J. B. FRENCH.

DRIVING CONNECTION.

APPLICATION FILED AUG. 27, 1919.

1,332,823.

Patented Mar. 2, 1920.

2 SHEETS—SHEET 1.

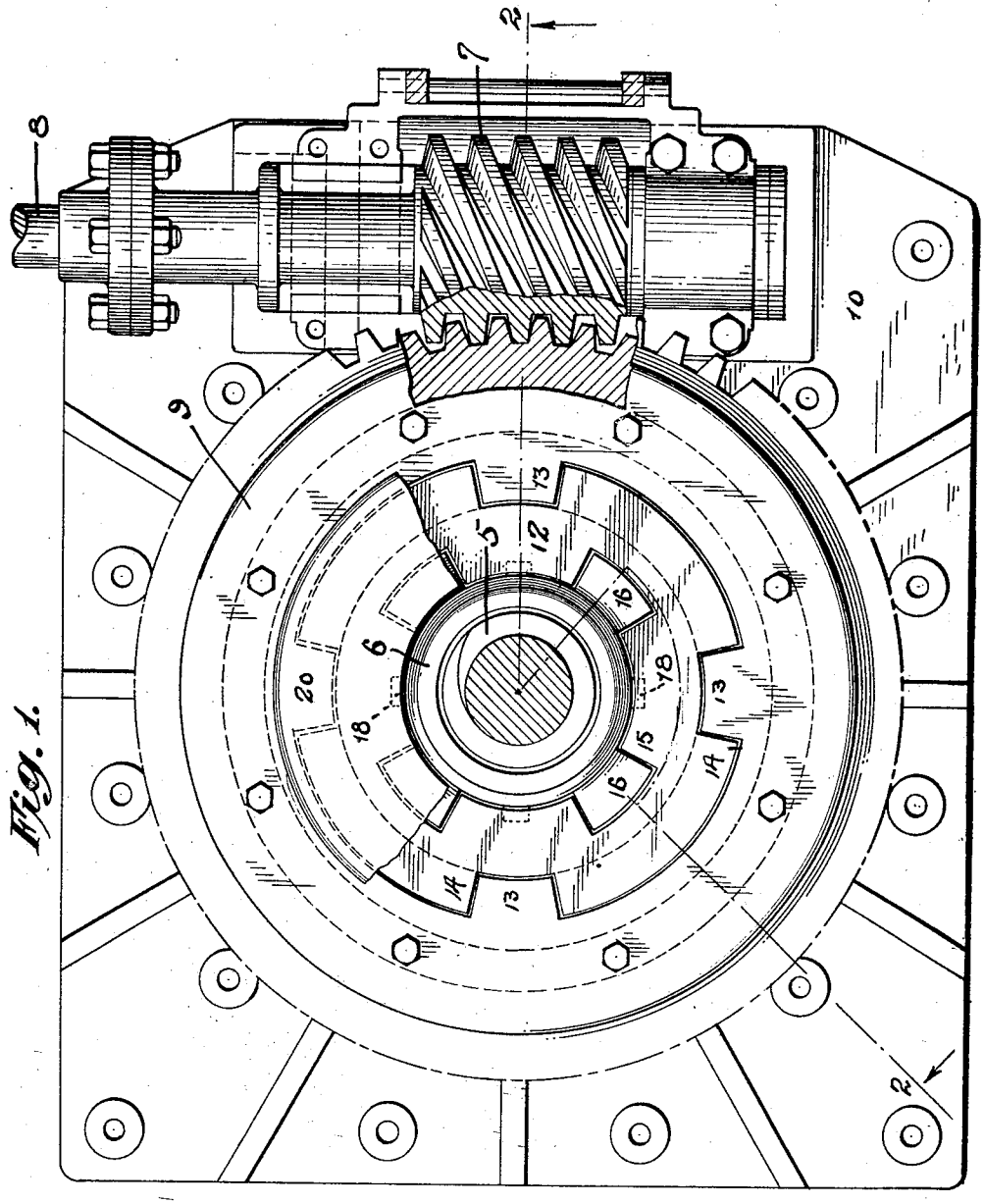


Fig. 1.

Inventor

JAMES B. FRENCH

By his Attorneys

Howson and Howson

J. B. FRENCH.

DRIVING CONNECTION.

APPLICATION FILED AUG. 27, 1919.

1,332,823.

Patented Mar. 2, 1920.

