No. 709,265. Patented Sept. 16, 1902.

C. W. HUNT.

TRANSMITTING MECHANISM.

(Application filed Nov. 30, 1900.)

(No Model.)

2 Sheets—Sheet 1.

Fig. 1.

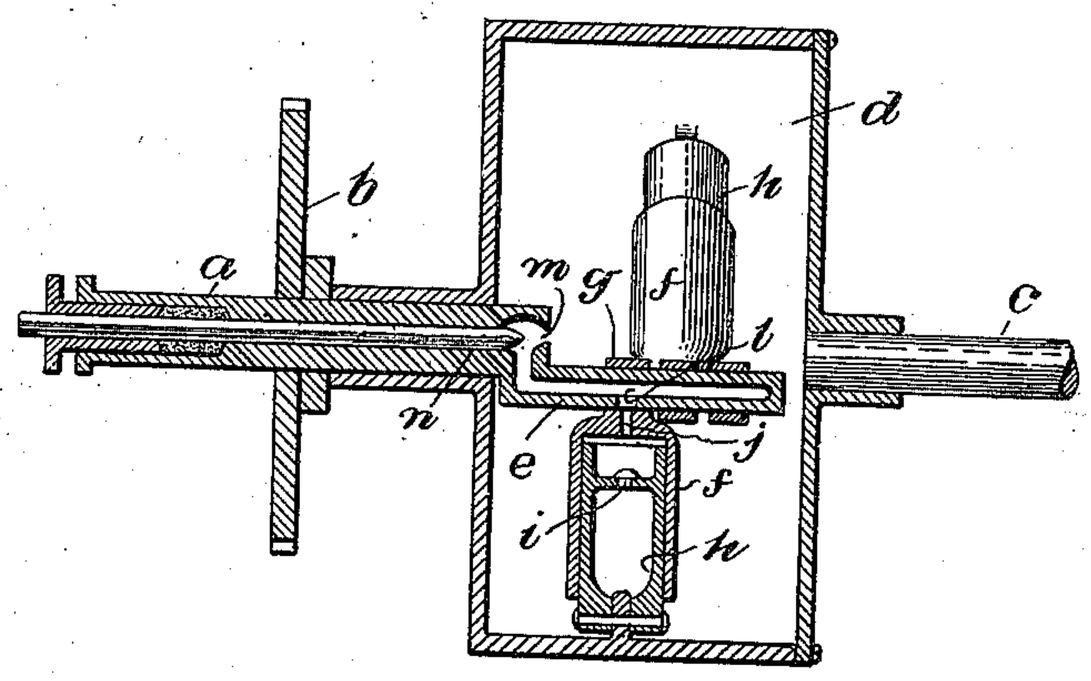

Fig. 2.

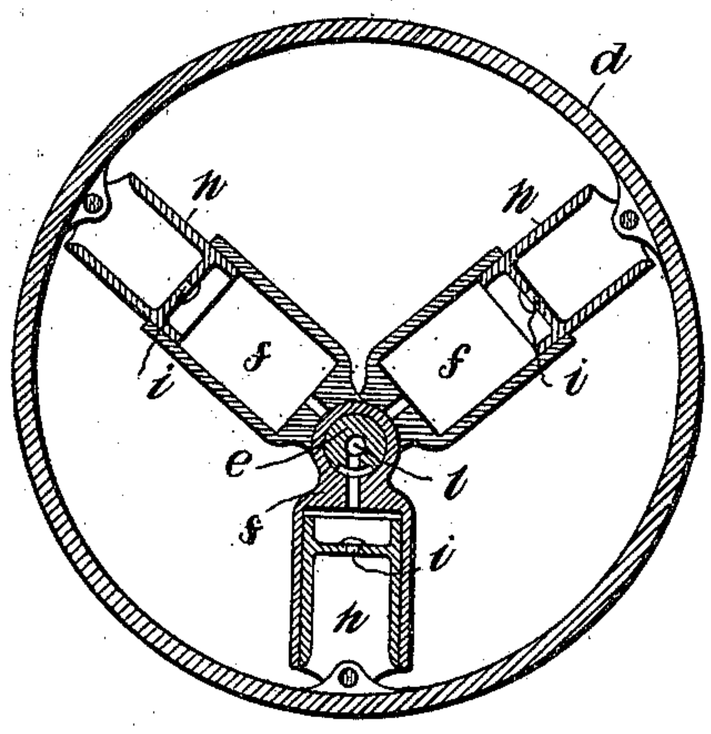

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Fig. 3.

