

(No Model.)

H. A. LAUGHLIN.

COMBINED THROTTLE AND SAFETY VALVE.

No. 318,004.

Patented May 19, 1885.

Fig. 1.

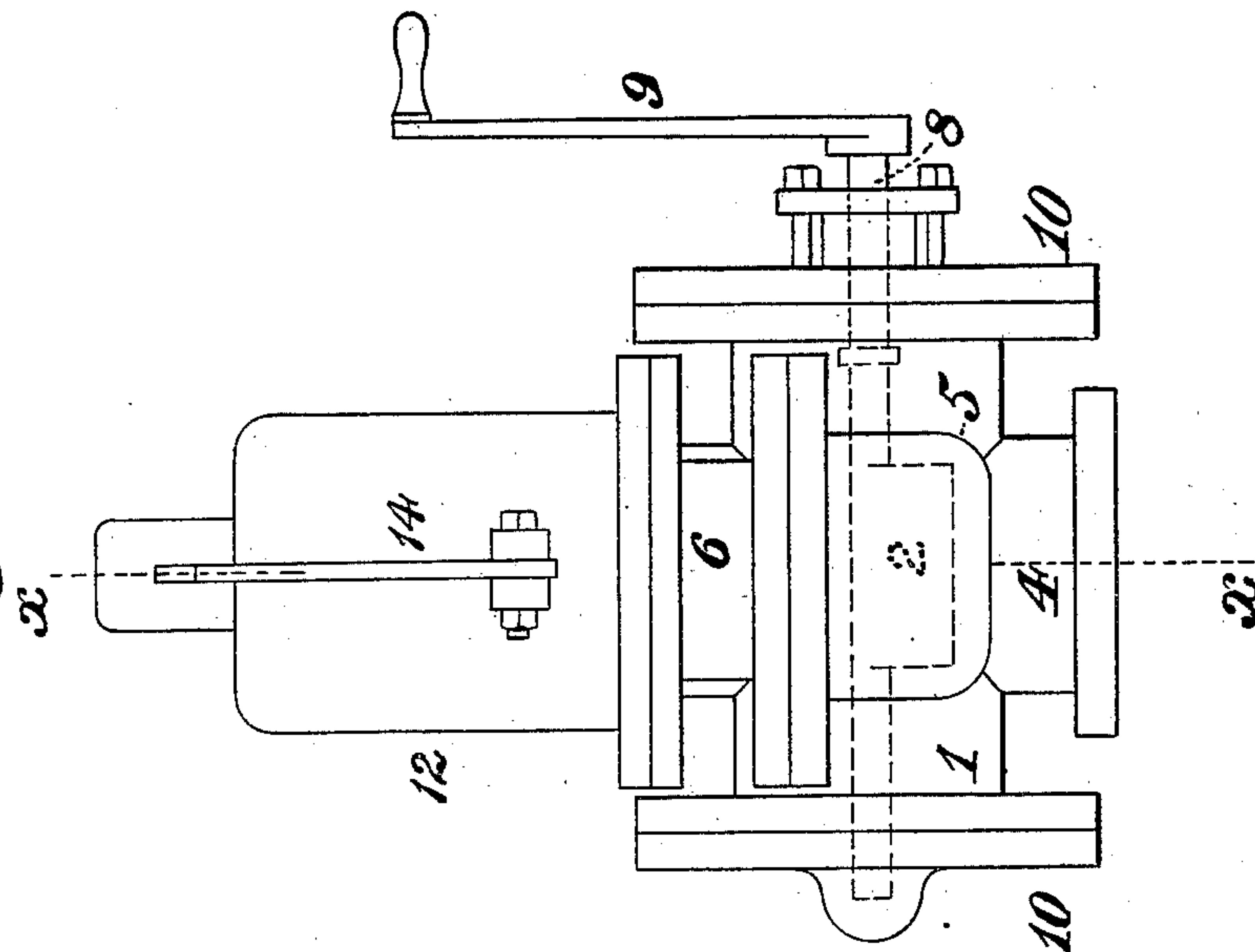
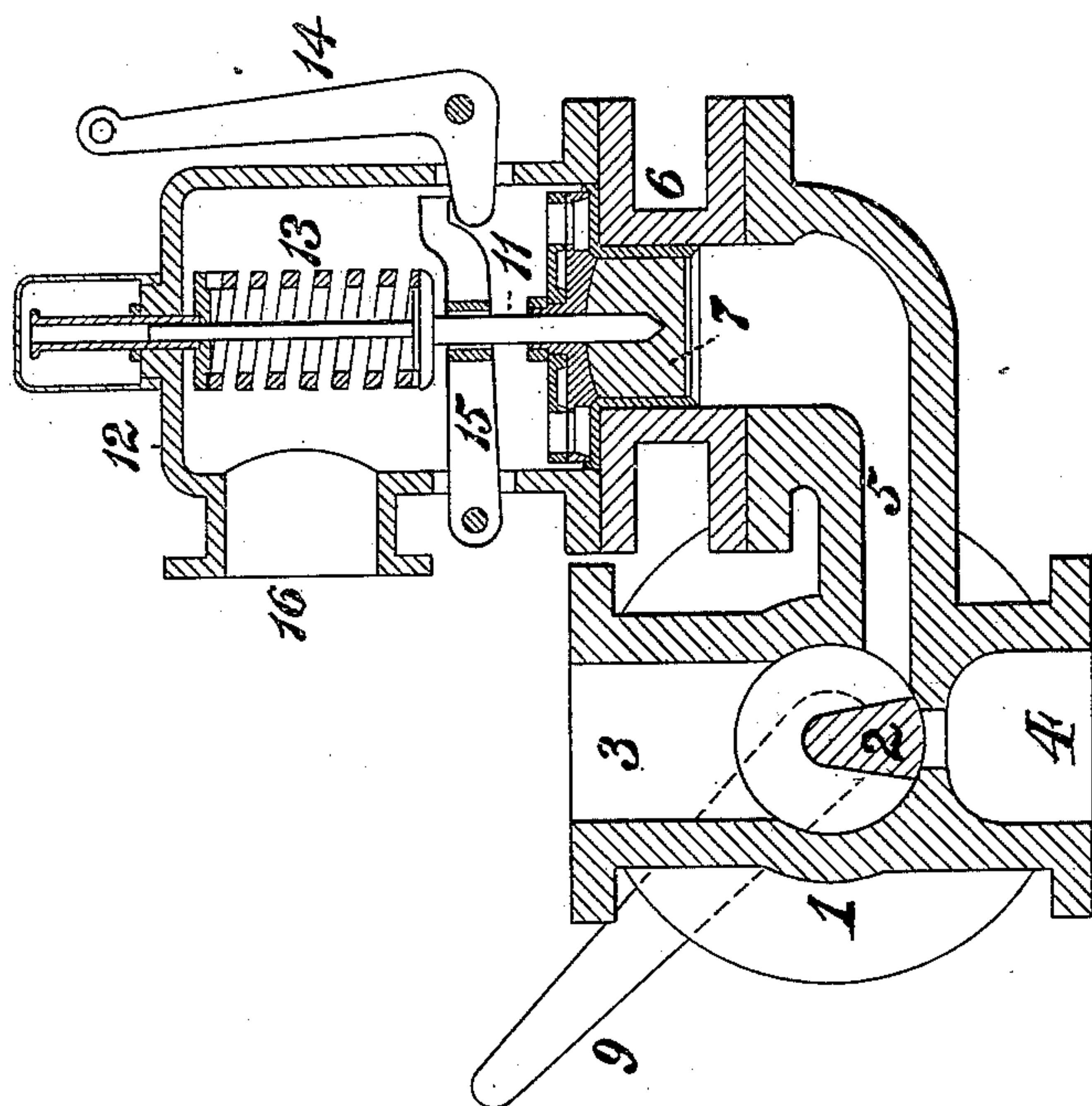


