No. 889,528. PATENTED JUNE 2, 1908.

T. B. JEFFERY.

SPEED CONTROLLING MECHANISM FOR AUTOMOBILES.

APPLICATION FILED JAN. 12, 1907.

2 SHEETS—SHEET 1.

Fig. 1.

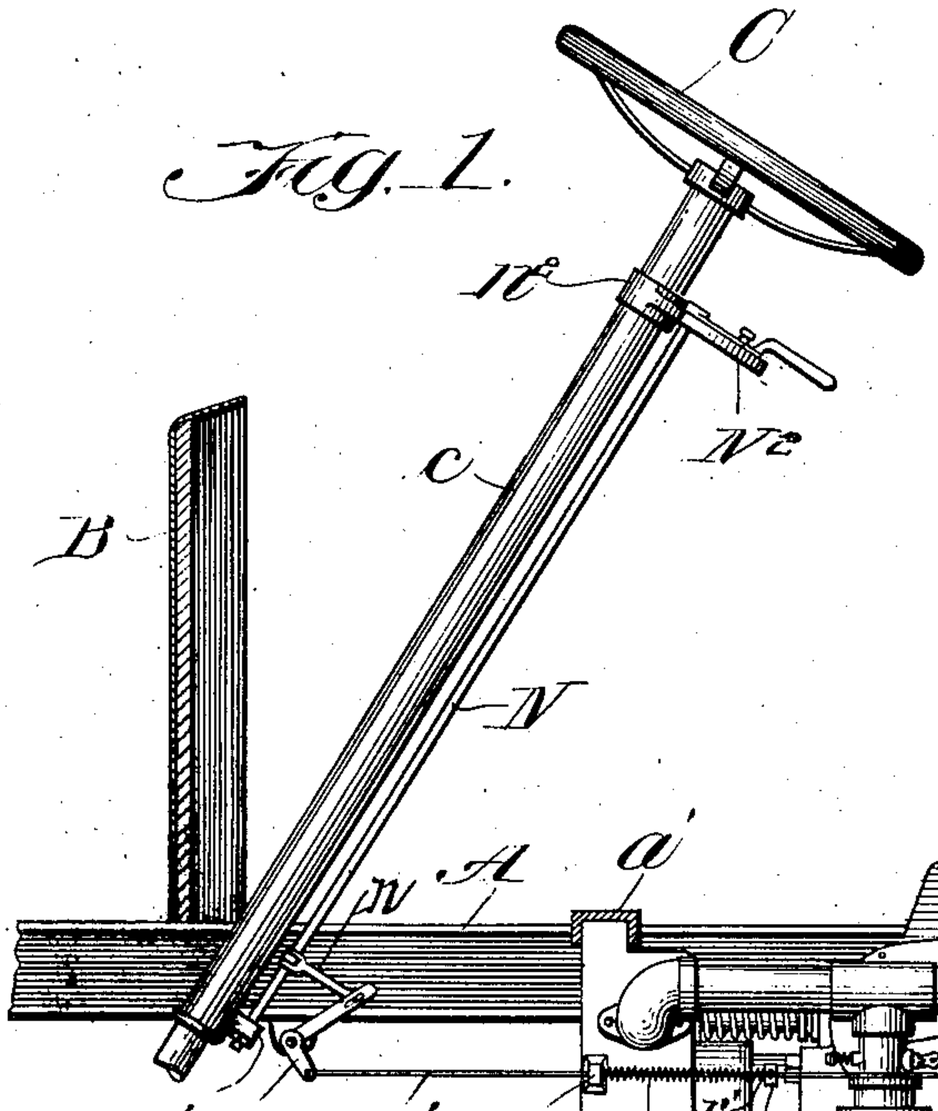


Fig. 2.

