No. 820,920. PATENTED MAY 15, 1906.

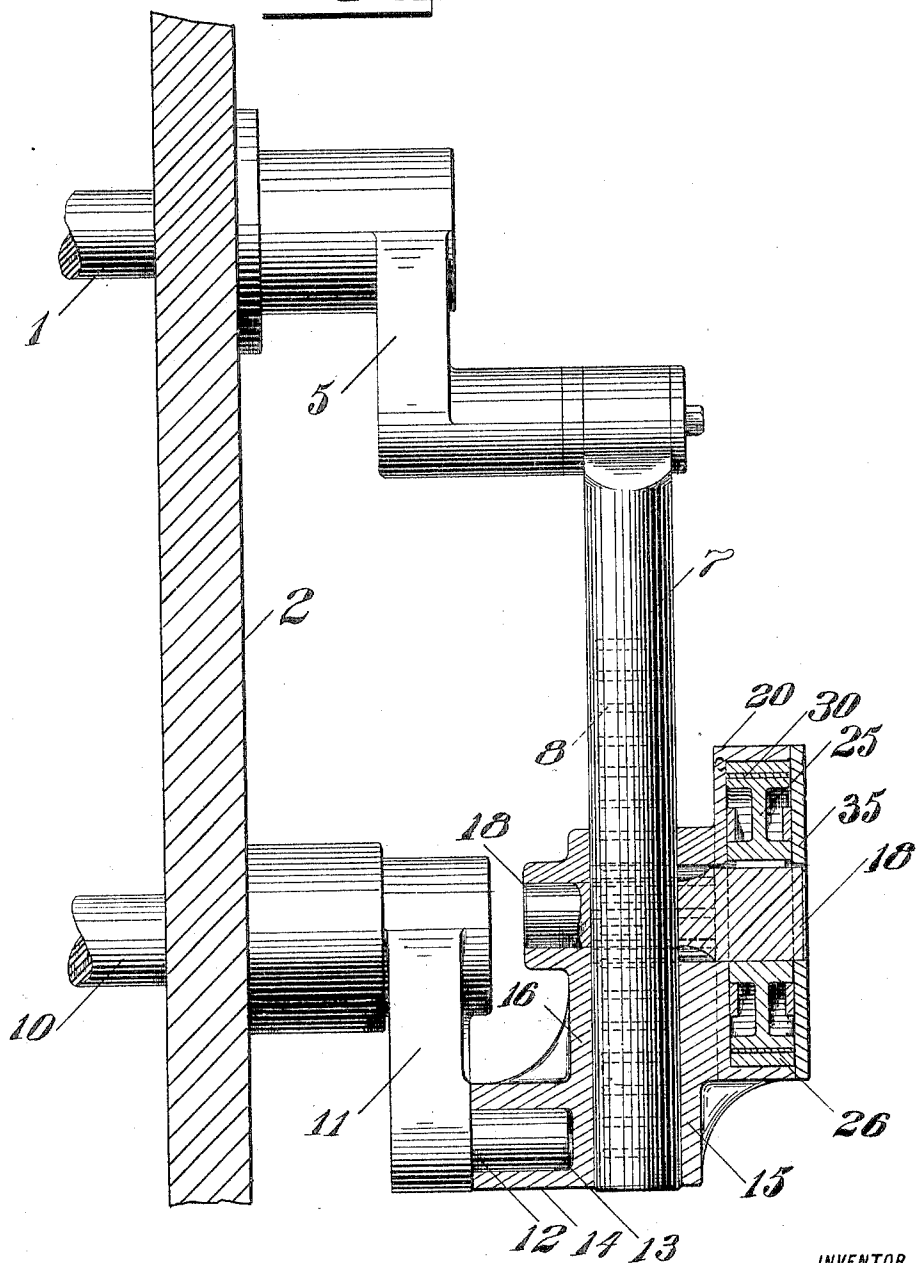
T. C. DEXTER.

POWER TRANSMITTING MECHANISM.

APPLICATION FILED NOV. 28, 1905.

