

G. W. BISHOP.  
 Improvement in Propulsion of Canal-Boats.  
 No. 131,652. Patented Sep. 24, 1872.

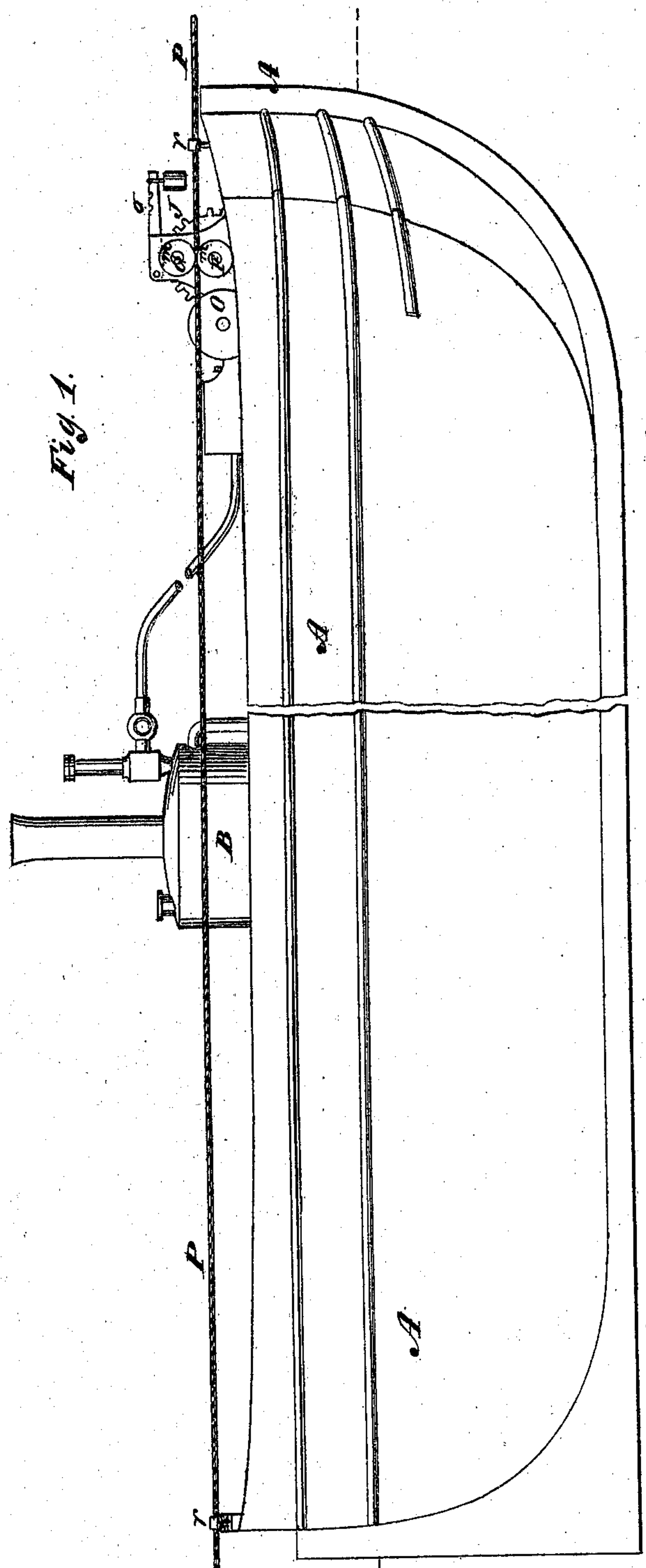


Fig. 1.