2 SHEETS—SHEET 2.

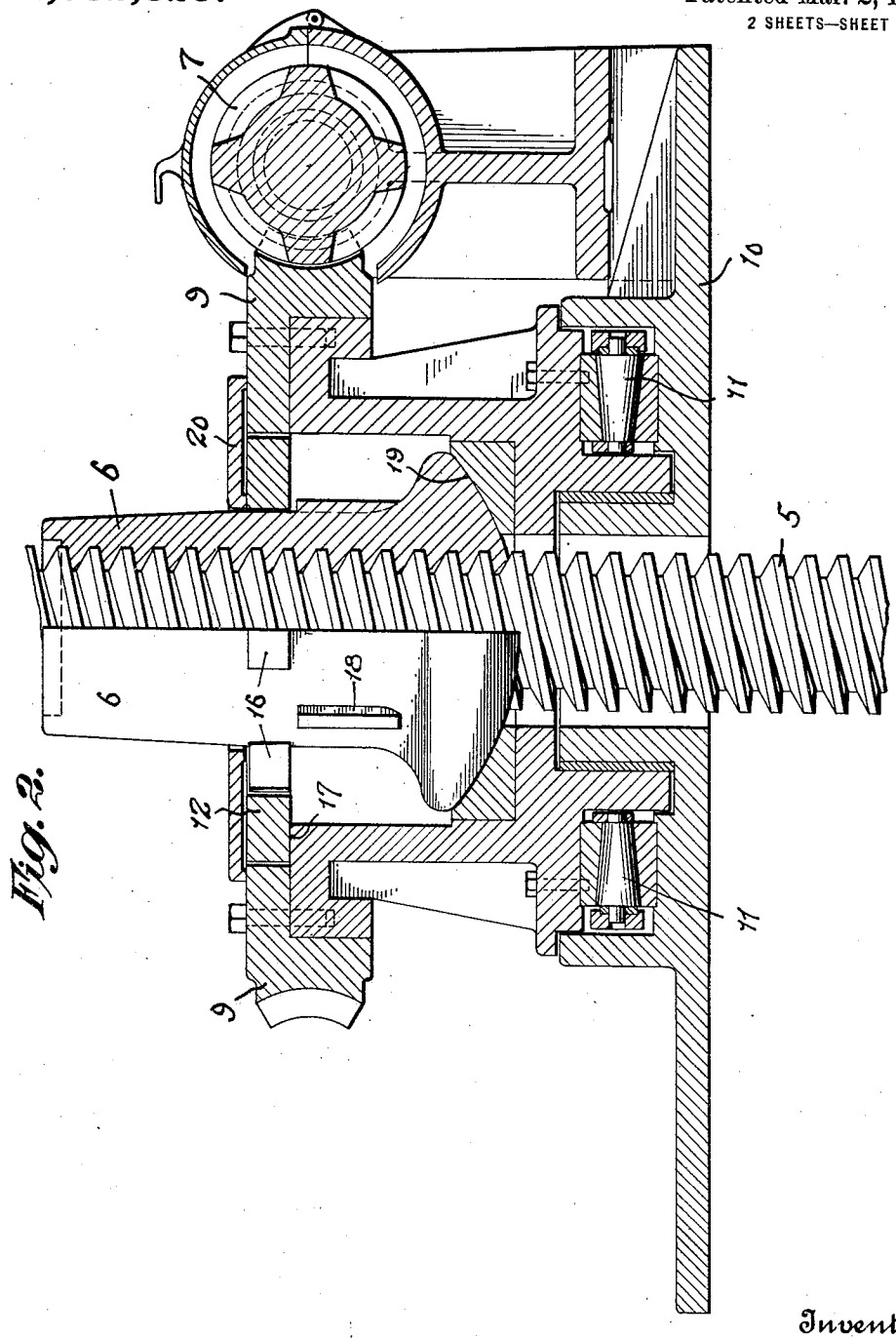


Fig. 2.

Inventor

JAMES B. FRENCH

By his Attorneys

Howson and Howson

UNITED STATES PATENT OFFICE.

JAMES B. FRENCH, OF JAMAICA, NEW YORK.

DRIVING CONNECTION.

1,332,823. Specification of Letters Patent. Patented Mar. 2, 1920.

Application filed August 27, 1919. Serial No. 320,201.

To all whom it may concern:

Be it known that I, JAMES B. FRENCH, a citizen of the United States of America, residing at Jamaica, Long Island, in the county of Queens and State of New York, have invented certain new and useful Improvements in Driving Connections, of which the following is a specification.

My invention relates to a driving connection, and particularly to a screw drive, the object of my invention being to provide a driving connection such that on the halt of the driven screw, or on its displacement in a direction opposed to the drive, the operative connection is broken without injury to the parts.

In the accompanying drawings—

Figure 1 is a broken plan view of an illustrative embodiment of my invention; and

Fig. 2 is a vertical section, partially in elevation, therethrough.