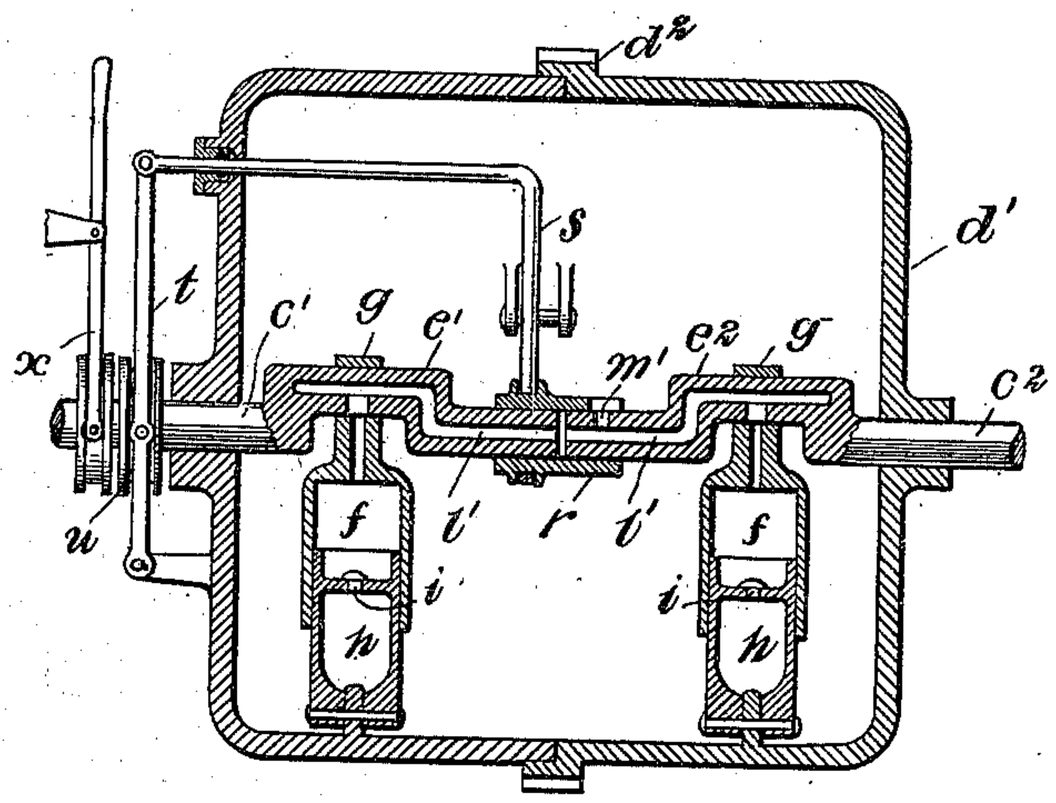


Fig. 4.

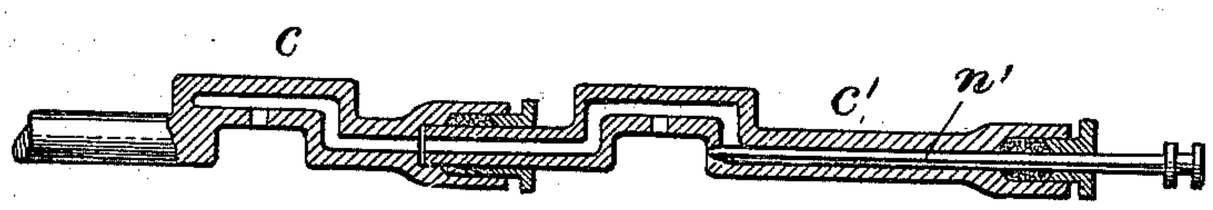
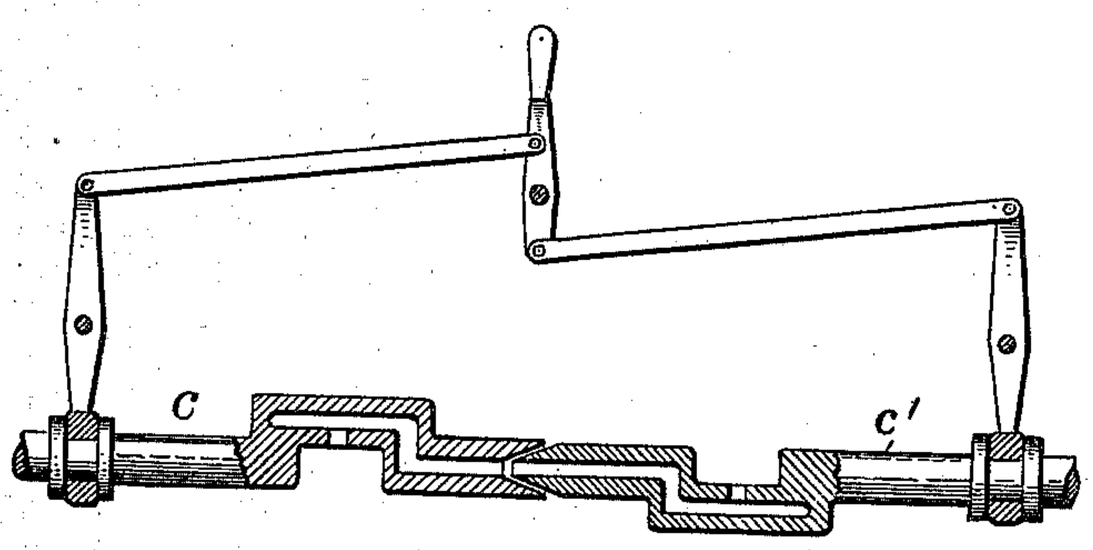