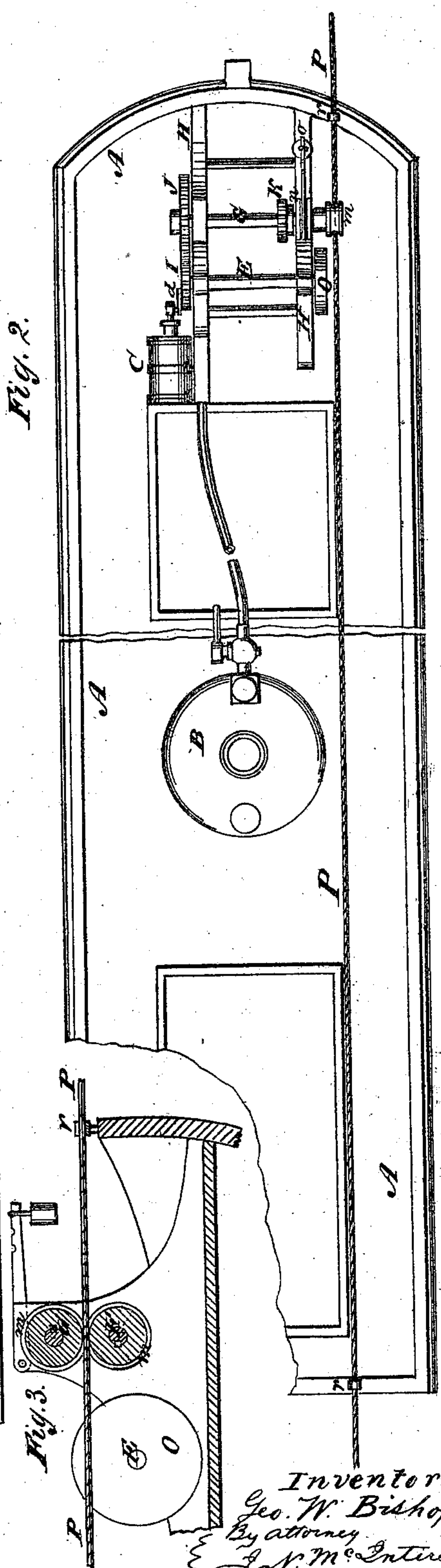


Fig. 2.

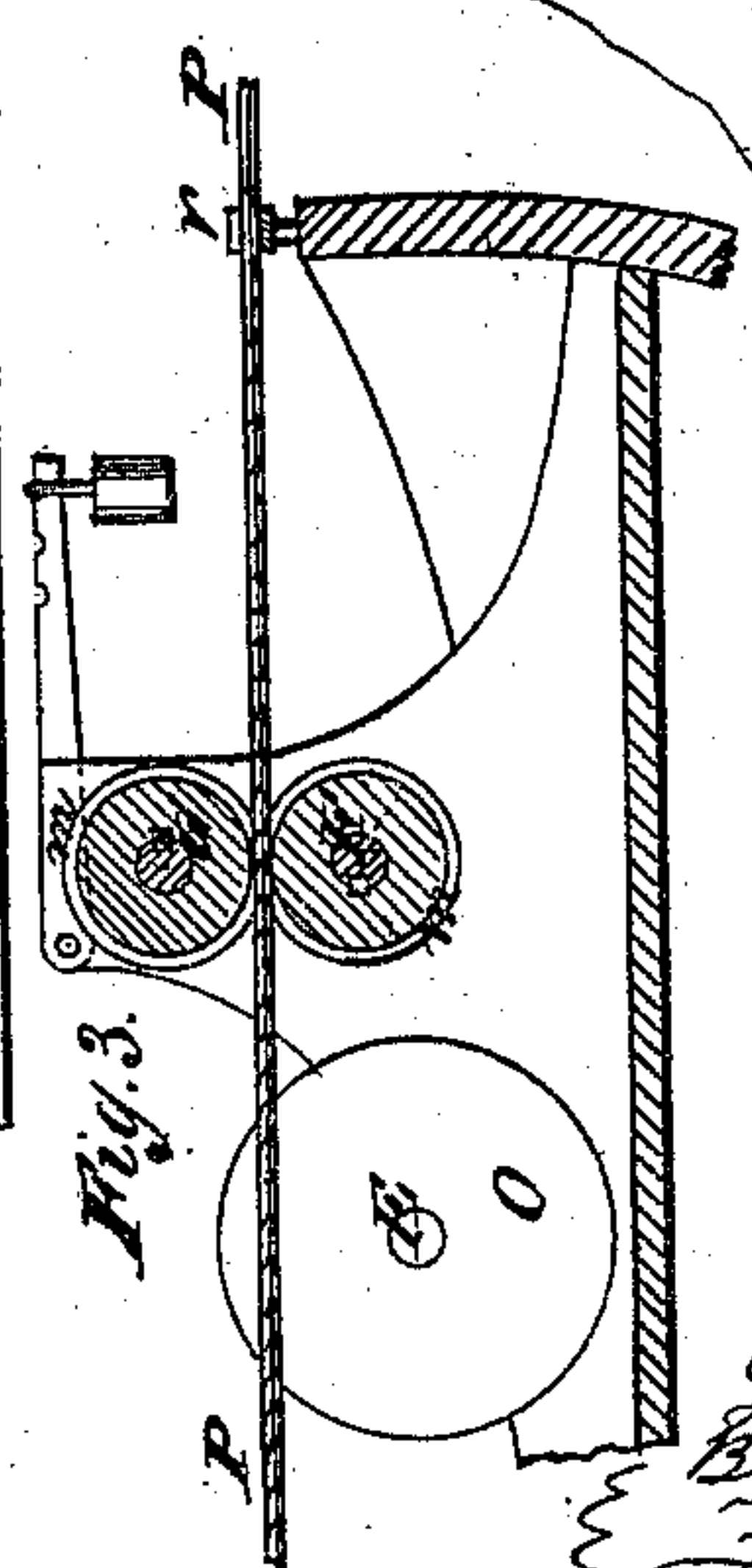


Fig. 3.

