A. E. HOOKE.

POWER DRIVING MECHANISM FOR CANAL AND OTHER BARGES.

APPLICATION FILED AUG. 14, 1917.

1,385,130. **Patented July 19, 1921.**

2 SHEETS—SHEET 1.

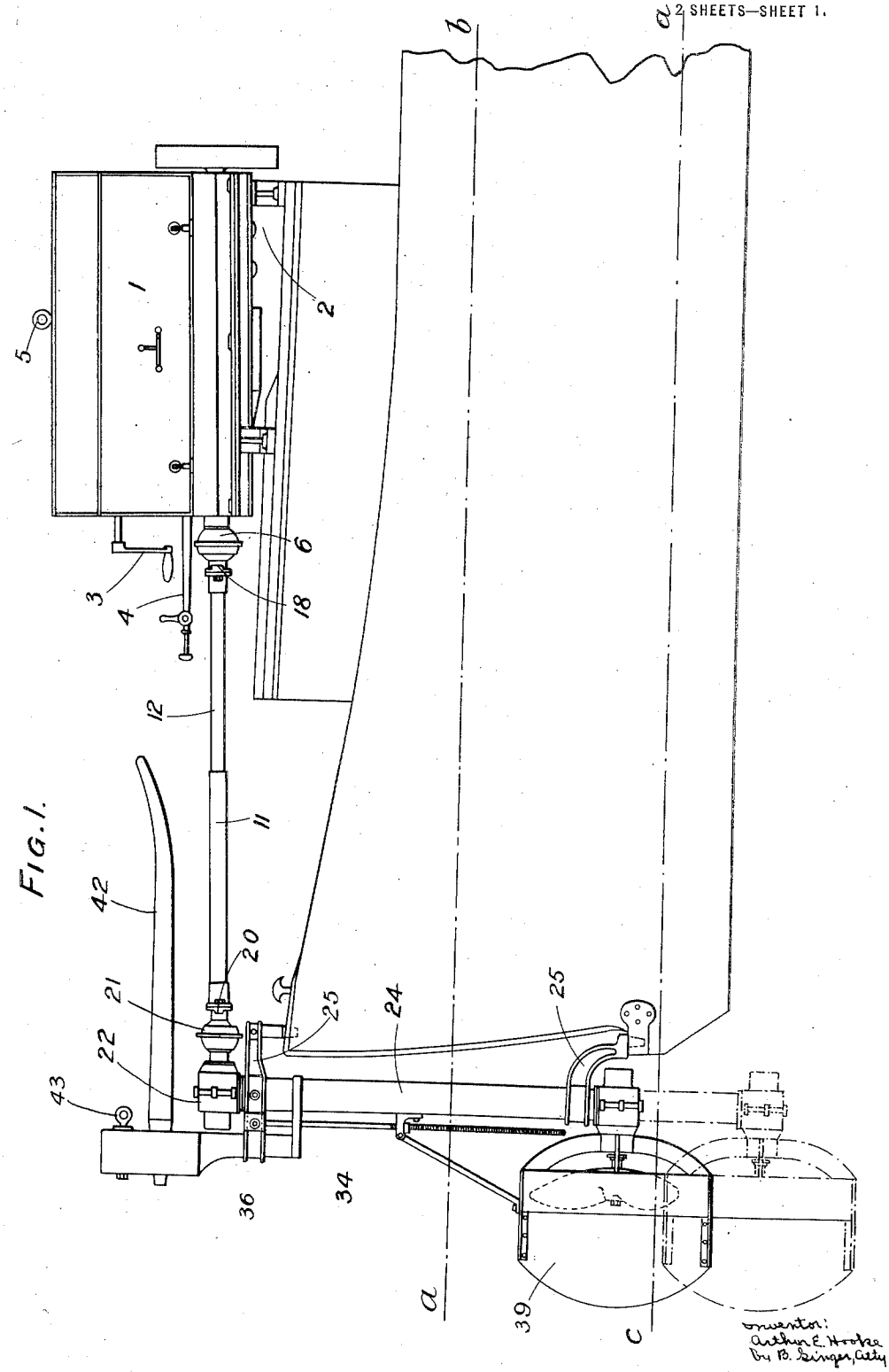


FIG. 1.

