

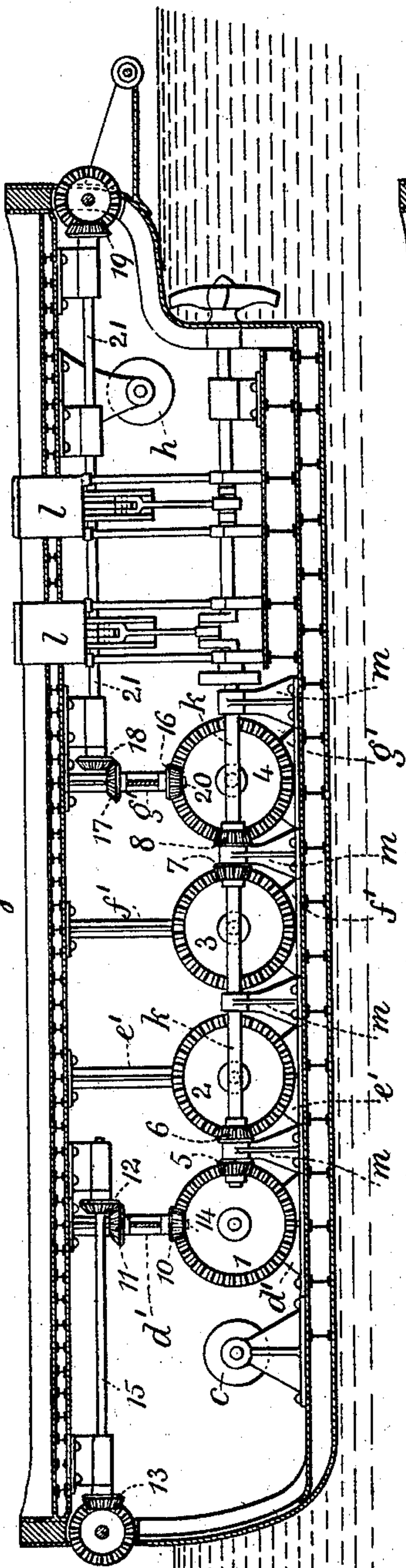
No. 719,907.

PATENTED FEB. 3, 1903.

J. C. TONE.
CANAL BOAT PROPULSION.
APPLICATION FILED JAN. 24, 1902.

NO MODEL.

Fig. 2.



Witnesses:
J. Stait
Chas. Smith

Fig. 1.

