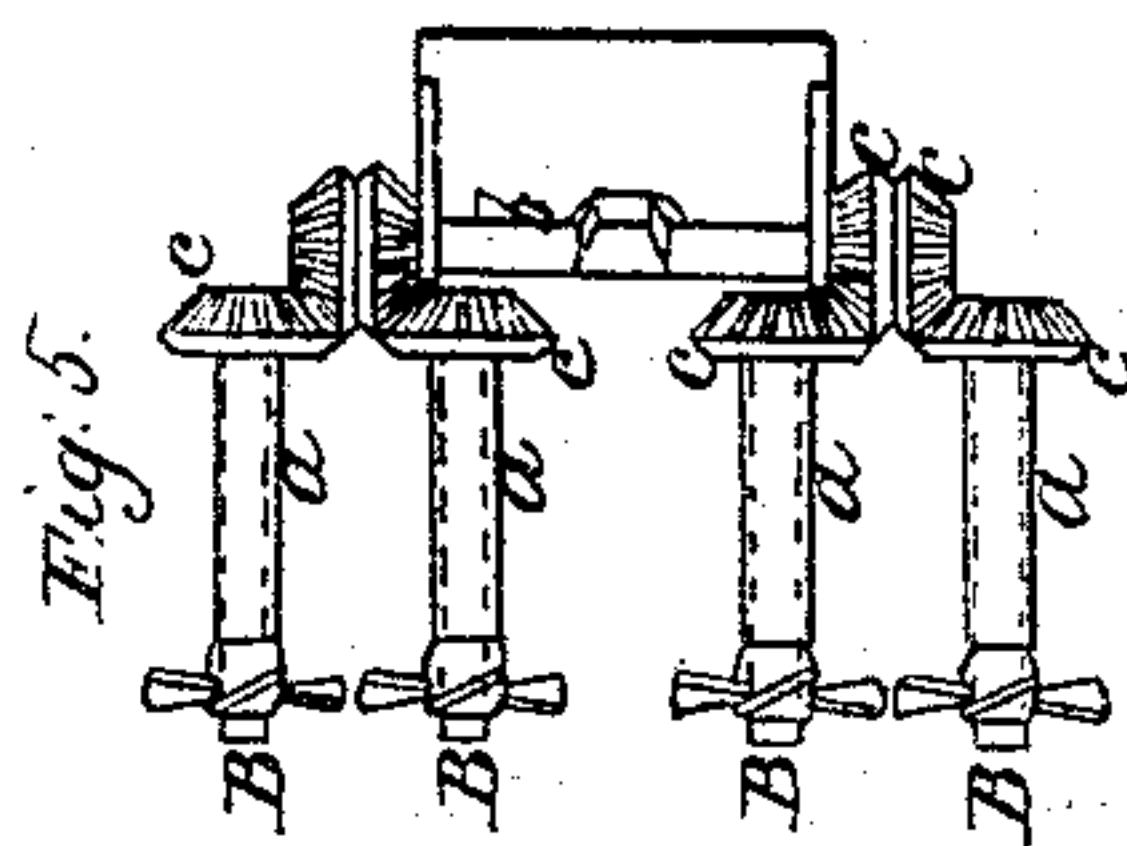