Inventor:
Arthur E. Hooke
By B. Singer, Atty

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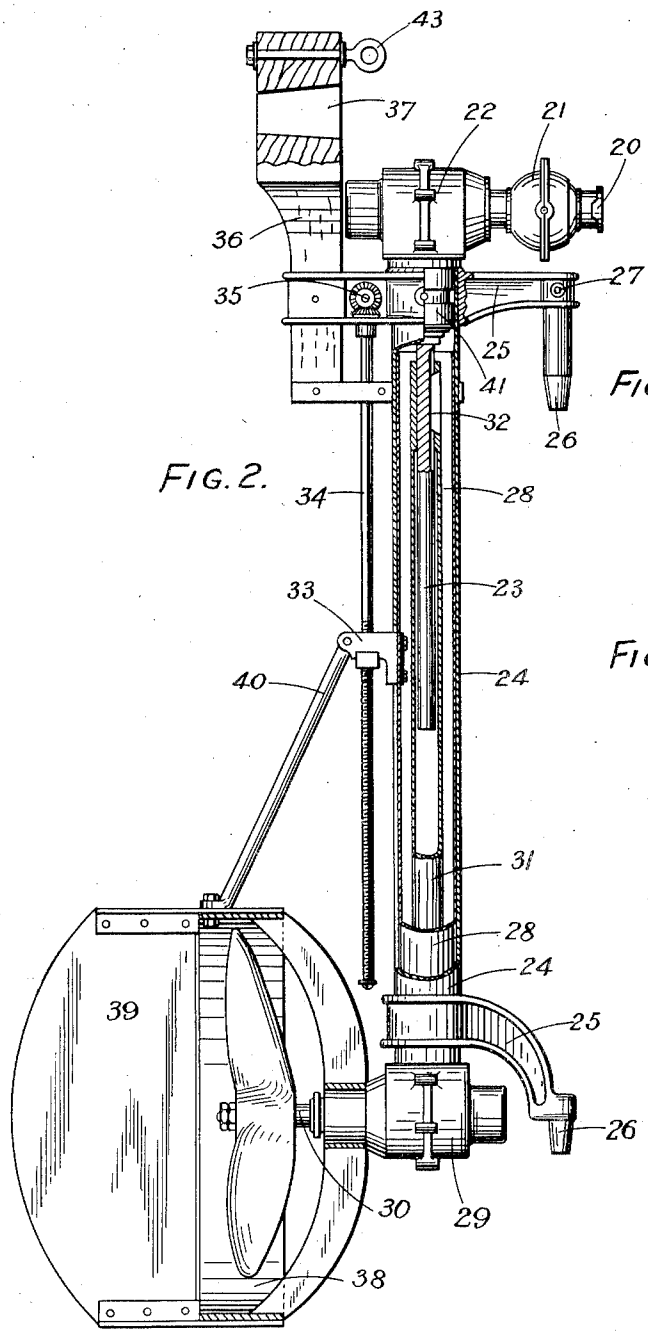


FIG. 2.

FIG. 4.

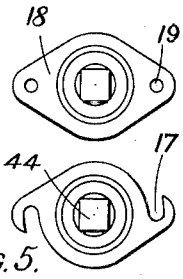


FIG. 5.

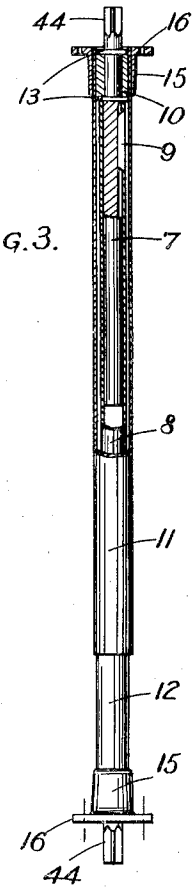


FIG. 3.

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UNITED STATES PATENT OFFICE.

ARTHUR EDWARD HOOKE, OF BIRMINGHAM, ENGLAND.

POWER DRIVING MECHANISM FOR CANAL AND OTHER BARGES.

1,385,130. Specification of Letters Patent. Patented July 19, 1921.

Application filed August 14, 1917. Serial No. 186,183.

To all whom it may concern:

Be it known that I, ARTHUR EDWARD HOOKE, a subject of the King of Great Britain, residing at 167 High street, Erdington, Birmingham, Warwickshire, England, engineer, have invented certain new and useful Power Driving Mechanism for Canal and other Barges, of which the following is a specification.

This invention comprises, in a power-driving mechanism for canal and other barges and water-craft of a like nature, in combination, a propeller element adapted to be installed upon the craft, a driving motor adapted to be installed upon the craft substantially separately from the propeller element and to impart power thereto from a point above the water-line, and a universal coupling provided between said motor and said propeller element.

The propeller of the present invention is adapted to be vertically adjusted to accommodate laden and unladen conditions without changing the horizontal condition of its axis, and without changing its position laterally in relation to the craft. For this purpose said propeller is adapted to be displaced longitudinally of the transmission mechanism by which it receives its power from above the water-line.