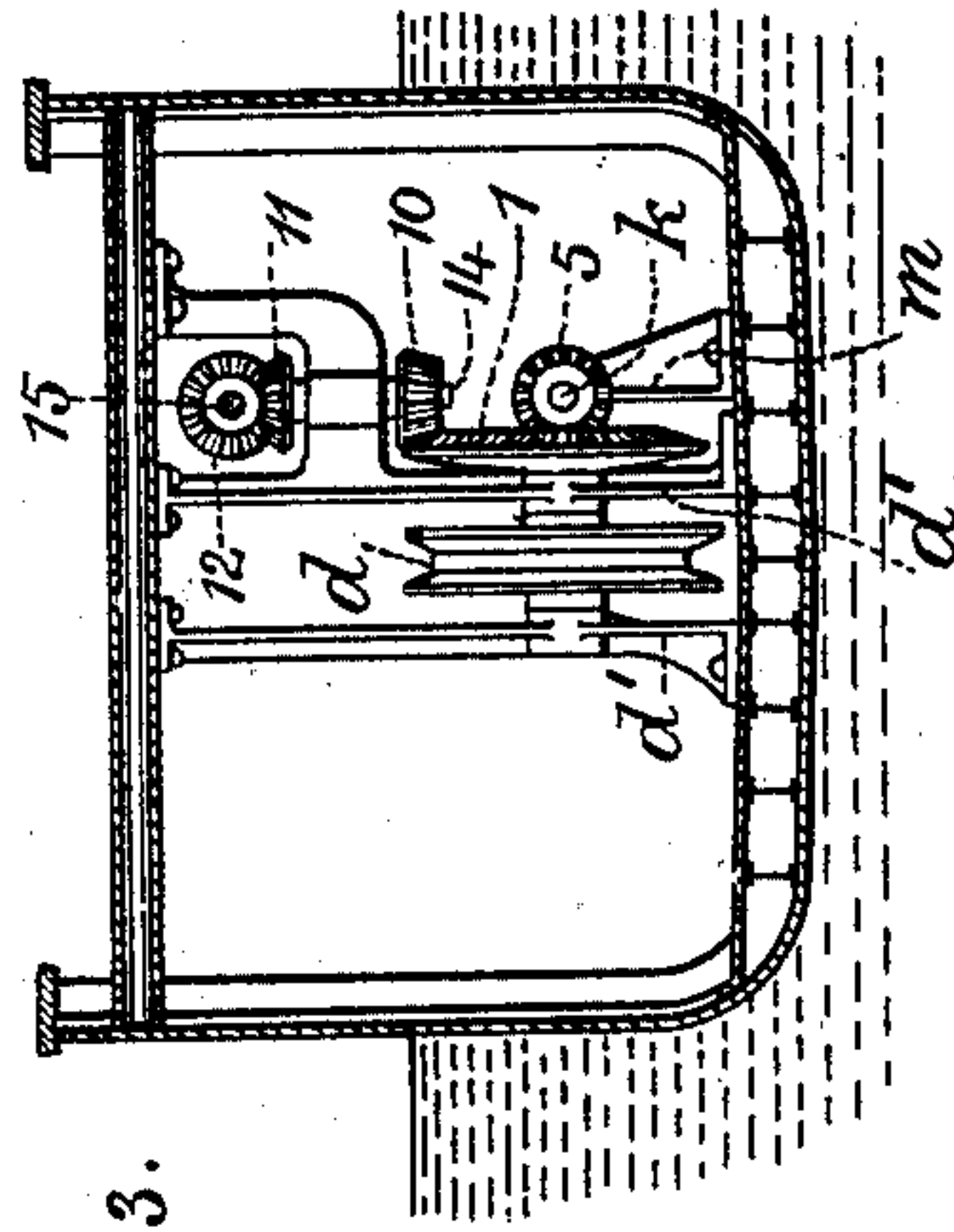
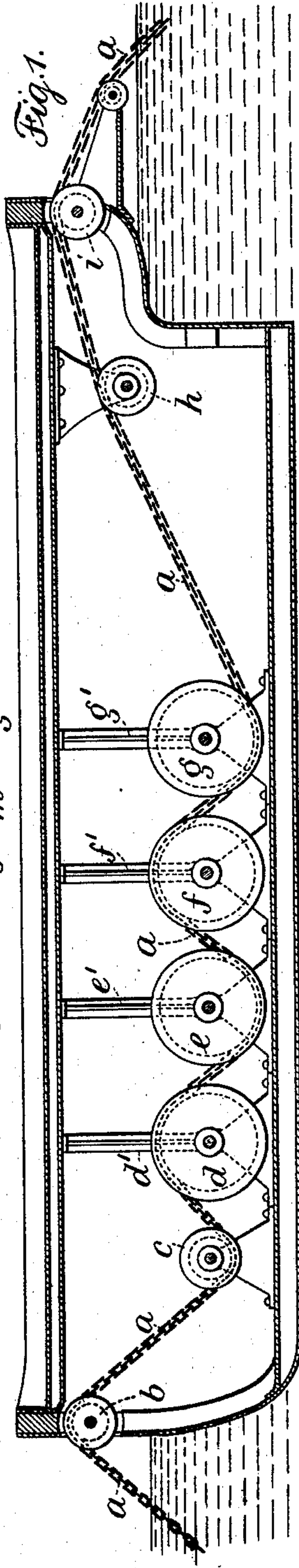


Fig. 3.