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 By attorney  
 J. P. McIntire



# UNITED STATES PATENT OFFICE.

GEORGE W. BISHOP, OF BROOKLYN, NEW YORK.

## IMPROVEMENT IN PROPULSION OF CANAL-BOATS.

Specification forming part of Letters Patent No. 131,652, dated September 24, 1872.

*To all whom it may concern:*

Be it known that I, GEORGE W. BISHOP, of Brooklyn city, in the State of New York, have invented an Improved Method of Propelling Canal-Boats; and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawing making part of this application.

The subject of propelling canal-boats by steam is one to which very much attention has been given, and previous to my invention a great variety of constructions of boat and methods of propulsion of the same has been suggested and made the subject of patents, both here and abroad. A great many, however, of such inventions, relate to the mode of construction of the boat with a view to avoid an undue agitation of the water and consequent washing of the banks of the canal when running at a comparatively fast rate.

My invention is foreign to this class of inventions, and should not be confounded therewith. I propose to employ any ordinary or desirable shape and construction of canal-boat; and my invention has for its object to provide a system and means by which steam-power may be utilized in an economical manner to effect the propulsion of the boat at an ordinary rate of speed; and to these ends my invention consists in an improved mechanism and novel arrangement thereof with the boat and engine, for effecting the propulsion of the boat from a fixed tow-rope or cable, as will be hereinafter more fully explained.

To enable those skilled in the art to make and use my invention, I will proceed to describe the construction and operation of my improved system of propulsion of canal-boats, referring by letters to the accompanying drawing, in which—

Figure 1 is a side elevation, and Fig. 2 a top view, of a canal-boat with my invention applied thereto. Fig. 3 is a detail vertical section, increased scale, at the line *x x*, Fig. 1.

In the different figures the same part is designated by the same letter of reference.

A represents an ordinary canal-boat, which I provide with a suitable steam-boiler, B, and oscillating engine C. I have shown this kind of engine and boiler—the latter to be provided with the usual furnace below—but any other character of boiler and construction of engine

may, of course, be employed, at the will of the engineer and builder. The engine is connected directly, by a crank, *d*, to one end of the main driving-shaft E, and this shaft, together with two other shafts, F and G, is mounted in suitable bearing-boxes in a strong frame-work, or a pair of connected stands, H H, as illustrated. To this frame-work on one side may also be attached the engine, as shown, making, all together, a compact apparatus. On one end of the main driving-shaft E is keyed a spur-pinion, I, which meshes into a gear, J, secured to shaft F, and the latter is geared to shaft G by means of a pinion, *k*, meshing into a similar pinion, *l*, on shaft G, as shown. By this means the two shafts F and G are driven at the same speed in opposite directions. On one end of each of the last-named two shafts is securely fastened a small pulley or wheel, *m*, in the face or periphery of which is turned a sort of V-shaped groove, and these two grooved pulleys or gripping-wheels are so arranged that the faces run close together and are intended to gripe between them and continuously draw through a rope or cable, P, as will be presently explained. The shaft G has one end hung in a vertically movable or sliding journal-box, *n*, which is lifted by means of a vibratory lever, *o*, and held down by a weight hung on said lever, so that by lifting this box slightly and replacing it in its normal condition, the gripping-wheels or cable-wheels *m* may at pleasure be moved apart to release the cable, and replaced to gripe the same, as and for purposes to be presently explained. O is a balance-wheel on the outer end of the main driving-shaft E, to govern or regulate the motion of the driving mechanism, and P is a rope or cable which is placed through two (more or less) suitable eyes or supporting and guiding stands, *r r*. These stands *r* are so formed that the rope or cable may be readily placed in and lifted out of them, being open at the top so as to permit the ready removal therefrom of the cable. In practice, and with the use of a boiler and engine about such as shown, I have adopted about the following proportions for the construction, viz.: The boat being two hundred tons burden, the boiler and engine are about three-horse power; size of boiler, about forty-eight inches high



and thirty inches diameter; engine-cylinder, about four inches diameter; stroke of piston, six inches. The main driving-pinion is made about fifteen to sixteen inches diameter, and the large gear about two and a half to three feet diameter. The whole room or space occupied by the boiler and engine need not be more than about six feet square, and the consumption of fuel in a boat thus made will be only about one ton of coal for four or five days running continuously (that is running night and day) at the rate of about four or more miles per hour. The rope or cable *P* is supposed to be attached to fixed points at each end, and lies about lengthwise of the canal, passing through the eyes or stands *r* and between the actuating-pulleys *m*.

