(No Model.)

M. C. WILSON.

DEVICE FOR CONVERTING MOTION.

No. 473,720. Patented Apr. 26, 1892.

Fig. 1.

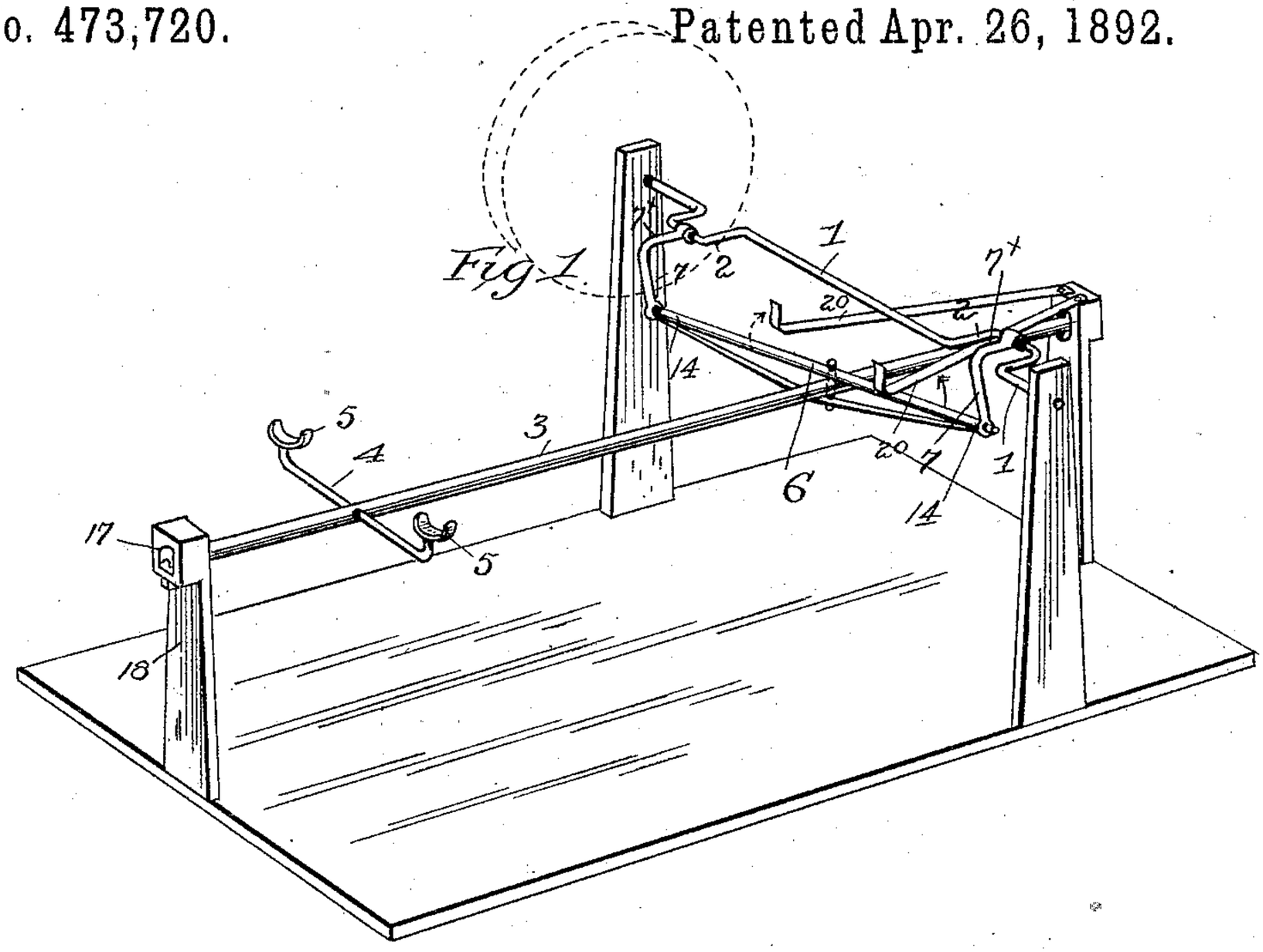


Fig. 2

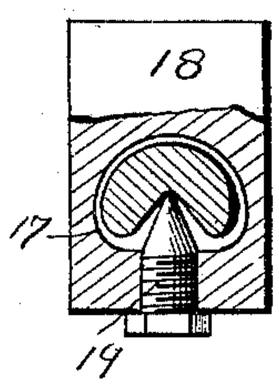


Fig. 3.