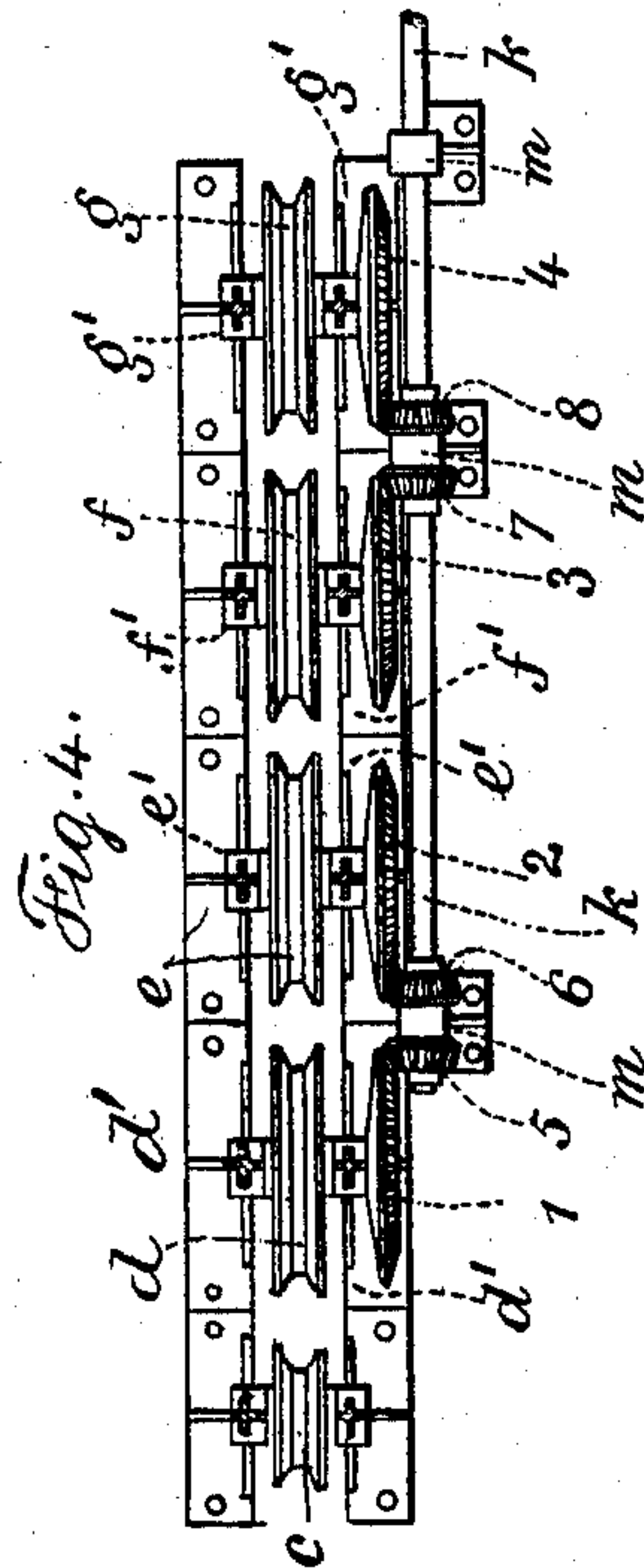


Fig. 4.

Inventor:
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UNITED STATES PATENT OFFICE.

JOSEPH C. TONE, OF IRONDEQUOIT, NEW YORK, ASSIGNOR TO HIMSELF,
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CANAL-BOAT PROPULSION.

SPECIFICATION forming part of Letters Patent No. 719,907, dated February 3, 1903.

Application filed January 24, 1902. Serial No. 91,024. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH C. TONE, a citizen of the United States, residing at Irondequoit, in the county of Monroe and State of New York, have invented an Improvement in Canal-Boat Propulsion, of which the following is a specification.