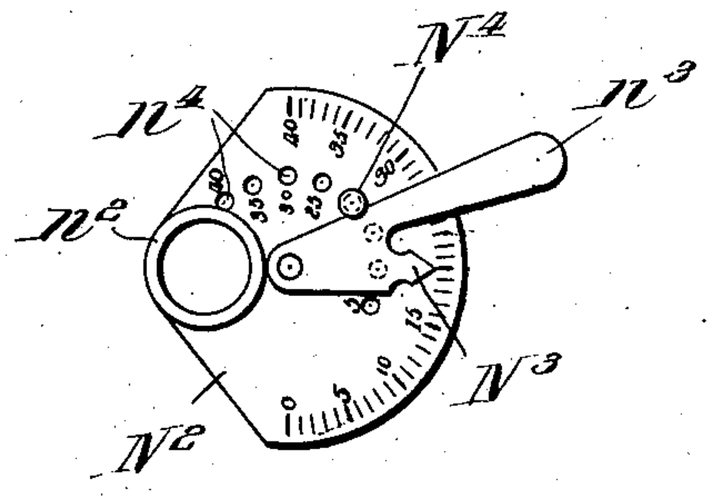
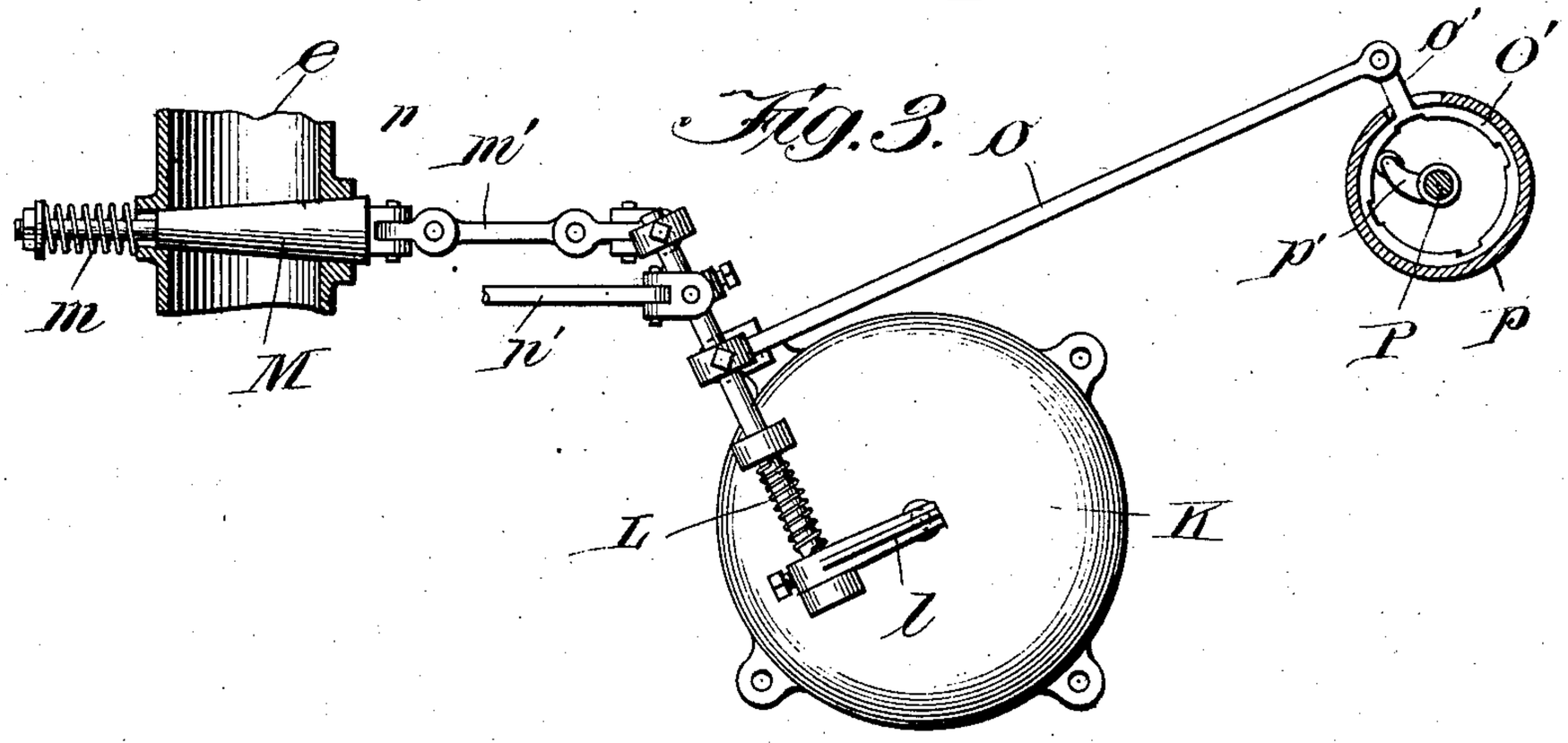


