No. 651,238. Patented June 5, 1900.

H. CROUAN.

DRIVING MECHANISM.

(Application filed May 26, 1899.)

(No Model.) 2 Sheets—Sheet 1.

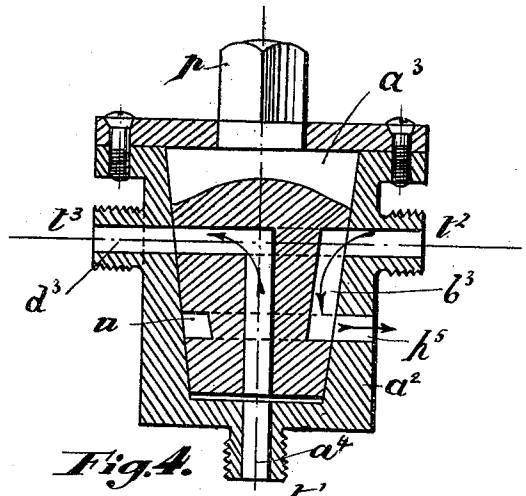


Fig. 4.

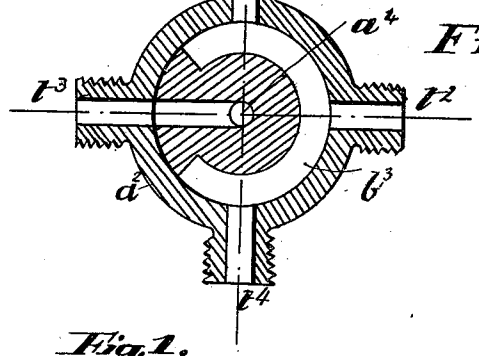
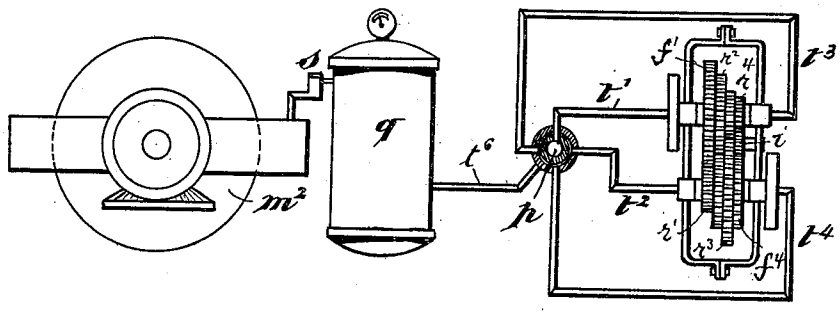


Fig 4a

Fig. 1.



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Fig. 2.