Boats have heretofore been propelled or drawn through canals by various devices, and in connection with said devices it has been common to employ a rope or chain lying in the bottom of the canal and which rope or chain was passed longitudinally through or alongside the power-boat, and the boat was provided with devices for engaging the chain or rope and drawing upon the same. This rope or chain was raised progressively from the bottom of the canal, passed through or along the boat and again into the water at the rear of the boat, the boats drawn thereby being carried through the canal by the power devices upon the boat. Among the devices employed upon the power-boat were sprocket-wheels, over which the chain passed and by which the chain was engaged or a drum around which the rope was drawn several times to obtain the necessary bite. In these devices suitable power was required, and the strain, as well as the applied power, were too much localized, having the tendency to rapidly wear the machinery, all of which it is the object of my present invention to obviate.

In carrying out my invention I employ a series of large sheaves or rollers and prefer to employ a chain to be raised from the bottom of the canal and which passes longitudinally through the power-boat, said chain passing alternately over and under the sheaves or rollers of the series. These sheaves or rollers are mounted upon suitable shafts, which carry large bevel-gears. The bevel-gears are engaged by small bevel-pinions, and these latter are mounted upon a horizontally-placed straight-line shaft driven directly by the engine. In this manner the power of the engine is directly applied, and the series of bevel-gears and sheaves or rollers not only distribute the applied power, but distribute the draft upon the chain, so that the chain is engaged at a number of places. By this device the strain of drawing upon the chain

is also considerably distributed over the structure of the power-boat. The tendency therefore of the device is to move evenly and smoothly and with a minimum amount of strain and wear and tear.

In the drawings, Figure 1 is a diagrammatic view illustrating my invention. Fig. 2 is a vertical longitudinal section through the power-boat. Fig. 3 is a vertical cross-section, and Fig. 4 is a plan of the essential operative mechanism.

I have generally illustrated the outline of a boat, showing the bottom portion, the stern, the bow, and the deck, but do not in any sense limit myself to the construction of the boat, as the devices of the invention may be fitted into a boat built expressly therefor or into a boat already in use.

a represents the chain or rope normally lying at the bottom of the canal and adapted to be raised therefrom and as raised passed lengthwise through the power-boat. I employ a sheave *b* in the bow of the boat, acting as a guide for the chain or rope as the same is raised from the bottom of the canal and prefer to employ a second sheave *c* in bearings fastened to the bottom of the boat and beneath which the said rope or chain passes.

d, *e*, *f*, and *g* represent large sheaves or rollers, preferably having V-shaped peripheries in cross-section, and the chain or rope *a* passes successively over and under these sheaves or rollers, and from the last roller thereof said chain or rope preferably passes over a sheave *h*, adjacent to the stern of the boat, and a sheave *i* directly in the stern of the boat, and thence back into the canal.

d', *e'*, *f'*, and *g'* represent standards in pairs having bearings for the shafts of the large sheaves or rollers *d*, *e*, *f*, and *g*, as shown in the cross-section, Fig. 3. These bearing-standards preferably extend between the under side of the deck and the bottom of the boat and are securely fastened to said points of contact, so as to make a rigid structure. Upon the shafts of said large sheaves or rollers I employ large bevel-gears 1, 2, 3, and 4. These preferably agree in diameter with the diameter of the large sheaves or rollers.

The power-shaft *k* is a horizontally-placed straight-line shaft directly driven by the en-

gine or engines *l*. It is placed in a horizontal plane passing through the axial centers of the shafts of the sheaves and bevel-gears, and mounted thereon are bevel-pinions 5, 6, 7, and 8, which engage the large bevel-gears 1 2 3 4, so as to cause them to turn in opposite directions upon the rotation of the power-shaft *k*.

This power-shaft *k* is mounted in suitable bearings *m*. The large sheaves *d e f g* are in line longitudinally of the boat and they agree in diameter, as do also the large bevel-gears 1, 2, 3, and 4, and the sheaves and gears also agree in diameter with one another. The channel or V form in cross-section given to the peripheries of the large sheaves or rollers *d e f g* grip or bite the chain or rope *a* as the same passes over and under said sheaves or rollers. Thus a powerful hold is obtained at the four points upon the chain or rope to draw upon the same in propelling the power-boat and drawing along the boats that may be connected therewith. The sheave *b* is quite essential in directing the chain or rope as the same enters the boat, and the sheave *c* is essential in effecting the bite of the chain or rope as the same passes over the large sheave *d*. The sheave *h* is also essential in effecting the bite of the chain or rope against the under surface of the large sheave *g*, and the sheave *i* is essential in directing the outgoing chain or rope.

