

No. 881,486.

G. B. PETSCHÉ.

PATENTED MAR. 10, 1908.

THROTTLE VALVE MECHANISM FOR STEAM ENGINES.

APPLICATION FILED MAR. 26, 1908.

2 SHEETS—SHEET 1.

Fig. 1.

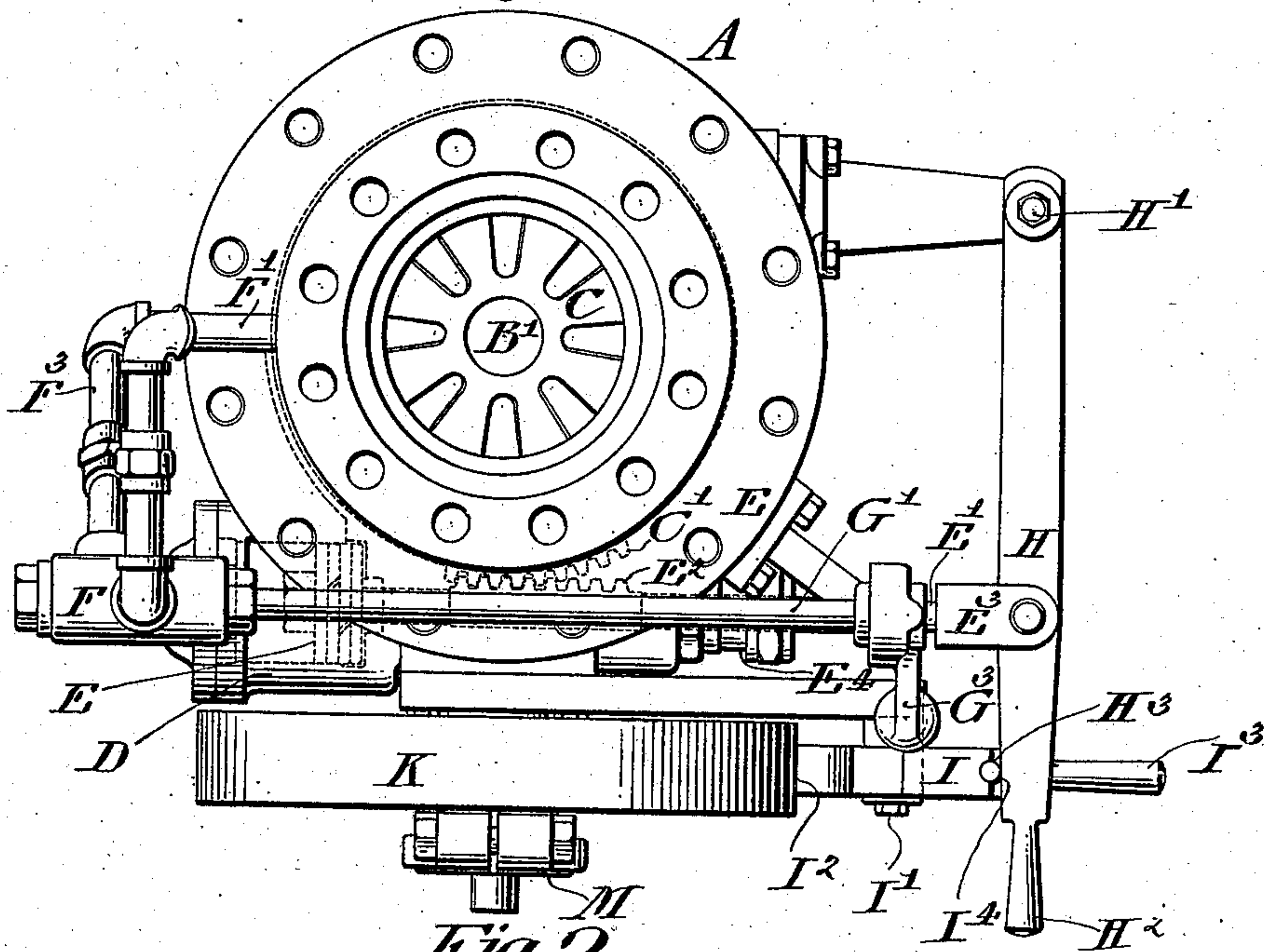
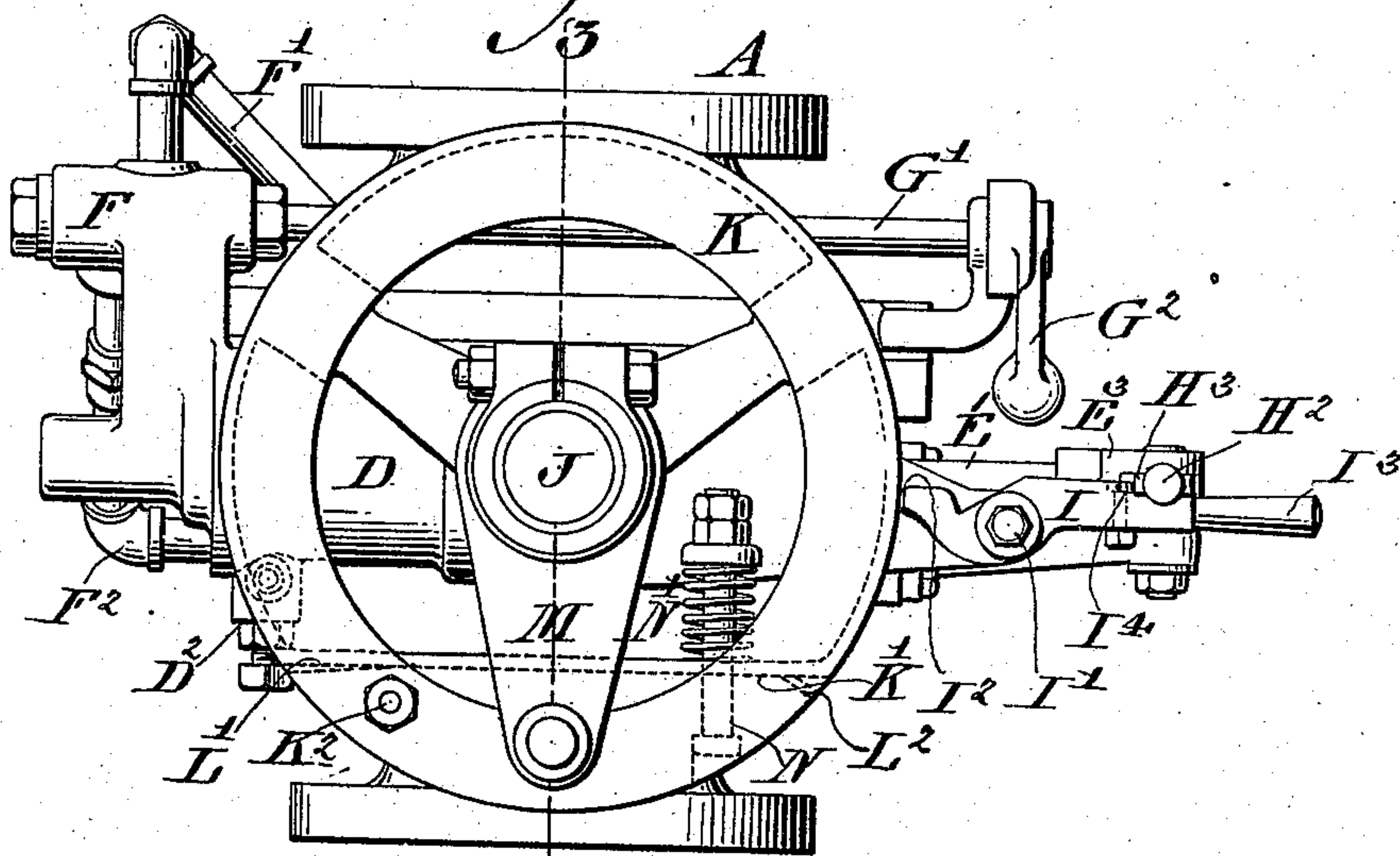


Fig. 2.



