

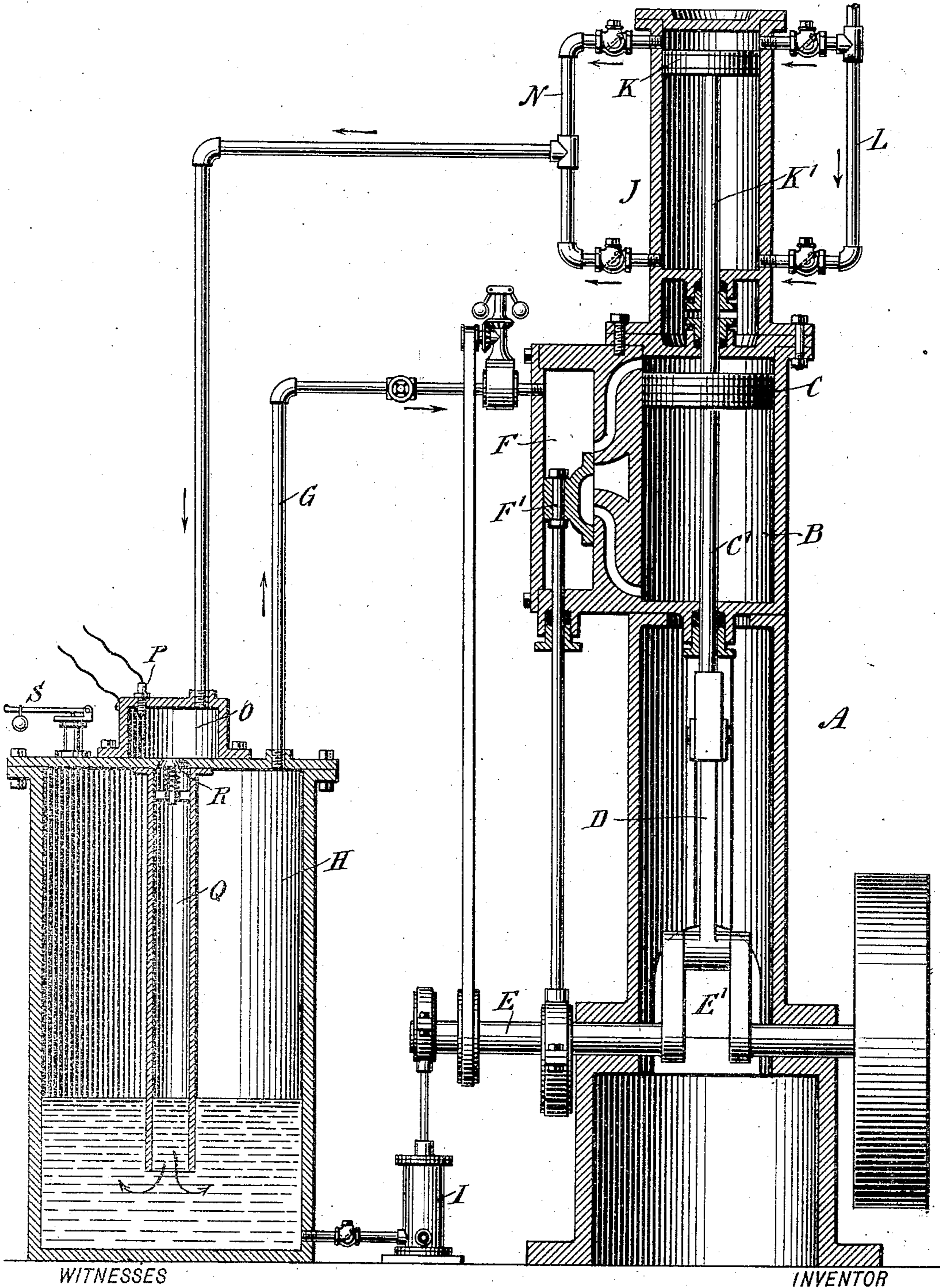
No. 886,199.

PATENTED APR. 28, 1908.

M. S. FLAIG.

COMBINATION GAS AND STEAM ENGINE.

APPLICATION FILED SEPT. 13, 1907.



WITNESSES

INVENTOR

Edward Thorpe.
Rev. G. Herbert.

Martin S. Flaig
BY *Munn Co*
ATTORNEYS

UNITED STATES PATENT OFFICE.

