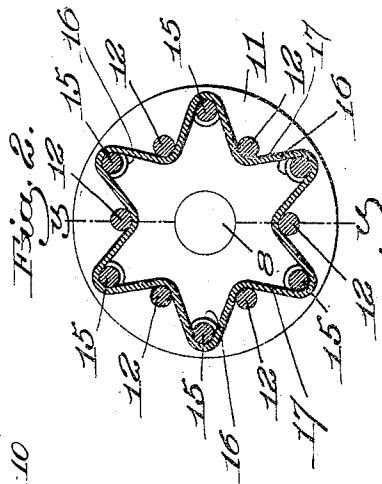
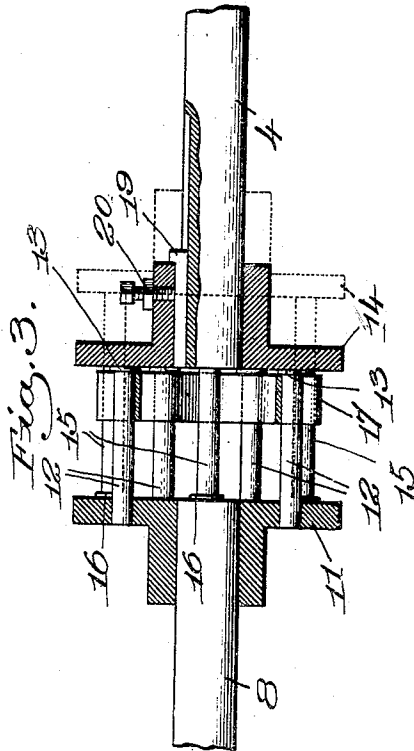
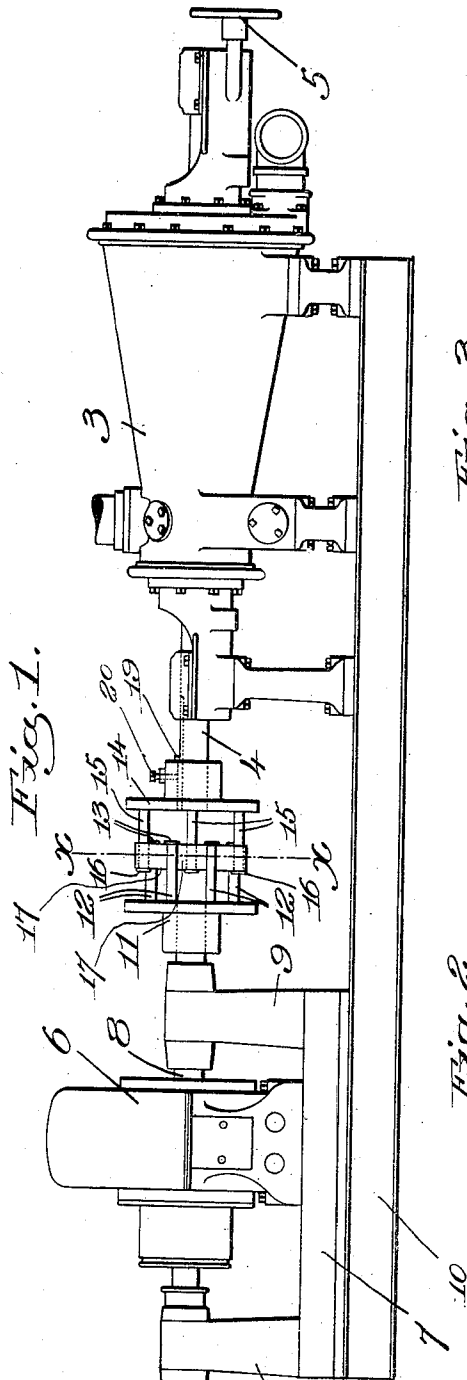


J. F. LANIGAN, JR.
 MOTOR DRIVE FOR JORDAN ENGINES.
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1,060,911.

Patented May 6, 1913.



witnesses:
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UNITED STATES PATENT OFFICE.

JAMES F. LANIGAN, JR., F. LAWRENCE, MASSACHUSETTS.