Fig. 5.



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TRANSMITTING MECHANISM.

SPECIFICATION forming part of Letters Patent No. 709,265, dated September 16, 1902.

Application filed November 30, 1900. Serial No. 38,089. (No model.)

To all whom it may concern:

Be it known that I, CHARLES W. HUNT, a citizen of the United States, residing in West New Brighton, borough of Richmond, city of New York, State of New York, have invented certain new and useful Improvements in Transmitting Mechanism, of which the following is a specification, reference being had to the accompanying drawings, forming a part hereof.

The object of this invention is to provide an improved power-transmitting device which shall be capable of regulation with exactness, so that any desired speed can be given to the driven part, shall be controlled easily, and shall be simple in construction.

The invention will be more fully described hereinafter with reference to the accompanying drawings, in which for purposes of illustration and explanation the invention is represented as embodied in convenient and practical forms.

In said drawings, Figure 1 is a view in longitudinal central section of a power-transmitting device which embodies the invention. Fig. 2 is a transverse section of the same on an irregular plane. Fig. 3 is view similar to Fig. 1, but showing a slightly-different embodiment of the invention. Figs. 4 and 5 are detail views showing different controlling devices.

In carrying the invention into practice any convenient form of pump is interposed between the driving part and the driven part of the mechanism, one of the working parts of the pump being connected to the driving part and the other of such working parts being connected to the driven part of the mechanism, and means are provided for controlling the circulation of fluid through the pump, whereby more or less resistance is offered to the relative movement of such working parts. The pump thus becomes a rigid or a yielding connection between such driving and driven parts. It will be obvious that any type of pump may be employed.

In the mechanism represented in Figs. 1 and 2 the driver or driving member is sufficiently represented by the shaft *a*, a gear-wheel *b* being shown as applied thereto. The driven member, (represented by a shaft *c*,) which is in line with shaft *a*, has secured thereto a closed shell *d*, which may have a bearing on the shaft *a*. A crank-arm *e* on the shaft *a* has connected therewith one or more pumps, preferably three, as shown. Each pump may be arranged in any convenient manner. As represented in the drawings, the cylinder *f* is connected by a sleeve *g* with the crank-arm *e*, and the piston *h*, which coöperates with the cylinder, is connected by a pin or loose connection with the shell *d*. Each pump is adapted to pump air or water or any other fluid which may be placed within the shell *d*, and means are provided for controlling the flow of water or air or other fluid from the pump, it being obvious that if the flow is unrestricted the pumps will work freely and the crank-shaft will rotate without causing the shell to rotate, while if the flow is restricted the pumps will work less freely or not at all and the shell will partake of the rotation of the crank-shaft, rotating with the same speed if the flow from the pump or pumps is cut off altogether. Any convenient means may be provided for regulating the flow from the pumps, and means which have been chosen for illustration will now be described. The end of each trunk-piston *h* is open, and the piston is provided with a valve *i*, which opens toward the crank-shaft. A outlet-port *j* in the end of the piston at a certain point in the travel of the pump is adapted to communicate, through a corresponding port formed in the crank-shaft, with a passage *l*, which is formed in the crank-arm and communicates through a suitable port or opening *m* with the chamber within the shell *d*. The outflow of the fluid from the pump-chamber is thereby regulated and will take place only when the port *j* registers with the corresponding port in the crank-shaft. A needle-valve *n* is disposed in the bore of the shaft *a* and may be controlled in any convenient manner for the purpose of varying the opening *m*, and thereby restricting more or less the flow from the pumps. In the operation of this form of the device it will be seen that if the opening *m* is open to the full extent, as indicated in Fig. 1, the circulation of the fluid through the pumps will be unimpeded. The pumps will then work freely and there will be no tendency of the shell *b* to rotate. On the other hand, if the opening *m* is closed completely the flow

through the pumps will be stopped, the pistons will cease to move with respect to the cylinders, and as the pumps then form rigid arms or connections from the shell to the crank-arm the shell will rotate with the crank-shaft and at the same speed. If the opening m is partly opened, so that flow from the pumps is permitted, although not freely, the shell will rotate, but at a slower speed than the crank-shaft.