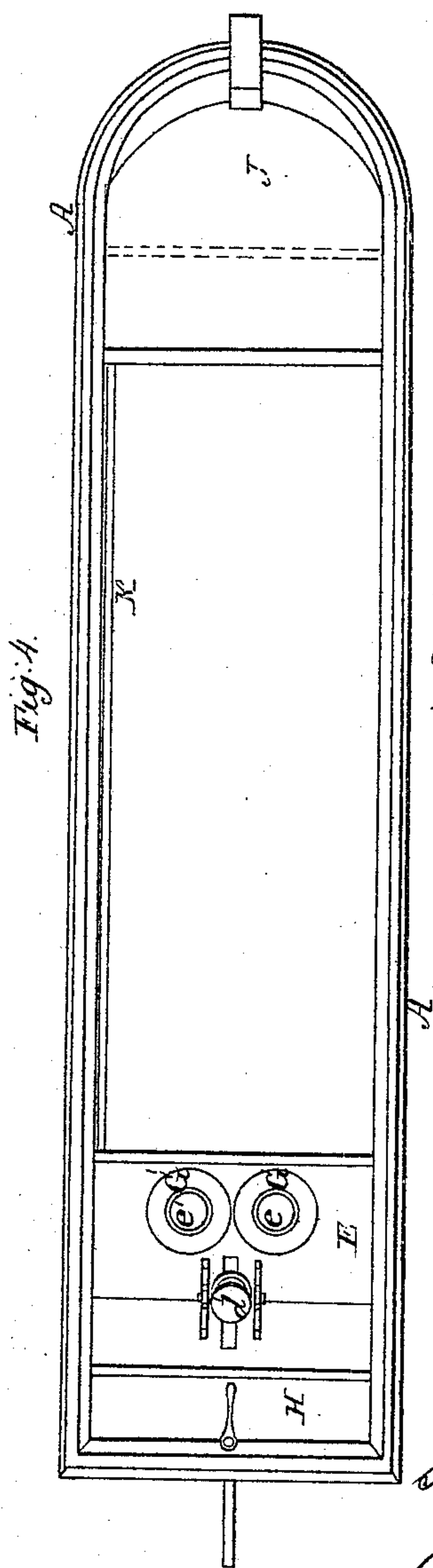
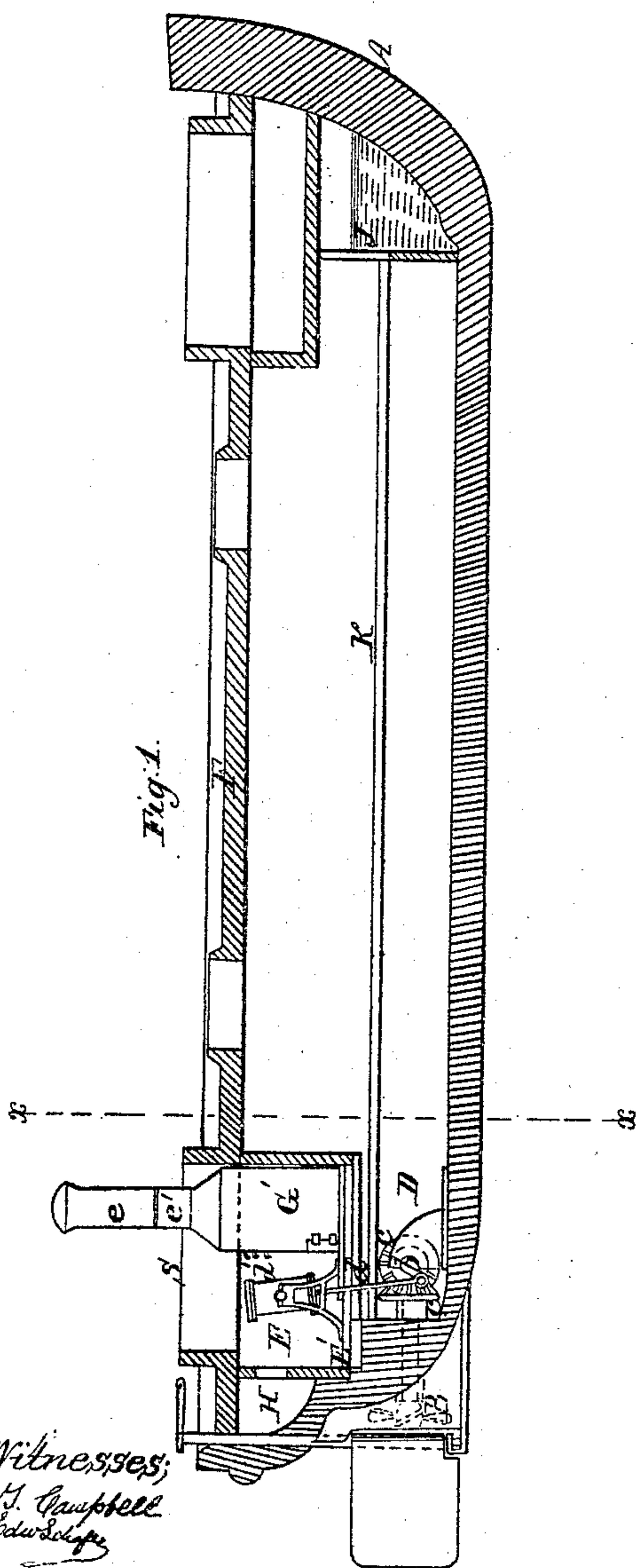
