J. W. INGISON.

CURRENT MOTOR.

APPLICATION FILED SEPT. 26, 1912.

1,071,748.

Patented Sept. 2, 1913.

2 SHEETS—SHEET 1.

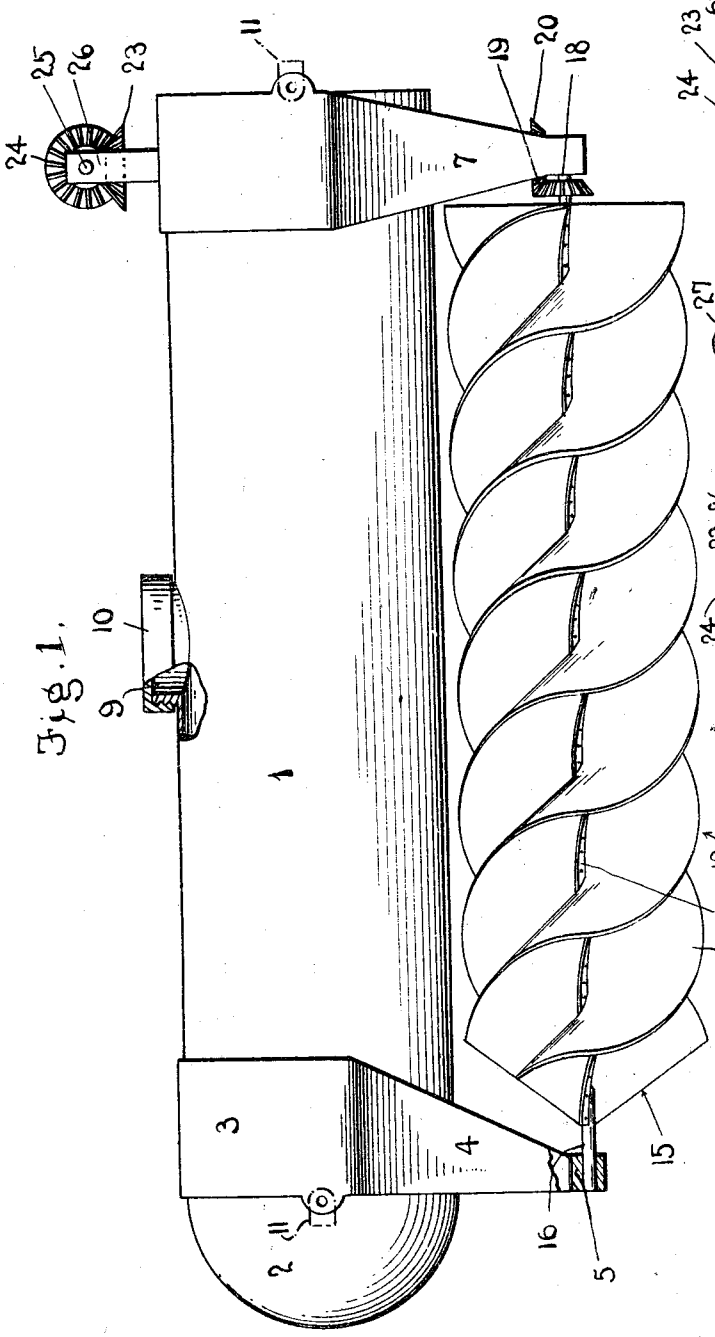


Fig. 1.

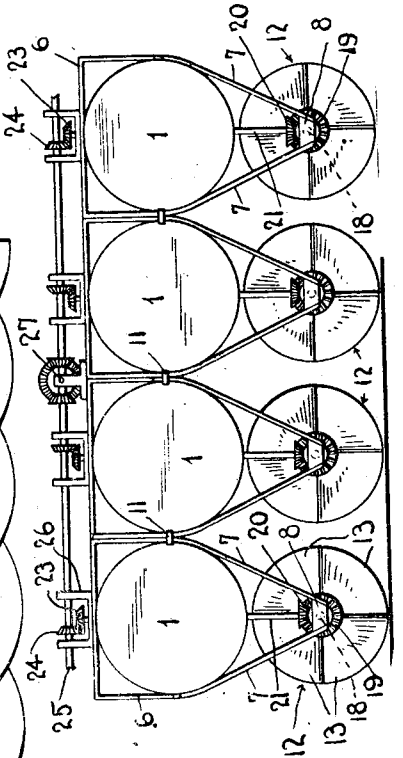


Fig. 7.