Fig. 3.



Witnesses:
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his Attorneys

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2 SHEETS—SHEET 2.

Fig. 4.

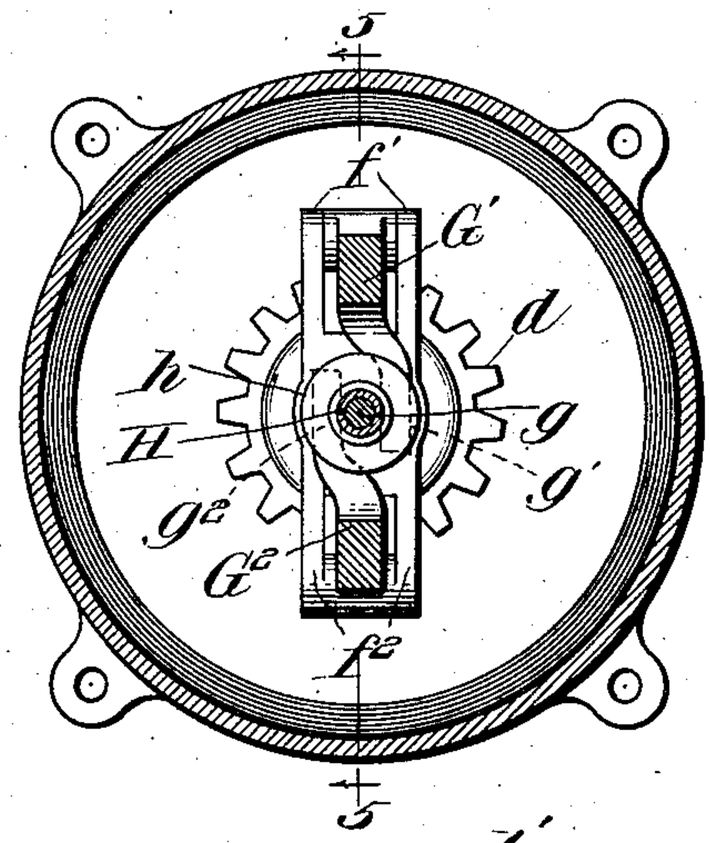

Fig. 5.