The connection between the driving motor and the propeller element advantageously includes a telescopic shaft which is readily detachable from both driving motor and propeller element, and the universal joint is incorporated advantageously between the said telescopic shaft and the motor. The motor and propeller element may thus be installed separately and coupled together in a very short space of time.

The propeller element may take the form of a helm or rudder, which may be pivotally installed upon the provision with which the craft is furnished for pivotally accommodating the helm or rudder usually carried; this not only increases the steering efficiency, but also enables the propeller to be thrown out of harms way when negotiating locks, by putting the helm hard over.

The said attachment may alternatively be rigidly fitted to the vessel, and may also be fitted in duplicate where twin propellers are advisable, or two or more propellers may be incorporated in one attachment.

In conjunction with this embodiment of the invention a rudder may be incorporated and carried by the rigidly fixed attachment.

The motor which may be an internal-combustion engine of any suitable type, may be placed in any convenient position on the deck of the vessel, and in the case of a canal barge it can be fitted to the top of the cabin usually found at the stern of such craft.

In order that this invention may be clearly understood and readily carried into practice, reference may be had to the appended explanatory two sheets of drawings, upon which:—

Figure 1 is a part side elevation of a canal barge having my power driving mechanism fitted thereto.

Fig. 2 illustrates separately, and partly in section, the propelling mechanism shown in Fig. 1.

Fig. 3 is a sectional plan of the transmission mechanism between the motor and the propelling mechanism.

Figs. 4 and 5 are detail views illustrating the detachable connections between the transmission mechanism and the engine and propeller mechanism.

In a convenient embodiment of the present invention, as shown in Fig. 1 of the drawings, 1 is a suitable internal-combustion engine adapted to be installed appropriately upon or within the barge, as for instance upon the top of the cabin. For this purpose there may be permanently provided upon the top of the cabin an appropriate bed-plate 2 to which the engine is adapted to be detachably bolted. The engine is fitted with the usual starting handle 3 and reverse gear 4, and is also furnished with a lifting ring 5, by which (by the use of any suitable lifting provision) it may be transferred from one barge to another. The engine crank shaft is at its rear extremity furnished with a universal joint contained within a ball-and-socket casing 6, and is coupled to a horizontal power transmission shaft. This power transmission shaft is shown in sectional plan at Fig. 3, and it involves shaft sections 7, 8 adapted to slide telescopically in relation to each other but coupled to collectively rotate by a key 9. These shaft sections 7, 8 work in bearing bushes 10 provided in a casing composed of two telescopic sections 11, 12. The bearing bushes 10 may be permanently secured within the casing sections in any suitable man-