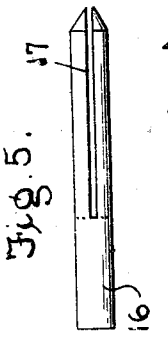


Fig. 5.

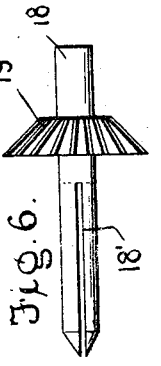


Fig. 6.

Witnesses

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2 SHEETS—SHEET 2.

Fig. 4.

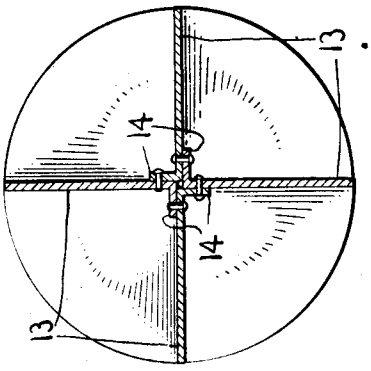


Fig. 3.

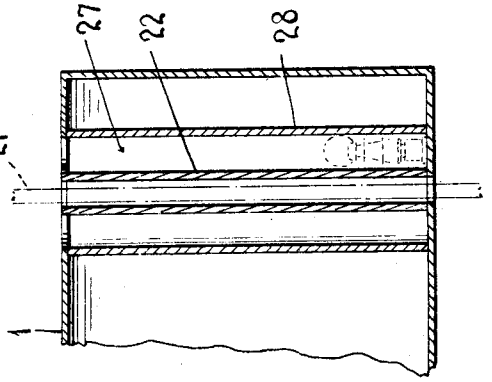


Fig. 2.

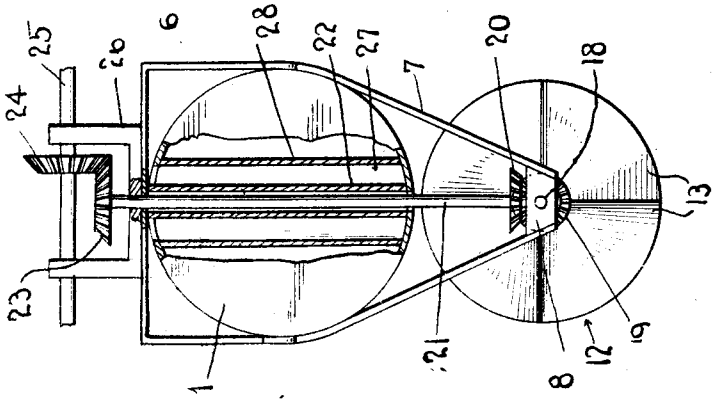
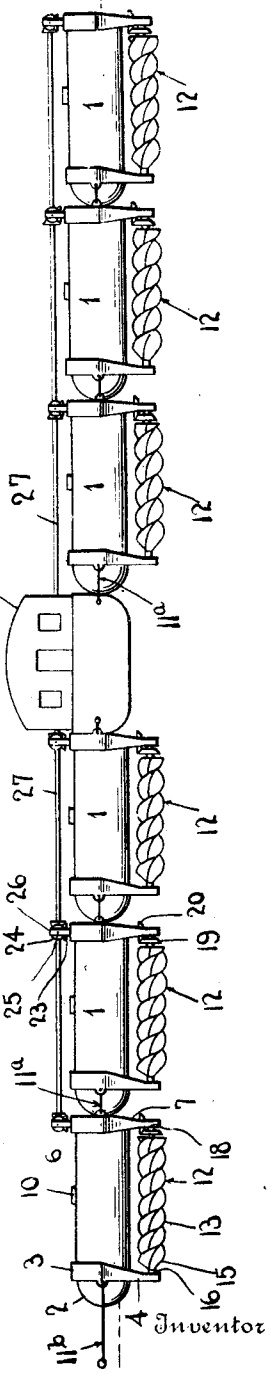


Fig. 8.



Witnesses

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CURRENT-MOTOR.