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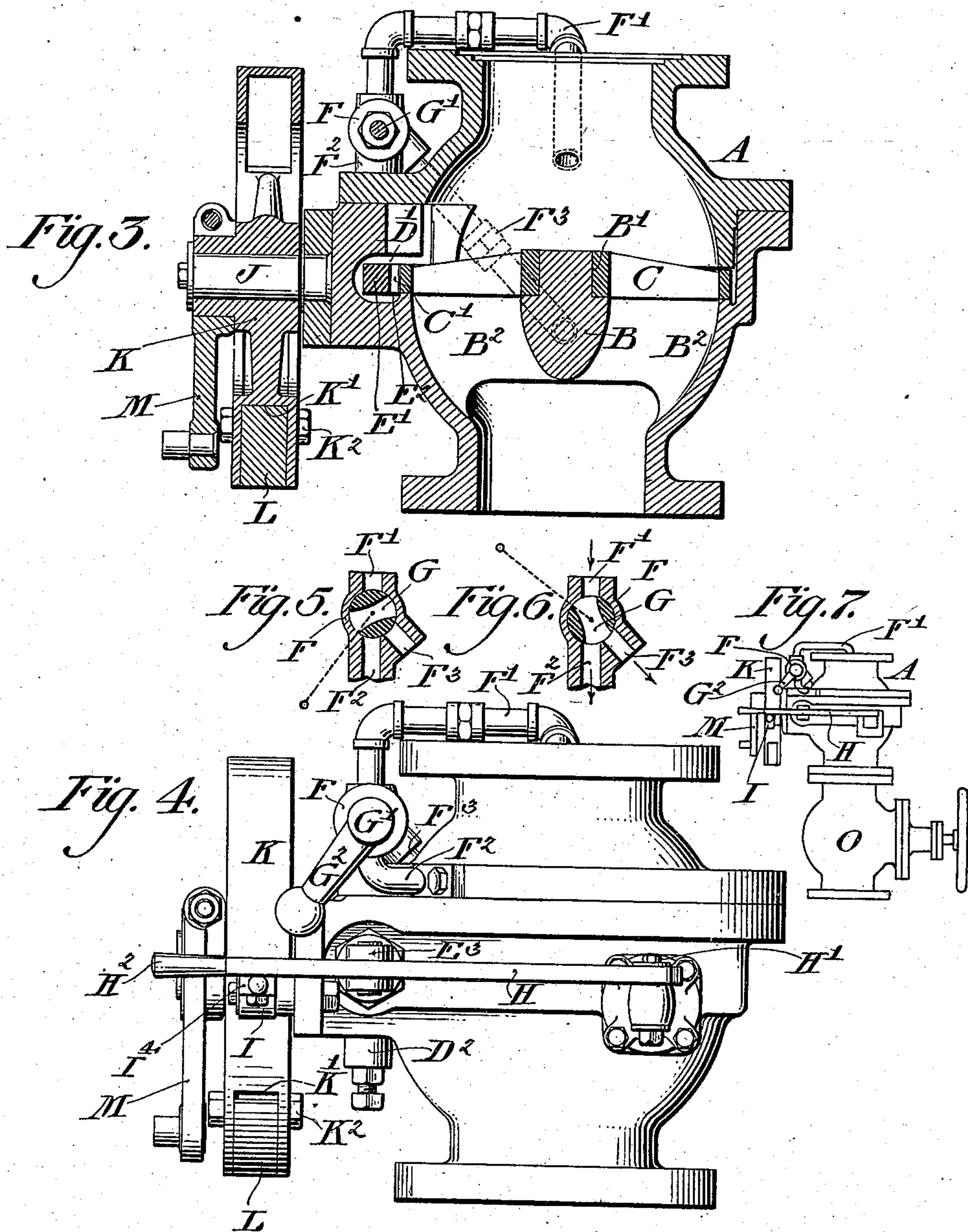
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GUSTAV B. PETSCHÉ, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO SOUTHWARK FOUNDRY AND MACHINE COMPANY, OF PHILADELPHIA, PENNSYLVANIA, A CORPORATION OF PENNSYLVANIA.

