(No Model.)

H. L. FREEMAN.

ENGINE GOVERNOR.

No. 459,545. Patented Sept. 15, 1891.

FIG. 1.

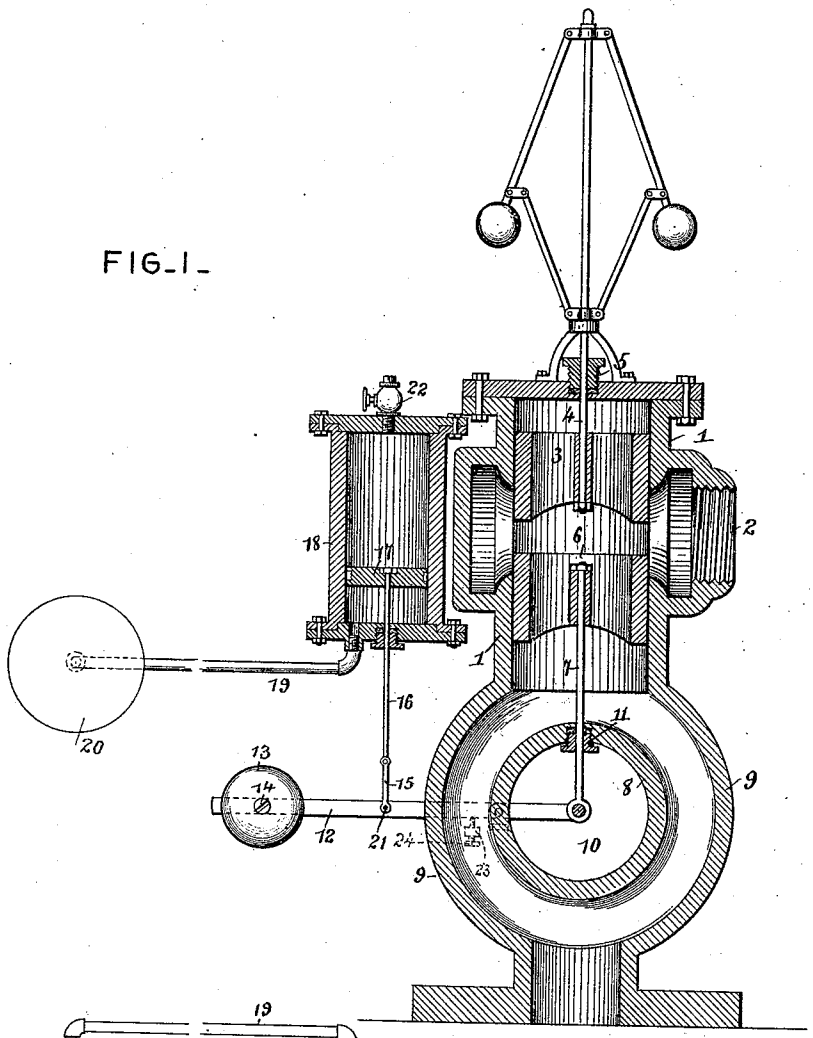
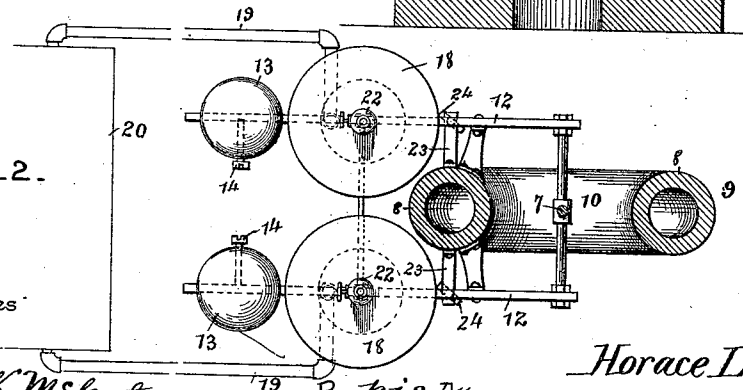


FIG. 2.



Witnesses

Jas. K. McCathran

Wm. Bagger

Inventor

Horace L. Freeman

By his Attorneys,

C. A. Snow & Co.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

HORACE LIZZELLE FREEMAN, OF LEXINGTON, NORTH CAROLINA.

ENGINE-GOVERNOR.

SPECIFICATION forming part of Letters Patent No. 459,545, dated September 15, 1891.

Application filed March 27, 1891. Serial No. 386,590. (No model.)

To all whom it may concern:

Be it known that I, HORACE LIZZELLE FREEMAN, a citizen of the United States, residing at Lexington, in the county of Davidson and State of North Carolina, have invented a new and useful Engine-Governor, of which the following is a specification.