1,071,748. Specification of Letters Patent. Patented Sept. 2, 1913.

Application filed September 26, 1912. Serial No. 722,462.

To all whom it may concern:

Be it known that I, JAY W. INGISON, a citizen of the United States, residing at Kenmare, in the county of Ward and State of North Dakota, have invented certain new and useful Improvements in Current-Motors; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to improvements in current motors.

One object of the invention is to provide a current motor having an improved construction and arrangement of auger or power screw and an improved construction and arrangement of float for supporting the auger in a submerged position at a sufficient distance to permit the same to operate below ice which may form on the upper surface of the water thereby enabling the motor to be used in cold climates.

Another object is to provide a motor of this character having an improved construction and arrangement of power transmitting mechanism and means for preventing the submerged parts thereof from being injured or interfered with by floating debris.

Another object is to provide means for preventing the submerged parts of the power transmitting mechanism from freezing.

Still another object is to provide a current motor which may be readily coupled with companion motors into longitudinally or transversely disposed lines or gangs and the power transmitting mechanism thereof combined thus providing a power plant the capacity of which is limited only by the size and force of the current of the body of water in which the motors are placed.

With these and other objects in view, the invention consists of certain novel features of construction, combination and arrangement of parts as will be more fully described and claimed.

In the accompanying drawings, Figure 1 is a side view of my improved motor; Fig. 2 is a rear end view thereof; Fig. 3 is a central vertical longitudinal section of a portion of the rear end of one of the floats showing more particularly the manner in which the power transmitting devices are protected and heated to prevent freezing; Fig. 4 is an enlarged vertical section of the auger of the motor showing the manner in which the auger is constructed; Fig. 5 is a detail view of the shaft or trunnion of the front end of the auger; Fig. 6 is a similar view of the trunnion at the rear end of the auger; Fig. 7 is a rear end view of a series of my improved motors connected to operate in unison; Fig. 8 is a side view of the same.

Referring more particularly to the drawings 1 denotes the auger supporting float of my improved motor, said float being preferably of hollow cylindrical form and constructed of sheet metal. The float 1 may be of any suitable length and diameter according to the size of the auger to be supported thereby. The forward end of the float is preferably rounded as shown at 2 and secured to the top and sides of the front end of the float are right angularly formed bracing plates 3 the upper or horizontal portions of which also form running boards or narrow platforms on which the operator may stand or walk from one side to the other of the float. The vertical side portions of the braces 3 are continued downwardly on opposite sides of the float and converge to a point a suitable distance below the float and form supporting plates 4 of a front journal box or bearing 5 to which said lower ends of the plates 4 are securely fastened. At the rear end of the float are also arranged right angular bracing plates 6 the upper or horizontal portions of which form rear running boards. The lower ends of the vertical portions of the braces 6 are extended downwardly on opposite sides of the float and form supporting plates 7 for a rear journal or bearing 8 to which the converging lower ends of the plates 7 are secured. In the upper side of the float preferably midway between its ends is arranged a manhole 9 which is normally closed by a suitable cap or cover 10. On opposite sides of the front and rear ends of the float and in line with the center thereof are clevises 11 by means of which the float of one motor may be operatively connected by chains or other suitable connecting devices 11^a with the end of another motor arranged in front or in rear of the motor as shown. The clevises 11 of the forward motor may also have connected thereto suitable anchoring cables or chains 11^b whereby the float is held in position in the stream.

Arranged at a suitable distance below the

float is the auger or power screw 12 of my improved motor, said auger being preferably constructed of a series of longitudinally disposed twisted blades 13 of which there may be any desired number, four of said blades being shown in the present instance. The blades are of suitable width and have their inner edges bent longitudinally to form connecting-flanges 14 each of which is adapted to be bolted to the adjoining portion of the next adjacent blade and the flanged portions of the blades abut against each other and form in connection with each other a central reinforce which replaces the shaft ordinarily employed and whereby said blades are fastened in operative engagement to form the auger or screw. The blades 13 at the forward end of the auger are preferably beveled or inclined as shown at 15 thus preventing the ends of the blades from catching and holding any debris which may be floating in the water and which if caught by the auger would seriously interfere with the operation thereof.

