No. 877,437. PATENTED JAN. 21, 1908.

C. B. KING.

CLUTCH.

APPLICATION FILED APR. 3, 1905.

2 SHEETS—SHEET 1.

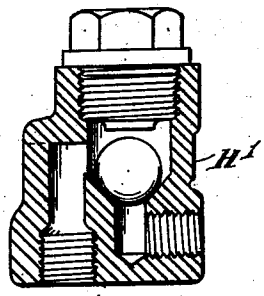


Fig 2.

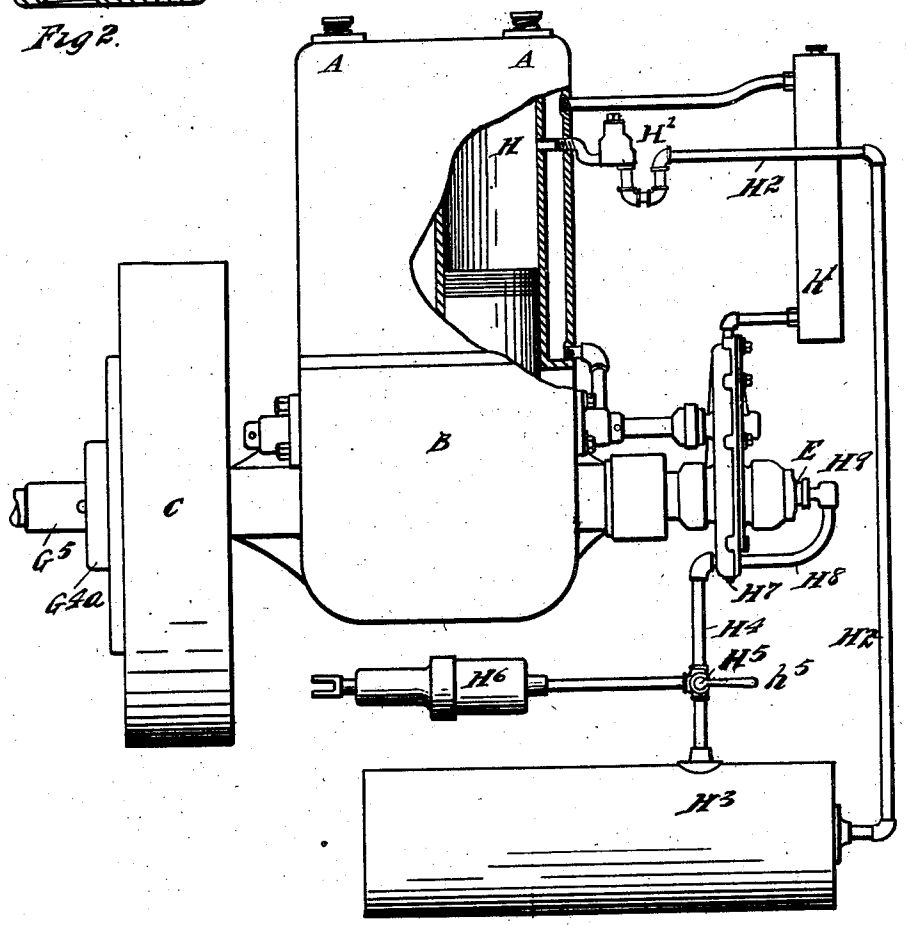


Fig 1.

WITNESSES

T. Massey

6. F. Day.

INVENTOR

Charles B. King

By Parker & Burton Attorneys.

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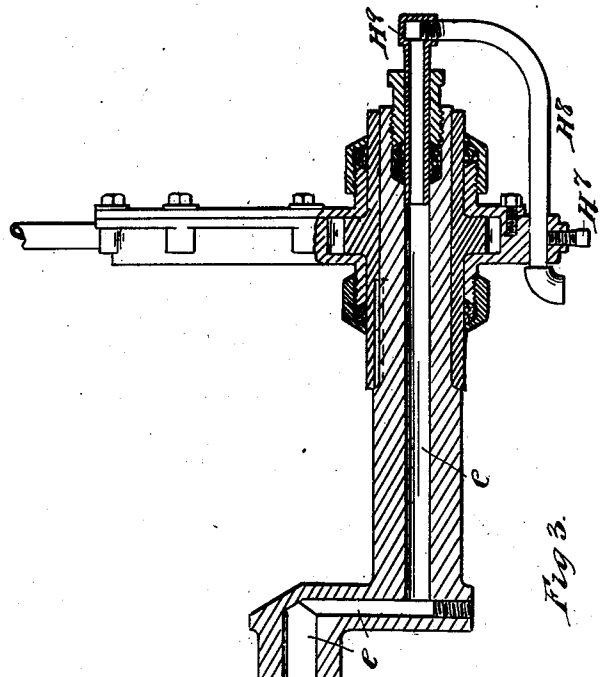


Fig. 3.