This invention relates to governors for steam-engines; and it has for its object to provide a device of this class which shall be simple in construction and absolutely automatic in its operation, and which shall serve, when additional load is to be overcome by the engine, to furnish an increased steam-supply to enable the machine to overcome such load without reduction of speed.

With these ends in view the invention consists in the improved construction, arrangement, and combination of parts, which will be hereinafter fully described, and particularly pointed out in the claims.

In the drawings hereto annexed, Figure 1 is a vertical sectional view of a steam-engine governor constructed in accordance with my invention. Fig. 2 is a perspective view of the same.

Like numerals of reference indicate like parts in all the figures.

1 designates the valve-casing, which is connected with the steam-supply pipe in the usual manner, it being provided with the inlet 2.

3 designates a valve having a stem 4, which extends through a packing-box 5 in the top of the valve-casing and is connected in the usual manner with a centrifugal governor, by means of which the said valve shall be opened when the speed is reduced, and vice versa, as is usually the case. In the lower part of the valve-casing is arranged an additional valve 6, having a stem 7. The pipe 8, through which steam passes from the valve-casing 1 to the engine, is provided with an enlargement 9, having a transverse opening 10, in which a packing-box 11 is located for the passage of the valve-stem 7.

Suitably pivoted to brackets projecting from the enlarged portion 9 of the pipe 8 are the levers 12 12, the inner ends of which are connected with the lower end of the valve-stem 7. The outer ends of said levers carry the weights 13, which are held adjustably upon said levers by means of set-screws 14. The levers 12 are connected by means of links 15 with the stems 16 of pistons 17, working in the vertically-arranged cylinders 18, of which there are two, and the lower ends of which are connected by means of pipes 19 with the front and rear ends of the engine-cylinder 20, so as to take steam and exhaust simultaneously with the latter, one of the said cylinders 18 taking steam while the other is exhausted. The levers 12 are connected with each other by means of the pin 21, by which the links 15 are pivotally connected with said levers, thus causing the latter to operate in unison. The upper ends of the cylinders are provided with air-cocks 22, by means of which the quantity of air above the pistons in said cylinders may be regulated, so as to offer any desired degree of resistance to the upward movement of said pistons. The enlarged portion 9 of the pipe 8 is provided with brackets 23, in which set-screws 24 are mounted to support the levers 12 and to prevent the downward movement of the latter below a given point.

The operation of this invention will be readily understood from the foregoing description, taken in connection with the drawings hereto annexed. The weights 13 are first adjusted upon the levers 12 to any desired position, so as to cause the valve 6 to occupy the desired position in the casing when the machine is running without a load or with a light load. When load is put upon the machine, the tendency is to slacken the speed, thus causing the centrifugal governor to act to open the valve 3, thus admitting an increased quantity of steam. The pressure in the engine-cylinder being thus increased, the pistons 17 in the cylinders 18 will be forced in an upward direction, thus opening the valve 6, and thus further increasing the steam-passage and enabling the resistance caused by the additional load upon the engine to be overcome without a reduction of steam or speed.

I do not broadly claim cut-off valves operated simultaneously by a centrifugal speed-governor; but I limit myself to the construction herein described and claimed.

Having thus described my invention, I claim and desire to secure by Letters Patent of the United States—

1. In a device of the class described, the independent and disconnected cut-off valves arranged in a single casing and operated, respectively, by a centrifugal governor and by the steam-pressure in the engine-cylinder, substantially as set forth.

2. In a device of the class described, the combination of the valve-casing, the valves, a pair of levers connected with the stem of one of said valves, the cylinders having pistons connected with said levers, and pipes connecting the said cylinders with the ends of the engine-cylinder, substantially as and for the purpose set forth.

3. In a device of the class described, the combination of the valve-casing, the valves, the levers connected pivotally with the stem of one of said valves, the weights mounted adjustably in said levers, the cylinders having pistons connected with said levers, the air-cocks at the upper ends of said cylinders, and pipes connecting the lower ends of the latter with the ends of the engine-cylinder, substantially as set forth.

4. In a device of the class described, the combination of the valve-casing, the steam-pipe having an enlarged portion provided with a transverse opening, the valves, the levers pivoted in the transverse opening of the steam-pipe and connected at their inner ends with the lower valve-stem, the weights mounted adjustably upon said levers, the cylinders having pistons connected with said levers, the air-cocks at the upper ends of said cylinders, and pipes connecting the lower ends of the latter with the ends of the engine-cylinder, substantially as and for the purpose set forth.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in presence of two witnesses.

HORACE LIZZELLE FREEMAN.

Witnesses:

HENRY T. PHILLIPS,

MARSHALL H. PINNIX.