2 SHEETS—SHEET 1.

FIG. 1



WITNESSES

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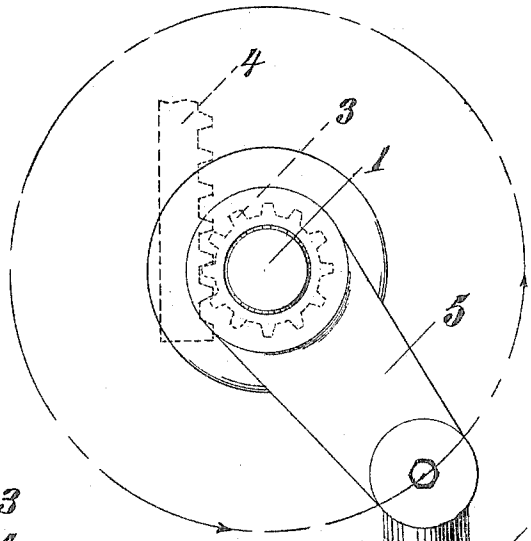
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2 SHEETS—SHEET 2.

Fig. 2



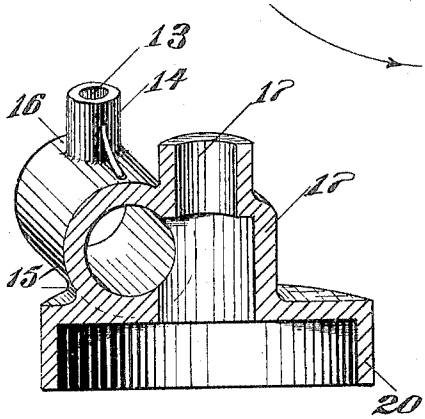
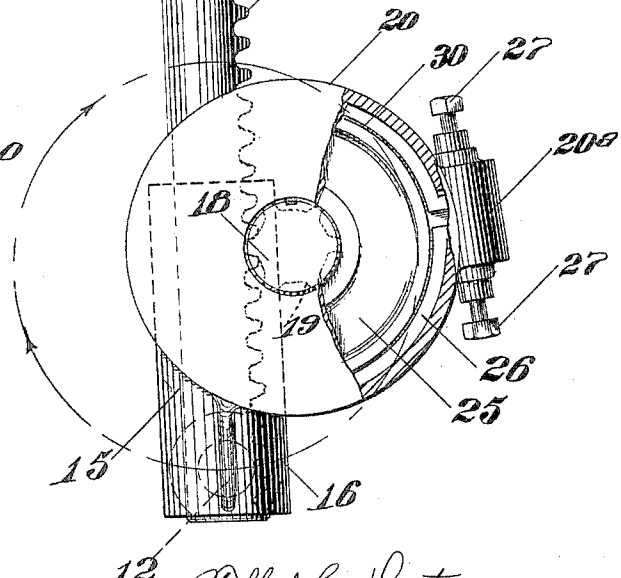


Fig. 3



WITNESSES

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UNITED STATES PATENT OFFICE.

TALBOT C. DEXTER, OF PEARL RIVER, NEW YORK.

POWER-TRANSMITTING MECHANISM.

No. 820,920. Specification of Letters Patent. Patented May 15, 1906.

Application filed November 28, 1905. Serial No. 289,508.

To all whom it may concern:

Be it known that I, TALBOT C. DEXTER, a citizen of the United States, residing at Pearl River, county of Rockland, in the State of New York, have invented certain new and useful Improvements in Power-Transmitting Mechanism, of which the following is a specification.

The object of my invention is to produce a simple, strong, and effective mechanism for transmitting power from a rotary shaft to a variably-movable rock-shaft, the arrangement being such that the same amount of force is applied to the rock-shaft for each stroke irrespective of the varying length of its strokes.

My invention is particularly designed as part of the driving mechanism for the clamp of a paper-cutting machine of the type illustrated and described in my application for patent, Serial No. 246,139, filed February 17, 1905. My invention, however, is of much wider application and will be found useful as a power-transmitting mechanism in any kind of machinery in which the same degree of pressure or thrust is to be imparted every stroke to an oscillating or reciprocating member having variable strokes in its operation.

In the application of my improved power-transmitting mechanism to a paper-cutting machine the rock-shaft (carrying the pinions which mesh with the clamp-operating rack-bars) is provided with a rock-arm, to which is pivotally connected a thrust-bar or piston, which slides in a socket formed in a casing, which is engaged by a crank upon a rotating power-shaft. The casing carries a short transverse shaft, on which is formed a pinion which meshes with a rack cut in one face of the thrust-bar or piston, a friction slip-clutch being provided for adjustably controlling the rotation of the pinion in the casing.