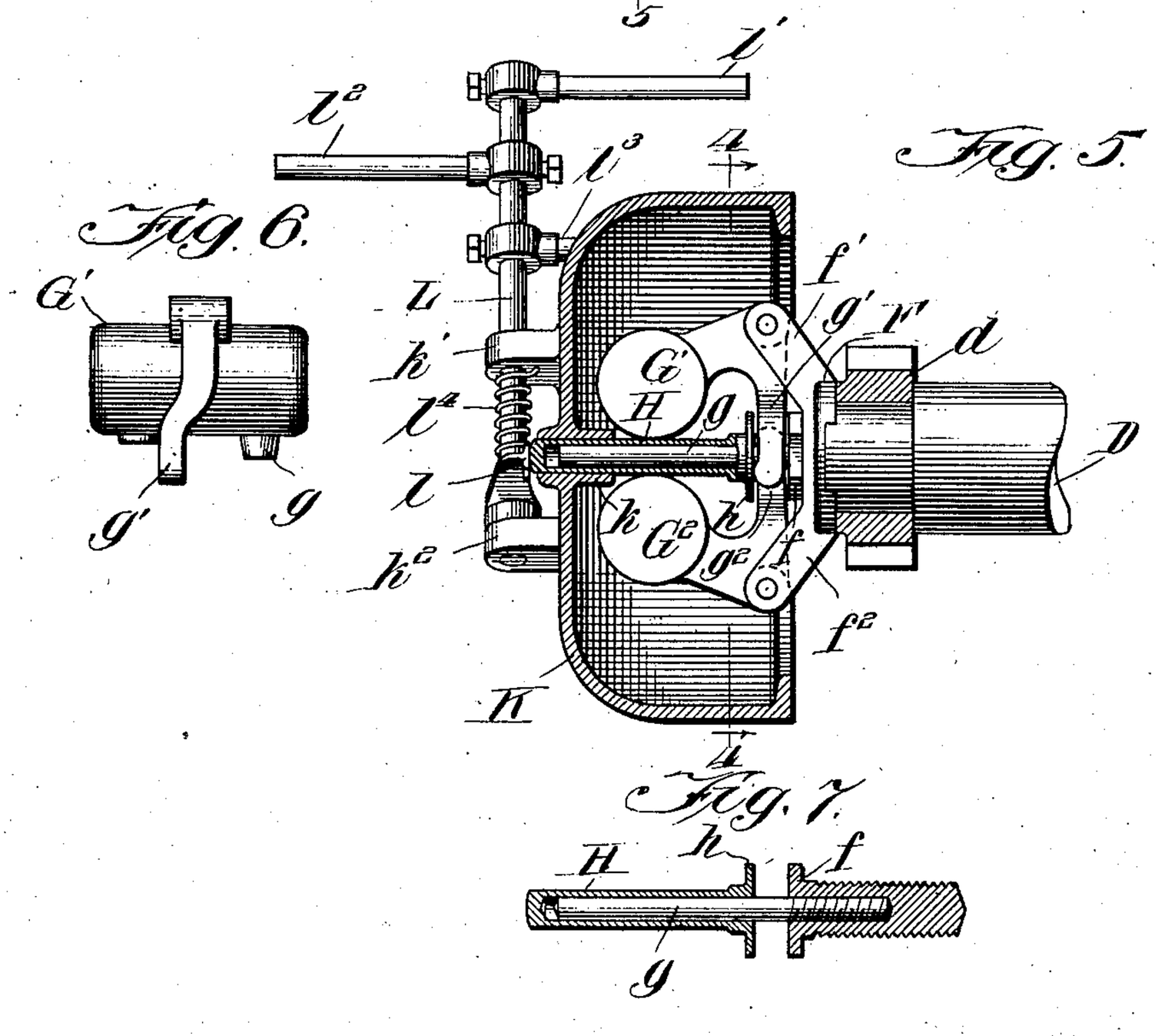

Fig. 6.

Fig. 7.

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UNITED STATES PATENT OFFICE.

THOMAS B. JEFFERY, OF KENOSHA, WISCONSIN.

SPEED-CONTROLLING MECHANISM FOR AUTOMOBILES.

No. 889,528. Specification of Letters Patent. Patented June 2, 1908.

Application filed January 12, 1907. Serial No. 351,934.

To all whom it may concern:

Be it known that I, THOMAS B. JEFFERY, a citizen of the United States, residing at Kenosha, county of Kenosha, State of Wisconsin, have invented a certain new and useful Improvement in Speed-Controlling Mechanism for Automobiles, and declare the following to be a full, clear, and exact description of the same, such as will enable others skilled in the art to which it pertains to make and use the same, reference being had to the accompanying drawings, which form a part of this specification.

