

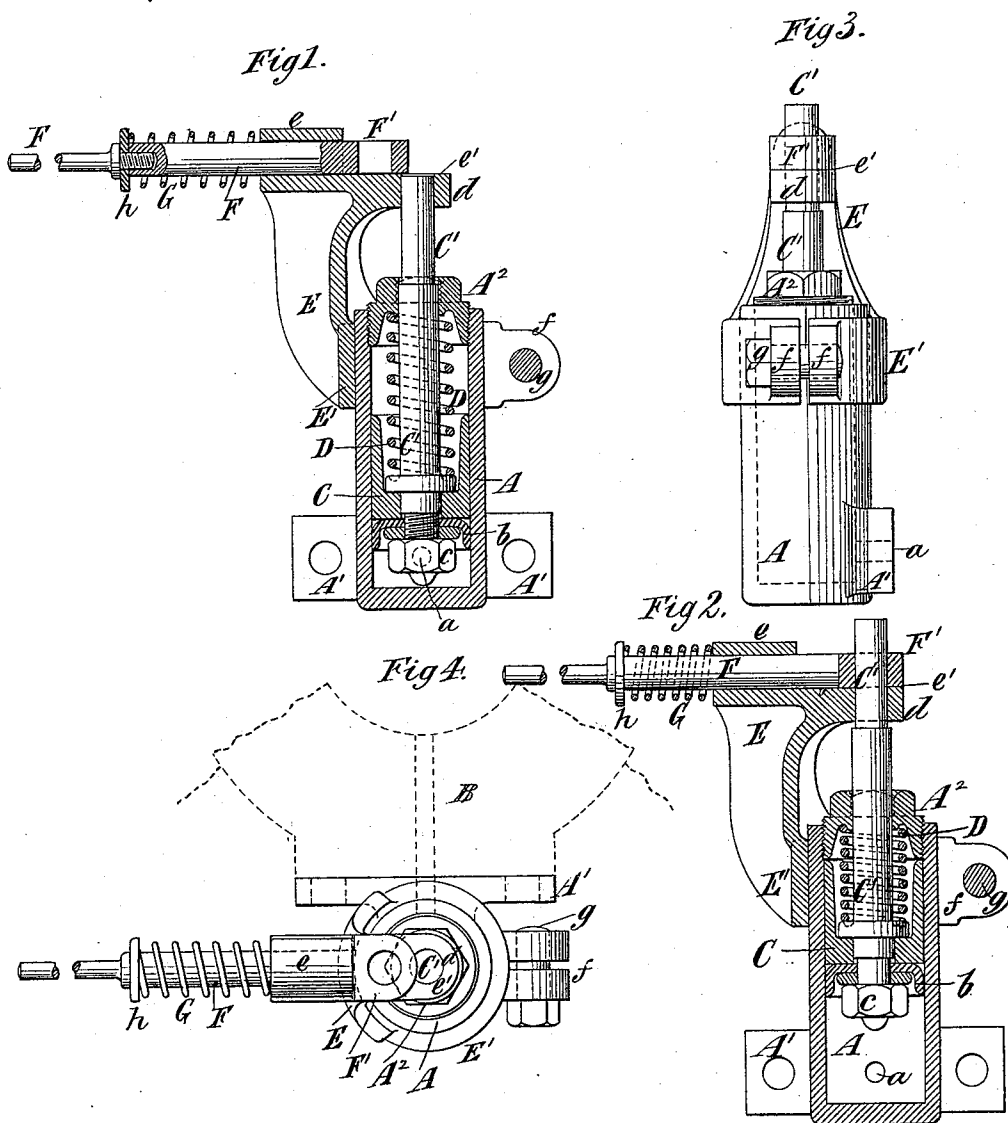
(No Model.)

G. R. CULLINGWORTH.

SAFETY GOVERNOR FOR AIR COMPRESSORS.

No. 287,101.

Patented Oct. 23, 1883.



Witnesses:
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GEORGE R. CULLINGWORTH, OF NEW YORK, N. Y.

SAFETY-GOVERNOR FOR AIR-COMPRESSORS.

SPECIFICATION forming part of Letters Patent No. 287,101, dated October 23, 1883.

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To all whom it may concern:

Be it known that I, GEORGE R. CULLINGWORTH, of the city and county of New York, in the State of New York, have invented a new and useful Improvement in Safety-Governors for Air-Compressors, of which the following is a specification.

In the operation of air-compressors perfect regularity of speed of the operating-engine is not of great importance; but in case of the breaking of the discharge-pipe, through which the compressed air is delivered to the reservoir or receiver, or in case there is a sudden diminution of pressure in the reservoir or receiver from any other cause, it is of great importance that the supply of steam to the operating-engine should be cut off, to prevent the engine from running away. To effect the quick shutting off of the supply of steam to the operating-engine under such circumstances is the object of my invention; and the invention consists in a governing device or apparatus of novel construction, which may be applied to the cylinder of the air-compressor, to the pipe for delivering compressed air therefrom, or to the reservoir or receiver for compressed air, and which, upon any sudden diminution in the pressure of the compressed air, will operate to liberate the steam-inlet or throttle-valve of the operating-engine, and so retard or stop entirely the operation of said engine.