In the arrangement shown in Fig. 3 the shell d' is shown as the driver, being provided with a sprocket or other gear wheel d^2 and having its bearings on two independent shafts c' and c^2, the device being adapted to be employed in this instance as a differential driving-gear, by which the two shafts can be driven at different speeds. The two shafts are provided with cranks e' and e^2, respectively, the ends of the crank being brought back into line with the shafts and made to abut closely. Each crank is formed with a passage l', with which the pumps communicate, (only one of each set being shown,) said pumps being connected with the cranks and with the shell, as already described with reference to Figs. 1 and 2. A lateral port m' is formed in the end portion of one of the cranks e' and e^2 to permit the escape into the chamber formed by the shell b' of the fluid delivered by the pumps, and a sleeve r is fitted closely about the end portions of the cranks and is movable thereon to regulate the flow of fluid through the port m'. It will be understood that any convenient means may be employed for regulating the flow through the port m', the sleeve r being shown merely for purposes of explanation. Such sleeve may be operated by a bent rod s, mounted within the shell and extended through a suitable stuffing-box in the shell, the outer end of such rod being connected to a lever t, mounted on the outside of the shell. The lever t also engages an annularly-grooved sleeve u on the shaft c'. The sleeve u may be moved to and fro on the shaft by a forked lever x. Any other convenient means may be employed for operating the sleeve r or other device which controls the flow of fluid from the pumps. In the operation of the device applied as represented in Fig. 3 it will be obvious that if the circulation of the fluid is shut off altogether the movement of both sets of pumps, those connected to the crank e' and those connected to the crank e^2, will be stopped, so that they will form rigid connections between the shell and both crank-shafts, whereby both crank-shafts will rotate together and at the same speed as the shell d'. If the circulation of the fluid is not impeded at all, the pumps will work freely and the shell will rotate without causing either of the shafts to rotate. If the circulation of the fluid is restricted, the shafts will rotate at a slower speed than the shell, the two shafts rotating at the same speed or at different speeds, as the case may be. It will be observed that the device shown in Fig. 3 is particularly useful in the driving of motor-vehicles, for if the driving-wheels of the vehicle are connected, respectively, to the shaft c' and c^2 they will be permitted to rotate at different speeds when the vehicle is turning and will accommodate themselves to the circles of different radius then described by said wheels.

In the form of controlling mechanism shown in Fig. 4, which is adapted for the arrangement shown in Fig. 3, one of the crank-shafts c' is provided with an axle-bore, which is an opening within the shell arranged to be controlled by a spindle n', specifically as described with reference to Fig. 1.

In the form of controlling mechanism shown in Fig. 5 the two crank-shafts c and c' are made relatively movable in longitudinal directions, so that the opening between them may be varied.

It will be obvious that the improved transmitting mechanism can be embodied in many different forms and that the invention is not to be restricted to the particular construction and arrangement of parts shown and described herein.

I claim as my invention—

1. In a device for transmitting power, the combination with a driving and a driven member, of a closed shell adapted for containing a fluid and connected to one of said members, a pump within said shell having its working parts connected respectively with said driving member and said driven member, said pump having inlet and outlet ports communicating with the interior of said shell whereby said shell may deliver fluid to and receive fluid from said pump, means in said outlet-port for regulating the flow, and means to control the rate of circulation of fluid through said pump.

2. In a device for transmitting power, the combination of a driving member, a driven member, a crank secured to one of said members, a closed shell adapted for containing a fluid and secured to the other of said members, a pump within said shell having one of its working parts connected to said crank and the other of said working parts connected to said shell, said pump having inlet and outlet ports communicating with the interior of said shell whereby said shell may deliver fluid to and receive fluid from said pump, means in said outlet-port for regulating the flow, and means to control the rate of circulation of fluid through said pump.

This specification signed and witnessed this 24th day of November, A. D. 1900.

CHARLES W. HUNT.

In presence of—
ANTHONY N. JESBERA,
LUCIUS E. VARNEY.