By constructing and arranging the blades of the auger in the manner described it will be seen that a strong and durable construction is provided without employing a continuous shaft thereby providing an auger of minimum weight and maximum strength. Secured to the forward end of the auger is a short journal or supporting shaft 16 the inner end of which is slitted longitudinally and at right angles to form crossed or right angularly disposed slits 17 with which the ends of the blades 13 are engaged when the journal or shaft is applied to this end of the auger. The outer end of the shaft 16 has a revoluble engagement with the bearing 5 secured to the lower ends of the front bearing supporting plates 4 as shown. The rear journal or shaft 18 for supporting the rear end of the auger is also provided with right angularly disposed slits 18′ which are engaged with the rear ends of the plates 12 and said slitted ends of the journals 16 and 18, when thus engaged with the plates may be readily secured thereto in any suitable manner. On the journal 18 adjacent to the rear end of the auger is a beveled gear 19 which is operatively engaged with a similar gear 20 on the lower end of a power transmitting shaft 21 which extends upwardly through a vertical shaft protecting sleeve 22 arranged through the float near the rear end thereof as clearly shown in Fig. 3 of the drawings. On the upper end of the shaft 21 is a beveled gear 23 which is in operative engagement with the gear 24 on the line power shaft 25 which is revolubly mounted in suitable bearings 26 on the upper side of the float. By thus arranging the power transmitting mechanism it will be seen that when the auger is revolved by the current of water passing by the same the movement of the auger will be imparted through the shaft 21 and the gears 20 and 23 to the main power transmitting shaft and may be applied thereby to any suitable use.

By providing the sleeve 22 through which the shaft 21 passes said shaft will be protected from injury by floating debris and in order to prevent the water from freezing around the shaft I preferably provide the float with a heating chamber 27 which is formed by a vertically disposed tube 28 arranged in the rear portion of the float around the sleeve 22 and in which may be placed a lamp or other heating device whereby the sleeve 22 and any water therein may be kept warm and the water thus prevented from freezing around the shaft. By arranging the auger a sufficient distance below the float to submerge the auger below the freezing point of the water and providing the heating mechanism for the power transmitting shaft as herein shown and described, it will be seen that my improved motor may be successively employed in freezing water or in cold climates where the surface of the water is frozen over for a greater or less period of time. It will also be noted that by constructing and arranging the float and the auger supporting devices as herein shown and described that these parts will present the least possible resistance to the force of the current so that the full force thereof will be applied directly to the blades of the auger.

My improved construction of motor permits the same to be readily connected with the other motors arranged side by side of the same or in longitudinal alinement therewith, so that the size and capacity of the plant formed by the motors will be limited only by the depth, length, width and swiftness of the stream in which they are located. When a plurality of motors are employed the power shafts 25 connected with the same will be geared to a main power shaft 27 by which the aggregate or combined power of all the motors will be conducted to the main power house H as shown in Fig. 8 of the drawings and may be applied to operate dynamos or other devices. When the motors are coupled together side by side as shown in Fig. 7 of the drawings the blades of every other auger will be arranged in a reverse direction from the adjacent augers so that the motion of the augers will harmonize thus avoiding friction which might interfere with operation of the augers and cause loss of power.

From the foregoing description, taken in connection with the accompanying drawings, the construction and operation of the invention will be readily understood without requiring a more extended explanation.

Various changes in the form, proportion and the minor details of construction may be

resorted to without departing from the principle or sacrificing any of the advantages of the invention as claimed.

Having thus described my invention, what I claim is:

1. A current motor having an auger comprising a series of curved blades having right angular attaching flanges on their inner edges, said flanged edges being arranged in close proximity and abutting against each other and bolted together to form solid central reinforcing means and to secure the blades in operative position.

2. In a current motor, a float, auger supporting plates secured to and projecting below the ends of said float, journal boxes secured in the ends of said plates, said boxes being disposed below the freezing point of the water, an auger comprising a series of curved or twisted blades having on their inner edges right angular attaching flanges adapted to be bolted together to secure the blades in operative position, said blades having their forward ends beveled, auger journals having right angular disposed slits adapted to be engaged with the blades at the ends of the auger whereby said journals are secured in position to revolubly support the auger in said journal boxes, and a power transmitting mechanism geared to the auger.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

JAY W. INGISON.

Witnesses:
GEO. H. PHELPS,
CHARLIE BICKER.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."