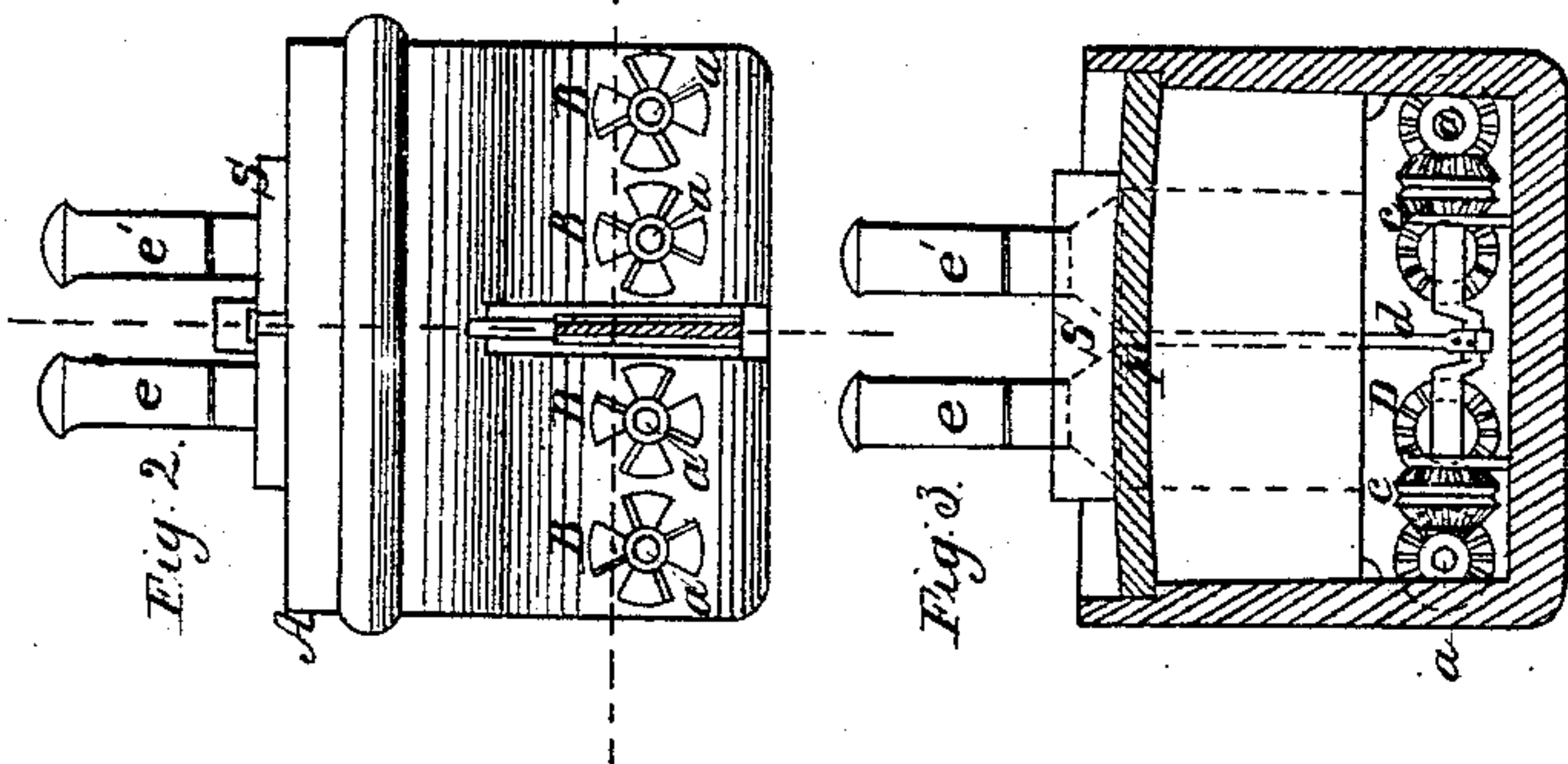


