

No. 732,057.

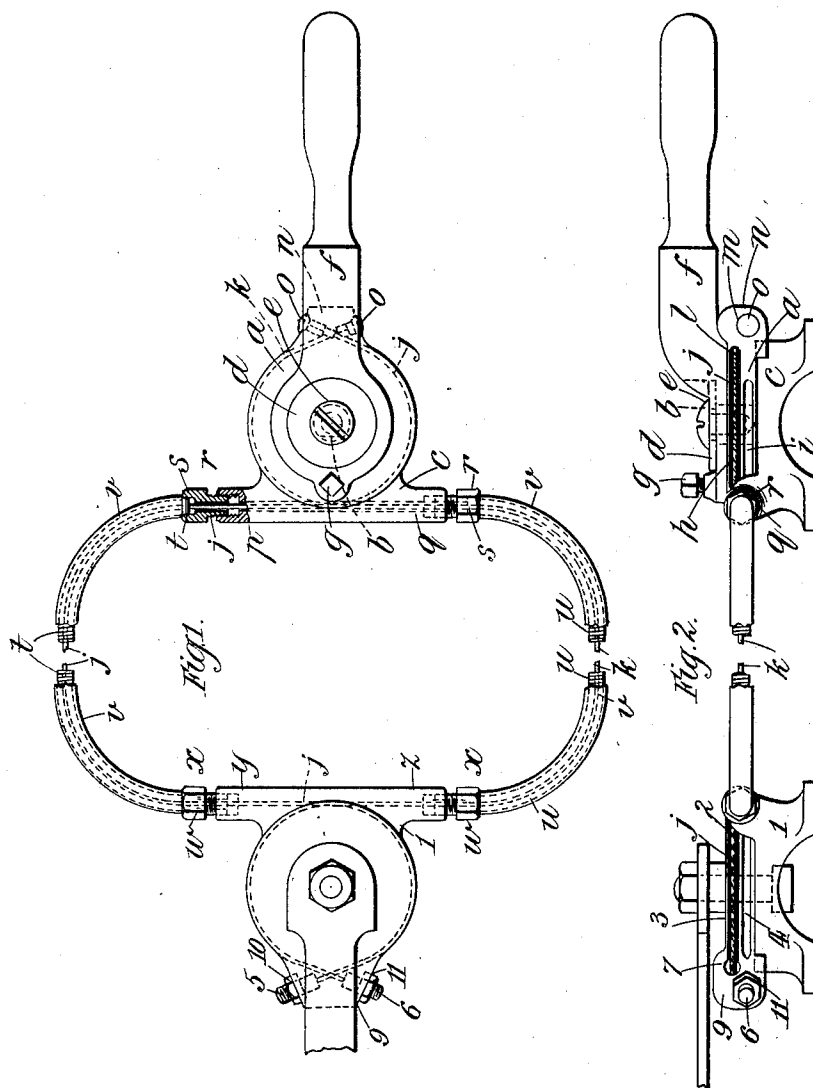
PATENTED JUNE 30, 1903.

J. DRING.
MECHANISM FOR THE TRANSMISSION OF POWER.

APPLICATION FILED NOV. 26, 1901.

NO MODEL.

2 SHEETS—SHEET 1.



Witness,
A. M. Perkins.
J. A. MacDonald.