As a convenient organization to illustrate an application of the invention, I have used the hoisting gear for a car transfer bridge such as shown in my prior Patent No. 983,617 of February 7, 1911. A bridge of this sort is supported by a rod system jointed at its upper end to a lifting and lowering screw, such as shown at 5 in the present drawings. This screw passes up through a nut 6 of appropriate size and strength, and suitably supported to carry the weight of the bridge suspended from it through the screw rod 5. Rotation of the nut in one direction or the other on its bearings, of course causes the screw 5 to pass through it either upward or downward, and thus lifts or lowers the bridge.

Under ordinary circumstances a constant drive connection between the motor and the lifting screw fully meets the needs of the situation. It occasionally happens, however, that when the nut 6 is rotated in a direction to force the screw 5 downward, and thus to lower the bridge, the downward motion of the latter is arrested, as by ice or some other cause, while the motor is still in operation. If the motor is not at once halted, the mechanism may be seriously damaged and the bridge put out of service. By the present invention I have provided a drive connection between the motor and the nut 6, such that when the screw 5 is halted or pressed upward during its downward travel, while the motor is running, the operating connection is automatically broken, and the motor permitted to run idle, while upon restoration of normal conditions the drive connection is automatically re-established or readily restored by hand.

Referring in detail to the construction shown, the gear for driving the nut 6 comprises a worm 7 driven by the power shaft 8, to which it is rigidly connected. Meshing with the worm 7 is the worm wheel 9, supported in any suitable manner upon the bed plate 10, but preferably upon bearing rollers 11. Between the worm wheel 9 and the nut 6 which it rotates, is interposed a lock plate 12. Under normal conditions the latter freely engages both worm wheel and nut, the former through the intermeshing segmental teeth 13 and 14 and the latter through similar teeth 15 and 16. In this position the lock plate rests freely upon the ledge 17 on the worm wheel 9. Beneath the lock plate, however, lugs 18 are formed on the nut 6. Consequently, when the screw 5 is obstructed in its downward movement, while the motor is still operating, the continued rotation of the nut causes the latter to run up the screw 5, leaving its seat 19 on the worm wheel and lifting, by the lugs 18, the lock plate 12 with it. As soon as the engagement between the teeth 13 and 14 is broken, the motor runs idle and no motion is imparted to the nut, the latter remaining stationary, unless both nut and screw are forced upward by some external force.

If the condition just described were the only one to be provided for, it would be perfectly feasible to make the lock plate fast or integral with the nut. But, if after the nut has been forced up out of its seat, accidental conditions change suddenly and it drops back to its seat, the lock plate either falls again into interengaging position, or it is halted by the teeth 13, which may not be in register with the spaces between teeth 14 of the lock plate. In the latter case, if the lock plate were integral with the nut, which carries the weight of the bridge, the whole weight of the latter would be imposed upon the teeth 13 of the worm wheel—an impossible burden. The advantage of having the lock plate as a separate piece is therefore

manifest. Moreover, it may be readily dropped into engaging position by hand when the worm wheel has rotated to proper position with relation to the nut.

In order to keep dirt and moisture so far as possible out of the joint between the lock plate and the worm wheel and nut, a cam plate 20 may be arranged freely in position thereon, and of course rises with it when carried up by the nut.

While I have described my invention with reference to transfer bridge mechanisms, it may be adapted to any appropriate mechanism. Moreover, the particular details of construction illustrated are but illustrative and not limitative, and may be variously modified without departing from what I claim as my invention.

I claim:

1. The combination with a screw and a rotatable nut thereon for displacing the screw longitudinally, of a seat upon which said nut freely rests to support the screw, means for driving said nut, and means for breaking the operative connection between the nut and its driving means on the rise of said nut from its seat incident to the halt of the screw during the drive.

2. The combination with a screw and a rotatable nut thereon for displacing the screw longitudinally, of a member for driving the nut, a movable member normally interlocking said driving member and nut, and means for shifting said member with the nut to break said interlocking connection when the nut is displaced with relation to said driving member incident to the halt of the screw during the drive.

3. The combination with a screw and a rotatable nut thereon for displacing the screw longitudinally, of a driving gear surrounding the nut, an independent locking plate normally interengaged freely between said gear and nut, and means for lifting said locking plate out of interengaging position when the nut is displaced with relation to said driving member incident to the halt of the screw during the drive.

4. The combination with a vertical screw and a nut thereon for supporting and vertically displacing the screw, of a driving member on which said nut is freely seated and with which the nut is in free driving engagement, said engagement being automatically broken when the nut rises from its seat incident to a halt of the screw during the drive.

5. The combination with a vertical screw and a nut thereon for supporting and vertically displacing the screw, of a driving gear surrounding the nut, a seat thereon for the nut and a locking plate freely supported on said gear and interlocking with the nut and gear to drive the nut, and means associated with said nut for lifting said plate from engagement with the gear when the nut rises from its seat incident to the halt of the screw during the drive.

In testimony whereof I have signed my name to this specification.

JAMES B. FRENCH.