THROTTLE-VALVE MECHANISM FOR STEAM-ENGINES.

No. 881,486.

Specification of Letters Patent.

Patented March 10, 1908.

Application filed March 26, 1906. Serial No. 308,002.

To all whom it may concern:

Be it known that I, GUSTAV B. PETSCHÉ, a subject of the Emperor of Germany, residing in the city and county of Philadelphia, in the State of Pennsylvania, have invented a certain new and useful Improvement in Throttle-Valve Mechanism for Steam-Engines, of which the following is a true and exact description, reference being had to the accompanying drawings, which form a part thereof.

My invention relates to throttle valves employed for cutting off the supply of steam to the valve chests of steam engines and has for its object to provide efficient mechanism for closing such valves with great certainty and speed when the engine exceeds a determined rate of speed and also to provide for a convenient reopening of such valves.

In a broad sense my present invention comprises some of the features described and claimed in my copending application for Letters Patent filed March 26, 1906 Serial Number 308001, my present invention being directed to the special features by which the closing and opening of such a valve can be effected by steam power in connection with the emergency governor mechanism for setting the closing devices in operation on the occurrence of the contemplated emergency.

The nature of my invention and the various features of construction will be best understood as described in connection with the drawings in which they are illustrated and in which

Figure 1 is a plan view of the throttle valve and actuating mechanism as I have preferred to construct it. Fig. 2 is a side elevation thereof on the side to which the oscillating emergency governor is connected. Fig. 3 is a vertical cross-section through the valve and governor on the line 3—3 of Fig. 2. Fig. 4 is a side elevation of the valve and connected mechanism viewed from the right hand side of Figs. 1 and 2. Figs. 5 and 6 are sectional views illustrating the valve forming a detail of construction and Fig. 7 is a side elevation showing my emergency valve in connection with a second hand actuated throttle valve situated below it.

A, is the casing of the throttle valve having a gridiron annular seat for the valve consisting of a central hub B with radial webs B², the central hub being continued up

above the webs to form a pivot center or pin B'.

C, is the circular gridiron valve pivoted on the pin B' and resting on the webs B². At one edge this valve is formed with a tooth segment indicated at C'; D the cylinder connected with and preferably formed integral with the valve casing the inner end of this cylinder connecting through a port D' with the live steam space of the casing.

E is a piston working in the cylinder and having attached to it the piston rod E', on which rod are formed teeth indicated at E², in engagement with the toothed segment C', on the edge of the valve. A head E³, attached to the end of the rod is pivotally connected to the lever H pivoted at H' and having a handle H². Under normal conditions the piston is held at the front end of the cylinder and the valve held open by the engagement of a detent H³, on the lever H, with a detent I⁴, on a lever I, pivoted at I', and having a handle I³, said lever I, having an arm I², which projects into close proximity to the oscillating emergency governor to be described and so as to be actuated by said governor under proper conditions.

J, is a stud shaft secured to the casing on which is pivoted the oscillating governor K, preferably formed in the shape of a wheel as shown and having on one side a recess K' in which lies an arm L pivoted at one end on a pin K², in the rear of which the arm is cut away as indicated at L', to permit a certain oscillatory movement, the front arm L², of the governor arm being adapted to project beyond the circumference of the wheel K, under certain conditions, but being normally held retracted by a rod N and spring N' (see Fig. 2).

M is a lever arm attached to the hub of the governor wheel and by which it is actuated, being connected to some reciprocating or oscillating part of the engine as described in my before mentioned copending application. The rear end of the cylinder E⁸, is connected with a live steam space by a conduit F', F², in which is situated the plug cock casing F, and from which extends the branch pipe F³, entering into the casing on the lower side of the throttle valve. Under normal conditions the plug cock indicated at G, is closed, as shown in Fig. 5, and when opened it connects the pipe F', with both the pipes F², and

F³, as shown in Fig. 6. The cock G, is actuated through a shaft G', by a weighted lever G², the weight of which normally keeps the valve or cock closed.