*S. D. Gilson.*  
*Screw Propeller.*

N<sup>o</sup>: 84, 108.

*Patented Nov. 17, 1868.*



Witnesses;  
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# United States Patent Office.

SAMUEL D. GILSON, OF OSWEGO FALLS, NEW YORK.

Letters Patent No. 84,108, dated November 17, 1868.

## IMPROVEMENT IN PROPELLERS FOR CANAL-BOATS.

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

To all whom it may concern:

Be it known that I, SAMUEL D. GILSON, of Oswego Falls, in the county of Oswego, and State of New York, have invented certain new and useful Improvements on Canal-Boats; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, making a part of this specification, in which—

Figure 1 is a longitudinal section, taken in a vertical plane through the centre of the improved canal-boat.

Figure 2 is a view of the stern of the boat.

Figure 3 is a cross-section, taken through the boat in the vertical plane indicated by the red line *xx*, in fig. 1, looking toward the stern.

Figure 4 is a top view of the boat, with the upper deck removed.

Figure 5 is a plan view of the four propellers and their driving-mechanism.

Similar letters of reference indicate corresponding parts in the several figures.

This invention relates to certain novel improvements which are designed to remedy several serious difficulties hitherto attending steam-propulsion on canals, particularly where boats were provided with stern-propellers.

One of these difficulties arises in consequence of making the propellers so large that they cannot be located low enough to operate to a good advantage when a boat is only partially loaded, or not loaded at all. To remedy this, I employ several propellers, of considerably less diameter than those heretofore used, but which will, collectively, exert the same power of propulsion as one or two larger propellers, which propellers I am enabled to arrange low enough to have them operate successfully upon the water, equally as well when the boat is not loaded as when it is heavily loaded, as will be hereinafter explained.

Another objection hitherto attending steam-propulsion on canals, is the consumption of a large amount of the space by the steam-machinery, which space is required for the cargo. This difficulty I remedy, to a great extent, by having the boiler-deck and engine-room arranged above the bottom of the boat, but below the upper deck, and by employing several propellers, which are so small as to allow their shafts to be located very low in the hold, thus affording a large space below said engine-room for stowage of freight, as will be hereinafter explained.

I also provide for the use of one or more auxiliary steam-boilers, in conjunction with three or more stern-propellers, which boilers are intended to be used should the principal boiler give out, or in case of the accidental grounding of a boat, or in any event when increased power is required to move the boat, said principal boiler and auxiliary boiler being of such capacity, when used together, as to afford all the power required to propel

a boat which is heavily loaded, so that when such boat is not loaded, one of the boilers only is required, thereby diminishing fire-surface when the maximum power is not required, and effecting a saving of fuel and stock, as will be hereinafter explained.

Furthermore, my invention provides for the use of a water-tank, at or near the bow of the boat, with a pipe leading to it from a pump in the engine-room or stern of the boat, said tank being of a suitable capacity to contain water enough to allow the boat to be trimmed under all circumstances, and also to furnish a supply of fresh water, for use when the boat travels in salt water, as will be hereinafter explained.

To enable others skilled in the art to understand my invention, I will describe its construction and operation.