The power of the rotating crank is transmitted to the thrust-bar through the casing, the pinion engaging the rack, tending to prevent movement of the casing upon the thrust-bar until the resistance is sufficient to overcome the frictional hold of the slip-clutch, at which point the pinion will be rotated in the casing to allow the casing to move upon the thrust-bar to the limit of the stroke of the crank. During the second half of the revolution of the power-crank the frictional clutch holds the pinion against rotation to cause the casing and thrust-bar to move together until the limit of the return movement of the thrust-bar is reached, when the frictional hold of the clutch is again overcome to allow the rotation of the pinion and the relative movement of the casing and thrust-bar until the parts are returned to their position of starting.

In order that my invention may be fully understood, I will first describe the same with reference to the accompanying drawings and afterward point out the novelty more particularly in the annexed claims.

In said drawings, Figure 1 is a sectional elevation of my improved power-transmitting mechanism. Fig. 2 is a side view of the same, part being broken away. Fig. 3 is an isometric view of a part of the mechanism.

I have illustrated my improved mechanism in the form in which I have applied it to the paper-cutting machine, in which 1 is a rock-shaft extending transversely of and journaled in the side frames 2 of the cutting-machine, said shaft 1 carrying adjacent to its opposite ends pinons, such as 3, which mesh with rack-bars, such as 4. (Illustrated in Fig. 2.) The rack-bars are attached to the straps which extend from the clamping-bar of the cutter in the usual manner, so that by the rocking of shaft 1 the clamp of the cutter is moved downwardly into engagement with a pile of sheets for holding the pile during the cutting operation and is raised away from the pile at the completion of the cutting operation.

The rock-shaft 1 carries at its outer end a cranked rock-arm 5, to the cranked end of which is pivotally connected the upper end of a thrust-bar or piston 7 of cylindrical cross-section and formed on one face with the rack-teeth 8 for the purpose presently to be explained.

10 is a rotary shaft extending transversely of the cutting-machine and also journaled in the side frames 2. This shaft 10 is designed to have power applied to it through any suitable mechanism—such, for instance, as illustrated in my above-named application, Serial No. 246,139. The shaft 10 carries a power-crank 11, whose crank-pin 12 is freely journaled in a socket 13, formed in the stud 14 of the reciprocating casing 15. The casing 15 has a vertical cylindrical barrel 16, through the bore of which the thrust-bar or piston 7 projects. The thrust-bar or piston 7 and casing 15 slide one upon the other in the operation of the mechanism, as hereinafter explained. The casing 15 is also formed with a

transverse barrel 17, in which is journaled a short transverse shaft 18. The opening through the barrel 17 (which is at right angles to the barrel 16) cuts tangentially the opening through the barrel 16, and the rack-teeth 8 of the thrust-bar or piston 7 are presented toward the opening which communicates between the bores of the barrels 16 and 17 in position to engage a spur gear or pinion 19, formed on or secured to the short transverse shaft 18, so that relative movement between the casing and thrust-bar or piston will cause the rotation of said shaft 18.

The barrel 17 expands into a cylindrical clutch-casing 20, in which is mounted a frictional clutch of any suitable construction, but preferably of the form described in my application, Serial No. 276,286, filed August 29, 1905.

25 is the friction-wheel member of the clutch, said member 25 being rigidly keyed to the short shaft 18 within the cylindrical casing 20. Supported between the periphery of the friction-wheel 25 and the casing 20 is an expansible split steel band 26, whose adjacent ends are formed with outwardly-projecting flanges, which rest within the radial recess of the projection 20^a of casing 20 in position to be engaged by the adjusting screws or bolts 27, by which the frictional hold of the slip-clutch is controlled. A strip or web of leather or other suitable frictional material is inclosed between the split band 26 and the frictional wheel 25, as shown at 30.

It will be observed that the construction and arrangement of the friction-clutch operating between the short shaft 18 and the supporting-casing is such as to regulate the freedom of rotation of shaft 18 in its casing. If the adjustment of the friction-clutch is such as to produce a minimum friction hold upon the friction-wheel 25, it will be understood that the shaft 18 will rotate in its casing with comparative freedom, whereas if the adjustment of the clutch is such as to produce an excessive amount of friction upon the wheel 25 it will be very difficult to cause the rotation of shaft 18 in its casing, and consequently the relative movement between thrust-bar or piston 7 and casing 15 will be resisted in proportion to the frictional hold of the clutch. 35 is a cover-plate on casing 20.