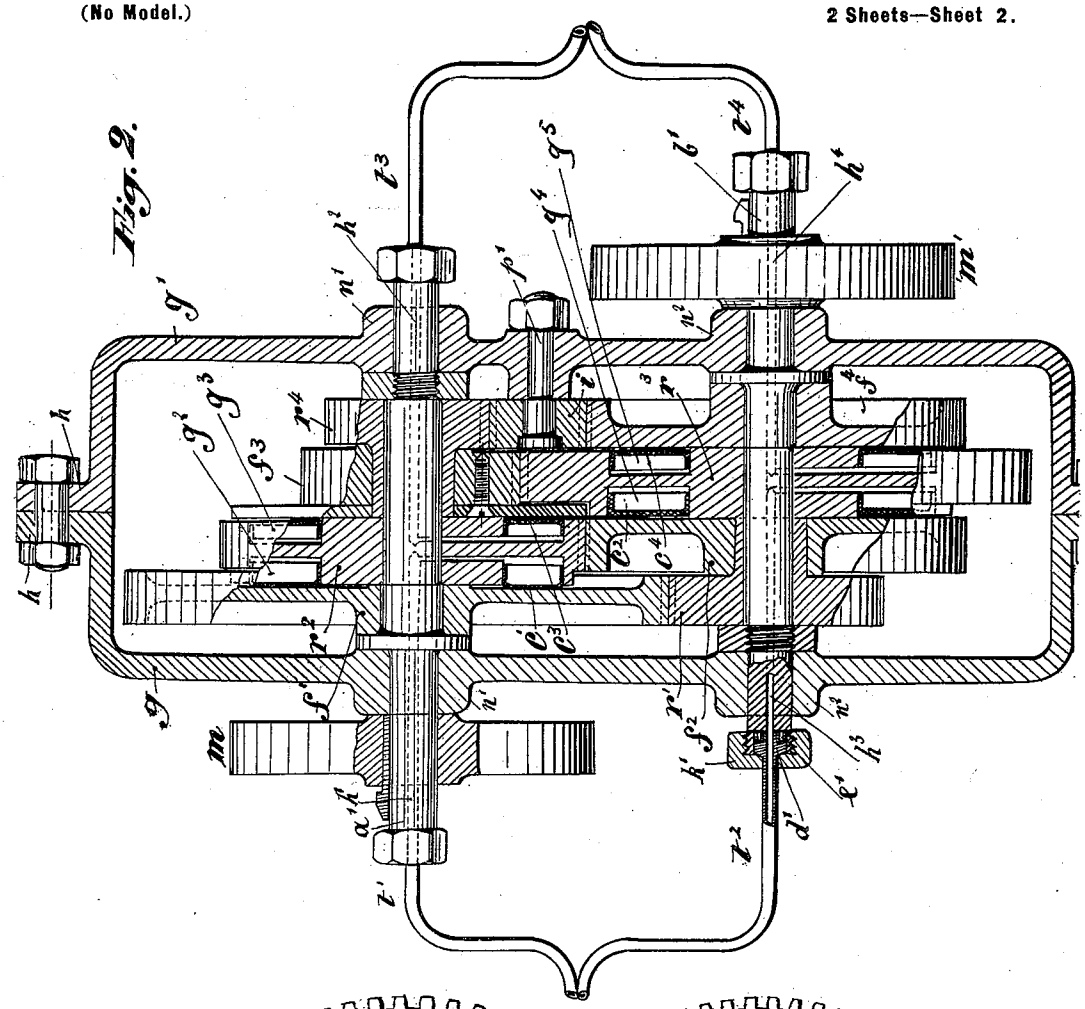
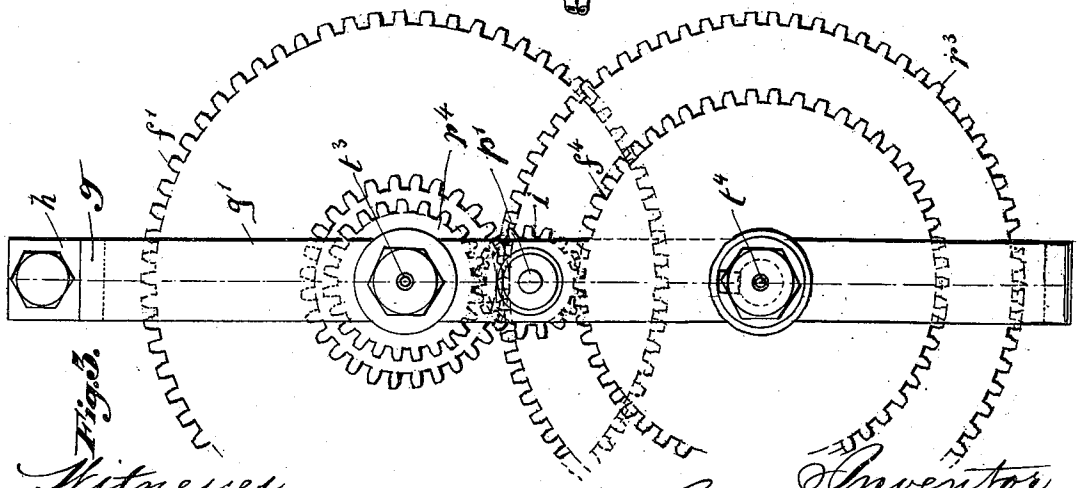


Fig. 3.



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UNITED STATES PATENT OFFICE.

HENRY CROUAN, OF PARIS, FRANCE.

DRIVING MECHANISM.

SPECIFICATION forming part of Letters Patent No. 651,238, dated June 5, 1900.

Application filed May 26, 1899. Serial No. 718,330. (No model.)

To all whom it may concern:

Be it known that I, HENRY CROUAN, a citizen of the Republic of France, residing at Paris, France, have invented certain new and useful Improvements in Driving Mechanism for Motor-Vehicles, of which the following is a specification.

My present invention relates to motor-vehicles, and more particularly to clutch devices for same, the object being to provide an apparatus of this kind in which pneumatic pressure is employed for throwing the several parts of the vehicles into engagement.

The principle involved by the invention consists in employing gaseous or liquid fluids under pressure, which is passed by means of a feeding apparatus in the desired direction for throwing the corresponding part into engagement, and thus obtaining the desired rate of speed, braking, or any other determinate effect.

The improvements consist in the construction, novel combination, and arrangement of parts fully described hereinafter, and specifically pointed out in the appended claims.

In order that this my invention may be the more readily understood and carried into practical effect, reference is hereby made to the accompanying drawings, in which—

Figure 1 is a general diagrammatical view of the apparatus and attachments. Fig. 2 is an elevation of the apparatus, partly shown in section. Fig. 3 is a diagrammatical side elevation. Fig. 4 is a vertical section of a four-way cock of the apparatus. Fig. 4^a is a horizontal sectional view of said four-way cock.

In the drawings, like letters refer to like parts throughout all the figures.

g g' represent a frame made of two parts held together by means of flanges h h and bolts, Fig. 2.

a' b' are two parallel shafts journaled in bosses n' n^2, each of which is bored with a circular opening receiving the ends of said shafts. The shaft a' carries a wheel m, receiving the movement from the motor, and the shaft b' carries a wheel m', transmitting the movement to the vehicle.

r^2 r^4 are gear-wheels keyed on shaft a'. r' r^3 are gear-wheels keyed on shaft b'. f' and f^3 are gear-wheels loosely mounted on shaft a', and f^2 f^4 are gear-wheels loosely mounted on shaft b'. The wheel r^2 has on each side a circular groove g^2 and g^3 and wheel r^3 has grooves g^4 and g^5. Each groove carries a circular embossed leather part c' c^2 c^3 c^4.

i is a gear-wheel loosely mounted between wheels r^4 and f^4 on a shaft p', secured in a boss of the frame.