The hull, *A*, of the boat may be constructed in the usual well-known manner of building canal-boats, with the exception that the stern is adapted for receiving four suitable screw-propellers, *B B B B*, arranged in the same plane, and so low as to operate upon the water with proper force when the boat is not loaded. For this purpose, the stern is not rounded or tapered laterally, but squarely built, as shown in figs. 1 and 2, so as to allow four or more of the screw-propellers *B* to be arranged abreast. These propellers may be constructed of paddles suitably feathered, and secured to hubs, or they may be made in any other suitable well-known manner. Their shafts, *a a a a*, are driven by means of a crank-shaft, *b*, acting through the medium of bevel-spur wheels *c c c c*, as shown in figs. 1, 3, and 5. The propeller-shafts *a* are all arranged parallel to the keel of the boat, and the crank-shaft *b* is arranged at right angles to the keel, and as low in the hold as possible. The use of propellers of small diameter admits of the location of the shafts *a* much lower than could be done with only one or two propellers of proper diameter to afford the necessary propelling-force.

I determine the size of the propellers *B* by first ascertaining the amount of water the boat will draw when not loaded, and then making the propellers of such diameter that they will dip into the water, and operate to the best advantage upon the water at such draught. The number of these propellers required can readily be determined by ascertaining their propelling-force. I prefer to adopt four, and arrange two on each side of the stern-post, as shown in fig. 2, but three may be used, by having the centre one forward of and in line with the rudder.

The crank-shaft *b*, by which the four propellers are driven simultaneously, is rotated by means of an engine, *d*, and a pitman-rod, *d*. The engine is located above the apartment *D* in the engine-room *E*, and the pitman-rod *d* passes through an opening made through the flooring or deck *E'*, and may be properly housed in. The deck *E'*, which forms the engine-room, is arranged below the main deck *F*, and sufficiently far above the hold *D* to leave space in the latter for stowage of freight



below the said deck E'. Within the engine-room E, and directly below the opening, S, through the main deck F, the boilers G G' are arranged, so that their upper portions will extend into said opening, and their pipes e e' pass through a roof, which should cover this opening. The opening or hatchway S not only affords air and light to the engine-room, but it also allows the deck or flooring F to be elevated a considerable height, so as to leave a large space below it.

In rear of the engine-room is the coal-bunker H, which occupies the extreme stern space of the boat, and is very convenient to the boilers.

I employ two boilers, G G', of the upright or other suitable kind, with smoke-stack sections, which can be taken off at any time before passing beneath very low bridges. I employ two small boilers, instead of one very large one, as heretofore, for the purpose of economizing fire-surface and saving fuel, when it is not required to expend the full power of both boilers to propel the boat; also to provide against the accidental failure of one of the boilers to operate. The two boilers can also be made to occupy much less space vertically than a single boiler of an equal capacity to the two would occupy. Both of these boilers will, in practice, be provided with suitable steam-pipes, leading to the engine d', and these pipes will have means applied to them, by which, from either one or both boilers, steam can be let on or cut off from the engine, at pleasure.

At or near the bow of the boat is a water-tight apartment, J, shown in fig. 1, which should be made of sufficient capacity to contain water enough to trim the boat and balance the weight of the steam machinery in the stern of the boat. This apartment J has a pipe, K, leading from it to the engine-room E, or to the apartment below this room, which pipe will, in practice, be attached to a forcing pump, adapted to be operated by hand, or otherwise, for the purpose of supplying said tank with more or less water, as may be found necessary, to keep the boat in proper trim.

Having described my invention,

What I claim as new, and desire to secure by Letters Patent, is—

1. The canal-boat, with pairs of shafts, *a a*, carrying propellers B, of small diameter, and applied on each side of the centre of the boat, at its stern, upon said shafts, which are all on the same or nearly the same horizontal plane, and driven substantially as described.

2. The combination and arrangement of two small steam-boilers, depressed engine, and boiler-room E, and shafts *a a*, with small propellers, B, in pairs, on each side of the centre of the boat, substantially in the manner and for the purposes described.

SAM'L D. GILSON.

Witnesses:

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