In the operation of the improved power-transmitting mechanism in its application to a paper-cutting machine it will be observed that the rotation of crank 11 tends to move casing 15 upwardly with thrust-bar or piston 7. So long as the rock-shaft 1 moves with sufficient freedom the casing 15 and thrust-bar or piston 7 will move upwardly together, since the frictional hold of the clutch upon the shaft 18 normally prevents the rotation of said shaft and the consequent movement of the casing upon the thrust-bar or piston. The parts will move upwardly together until the resistance to shaft 1 (in this case caused by the clamp engaging the pile of paper) is sufficient to overcome the frictional hold of the clutch 25 26, at which point the shaft 18 will be allowed to rotate in its casing, which in turn permits the upward movement of the casing upon the thrust-bar or piston 7 until the limit of the upward stroke of crank 11 is reached. In a paper-cutting machine the portion of the stroke of the mechanism in which the clutch is slipping is the time when the cutting-knife is operated. When the crank 11 passes its highest point in its stroke and starts the return half of its revolution, the casing 15 and thrust-bar or piston 7 will move downwardly together, causing the rock-shaft 1 to be returned to its normal position, the hold of the friction-clutch being sufficient to prevent the rotation of short shaft 18 during the initial part of this return movement. When the rock-shaft 1 reaches its position of starting and will yield no further, the frictional hold of the clutch 25 26 will again be overcome to allow the rotation of short shaft 18 and the relative downward movement of casing 15 upon the thrust-bar of piston 7, which brings the parts to the position of starting.

Having thus described my invention, the following is what I claim as new therein and desire to secure by Letters Patent:

1. In a power-transmitting mechanism the combination of two members each having movement of translation and one driven by the other, a spur gear or pinion journaled upon one of said members and meshing with rack-teeth with which the other member is provided, and frictional means retarding rotation of the said spur gear or pinion and thereby controlling relative movement of said members.

2. In a power-transmitting mechanism the combination of a driving and a driven member sliding one upon the other, one provided with rack-teeth and the other with a spur gear or pinion meshing with said rack-teeth, and adjustable friction means for controlling the rotation of said spur gear or pinion, whereby relative movement of translation is permitted between the driving and the driven member.

3. In a power-transmitting mechanism the combination with a crank and a device to be driven by said crank, of a power-transmitting device consisting of two relatively movable members one connected to the crank and the other to the said driven device, a spur wheel or pinion journaled on one of said relatively movable members and meshing with rack-teeth with which the other member is provided, and frictional means for controlling the rotation of said spur gear or pinion.

4. In a power-transmitting mechanism, the combination of two cranks, one of which is to

be driven by the other, of two relatively movable members sliding one upon the other, one of which is connected to each of said cranks, rack-teeth on one of said members, a shaft journaled upon the other of said members, a spur gear or pinion upon said shaft meshing with said rack-teeth, and a frictional device operating upon said shaft for controlling the rotation of said spur gear or pinion.

5. In a power-transmitting mechanism, the combination of a rotary crank and an oscillatory crank, with coöperating telescoping members connected respectively with said cranks, a rack-bar formed upon one of said members, a shaft journaled in the other of said members and carrying a spur gear or pinion which meshes with said rack-bar, and an adjustable frictional clutch operating between said shaft and the member on which said shaft is journaled.

6. In a power-transmitting mechanism, the combination of a rotary crank, the coöperating telescoping piston and casing, means of engagement between the crank and casing, a rack-bar formed upon the piston a shaft journaled in the casing and carrying a spur gear or pinion which meshes with said rack-bar, and an adjustable frictional clutch operating between said shaft and casing.

7. In a power-transmitting mechanism, the combination of a reciprocatory casing, a thrust-bar or piston telescoping with said casing, a rack-bar formed upon said piston, a shaft journaled in the said casing and carrying a spur gear or pinion which meshes with said rack-bar, and an adjustable frictional clutch, one member of which is secured to said shaft and the other member of which is carried by the casing.

8. In a power-transmitting mechanism, the combination of a piston having rack-teeth, with a reciprocatory casing having a bore or socket in which said piston has sliding engagement, and a second bore or socket extending approximately at a right angle thereto, a shaft journaled in said second bore or socket, a pinion or gear upon said shaft meshing with said rack-teeth, a friction-wheel also on said shaft, and an adjustable friction-band encircling said friction-wheel and held by the casing.

9. In a power-transmitting mechanism the combination of two members sliding one on the other and each capable of movement of translation independently of the other, a spur-gear on one of said members meshing with rack-teeth with which the other member is provided and means for applying frictional resistance to rotation of the said spur-gear and thereby retarding the relative sliding movement referred to.

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Witnesses:
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