The shaft a' is provided with two passages h' and h^2. h' is connected to groove g^2 on wheel r^2, and h^2 is connected to groove g^3. The shaft b' is also provided with two passages h^3, connected to groove g^4 on wheel r^3, and h^4, connected to groove g^5 on the same wheel.

At each end of each shaft a' and b' is secured a tube leading fluid under pressure thereto. These tubes t' t^2 t^3 t^4 are each connected to said passages h' h^2 h^3 h^4 and secured to said shafts a' and b' by means of suitable stuffing-boxes, each of which is formed of a nut k', screwed onto the corresponding threaded end of the shaft, said threaded end being hollowed out to receive the end of the tube on which the shaft is adapted to rotate and which is provided with a shoulder d', forming, with the hollow of the shaft end, a recess within which is lodged a packing e'. The tubes t' t^2 t^3 t^4 are connected to a four-way cock. (Shown in Fig. 4 of the accompanying drawings.) Said cock is composed of a casing a^2, having a lower opening a^4, through which flows the fluid under pressure, and a plug a^3, provided with a passage d^3, one end of which is in line with opening a^4 and which is adapted to be communicated with t' t^2 t^3 t^4, according to the position of plug a^3. The tubes which are not connected to a^4 communicate with the atmosphere through a groove b^3, connected to another groove u and a channel h^5. The plug a^3 is operated by means of a key engaging a prismatic projection p, formed on said body.

The aforegoing clutch device operates as follows: The wheels described and shown in Fig. 2 mesh with each other and are of relative diameters determined so that the speed given to shaft b' will be that which it is desired to obtain in accordance with the wheels which are actuated. Each set of wheels comprises one of said wheels r', r^2, r^3, or r^4, keyed on the respective shafts, and one of wheels f', f^2, f^3, or f^4, loosely mounted on the shafts.

So long as the wheels f' f^2 f^3 f^4 are loose on the shafts no movement is transmitted from wheel m to wheel m'. Now as fluid under pressure is led into one of the grooves—g^2, for instance—by operating the four-way cock the corresponding leather part c' will be strongly pressed against the side of the corresponding loose wheel f', whereby the latter will be carried around with said leather part. As said wheel f' meshes with wheel r', the latter and the shaft b' will be rotated at a speed corresponding to the relative diameters of said wheels f' and r'. As the wheel f^4 is rotated by leather part c^4 on wheel r^3 the movement of shaft b' will be in opposite direction to that imparted by the other sets of wheels by reason of the intermediate wheel i, in which case back motion is obtained.

The pressure given to the clutch devices is supplied by any reservoir q, Fig. 1, and may be produced either by a special pump or by the action of the gas coming from the motors, (shown at m^2.)

At each explosion a certain quantity of the gas under pressure coming from the motor passes into the reservoir, where it is retained by means of a suitable valve s. If there is a determinate maximum pressure within the reservoir, no gas is admitted in the latter, and as soon as pressure is taken in the reservoir for operating any part, as above described, the motor again supplies gas automatically, said gas being admitted in such quantity as to reproduce the initial pressure. The reservoir q is connected to the above-described four-way cock through a tube t^6.

Changes in the relative arrangement and minor details of construction may be made without departing from the scope or sacrificing any of the advantages of the invention.

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

1. In a driving mechanism, the combination with a frame, of two parallel shafts a' and b', two gear-wheels r^2 r^4 keyed on shaft a', said wheel r^2 having grooves g^2, g^3, two gear-wheels f' f^3, loosely mounted on said shaft, two gear-wheels r' r^3 keyed on shaft b', said wheel r^3 having grooves g^4 g^5, two gear-wheels f^2 f^4 loosely mounted on said shaft b', circular embossed leather portions c' c^2 c^3 c^4 arranged in said grooves g^2 g^3 g^4 g^5, respectively, and a gear-wheel i, meshing with wheels r^4 and f^4 and rotating on a shaft p' secured to the frame, substantially as and for the purpose set forth.

2. In an apparatus of the class described, the combination with a frame, two parallel shafts a', b', said shaft a' having passages h' h^2 and shaft b' having passages h^3 h^4, keyed gear-wheels r' r^2 r^3 r^4, said wheel r^2 having grooves g^2 g^3 and wheel r^3 having grooves g^4 g^5, and loose gear-wheels f' f^2 f^3 f^4, and tubes t' t^2 t^3 t^4 suitably secured in pairs to said shafts a' and b' respectively, substantially as and for the purpose set forth.

In testimony whereof I have hereunto signed my name in presence of two subscribing witnesses.

HENRY CROUAN.

Witnesses:
EDWARD P. MACLEAN,
GEORGE E. LIGHT.