MOTOR-DRIVE FOR JORDAN ENGINES.

1,060,911.

Specification of Letters Patent.

Patented May 6, 1913.

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To all whom it may concern:

Be it known that I, JAMES F. LANIGAN, Jr., a citizen of the United States, residing at Lawrence, county of Essex, State of Massachusetts, have invented an Improvement in Motor-Drives for Jordan Engines, of which the following description, in connection with the accompanying drawing, is a specification, like characters on the drawing representing like parts.

This invention relates to a novel connection between a motor and the plug shaft of a Jordan engine which permits the necessary adjustment of the plug shaft as the plug wears without interfering at all with the operation of the motor.

There are many advantages in driving a Jordan engine direct from a motor. The principal difficulty in practically accomplishing this is that the shaft of the Jordan engine requires to be adjusted longitudinally to take up the wear which occurs in the plug, and such adjustment of the plug requires a connection between the plug shaft and the motor which will permit the plug to be adjusted without affecting or disturbing the operation of the motor. One means of overcoming this difficulty heretofore proposed has been to mount the motor on a movable base and provide connections between the plug-adjusting means and the motor base whereby the motor is shifted longitudinally with the plug shaft when the latter is adjusted. With an arrangement of this sort, however, it is somewhat difficult to keep the motor shaft properly aligned with the plug shaft. Another way of overcoming the difficulty which has been proposed is to couple the motor shaft with the plug shaft by means of a telescopic coupling which permits longitudinal adjustment of the plug shaft without affecting the motor shaft.

The coupling which I have devised and which forms the subject matter of this application is in the nature of a telescopic connection, but it is also somewhat flexible so that it will operate freely even though the motor shaft and the plug shaft are not exactly in alinement.

I will first describe one embodiment of my invention and then point out the novel features thereof in the appended claims.

Figure 1 is a view of a Jordan engine and motor showing a coupling embodying my invention for coupling the motor to the engine shaft; Fig. 2 is an enlarged section

on substantially the line $x-x$, Fig. 1; Fig. 3 is an enlarged section on the line $y-y$, Fig. 2.

In the drawings, 3 designates generally a Jordan engine, 4 the plug shaft thereof and 5 the mechanism for adjusting the plug shaft longitudinally to take up wear in the plug. Since a Jordan engine is a well-known type of refining engine commonly used in the manufacture of paper, I have not deemed it necessary to further illustrate it.

6 designates an electric motor of any suitable or usual construction adapted for rotating the plug shaft 4 of the Jordan engine. This motor is provided with an armature shaft 8 which is journaled in suitable bearings 9 supported on a base 7, and the base 7 is in turn rigidly secured to the base 10 on which the Jordan engine is fixedly secured. For coupling the motor shaft 8 to the plug shaft 4, I have provided a coupling having the following construction.

Fast on the motor shaft is a head 11 which has extending therefrom a plurality of pins or arms 12, each preferably provided at its end with a head 13. The plug shaft 4 has mounted thereon another head or plate 14 which has extending therefrom a plurality of pins 15, each also provided with a head 16. The pins or arms 12 are arranged in a circle and the pins or arms 15 are also arranged in a circle, but the circle of the pins 12 is of a different diameter from that of the pins 15, the pins 15 being shown, as in a circle of larger diameter than the pins 12. An endless belt 17 is passed around outside of the pins 15 which occupy the circle of larger diameter, and inside of the pins 12 which occupy the circle of smaller diameter, as clearly seen in Fig. 2, so that when the motor shaft is operating the action of the pins 12 on the belt will rotate the plug shaft 4.