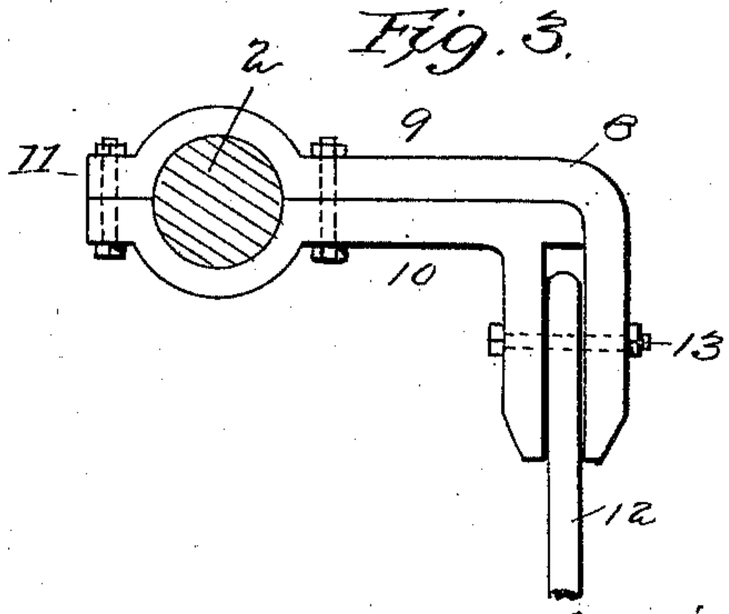
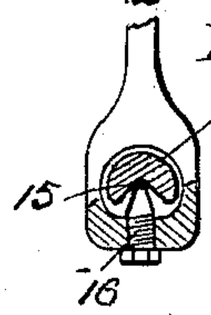


Fig. 4.



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UNITED STATES PATENT OFFICE.

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DEVICE FOR CONVERTING MOTION.

SPECIFICATION forming part of Letters Patent No. 473,720, dated April 26, 1892.

Application filed January 7, 1892. Serial No. 417,257. (No model.)

To all whom it may concern:

Be it known that I, MORTEN C. WILSON, a citizen of the United States of America, residing at Malden, in the county of Middlesex and State of Massachusetts, have invented certain new and useful Improvements in Devices for Converting Motion, of which the following is a specification.

My invention is an improved device for transferring or converting the motion of a rocking shaft into the continuous rotation of a driving-shaft with increased power.

One object of the invention is to convert the motion of the rocking shaft into the rotation of a driving-shaft substantially at right angles thereto in such a manner that the amount of friction shall be reduced to a minimum and the parts be as few in number as possible, thus lessening their liability to breakage.

Another object is to convert the motion of a rocking shaft into the motion of a driving-shaft in such a manner that all liability of a dead-center shall be removed and the driving-shaft may be started with ease whatever be its position when at rest.

A further object is to provide means to prevent the backward movement of the driving-shaft in starting the same.

In the accompanying drawings, which illustrate an embodiment of my invention, Figure 1 is a perspective view of the device. Fig. 2 is an enlarged sectional view of the bracket supporting the rocking shaft. Fig. 3 is a sectional view of the preferred form of boxing and rod connecting the oscillating bar with the cranks of the driving-shaft. Fig. 4 is a sectional view illustrating the manner of connecting the rod with the ends of the oscillating bar.

In the drawings, 1 is representative of the driving-shaft of any piece of machinery which it is desired to operate, this shaft being provided with cranks 2 2. Beneath this driving-shaft and at substantially right angles thereto is journaled the rocking shaft 3, which carries a cross-bar 4, rigidly connected therewith and provided with pedals or foot-rests 5, the bar and foot-rests being representative of any desirable means for rocking the shaft 3.

6 represents an oscillating bar or rod pivoted upon the rocking shaft beneath the driving-shaft in such a manner that when the shaft 3 is rocked this oscillating shaft will be tilted first in one direction and then in the other, but at the same time may swing in a plane parallel with the longitudinal axis of the rocking shaft. The ends of this oscillating shaft are connected with the cranks of the driving-shaft by the connections 7, which are formed in the manner hereinafter described.

When the shaft is rocked, it will be seen that the oscillating rod is tilted, each end being alternately raised and lowered, and the connections between the ends of the oscillating rod and the cranks of the driving-shaft pull and push upon the said cranks, thus causing the driving-shaft to rotate, the oscillating shaft swinging upon its pivoted connection with the rocking shaft as the cranks swing around in the rotation of the driving-shaft.