Fig. 2.



Attest
J. Snowden Bell.
C. M. Clarke.

Inventor
Henry A. Laughlin.
by *George H. Christy* Atty.

UNITED STATES PATENT OFFICE.

HENRY A. LAUGHLIN, OF PITTSBURG, PENNSYLVANIA.

COMBINED THROTTLE AND SAFETY VALVE.

SPECIFICATION forming part of Letters Patent No. 318,004, dated May 19, 1885.

Application filed March 19, 1885. (No model.)

To all whom it may concern:

Be it known that I, HENRY A. LAUGHLIN, a citizen of the United States, residing at Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented or discovered a certain new and useful Improvement in a Combined Throttle and Safety Valve, of which improvement the following is a specification.

In the accompanying drawings, which make part of this specification, Figure 1 is a side view, in elevation, of a combined throttle and safety valve embodying my invention, and Fig. 2 a vertical central section at the line *x x* of Fig. 1.

The object of my invention is to afford effective and desirable means for relieving any excess of steam-pressure above a safe and normal limit which may be generated in a steam-boiler during temporary stoppages of the engine which it supplies; to which end my invention consists in the combination of a throttle or steam-supply valve and a safety or relief valve, said throttle-valve governing communication between the boiler and safety-valve, as well as between the boiler and the engine, so that steam may be admitted to the engine and shut off from the safety-valve, or vice versa, in accordance with different adjustments of position of the throttle-valve. The improvement claimed is hereinafter fully set forth.

In the operation of steam-boilers, particularly those employed in steam-vessels, disastrous explosions have frequently been caused by an increase of pressure beyond the limit of resistance of the boiler or capacity of discharge of its ordinary safety-valve during temporary stoppages of the supply of steam to the engine, specially when such stoppages have been sudden and unexpected, and have occurred at periods when strong combustion was being maintained in the furnaces, and the boiler was freely generating steam to the normal limit of pressure. Under these circumstances the pressure rapidly increases when the engine is stopped, and unless proper and immediate precautions are taken to check the fires and relieve the excess of pressure the danger of explosion is imminent, the liability thereto being increased by the fact that the boiler safety-valve may stick by reason of neglect or infrequent use, or fail to afford suffi-

cient means of escape for the steam which continues to be generated. By my improvement the closing of the throttle-valve coincidently opens communication between the boiler and an additional or supplemental safety-valve, correspondingly increasing the facilities for relieving pressure, and access of steam to said valve is maintained during the entire duration of the stoppage of the engine.

In the practice of my invention the chest or casing 1 of the throttle-valve 2, which communicates, as in the ordinary construction, with the steam-supply pipe leading from the boiler by a nozzle or flanged passage, 3, and with the pipe leading to the engine by a nozzle, 4, is provided with a lateral connecting-pipe, 5, leading from the throttle-valve chest 1 to a chest, 6, in which is seated a safety or relief valve, 7, loaded by a weight or spring in correspondence with the normal pressure under which the boiler is to be operated. The throttle-valve 2, which is in this instance illustrated as fixed upon a stem, 8, provided with an operating-arm, 9, and adapted to move axially in bearings in the heads or bonnets 10 of the chest 1, controls communication, according to the position in which it may be placed, either between the common supply-nozzle 3 and the nozzle 4 leading to the engine, or between said nozzle 3 and the pipe 5 leading to the safety-valve 7, the pipe 5 being opened when the nozzle 4 is closed, and vice versa.

It will be obvious that, if desired, the traverse of the throttle-valve may be increased sufficiently to admit of the nozzle 4 and pipe 5 being simultaneously maintained in communication with the supply-pipe; but the safety-valve pipe 5 will necessarily be opened under all circumstances in and by the closure of the nozzle 4 by the throttle-valve in shutting off steam from the engine. A slide or puppet valve may, further, be substituted for the partially-rotating valve shown without departing from the principle of my invention.

The safety-valve 7 is secured upon a stem, 11, and is shown as of the locked type, being inclosed in a casing, 12, so as to prevent its load being increased without removing the casing. The valve is held to its seat by a spring, 13, the tension of which is adjusted in accordance with the pressure at which it is desired to blow off, and may be raised, when desired, from

time to time by a lever, 14, pivoted to lugs on the outside of the casing 12, and having an arm projecting into said casing and bearing against the free end of a lever, 15, which, when raised, abuts against a collar on the valve-stem 11 and raises the valve 7 from its seat. A nozzle, 16, on the side of the casing 12, serves for the connection of a suitable escape-pipe.

I claim herein as my invention—

10 1. The combination of a throttle-valve, a safety or relief valve, and a passage connecting the chests of the throttle and safety valves and controlled by the throttle-valve, substantially as set forth.

15 2. The combination of a throttle-valve chest

having supply and delivery openings, a safety or relief valve seated in a chest communicating with the throttle-valve chest, and a throttle-valve adapted by changes of its position to control communication either between the 20 supply-opening and the safety-valve chest, or between the supply and the delivery openings, substantially as set forth.

In testimony whereof I have hereunto set my hand.

HENRY A. LAUGHLIN.

Witnesses:

J. SNOWDEN BELL,

R. H. WHITTLESEY.