5 Under normal conditions when valve is opened and the ports in the position shown in the various drawings when through some accident the speed of the engine exceeds a predetermined amount, the spring N', yields to the
10 centrifugal tendency of the governor arm L, permitting the end L², of this arm to project so that it strikes against the arm I', of the lever I, forcing this arm up and the other arm of the lever down releasing the latch lever H, whereupon the pressure of steam on
15 the face of the piston E, at once causes it to move inward in the cylinder D, and through its toothed segment E², to close the valve C.

Where the pressure involved is not great
20 the valve can be opened and the parts set in normally latched position by drawing outward the lever H, but this is best accomplished by opening the plug cock G, and admitting steam to the rear end of the cylinder
25 D, balancing the pressure on the piston E, or somewhat exceeding the pressure on the front of said piston, so that the piston will either automatically or through slight assistance from the hand lever H, be brought to open
30 position.

In cases where the full pressure of live steam remains on the face of the valve C, as for instance, where the supplemental throttle valve O, is situated below the casing A, as
35 shown in Fig. 7, it is advisable to provide means for balancing the pressure on the valve C, and this I accomplish by the branch pipe F³, which, when the plug cock G, is opened, admits live steam below the valve
40 C, and balances the pressure on both faces of this valve.

Having now described my invention, what I claim as new and desire to secure by Letters Patent is

45 1. A throttle valve for steam engines, comprising a valve casing, a valve for opening and closing the steam passage in the same, a steam cylinder open at one end to the live steam space, a steam pipe leading from the
50 live steam space to the other end of the cylinder, a valve for opening and closing said pipe, a piston working in said cylinder and connected to actuate the valve, catch mechanism whereby the piston is normally held in position to hold the throttle valve open, and an
55 emergency governor adapted to act as a releasing device for said catch mechanism.

2. A throttle valve for steam engines com-

prising a valve casing, a valve for opening and closing the steam passage in the same, a
60 steam cylinder open at one end to the live steam space, a steam pipe leading from the live steam space to the other end of the cylinder, said pipe having a branch leading to the casing below the valve seat, a valve for open-
65 ing and closing said pipe, a piston working in said cylinder and connected to actuate the valve, catch mechanism whereby the piston is normally held in position to hold the throttle valve open, and an emergency gov-
70 ernor adapted to act as a releasing device for said catch mechanism.

3. A throttle valve for steam engines having in combination a valve casing with a seat for a slide valve, a slide valve working on
75 said seat, a cylinder having one end in free connection with the live steam space, a piston working in said cylinder and connected to actuate the valve, a piston rod, catch mechanism acting to engage the piston rod
80 and through it hold the valve open and an emergency governor arranged to act as a catch releasing device.

4. A throttle valve for steam engines having in combination a valve casing with a seat
85 for a slide valve, a slide valve working on said seat, a cylinder having one end in free connection with the live steam space, a steam pipe connecting the other end of the cylinder also with the live steam space, a valve for
90 opening and closing said conduit, a piston working in said cylinder and connected to actuate the valve, a piston rod catch mechanism acting to engage the piston rod and through it hold the valve open and an emer-
95 gency governor arranged to act as a catch releasing device.

5. A throttle valve for steam engines having in combination a valve casing with a seat for a slide valve, a slide valve working on
100 said seat, a cylinder having one end in free connection with the live steam space, a steam pipe connecting the other end of the cylinder also with the live steam space, said pipe having a branch extending into the casing below
105 the slide valve, a valve for opening and closing said conduit, a piston working in said cylinder and connected to actuate the valve, a piston rod catch mechanism acting to engage the piston rod and through it hold the
110 valve open and an emergency governor arranged to act as a catch releasing device.

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Witnesses:

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