My invention relates in general to speed controlling mechanism and more particularly to means for either automatically or manually controlling the speed of an explosive engine of an automobile.

It is well known that the speed of automobiles propelled by explosive engines may be increased by advancing the time of the ignition of the explosive mixtures, by increasing the supply of air to the explosive mixture, and also by increasing the quantity of explosive mixture in proportion to the increasing speed. It is therefore customary to provide explosive engines on automobiles with means for advancing the ignition and for increasing the air supply in order that the greatest efficiency may be obtained.

An object of my invention is to provide an explosive engine of an automobile with a governor for automatically regulating the supply of air to the explosive mixture according to the speed of the engine.

A further object of my invention is to provide an explosive engine of an automobile with a governor for automatically regulating the speed of the engine, the operation of which will be visible to the driver thereby indicating the speed of the machine.

A further object of my invention is to provide an explosive engine of an automobile with a governor for automatically regulating the speed of the engine the operation of which may be manually controlled from the driver's seat.

A further object of my invention is to provide an explosive engine of an automobile with a governor for automatically regulating the ignition of a mixture and the supply of air according to the speed of the engine, the operation of which may be controlled manually by the driver.

A still further object of my invention is to provide an improved speed controlling mechanism for automobiles which will be simple in construction, inexpensive in manufacture and efficient in operation.

The embodiment of my invention herein disclosed may be generally described as comprising a centrifugal governor carried by a shaft rotated by the engine, a connection leading from the governor to an ignition timing device, another connection leading from the governor to a valve for controlling the supply of air to the mixture, a third connection leading from the governor to an indicator located in a position convenient to the driver, and means for manually moving the indicator and thereby controlling through the interposed governor the timing and air supply.

My invention will be more fully described hereinafter with reference to the accompanying drawings in which the same is illustrated in a convenient and practical form, and in which

Figure 1 is an elevational view of a double cylinder explosive engine, and the adjacent portions of an automobile frame; Fig. 2 a plan view of the indicator; Fig. 3 an enlarged elevational view of the air supply valve, timing device and operative connections with the governor; Fig. 4 a sectional view on line 4—4 Fig. 5; Fig. 5 a sectional view on line 5—5 Fig. 4 showing the governor and rock shaft actuated thereby; Fig. 6 an elevational view of one of the weighted bell crank levers of the governor; and Fig. 7 a longitudinal sectional view through the plunger actuated by the governor.

Similar reference characters are used to designate similar parts in the several figures of the drawings.

Reference letter A designates one of the side frames of an automobile and reference characters a' and a^2 transverse frames beneath which the engine is supported.

B designates the dash board of the automobile.

C indicates the steering wheel secured to the upper end of a shaft mounted within a tubular support *c*.

D′ and D² designate the cylinders of an explosive engine located on opposite sides of a crank-shaft.

E indicates a carbureter for supplying an explosive mixture through the conduit *e* to the engine cylinders.

The structure above described forms in itself no part of my invention, but is illus-

trated in order that the operation of my invention may be fully understood. It will, of course, be understood that my invention is applicable to any type of an automobile explosive engine and is not limited in its use to the type of double cylinder engine in connection with which it is disclosed in the drawings.

Reference character D designates the crank-shaft which is rotated in the usual manner by the successive explosions in the engine cylinders.

d indicates a gear wheel adapted to rotate a shaft for controlling the valves of the engine cylinders.

F indicates a cap secured on the end of the crank-shaft which projects through the gear wheel *d*. The cap F may be conveniently secured to the crank-shaft by means of a screw-threaded post *f* having a flange around the outer end thereof. Brackets *f'* and *f*^{2} project from diametrically opposite points on the cap F and serve as fulcrums for weighted bell-crank levers G' and G^2 which constitute a centrifugal governor. The arms *g'* and *g*^{2} of the bell-crank levers lie adjacent opposite sides of a rod *g* projecting concentrically from the post *f*. A plunger H is loosely mounted upon the rod *g* and may be conveniently in the form of a tube having its outer end closed. A flange *h* surrounds the inner end of the plunger H and is adapted to be engaged by the arms of the weighted bell-crank levers when they are swung outwardly by centrifugal force. The outer end of the plunger H extends through a tubular guide *k* formed through a casing K surrounding the centrifugal governor.