In order to remove all liability of a dead-center and to enable the driving-shaft to be started without regard to the position of the cranks thereof when at rest, I prefer to form the connections between the ends of the oscillating bar and the cranks of the driving-shaft, as illustrated in Fig. 3, with an angular bent portion or boxing 8, which is formed in two portions 9 10, adapted to be held together, with their ends, as at 11, embracing the cranks of the driving-shaft. Between their other ends, which are bent downwardly at approximately right angles to the main portion of the boxing, is secured the rod 12 by the bolt 13, passing through the parts 9 and 10 and allowing slight pivotal movement of the said rod 12. The lower end of this rod 12 is pivotally secured to the end of the oscillating bar, as illustrated, by forming a hole or opening in the side of the rod 12, which hole is slightly larger than and adapted to receive the end of the oscillating bar, rounded upon its upper side, as at 14. It has a V-shaped concavity in its lower face, as at 15, and into this V-shaped concavity passes the conical end of a screw 16, seated in the end of the rod. This provides a pivotal connection between the rod and oscillating bar which will allow but little friction and one which may be easily adjusted to take up wear.

The oscillating rod is mounted upon the rocking bar forward of the driving-shaft a distance equal to the length of the horizontal

arm $7^{\times}$ of the angular connection 7. This arrangement avoids all dead-centers, and in whatever position the driving-shaft is left at the cessation of its movement it may be started again by rocking the bar or shaft 3 either in one direction or the other, the oscillating bar and angular connections acting to draw upon the crank when it is in an elevated position, and of course the other end of the oscillating bar will push upon the other crank a corresponding degree. To further reduce friction as much as possible, I have formed holes or sockets 17 in the brackets 18, which support the rocking shaft, the ends of the rocking shaft being adapted to fit within these holes. A V-shaped concavity is formed in the under side of the rocking shaft where it rests within the socket 17, and the bar is supported by the screw 19 passing through the under side of the bracket, the conical point or end of the screw entering the V-shaped concavity and holding the end of the rocking bar firmly in place. By this means a bearing is formed which will allow free pivotal movement; but the parts may be held sufficiently tight to avoid all rattle and play and may be easily adjusted to take up the wear.

In many classes of machinery it is desirable to prevent all danger of starting the driving-shaft in a reverse direction from that in which it is ordinarily driven, and I have aimed to accomplish this by the spring-stops 20. These spring-stops are attached to a support slightly in rear of the oscillating rod, and may consist of strips of spring material having their ends bent upwardly to form a bearing-surface on each side of the rocking shaft. As the oscillating bar rises on one side in the movement of the rocking shaft it comes against this spring-bar and raises it until that portion of the oscillating bar has reached its highest position, at which time the spring drops behind the bar and prevents its return under any conditions. Should it be found desirable, however, to reverse the movement of the driving-shaft, the spring-stops may be swung to one side out of contact with the oscillating bar.

To more particularly describe the action of the stops, it may be stated that the arrow shown in full lines represents the path of the oscillating bar as it moves on its pivot and is raised and lowered by the rock-shaft. It will be clear that this movement will simply raise the stop until the oscillating bar slips from under it, when the stop will return to normal position to be raised by the bar again. Should the oscillating movement of the bar be reversed while in the position shown, the dotted arrow will show the path of the bar relatively to the spring-stop, and it will be clear that this movement will bring the bar squarely against the end of the stop, which under such contact acts as a rigid stop.

I claim as my invention—

1. In combination, the rocking shaft, a bar arranged transversely thereof and pivoted thereto to oscillate longitudinally of the rock-shaft, the part to be driven, and the connection from the transverse bar to said part, substantially as described.

2. In combination, the rocking shaft, a bar arranged transversely thereof and pivoted thereto to oscillate longitudinally of the rock-shaft, the crank-shaft, and the connections from said oscillating bar to the cranks of said shaft, substantially as described.

3. In combination, the rocking shaft, a bar arranged transversely of the rock-shaft and pivoted thereon to oscillate longitudinally thereof, the part to be driven, and the angular connection between the oscillating bar and said part, substantially as described.

4. An oscillating bar pivoted upon a rocking shaft, connections between the ends of the oscillating bar and the cranks of the driving-shaft, and means for preventing the retrograde movement of the oscillating bar, substantially as described.

5. An oscillating bar mounted on a rocking shaft, connections between the ends of the bar and the cranks of the driving-shaft, and spring-arms carried upon a pivoted support and adapted to engage the oscillating bar and prevent the retrograde movement thereof, substantially as described.

6. An oscillating bar mounted on a rocking shaft and connections between the ends of the bar and the cranks of the driving-shaft, said connections consisting of a boxing having an angular extension, and a rod pivoted between the arms of the extension, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

MORTEN C. WILSON.

Witnesses:
CHARLES T. HALL,
JOHN F. HAMBLETT.