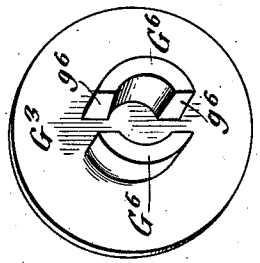
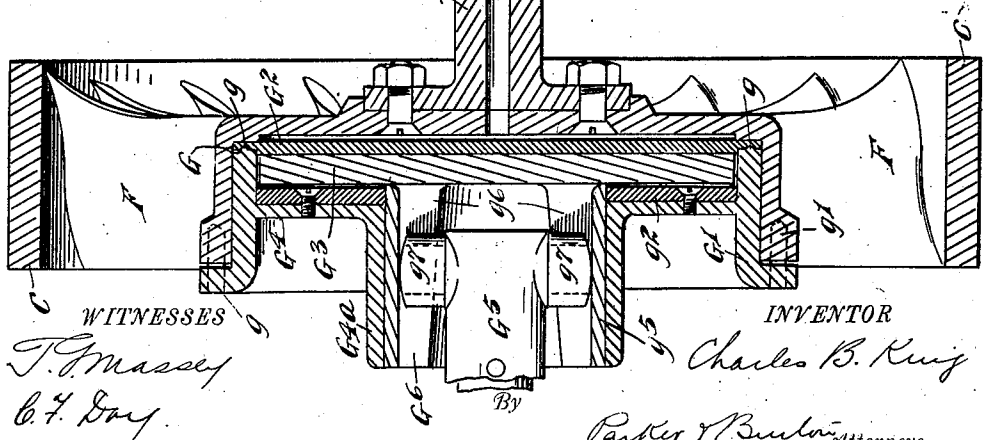


Fig. 4.



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UNITED STATES PATENT OFFICE.

CHARLES B. KING, OF DETROIT, MICHIGAN, ASSIGNOR TO NORTHERN MOTOR CAR COMPANY, OF DETROIT, MICHIGAN, A CORPORATION OF MICHIGAN.

CLUTCH.

No. 877,437. Specification of Letters Patent. Patented Jan. 21, 1908.

Application filed April 3, 1905. Serial No. 253,586.

To all whom it may concern:

Be it known that I, CHARLES B. KING, a citizen of the United States, residing at Detroit, county of Wayne, State of Michigan, have invented a certain new and useful Improvement in Clutches, and declare the following to be a full, clear, and exact description of the same, such as will enable others skilled in the art to which it pertains to make and use the same, reference being had to the accompanying drawings, which form a part of this specification.

My invention relates to clutches, and the object of my improvements is to provide an improved clutch mechanism and one in which the operative parts of a motor and transmission mechanism may be connected and disconnected.

In the drawings:—Figure 1, is an elevation of a gas engine and transmission mechanism embodying my invention. Fig. 2, is a detail sectional view of the valve H^1. Fig. 3, is a sectional view of the main shaft of the engine, the fly-wheel and some adjacent parts. Fig. 4, is a perspective view of the disk G^3 and sleeve G^6.

A, A, are the cylinders; B, is the crank case and C, the fly-wheel.

E, is the main shaft of the engine.

I form an aperture H through the cylinder and provide a pipe H^2 leading therefrom. The aperture H may be below the upper end of the piston stroke or it may be in the explosion chamber.

H^1, is a non-return valve in the pipe H^2 and opening outward. The pipe H^2 communicates with a reservoir H^3. When the engine is working, there is a considerable pressure in the cylinder and the gases therefore pass through said opening past the valve H^1 into the pipe H^2 and accumulate and cause a pressure in the tank H^3. The degree of such pressure may be regulated by the position of the opening H.

Through the main shaft E, is formed a passage *e*, which extends from end to end of the crank shaft and through the cranks.

F, are fan blades in the fly-wheel C. Within the fly-wheel and supported coaxially therewith by said fan-blades is a cylinder G closed at its inner end. The passage *e* communicates with the interior of the cylinder G through a passage at the center of its closed end.

G^2, is a diaphragm preferably of leather, its periphery resting upon an annular shoulder within the cylinder G.

G^1, is a collar fitting within the cylinder G, its inner edge coming against the periphery of the diaphragm G^2 and holding it in place against the annular shoulder in said cylinder. The inner edge of the collar G^1 is preferably provided with a bead *g*. The outer edge of the collar G^1 is turned over and secured by screws g^1 extending into the edge of the wall of the cylinder G and serving to secure, and draw said collar tight against the edge of the diaphragm G^2. From the collar G^1, a flange G^4 extends inward and then outward to form a sleeve G^{4a}.

g^2, is a leather annulus secured to the inner face of the flange G^4.