ner, and on each side of said bearing bushes 10 each shaft section 7 or 8 has enlargements or flanges 13 by virtue of which the casing 11, 12 is adapted to elongate or contract with the elongation or contraction of the shaft 7, 8. Permanently secured externally around each extremity of the casing 11, 12 is a socket 15, which socket is integrally furnished with a flange 16 of the form shown in Fig. 5. This flange 16 is formed with two slots 17 by virtue of which it is adapted to be bolted to the casing containing the driving or driven element appertaining to the shaft 7, 8. For this purpose the casing element which contains the driven part of the universal joint contained in the casing 6 is also furnished with a flanged extremity 18, as shown in Fig. 4, and bolts or screws are adapted to be screwed into perforations 19 therein, the stems of said bolts or screws being adapted to engage within the notches 17 in the flange 16. With this method of connection, by simply loosening the attachment screws the flange 16 can by rotation be readily disengaged. A similar connection is incorporated at the rear end of the horizontal power transmission shaft, the flange 20 being similar to the flange 18. The horizontal transmission shaft 7, 8 is squared at each extremity as shown at 44, and such squared extremities are adapted to engage within squared sockets in the driving and driven elements appertaining to said transmission shaft 7, 8. When dismounting it is thus only necessary to disengage the flanges 16 from the flanges 18, 19 when by contracting the shaft 7, 8 and its casing, the latter can be removed to permit of the separate removal of the engine and propeller mechanism. The rear extremity of the horizontal transmission shaft 7, 8 is adapted to drive, through a universal joint contained in a ball-and-socket casing 21, and through bevel transmission contained in a casing 22, a vertical shaft 23, shown in Fig. 2. This bevel transmission may provide for gearing down at any appropriate ratio or the drive may involve no gear reduction. The casing 22 and the part of the casing 21 which is connected thereto, are adapted to swivel about an axis co-axial with that of the shaft 23 within a casing 24. This casing 24 is furnished at top and bottom with brackets 25 carrying projections or swivel pins 26, and the said projections or swivel pins 26 are adapted to engage with the sockets already provided in existing barges for accommodating the rudder. The casing 24 is thus enabled to swing in an arc having for its center the axes of the projections 26. The upper projection 26 may be axially adjustable in its bracket 25, and may be fixed by a set pin 27. This permits of the adaptation of the device to a barge having its sockets spaced slightly differently from those of the barge on which the apparatus has previously been used. Within the casing 24 is a casing 28. This casing 28 is adapted to slide longitudinally within the casing 24, and at its lower extremity it rigidly carries a bevel gear casing 29 from which a propeller shaft 30 is adapted to rearwardly project, an appropriate packing gland being incorporated at the point at which the propeller shaft passes into the casing 29. Said propeller shaft 30 is geared by bevel gearing with a shaft 31 which is adapted to telescopically slide in relation to, but to be driven by, the vertical shaft 23, which receives its power from the horizontal transmission shaft. 32 is a key offering driving connection between the shafts 23 and 31, while permitting of their telescopic elongation or contraction. The casing 28 is furnished with a bracket 33 which passes through an elongated opening in the casing 24, and said bracket 33 or a part carried thereby is adapted to have screwed connection with a vertically disposed shaft 34 which is mounted to rotate without moving longitudinally. Said shaft 34 may at its upper extremity be geared by bevel gearing with a horizontal shaft 35 which carries an appropriate handle. By rotating the handle on the shaft 35 the casing 28 and consequently the propeller shaft 30 are elevated or lowered, and the shaft 34 serves to retain the propeller in its adjusted condition. Fig. 1 illustrates at *a*—*b* the water-line of the vessel when the latter is laden, and under these conditions the propeller occupies the position shown in full lines in that figure. When, however, the vessel is unladen and the water-line therefore occurs at the position indicated by *c*—*d*, the propeller is by the gear 35, 34, 33 lowered into the position shown in dotted lines in Fig. 1 in order that it may be fully immersed. The complete immersion of the propeller is thus obtained under both conditions, while there is no possibility of the propeller coming aground when the vessel is laden. The upper part of the shaft 34 may be carried by a rearwardly projecting part of the upper bracket 25, and said bracket 25 may also carry a member 36 which is adapted at 37 to accommodate the tiller 42. Said member 36 may also be furnished with a lifting ring 43 by which the apparatus shown in Fig. 2 may be bodily detached from the barge after the horizontal power transmission shaft shown in Fig. 3 has been detached therefrom. By the tiller the brackets 25, casing 24,-28, shafts 23, 31, and propeller may thus be displaced about the axes of the pivots 26. During this displacement the axis of the casing 22 is maintained substantially in alinement with the horizontal transmission shaft 7, 8,

this being permitted by the swivel connection heretofore mentioned between said casing 22 and the casing 24. To provide for this the joint between the parts of the ball and socket casing 21, instead of being a universal one, is adapted to articulate about only a horizontal axis. The casing 22 is furnished with a downward extension 41 having a peripheral groove with which an inward projection within the casing 24 engages to retain the casing 22 from longitudinal movement within the casing 24. Said downward extension 41 internally carries appropriate bearings for the shaft 23, while the shaft 31 is appropriately borne at its lower extremity within the casing 28, 29.

Around the propeller any appropriate form of protector cage such as 38 may be mounted, and said protector cage may carry a vane 39 which may function as a rudder. The steering portion is, however, not dependent upon this vane 39, as the change of position of the propeller is sufficient to bring about the desired process of steering. The cage 38 may be coupled to the bracket 33 by a stay or strut 40.

What I claim as my invention and desire to secure by Letters Patent is:

1. A power-propelling mechanism including a propeller, a vertically extending telescopic driving shaft therefor, a housing for said propeller, an arm having one of its ends secured to such housing, its opposite end terminating in a block formed with an internally screw threaded opening, a screw threaded rod passing through said opening, and means for turning said rod.

2. In combination with an attachment overhanging the wall of a heavy water craft and pivotally suspended therefrom, of a telescoping shaft depending vertically from said attachment and carrying a propeller at the lower end, a motor, and means for connecting said telescoping shaft with said motor to permit variation of the distance of said motor from the stern of the craft without disturbing the connecting means, said means including a horizontal shaft geared to said telescoping shaft and a horizontal telescoping shaft detachably connected to said horizontal shaft and said motor.

In witness whereof I have hereunto set my hand in the presence of two witnesses.

ARTHUR EDWARD HOOKE.

Witnesses:
ARTHUR H. BROWN,
EDGAR N. WHEELER.