A rock-shaft L is supported upon the exterior of the casing K by means of ears *k'* and *k*^{2}. A crank arm *l* is secured to the rock-shaft L and overlies the outer end of the plunger H. A spring *l*^{4} surrounds the rock-shaft L intermediate of the brackets *k'* and *k*^{2} the tension of which retains the crank-arm *l* in contact with the outer end of the plunger H. The spring *l*^{4} may be of any desired construction and for convenience is shown as secured at one end to the bracket *k'* and at its other end to the rock-shaft L so that the oscillation of the shaft by the outward movement of the plunger engaging the arm *l* will increase the tension of the spring.

An arm *l'* is adjustably secured to the rock-shaft L and is connected at its outer end by a link *m'* with an air supply valve M located within the conduit *e* leading from the carbureter E to the engine cylinders. The valve M may be of any suitable construction and is shown for convenience as in the form of a conical rceiprocating valve normally retained in closed position by the tension of a spring *m* interposed between a collar on the end of the valve stem and a boss on the exterior of the conduit *e*, as clearly shown in Fig. 3. The link *m'* is preferably connected to the arm *l'* and to the valve M by interposed links so that the connection between the arm and valve may be sufficiently flexible to prevent binding of the valve when opened by the oscillation of the rock shaft.

A second crank-arm *l*^{2} is adjustably secured to the rock-shaft L and is connected by suitable means with an indicator located in position to be readily seen by the driver of the machine. I have illustrated the indicator as being secured to the guide tube *c* of the steering shaft at a point below the wheel C. It will be understood, however, that the indicator may be located at any other convenient point. The indicator comprises a dial N^2 secured by a collar *n*^{2} to the guide tube *c* of the steering shaft.

N^3 designates a pointer adapted to move relatively to a scale upon the indicating dial N^2. The pointer N^3 is provided with a handle *n*^{3} by means of which it may be manually moved by the driver. The dial is provided with suitable means for limiting the movement of the pointer as for instance a series of holes *n*^{4} into which a pin N^4 may be inserted to obstruct the movement of the pointer relatively to the scale. The pointer is rigidly secured to the upper end of a rod N the lower end of which is supported in a bracket *c'* projecting from the guide tube *c*. A link *n* connects a crank-arm on the rod N with the upper end of a bell-crank lever N'. The opposite arm of the bell-crank lever is connected by a rod *n'* with the crank-arm *l*^{2} on the rock-shaft L.

A third crank-arm *l*^{3} is adjustably secured to the rock-shaft L and is connected by a rod *o* with a device for regulating the time of ignition of the explosive mixture in the engine cylinder. The timing device may be of any suitable or usual construction, and is illustrated as comprising a commutator ring O' to a radial rod *o'* on which the end of the rod *o* is pivotally connected.

P indicates the commutator shaft which carries a finger *p'* adapted to successively engage contacts on the commutator ring and thereby close the ignition circuits. *p* indicates a housing surrounding the commutator ring and through a slot in which the arm *o'* extends.