I have shown and may prefer to employ the bevel-gears 10, 11, 12, and 13 and the shafts 14 and 15 in suitable bearings for communicating rotation and power from the large bevel-gear 1 to the sheave *b* in the bow of the boat, and I have shown and may prefer to employ bevel-gears 16, 17, 18, and 19, mounted on the shafts 20 and 21 in suitable bearings and communicating rotation and power from the large bevel-gear 4 to the sheave *i* in the stern of the boat, these devices facilitating the drawing upon, entrance into, and exit from the power-boat of the chain or rope, and thus to a certain extent distributing the force applied and relieving the strain upon the large sheaves or rollers. I do not, however, limit myself to the use of these devices or to the number of the large sheaves or rollers employed so long as there is a series thereof.

I claim as my invention—

1. The combination with the power-boat and the engine thereof, of a series of large sheaves or rollers in line longitudinally of the boat with their axial centers in substantially the same plane, and devices substantially as shown and described for rotating the said series of sheaves simultaneously and in two sets in opposite directions by the engine, and a rope or chain passing over and alternately under the, respective sheaves, substantially as set forth.

2. The combination with the power-boat, the engine thereof and a horizontally-placed straight-line shaft from the engine, of a series

of large sheaves or rollers corresponding in diameter and placed in line longitudinally of the boat, with their axial centers in substantially the same plane, shafts therefor and large bevel-gears mounted on said shafts and bevel-pinions mounted upon the straight-line shaft of the engine and meshing with the large bevel-gears and adapted to simultaneously rotate the large bevel-gears and large sheaves or rollers together and in two sets in the opposite direction, and a rope or chain passing over and alternately under the respective sheaves, substantially as set forth.

3. The combination with the power-boat, the engine thereof and a horizontally-placed straight-line shaft from the engine, of a series of large sheaves or rollers corresponding in diameter and placed in line longitudinally of the boat, shafts therefor and large bevel-gears mounted on said shafts and agreeing in size with the diameter of the said large sheaves or rollers, and bevel-pinions mounted upon the straight-line shaft of the engine and meshing with the large bevel-gears and adapted to simultaneously rotate the large bevel-gears and large sheaves or rollers together and in the required direction, guide-sheaves in the bow and stern of the boat respectively, a guide-sheave forward of the first large sheave and a guide-sheave between the last of the large sheaves and the sheave in the stern of the boat and a rope or chain passing over and alternately under the respective sheaves, substantially as set forth.

4. The combination with the power-boat, the engine thereof and a horizontally-placed straight-line shaft from the engine, of a series of large sheaves or rollers corresponding in diameter and placed in line longitudinally of the boat, shafts therefor and large bevel-gears mounted on said shafts and agreeing in size with the diameter of the said large sheaves or rollers, and bevel-pinions mounted upon the straight-line shaft of the engine and meshing with the large bevel-gears and adapted to simultaneously rotate the large bevel-gears and large sheaves or rollers together and in the required direction, guide-sheaves in the bow and stern of the boat respectively, a guide-sheave forward of the first large sheave and a guide-sheave between the last of the large sheaves and the sheave in the stern of the boat, and series of bevel-gears and shafts upon which the same are mounted for communicating rotation and power from the first and last of the large bevel-gears respectively to the sheaves in the bow and stern of the boat and a rope or chain passing over and alternately under the respective sheaves, substantially as set forth.

Signed by me this 16th day of January, 1902.

JOSEPH C. TONE.

Witnesses:

GEORGE T. PINCKNEY,
BERTHA M. ALLEN.