To all whom it may concern:

Be it known that I, Moses Edward Teague, a subject of the King of Great Britain and Ireland, and residing at Bowson House, Cinderford, Gloucester, in the county of Gloucester, England, have invented certain new and useful Improvements in Governor Mechanisms for Compressor-Engines and the like, of which the following is a specification.

This invention relates to improvements in governing mechanism for compressor-engines and the like of the type in which a combined centrifugal and pressure governor is employed.

The object of the present invention is to devise an improved arrangement of the above type and the invention consists in governing mechanism comprising an expansion valve operated by a rack bar, a speed governor and a pressure governor each of which is adapted to act separately when required upon the rack bar.

The invention also consists in governing mechanism of the character above referred to wherein the pressure governor acts upon the rack bar through the medium of a bell crank lever while the other end of the rack bar is connected to a lever loosely mounted upon a spindle which is connected to the speed governor, means being provided for connecting the loosely mounted lever to the spindle upon which it is mounted when required.

The accompanying drawings illustrate more or less diagrammatically one convenient arrangement of apparatus in accordance with the invention.

Figure 1 is an elevation, Fig. 2 is a plan of a portion of Fig. 1, the speed governor being omitted, Fig. 3 is an elevation on an enlarged scale of a portion of the mechanism shown in Fig. 1, parts being shown in section, and Fig. 4 is a detail view showing in side elevation one of the levers illustrated in Fig. 3.

In carrying my invention into effect in one convenient manner as, for example, in its application to a compressor engine I provide any suitable form of expansion valve for controlling the point of cut-off of the power medium from the engine cylinder but I prefer to employ my well-known type of expansion valve as described in the specification of my prior British Patent No. 5384 of 1895, having a ported sleeve, the position of which in relation to the ports in the outer casing may be regulated at will by means of a screwed spindle or the like.

The drawings illustrate the arrangement in which my expansion valve is employed, the ported sleeve referred to being within the casing a and the position of which is controlled by means of the screwed spindle b which is raised or lowered by means of the rotary nut c adapted to be operated by the rack or toothed bar d engaging with any suitable toothed pinion or portion of pinion formed integral with or secured to the rotary nut c. In conjunction with the expansion valve I provide a speed governor e of any suitable form and construction and a pressure governor f which in one convenient example may be in the form of a cylinder communicating by the port g with the pressure chamber of the compressor or with the reservoir and within which works a ram h loaded by means of weights i, spring, or the like to any required extent depending upon the pressure at which the apparatus is to operate. The two governors referred to are so combined with or connected to the expansion valve that they may operate independently thereon when required so that when, for example, the speed of the engine becomes excessive the speed governor e operates the expansion valve in such a manner as to cut off the power medium at an earlier point in the stroke while the pressure governor f operates in a similar manner when the pressure rises beyond a predetermined limit, the operations of the two governors being however entirely independent of one another.

In one convenient construction the rack bar d is connected at one end to a link k, one end of which engages with a rectangular or other suitable slot in the rack bar while the other end is loosely mounted upon a shaft or spindle l held in a bearing which may be formed in one with or secured to the casing or framework of the expansive valve upon which spindle l is rigidly secured a lever m connected by means of a suitable link or the like n to the collar or other moving part o of the speed governor. The pressure governor is connected by means of a single link p to a bell crank lever q pivotally mounted upon the casing of the expansion valve, the free end of which is adapted to act when necessary upon the end of the rack bar d for the purpose of vary-
ing the cut-off, the arrangement being such that the bell crank lever \( q \) is slightly out of contact with the rack bar \( d \) when the pressure governor is in its normal position. The rack bar \( d \) being connected to a lever loosely mounted upon the spindle \( l \) is free to move under the action of the air governor independently of the speed governor while a clutch \( s \) is provided for the purpose of connecting the spindle \( l \) with the lever \( k \) so that the rack bar will be operated to vary the cut-off when the spindle \( l \) is rotated by the governor mechanism pulling upon the link \( n \). Thus the speed and pressure governors act independently to vary the cut-off of the expansion valve while the valve itself is operated by a chain drive and crank and connecting rod mechanism or by means of the lever \( t \) connected to the engine crank or eccentric by the link \( u \), the lever \( t \) being mounted upon a spindle \( v \) upon which is rigidly mounted the lever \( w \) serving to operate the valve. The counterweight \( z \) or its equivalent is applied to the mechanism by being fixed to a lever secured to the shaft upon which the lever \( k \) is mounted for the purpose of bringing the expansion valve to its normal position when the action of either the speed governor or the air governor ceases.

It is to be understood that I do not confine my invention to the various details hereinbefore given by way of example as the same may be suitably modified depending upon the type of expansion valve to which the invention is to be applied and the purpose for which the apparatus is to be employed and I suitably dispose the various parts of the mechanism in any given relation to one another depending upon the particular practical requirements that are to be fulfilled.

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

1. Governor mechanism for compressor engines and the like comprising in combination an expansion valve, a rack bar adapted to actuate said valve and a speed governor and a pressure governor each of which is adapted to act separately and independently upon said rack bar.

2. Governor mechanism for compressor engines and the like comprising an expansion valve, a rack bar actuating said valve, a pressure governor, a bell crank lever serving to transmit the movement of the pressure governor to the rack bar, a speed governor and means whereby the speed governor may actuate said rack bar separately and independently of the pressure governor.

3. Governor mechanism for compressor engines and the like comprising an expansion valve, a rack bar adapted to actuate said valve, a speed governor, link mechanism whereby said speed governor may operate said rack bar, a pressure governor and means whereby said pressure governor may operate said rack bar separately and independently of the speed governor.

4. Governor mechanism for compressor engines and the like comprising in combination an expansion valve, a rack bar adapted to operate said valve, a pressure governor, a bell crank lever one end of which is connected with said pressure governor while the other end abuts against one end of said rack bar, a speed governor, a link connected to the speed governor and to the other end of said rack bar, and means for rendering the action of the pressure governor and speed governor upon the rack bar independent of one another.

5. Governor mechanism for compressor engines comprising in combination an expansion valve, a rack bar adapted to actuate said valve, a pressure governor, a bell crank lever, one end of which is connected with said pressure governor while the other end abuts against one end of said rack bar, a speed governor, a link connected with the other end of said rack bar and loosely mounted upon a spindle connected by link mechanism with said speed governor, and means for connecting the loosely mounted link to the spindle upon which it is mounted when required.

6. Governor mechanism for compressor engines comprising in combination an expansion valve, a rack bar adapted to actuate said valve, a pressure governor, a bell crank lever, one end of which is connected with said pressure governor while the other end abuts against one end of said rack bar, a speed governor, a link connected with the other end of said rack bar and loosely mounted upon a spindle connected by link mechanism with said speed governor, and clutch mechanism for connecting the loosely mounted link to the spindle upon which it is mounted when required.

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

Moses Edward Teague.

Witnesses:

Frank J. G. Sleeman,
C. Kenneth Hale.