The operation of the machine is so simple as to render very little further explanation necessary. As the engine runs the geared shafts are set in motion and the wheels *m m*, between which the cable is clasped, are driven at a uniform velocity in opposite directions, and so as to continuously pull or draw through the rope *P* and thus effect the motion of the boat and its load. The cable is lifted out of the water (if it is immersed therein) at the bow and drops again from the stern. Where many boats are traveling they will of course keep the cable pretty much all up out of the water. Various sorts of rope or cable may be employed, and the construction of the cable-wheels to take hold thereof may of course be varied to suit, and the location and details of construction of the boiler and engine may be varied without departing from my invention, the gist of which rests in the idea of propelling or drawing the boat or trains or strings of boats by means of a cable or rope passing along over the decks between suitable guides and griping-rolls or cable-wheels, as described. The pressure of the wheels *m* on the rope or the tenacity with which the latter is held between said wheels may be regulated according to circumstances by shifting the weight on the lever *o*. This lever may be graduated for the convenience of designating to the boatman the proper location of the weight according to the nature of the load or amount of work to be done, and it will be understood that any other suitable means or device may be substituted for enabling the boatman or engineer to regulate or adjust and set the mechanism, so that the pressure-rolls shall exert a degree of friction in proportion to the hauling power necessary to be developed. And it will be understood that since the consumption of power is in proportion to the friction created where the power is applied to the cable, and since any unnecessary friction there created will induce to a corresponding waste of power and consequent increase in the expense of transportation, it becomes important to provide the driving mechanism with some suitable means by which, according to the load to be drawn and all the surrounding circumstances, the friction on the cable may be so

regulated always that only the actually necessary amount of power shall be expended to hand the cable through without any slip and properly propel the boat at the determined velocity. Boats or lines of boats can readily work while running in opposite directions on one and the same cable, for the eyes and stands being so constructed as to permit the convenient extrication of the cable, and being located near the right-hand side of the deck, the attendants of either boat or set of boats can very easily disengage the cable entirely from the boats, fixtures, and driving machinery, and replace it immediately after passing the boats going in an opposite direction. The canal may of course be provided with a series or set of cables, but one cable may be used for the boats traveling in both directions without any difficulty.

It will be understood that the theory on which my system and plan of propulsion of canal-boats is based does not contemplate any material change in the known construction of the boat, nor any material increase of speed in transportation, and may be carried out under various modifications of the employed machinery. Its object is to provide a sure and economical substitute for the tow-path system now in general use, and it will be seen that it consists in simply substituting for hand-power, in the primitive plan for pulling a boat in the water by a fixed rope, a most simple, economic, and efficient contrivance for performing the same operation by the aid of steam-power.

I am aware that systems for propulsion for canal-boats have been suggested in which cables, railroad-tracks, &c., are arranged beneath the water or on the bed of the canal, and involving complex means, and also that cable devices have been used in connection with the boat and driving machinery in which the cable was inseparable from the boat and its machinery during the travel; and I do not wish my plan or system, in which a rope or cable above water simply passes or is strung through the boat and in which the cable may at pleasure be disconnected with the driving medium, to be confounded with any such systems.

It will be seen that the first cost of the necessary machinery and appliances for my system will be small, while the great desideratum of an economic and convenient mode of carrying the boats is attained to; and it will be understood that, in my improved plan and adaptation of mechanism, the whole cable griping and propelling mechanism is so constructed and located that, while it is simple and effective, the attendant can, without difficulty, disengage from and re-engage the cable with the machine under all circumstances, which is very important when it is considered that the cable is awkward to handle, and has to be manipulated in all kinds of weather, always wet, and often clogged with ice.

Having so fully explained the construction and operation of the boat's machinery and its



appliances that those skilled can make and use my improved system, what I claim therein as new, and desire to secure by Letters Patent, is—

1. In connection with the boat and a suitable stationary cable, a continuously-operating cable-hauling mechanism adapted to permit the ready removal and re-engagement of the cable, the whole constructed and operating substantially in the manner described.

2. In a cable-hauling mechanism, a suitable

means for setting and holding the pressure-rolls, which gripe the cable, to act with a degree of friction correspondent to the amount of hauling power necessary to be applied, in the manner hereinbefore described.

In testimony whereof I have hereunto set my hand and seal.

GEORGE W. BISHOP. [L. S.]

In presence of—

J. FELBEL,

J. N. McINTIRE.