MARTIN S. FLAIG, OF LA CROSSE, WISCONSIN.

COMBINATION GAS AND STEAM ENGINE.

No. 886,199.

Specification of Letters Patent.

Patented April 28, 1908.

Application filed September 13, 1907. Serial No. 392,768.

To all whom it may concern:

Be it known that I, MARTIN S. FLAIG, a citizen of the United States, and a resident of La Crosse, in the county of La Crosse and State of Wisconsin, have invented a new and Improved Combination Gas and Steam Engine, of which the following is a full, clear, and exact description.

The object of the invention is to provide a new and improved combination gas and steam engine, in which a mixture of steam and gas under pressure is produced in a very economical manner, and the said mixture is utilized to drive the engine to the fullest advantage.

The invention consists of novel features and parts and combinations of the same, as will be more fully described hereinafter and then pointed out in the claims.

A practical embodiment of the invention is represented in the accompanying drawings forming a part of this specification, in which the figure is a sectional side elevation of the improvement.

The reciprocating engine A, of any approved construction, consists essentially of a cylinder B, in which reciprocates a piston C, having its piston-rod C' connected by a pitman D with the crank-arm E' of an engine-shaft E. The cylinder B is provided with the usual chest F containing a slide-valve F', actuated from the engine-shaft E for controlling the motive agent to and from the cylinder B. The chest F is connected by a supply-pipe G with a reservoir H, adapted to contain water supplied by a feed-water pump I, driven from the engine-shaft E, as plainly indicated in the drawings.

A compressor is mounted on the cylinder B and is provided with a cylinder J, in which reciprocates a piston K, having its piston-rod K' connected with the piston C, so that when the engine A is running the compressor works in unison with the engine.

The cylinder J of the compressor is provided with the usual valved supply pipe L for conducting gas, gasoline or like gaseous fluid into the cylinder J at opposite ends thereof, and from the said cylinder J leads a valved outlet pipe N, which connects with an explosion-chamber O mounted on the reservoir H.

The explosion-chamber O is provided with a suitable ignition device P, periodically actuated by suitable means, the ignition device being preferably in the form of a sparking-

plug. From the explosion-chamber O leads a pipe Q downwardly into the reservoir H, the lower end of the pipe Q terminating below the level of the water contained in the reservoir H. A check-valve R controls the connection between the explosion-chamber O and the pipe Q, as indicated in the drawings.

The reservoir H is provided with a suitable safety-valve S and with other paraphernalia such as is usually employed on boilers and the like.

The operation is as follows: When the engine is running, gas is compressed in the cylinder J and the compressed gas is passed into the explosion-chamber O, in which the gas is exploded periodically by the use of the igniting device P, the resultant gas of each explosion passing down through the pipe Q into the water contained in the reservoir H, so that the water is heated and steam is generated, the steam mixing with the gas as the latter passes through the water up into the upper portion of the reservoir H. The mixture of steam and gas contained in the reservoir H is conducted by the pipe G into the chest F, from which the mixture passes into the cylinder B to act on the piston C therein, thus driving the engine A, the same as an ordinary reciprocating engine.

From the foregoing it will be seen that a mixture of steam and gas under pressure is produced in a very economical manner and this mixture is stored in the reservoir H and is utilized as a motive agent, to drive the engine A.

Having thus described my invention, I claim as new and desire to secure by Letters Patent:

1. A combination gas and steam engine, comprising a reservoir for containing water, an explosion chamber above the reservoir, a pipe leading from the explosion chamber into the reservoir below the normal level of the water therein, an engine connected with the reservoir and adapted to be driven by the steam and gas therein, a compressor connected with the explosion chamber and operated by the engine, and a pump driven by the engine for supplying water to the reservoir.

2. A combination gas and steam engine, comprising a reservoir for containing water, an explosion chamber above the reservoir, a pipe leading from the explosion chamber into the reservoir below the normal level of the water therein, an engine connected with the reservoir and adapted to be driven by the

steam and gas therein, a compression cylinder in alinement with the cylinder of the engine and connected with the explosion chamber, a piston in the cylinder having a direct
5 connection with the piston of the engine cylinder, and a pump driven by the engine for supplying water to the reservoir.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

MARTIN S. FLAIG.

Witnesses:

C. W. HUNT,

F. W. THOMPSON.