The pins 12 and 15 have a length considerably greater than the width of the belt 17, and when the engine is first set up the parts will be in the position shown with the ends of the pins overlapping a distance equal to the width of the belt so that the belt will be held between the heads 13 and 16 of the pins. As the engine plug wears the plug shaft 4 may be adjusted longitudinally to take up wear, and during this movement the head 14 will be moved toward the head 11 and the pins 15 will be slid through

the belt 17. This arrangement permits the plug shaft 4 to be adjusted longitudinally for taking up wear a distance equal to the distance between the ends of the pins 15 and the head 11, and when the plug shaft has been moved through this distance, the parts will be as shown in Fig. 3, that is, the pins 15 will abut against the head 11 and the pins 12 against the head 14. To permit further adjustment of the plug shaft, I have made the head 14 adjustable on the plug shaft 4, as seen in Fig. 3, so that when the plug has been adjusted as far as the pins 12 and 15 will permit, said head 14 may be set back on the shaft 4 into the dotted line position Fig. 3 thereby to bring the pins 12 and 15 into the same relative position in which they are in Fig. 1. When the position of the head 14 on the plug shaft 4 has been thus shifted, as shown in dotted lines Fig. 3, said plug shaft 4 may be still further advanced to take up wear until the pins 12 and 15 alone come into contact with the heads 14 and 11, respectively. By thus making provision for shifting the position of the head 14 on the plug shaft 4, it is possible to provide for adjusting the plug shaft 4 longitudinally a foot or more without having the pins 12 and 15 of so great a length that they will be liable to bend when the heads are separated from each other, as shown in Fig. 1. The head 14 may be secured on the shaft 4 to permit longitudinal adjustment thereof in any suitable way. As herein shown, said head is keyed to the shaft by means of a key 19, and a set screw 20 is employed for locking the key in place.

The construction above described provides the desired slip or telescopic connection between the plug shaft 4 and the motor shaft 8 at the same time the connection is sufficiently flexible so that there will be no binding of the parts even though the plug shaft and motor shaft are not accurately in alignment.

I am aware that it has been heretofore proposed to provide a flexible shaft coupling comprising two heads on the two shaft ends to be coupled, each having pins extending therefrom, the pins on one head being on a larger circle than those on the other head and a flexible connection wound about the pins, and I do not claim herein such a flexible coupling broadly. In my improvement provision is made for adjusting the two shafts to be coupled together longitudinally relative to each other, and the claims herein are directed to this feature.

While I have herein illustrated my improved coupling as used in driving a Jordan engine shaft from a motor, yet it will be obvious that it might be used for coupling the

Jordan engine shaft to any driving member even though it was not a motor shaft, and also that it might be used in other relations where two shafts are to be coupled together, one of which requires to be adjusted at intervals longitudinally relative to each other.

Having fully described my invention, what I claim as new and desire to secure by Letters Patent is:—

1. The combination with a Jordan engine having a longitudinally-adjustable plug shaft and means to effect the adjustment thereof, of a motor having a motor shaft in alinement with the plug shaft, a head on the plug shaft, fingers extending therefrom parallel to the axis of the shaft, another head on the motor shaft, fingers extending therefrom parallel to the first-named fingers, and a flexible connection passing around said fingers, the fingers on one of said heads being free to slide through the connection and having a length sufficiently greater than the width of the connection to permit of the desired adjustment of the plug shaft without disturbing the driving connection.

2. The combination with a Jordan engine having a longitudinally-adjustable plug shaft, of a motor having a motor shaft in alinement with the plug shaft, a head fast on the motor shaft and having fingers extending therefrom, a second head mounted on the plug shaft and capable of adjustment longitudinally thereof and also having fingers extending therefrom, a flexible connection passing around the fingers on both heads and having a width sufficiently less than the length of the fingers to permit of the desired adjustment of the plug shaft without disturbing the driving connections.

3. The combination with a Jordan engine having a longitudinally-adjustable plug shaft, and means to effect the adjustment thereof, of a head sustained by said plug shaft, headed pins extending therefrom, a motor having a motor shaft in alinement with the plug shaft, a head on the motor shaft, pins extending from said latter head overlapping the first-named pins, one of said heads being adjustable longitudinally on its shaft, and a flexible connection passing about said pins, all of said pins being sufficiently longer than the width of the connection to permit of the desired longitudinal adjustment of the plug shaft without disturbing the driving connection.

In testimony whereof, I have signed my name to this specification, in the presence of two subscribing witnesses.

JAMES F. LANIGAN, JR.

Witnesses:

LOUIS C. SMITH,

THOMAS J. DRUMMOND.