In the accompanying drawings, Figure 1 is a sectional elevation of my improved safety-governor, showing the parts in the position which they occupy after releasing the steam-valve of the operating-engine. Fig. 2 is a similar view, showing the parts in the position which they occupy while holding said valve open. Fig. 3 is an elevation of the governor, showing the parts in the same position as in Fig. 2; and Fig. 4 is a plan of the governor and a dotted outline of a portion of an air-compressor to which it is applied.

Similar letters of reference designate corresponding parts in all the figures.

A designates a cylinder, which forms one of the parts of the governor, and which is here shown as formed with lugs, or a flange, A', whereby it may be secured to the side of the cylinder B of an air-compressor. Near the bottom of the

cylinder is an inlet-port, *a*, whereby it may be connected with the discharge-chest of the air-compressor cylinder. In lieu of the cylinder A being connected directly with the cylinder B, it may be applied to the pipe leading from the compressor to the reservoir or receiver for compressed air, or to such reservoir or receiver itself, it being only necessary that the port *a* be so connected that the compressed air will be admitted to the cylinder A.

In the cylinder A is a plunger or piston, C, which, as here shown, is provided with a cup-packing, *b*; and C' designates a plunger or piston rod, which is connected with the plunger or piston by a nut, *c*, which likewise serves to secure the packing *b*. The rod C' works through a plug or bonnet, A², in the top of the cylinder A, and is surrounded by a spring, D, between the plunger or piston C and the plug A², which imparts a constant downward tendency to the plunger or piston. It will therefore be seen that the pressure of the compressed air admitted by the port *a* below the plunger or piston C and the pressure of the spring D are opposed to each other, and so long as the pressure of air is maintained the plunger or piston will be held up in the position shown in Figs. 2 and 3 and the spring D kept compressed. As soon, however, as, by reason of any break or leakage, there is a sudden diminution in the pressure of air acting on the plunger or piston, the spring will force it down into the position shown in Fig. 1.

E designates a standard which projects above the cylinder A, and comprises a guide, *d*, for the rod C', a guide or socket, *e*, through which works a rod, F, in a direction transverse to the length of the rod C', and a flat seat, *e'*, on which works an eye, F', formed on the end of the rod F, for a purpose hereinafter described. The standard E might be cast integral with the cylinder A; but, as here shown, it is constructed with a split or divided circular portion or collar, E', provided with lugs or ears *f*, and by means of a bolt, *g*, inserted through said lugs or ears, the circular portion or collar may be tightly clamped on the cylinder A.

To the rod F is connected, in any suitable manner, the inlet or throttle valve of the operating-engine. (Not here shown.) The said

rod is surrounded by a spring, G, which acts between the socket or guide *e* and a collar, *h*, on the rod F, and constantly tends to move the rod in a direction to close or allow the closing of the said valve.

While the engine and compressor are in operation the parts occupy the position shown in Figs. 2 and 3, the upper end of the rod C' being inserted through the eye F', the spring G being thereby held compressed, and the plunger or piston C being held in such elevated position by the action of the compressed air below it. The steam-inlet or throttle-valve of the operating-engine is thus held open.

In case of any accident—as, for example, the breakage of the compressed-air pipes, which would cause a sudden diminution in the pressure of the compressed air—the pressure below the piston or plunger C will be greatly reduced, and the spring D will at once force the plunger or piston C down and carry the rod C' out of the eye F' and below the seat *e'*, on which said eye moves. The rod F will thus be released, and the power of the spring G will at once move the rod F into the position shown in Fig. 1, thereby instantly closing the throttle-valve of the engine, thus stopping it and preventing its running away.

This governor does not serve in any sense to control the speed of the engine, as do ordinary governors, but simply acts to shut off steam entirely when the engine is relieved of its load.

The eye F' and rod C' form a lock for holding the rod F, and said rod F constitutes a connection with the throttle-valve.

I do not confine myself to the particular devices herein shown, whereby the rod F is locked to hold the throttle-valve of the engine open and released by the movement of the plunger or piston C, and obviously the spring D might be dispensed with and its equivalent (a weight) be substituted. The plunger or piston C constitutes in effect a movable diaphragm or partition, and obviously a flexible diaphragm fixed at the edge in its chamber or cylinder

might be substituted, and would be the equivalent of the piston.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The combination, with a rod or connection for the throttle-valve of an engine, of a lock for securing the rod or connection to hold the said valve open, a cylinder, a piston or diaphragm in said cylinder capable of being acted upon by compressed air to hold said rod or connection locked, and a spring for actuating said piston or diaphragm to unlock said rod or connection upon a sudden diminution of air-pressure, substantially as and for the purpose described.

2. The combination, with a rod or connection for the throttle-valve of an engine, of a lock for securing said rod or connection to hold said valve open, a cylinder, and a piston on which air-pressure may act, and which is movable in said cylinder and connected with said lock, and a spring for actuating said piston to unlock said rod or connection upon a sudden diminution of air-pressure, substantially as and for the purpose described.

3. The combination, with the rod F and the rod C', serving to lock the same, of the cylinder A, to which compressed air may be admitted, the piston C, fitting said cylinder and carrying said rod C', and a spring acting on said piston, substantially as and for the purpose described.

4. The combination, with the rod F, provided with the eye F', and the rod C', for engaging with said eye, of the cylinder A, the piston C, and the spring D.

5. The combination of the cylinder A, the standard E, comprising the guides *d e* and seat *e'*, the piston C and rod C', the spring D, and the rod F and eye F', all substantially as and for the purpose described.

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Witnesses:

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