G^3, is a metal disk within the cylinder G between the diaphragm G^2 and the flange G^4.

G^5, is a shaft to which the power of the engine is to be transmitted.

G^6, is a sleeve surrounding the shaft G^5.

g^6, are longitudinal slots extending into the inner wall of the sleeve G^6.

g^7, are pins extending from the shaft G^5 into the slots g^6. The sleeve G^6 is rigidly connected to the disk G^3.

g^5, is a bushing between the sleeves G^{4a} and G^5.

H^4, is a pipe leading from the reservoir H^3.

H^5, is a multiple way valve in the pipe H^4, by which air from the reservoir H^3 may be led into the passage *e* and thence to the cylinder G, or may be exhausted from said passage and cylinder to the open air or may be led to a brake operating cylinder H^6 and exhausted therefrom.

h^5, is a handle by which the valve H^5 may be manipulated.

H^8, is a pipe communicating with the pipe H^4 at one end bending upward and communicating with a pipe H^9, which passes through a stuffing box in the end of the crank shaft and communicates with the passage *e* through the crank shaft E.

H^7, is a set screw by which the pipe H^8 is secured in position.

By turning the handle h^5, so as to allow a free passage through the pipe H^4, compressed air or gases is caused to pass through the passage *e* into the cylinder G pressing the disk G^3 against the flange G^4 and therefore binding the sleeve G^6 and shaft G^5 to the shaft E. By turning the handle h^5 so as to cause the pipe H^4 beyond the valve H^5 to communicate

with the outer air, the compressed gases are discharged from the cylinder G through the passage *e*, releasing the connection between shafts G^5 and E.

What I claim is:—

1. In a clutch mechanism, the combination of a cylinder having one end closed, a flange fixed to the edge of said cylinder around its open end and extending part way to the center, a disk in said cylinder between said flange and the end of said cylinder, means for connecting said disk toward its center with the transmission mechanism, and means for supplying fluid under pressure to said cylinder back of said disk to press it against said flange to bind said disk and flange together for the purpose described.

2. In a clutch mechanism, the combination of a cylinder having one end closed, a flange fixed to said cylinder at the edge surrounding its open end and extending partway to the center, the said flange being provided with an annular coaxial outwardly extending sleeve, a disk in said cylinder between said flange and the end of the cylinder, said disk being provided with a central projection extending beyond said flange in said sleeve, and means for supplying fluid under pressure to said cylinder back of said disk to press it against said flange for the purpose described.

3. In a clutch mechanism, the combination of a cylinder having one end closed, a flange fixed to said cylinder, a disk in said cylinder between said flange and the end of said cylinder, said disk being provided with a central projection extending beyond said flange, said projection being provided with a central longitudinal aperture, and a longitudinal slot in its wall, a shaft projecting into said central aperture provided with a lug extending into said slot, and means for supplying fluid under pressure to said cylinder back of said disk to press it against said flange for the purpose described.

4. In a clutch mechanism, the combination of a cylinder having one end closed, a flange fixed to said cylinder provided with an annular coaxial outwardly extending sleeve, a disk in said cylinder between said flange and the end of the cylinder, said disk being provided with a central projection extending beyond said flange in said sleeve, said projection being provided with a central aperture and a longitudinal slot in its wall, a shaft extending into said aperture and provided with a lug extending into said slot, and means for supplying fluid under pressure to said cylinder back of said disk to press it against said flange for the purpose described.

5. In a clutch mechanism, the combination of a cylinder having one end closed, a flange fixed to said cylinder, a disk in said cylinder between said flange and the end of said cylinder, means for supplying fluid under pressure to said cylinder back of said disk to press it against said flange, and a shaft, said disk being connected to said shaft so as to restrain relative rotary motion between said disk and shaft and to permit a motion of said disk in the direction of the length of said shaft.

6. In a clutch mechanism, the combination of a cylinder having one end closed, a flange fixed to said cylinder at its edge around its opened end, a disk in said cylinder between said flange and the end of said cylinder, means for supplying fluid under pressure to said cylinder back of said disk to press it against said flange to bind said cylinder and disk together, and a transmission mechanism, said disk being connected towards its center adjacent to the open end of said cylinder with the transmission mechanism so as to restrain relative rotary motion between said disk and transmission mechanism and to permit a motion of said disk relative to said cylinder in the direction of the axis of said cylinder, for the purpose described.

In testimony whereof, I sign this specification in the presence of two witnesses.

CHARLES B. KING.

Witnesses:
THOMAS G. MASSEY,
ELLIOTT J. STODDARD.