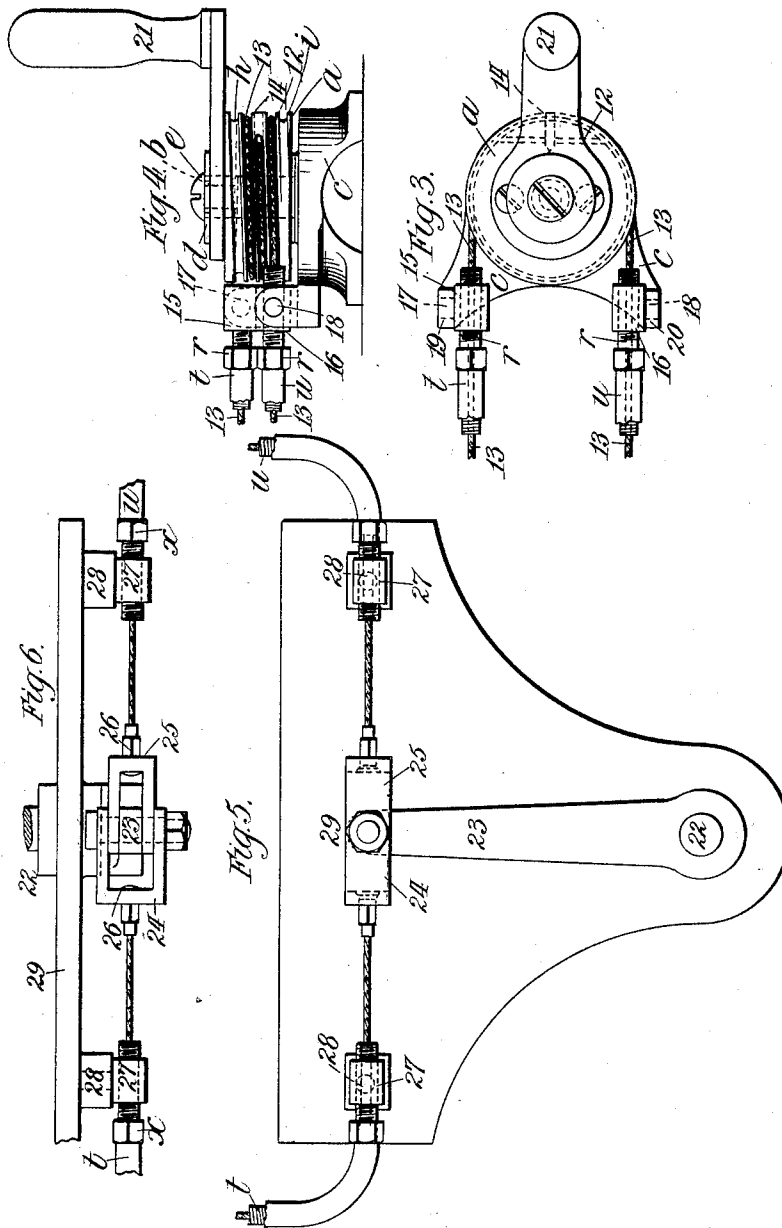
Inventor,
John Dring,
By his Attorneys,
Baldwin, Dandson & Wight.

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Witnesses,
A. M. Parkins
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Inventor,
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UNITED STATES PATENT OFFICE.

JOHN DRING, OF LONDON, ENGLAND.

MECHANISM FOR THE TRANSMISSION OF POWER.

SPECIFICATION forming part of Letters Patent No. 732,057, dated June 30, 1903.

Application filed November 26, 1901. Serial No. 83,744. (No model.)

To all whom it may concern:

Be it known that I, JOHN DRING, a subject of His Majesty the King of Great Britain, residing at London, in the county of Middlesex, England, have invented new and useful Mechanism for the Transmission of Power, of which the following is a specification.

My invention relates to mechanism for the transmission of power such as described in the specification of Letters Patent of the United States granted to E. M. Bowden, No. 609,570. In that patent there is shown a flexible medium connecting an actuated lever or one moving part with another operated or moving part. This connecting medium consists of an incompressible guide member and an inextensible operating member. The guide member consists of a length of coiled wire, each turn abutting the next one, and therefore incompressible, similar to a length of flexible shafting. The inextensible member consists of a cord, wire, or cable passing freely through the incompressible member, and therefore capable of longitudinal movement through it; but when the actuated lever or one part is moved the movable member of the connecting medium is operated against the resistance of a spring and under the influence of which it is returned.

My present objects are to provide means whereby the said spring may be dispensed with and positive movements in both directions may be transmitted to the part it is desired to operate and so that such latter will remain in the position to which it is moved when the source of power is removed from the actuated lever, and generally to effect the improvements herein indicated.

In the accompanying drawings, which are illustrative of my invention, Figures 1 and 2 are respectively a plan and elevation of one form. Figs. 3 and 4 are respectively a plan and elevation of a modified form of the actuated portion of my said apparatus, and Figs. 5 and 6 are respectively a plan and elevation of a modified form of the operated portion thereof.

In carrying out my invention I employ at the actuated end of the apparatus a drum or other suitable part *a*, journaled upon a bearing *b*, that is formed upon a base *c* and kept in place by a washer *d* and screw *e*. The

drum *a* is provided with a hand-lever *f*, whose angular position may be adjusted and thereafter secured by means of a set-screw *g*. The drum *a* is also provided with two grooves *h i*, which nearly surround it and form guides for two flexible inextensible members *j k*, composed, preferably, of spun wire. These inextensible members are wound upon the drum *a* in reverse directions and their ends secured thereto by being passed through holes *l m*, formed in the lug *n*, and thereafter soldered to nipples *o*, fitted into the said holes.

The free ends of the inextensible members *j* and *k* are then led, respectively, through the tubular portions *p* and *q*, formed on the base *c*. These tubular portions *p* and *q* are screw-threaded internally and fitted with tubular studs or abutments *r*, which are provided with internal shoulders *s*, against which abut the ends of flexible incompressible members *t* and *u*, through which the inextensible members *j* and *k* respectively pass.

