided with a piston, *e*, and the horizontal tube may have one or more cocks, *p* *q*. By opening cock *p* and closing cock *q*, and depressing or raising the rod *h*, the signal at B may be raised or lowered. In the same manner, by closing cock *b* and opening cock *q*, the signal at C may be raised or lowered. By having suitable stops for arresting the movement of each signal-rod at a cer-

tain height, both signals may be raised or lowered by lowering or raising the rod *h*. Two long arms or inclines may be jointed to the pin projecting from the signal-rod, as seen at Fig. 3, the point of one incline being slightly higher than the other. An engine coming in one direction has upon its side adjacent to the signal, a projection which runs under the point of the arm it is approaching and raises both the arms and the signal, while the engine coming in an opposite direction has upon its side adjacent to the signal, a projection which runs over the point of the arm it approaches and presses down the arms and the signal.

Thus, trains running over the same track from trunk and branch tracks may know of the passage of prior trains, the signal shown at C being connected with co-operating signals, as before described.

The station-signal A may be operated by direct application of the hand to the rod *h*, or from the inside of the station-house, or from some other point, and may be used simply to display a station-signal, or to operate by means of the distant signals, to notify approaching trains of pre-occupation of the track at the station, or that they may or may not approach.

I claim—

1. In connection with a railway track, a horizontal liquid-charged tube having vertical piston cylinders, upon the rods of which are placed signals, said rods having projections which are moved by a passing engine or car, the movement of one rod and its signal effecting the movement of the next piston and its signal, substantially as described.

2. In combination with two or more signals mounted upon the pistons of the hydraulic tubes the cock *p q*, so arranged that either signal may be operated from the station without effecting the other signal or signals, substantially as described.

3. The jointed inclines or arms having their outer ends at different elevations, (as shown in Fig. 3,) so that an engine in passing in one direction raises the signal, and in passing in the other direction lowers the signal, substantially as described.

Executed the 22d day of September, A. D. 1871.

C. D. TISDALE.

Witnesses:

FRANCIS GOULD,
M. W. FROTHINGHAM.

(120)