The flexible incompressible members are preferably formed of a closely-wound wire helix, which may be inclosed in a rubber or other suitable tube *v*. These incompressible members extend between the actuated and operated parts of the apparatus, and their distant ends abut against the shoulders *w* of studs *x*, (similar to the studs *r*,) which constitute stops or abutments. The inextensible members *j* and *k* extend through the incompressible members *t* and *u* and thereafter pass through the tubular portions *y z* of a base 1 (similar to the base *c*) and are finally wound partly around a drum or other suitably operated or moving part 2, journaled upon the base 1.

The drum 2 is provided with grooves 3 and 4 to receive the inextensible members *j* and *k*, which are wound thereon in reverse directions and their outer ends secured to studs 5 and 6, which pass through holes 7, formed in the lug 9, and are there retained by nuts 10 and 11, by which the slack in them is taken up until the coils of the outer members *t u* are closed and those members rendered longitudinally incompressible. This purpose is also served by the adjustable stops *r* and *x*.

It will now be seen that if by actuating the drum *a* one of the inextensible members—for instance, the one *j*—be pulled it must be

drawn through member t , (which is now longitudinally incompressible,) however sinuous the course between its extreme points may be, and as a result of the said inextensible member being pulled the drum 2, upon which its farther end is wound, will be turned and the other inextensible member k , which is wound upon the same drum in the reverse direction, will be pulled in the opposite direction sufficiently to take up what was unwound from the other drum a when it was turned to pull the first-mentioned member j . By these means the drum 2 will be caused to turn in either direction when the drum a is correspondingly moved, or it may be caused to turn the reverse way by reversing the connections, and by varying the respective diameters of the drums their relative angular movement and the corresponding gain or loss of power may be regulated.

When it is desired to obtain a longer pull, the drum a is provided with two helical grooves h and i , which are rendered continuous by a hole 12, as shown in Figs. 3 and 4. According to this construction only one continuous length of inextensible member 13 is employed. This is passed through the hole 12 and secured there by a set-screw 14 in such a manner that the ends of the said inextensible member extend a convenient distance on each side of the said hole. These ends are wound around the drum a a convenient number of turns in reverse directions and then pass through the tubular studs or abutments r to the interior of the incompressible members t and u , as before.

The tubular studs r may be screwed into blocks 15 and 16, which are pivoted at 17 and 18 to ears 19 and 20, formed on the base c , in order that they may aline themselves to the varying direction of the inextensible member 13, which is controlled by the point at which it leaves the drum a . The drum is illustrated in this case as being provided with a crank-handle 21 instead of a hand-lever, as shown in Figs. 1 and 2.

According to the modification shown in Figs. 5 and 6 the shaft 22 to be operated is provided with a lever 23, to the outer end of which are pivoted connections 24 and 25. These connections are provided with holes, into which the nipples 26, soldered to the ends of the inextensible member or members, are fitted.

The incompressible members t and u abut against the internal shoulder of tubular studs x , which are screwed into the blocks 27, pivoted at 28 to the base 29, so that these parts may aline themselves to the varying direction of inextensible members.

While I have described the incompressible members u and t as separate members, they may be regarded as one member made in two branches, and the inextensible members

j and k may be regarded as a single member made in two branches.

What I claim, and desire to secure by Letters Patent of the United States, is—

1. Mechanism for the transmission of power comprising in combination an actuated part, an operated part, a tubular flexible incompressible member having two branches between said actuated and operated parts, an inextensible member having two branches movable freely endwise in opposite directions within the branches of the incompressible member and actuating the operated part, and abutments for the incompressible member, substantially as described.

2. Mechanism for the transmission of power comprising in combination an actuated part, an operated part, a flexible inextensible member extending from one of said parts completely around the other and back to the first-mentioned part and independently actuating the operated part, a flexible incompressible member having two branches through which the inextensible member passes, and abutments for the incompressible member.

3. Mechanism for the transmission of power comprising in combination an actuated part, an operated part, an incompressible member having two branches, an inextensible member connecting the actuated part with the operated part, and extending through the branches of the incompressible member and pivotally-mounted abutments for the incompressible member.

4. Mechanism for the transmission of power comprising in combination an actuated part, an operated part, an incompressible member having two branches between the operated part and the actuated part, an inextensible member having two branches connecting the actuated and operated parts and movable endwise freely within the incompressible member, pivotally-mounted abutments for the incompressible member, and a pivotally-mounted connection for the branches of the inextensible member on the operated part.

5. Mechanism for the transmission of power comprising in combination an actuated part, an operated part, a flexible but inextensible member connecting the actuated part to the operated part, and a flexible incompressible member surrounding the inextensible member, and in which the inextensible member is movable freely endwise, and a pivotally-mounted abutment for the incompressible member.

In testimony whereof I have hereunto subscribed my name.

JOHN DRING.

Witnesses:

J. S. WITHERS,
JOSEPH LAKE.