The operation of my invention is as follows: Rotation of the crank-shaft D rotates the centrifugal governor so that as the speed of rotation of the shaft increases the weights of the governor will be thrown outwardly, thereby forcing the plunger H outwardly with respect to the surrounding casing. The outward movement of the plunger oscillates the crank-shaft L through engagement with the crank-arm *l*. The extent of oscillation of the crank-shaft varies according to the movement of the governor and consequently according to the speed of rotation of the

crank-shaft. The oscillation of the rock-shaft through the crank arm l' and link m' un-seats the valve M and permits air to pass into the conduit e thereby diluting the combustible mixture. The oscillation of the rock-shaft also through the crank-arm l^3 and rod o oscillates the commutator ring and thereby advances the time of ignition. The operation of the governor and consequently the speed of the machine is indicated by means of the oscillation of the rock-shaft rotating the pointer n^3 with respect to the dial through the medium of the interposed connections. When it is desired to manually control the speed of the engine pressure is applied to the handle n^3 of the pointer N^3 to oscillate the rock-shaft L in a direction either to open or close the air supply valve and to coincidently advance or retard the ignition timing device. When it is desired to limit the speed to a predetermined degree the stop pin N^4 is inserted in one of the holes n^4 in the dial N^2 according to the speed desired, as indicated on the graduations of the dial.

From the foregoing description it will be observed that I have invented an improved speed controlling mechanism for automobiles by means of which an air supply valve and an ignition timing device will be automatically regulated as the speed of the engine varies, and by means of which the speed of the engine may be indicated to the driver and by him manually controlled by adjusting the air supply valve and ignition timing device.

While I have illustrated the air supply valve as located in the conduit leading from the carbureter to the engine cylinders, yet it is, of course, evident that the air supply valve can be located at any other point and may in fact control the supply of air to the carbureter. So far as my invention is concerned the air supply valve may be located at any point where it would regulate the proportion of air in the combustible mixture. It will also be observed that the operation of the governor may be adjusted by varying the tension of the spring R which is shown as surrounding the rod n' and as interposed between the stationary guide ear r and a collar R′ adjustably secured to the rod by a clamp screw r'. It is also evident that the arms on the rock-shaft may be adjusted so as to regulate as desired the movement of the valve, or of the timing device, or of the indicator relatively to the movement of the governor.

While I have described more or less precisely the details of construction, I do not wish to be understood as limiting myself thereto, as I contemplate changes in form, the proportion of parts, and the substitution of equivalents, as circumstances may suggest, or render expedient without departing from the spirit of my invention.

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

1. In a motor-driven vehicle, a motor for propelling the vehicle at various speeds, a motor-controller, a speed indicator driven in time relation with said motor so as to show the speed at which the vehicle is traveling, operative connections between said controller and said indicator for causing the controller to be actuated upon variations in the speed, said indicator including relatively movable coöperative dial and index members located within reach of an occupant of the vehicle, and said latter members being so arranged that relative movements may be effected between them by such occupant.

2. In a motor-driven vehicle, a motor for propelling the vehicle at various speeds, a motor-controller, a device driven in time relation with respect to said motor, connections between said controller and said device for causing the latter to operate the controller according to the speed, relatively movable coöperating index and dial members located within reach of an occupant of the vehicle, and said members for producing relative movements of said members.

3. In a motor-driven vehicle, a motor for propelling the vehicle at various speeds, a motor-controller, a device driven in time relation with respect to said motor, connections between said controller and said device for causing the latter to operate the controller according to the speed, relatively movable coöperating index and dial members located within reach of an occupant of the vehicle, operative connections between said device and said members for producing relative movements of said members, and said members being so arranged that relative movements between said members may be effected by such occupant.

4. In a motor-driven vehicle, an internal combustion engine for propelling the vehicle at various speeds, a controller for regulating the charge, a device driven in time relation with respect to said engine, connections between said controller and said device for causing the latter to operate the controller according to the speed of the engine, relatively movable coöperating index and dial members located within reach of an occupant of the vehicle, and operative connections between said device and said members for producing relative movements of said members.

5. In a motor-driven vehicle, an internal combustion engine for propelling the vehicle at various speeds, a controller for regulating the charge, a device driven in time relation with respect to said engine, connections between said controller and said device for causing the latter to operate the controller

according to the speed of the engine, relatively movable coöperating index and dial members located within reach of an occupant of the vehicle, operative connections between said device and said members for producing relative movements of said members, and said members being so arranged that relative movements between said members may be effected by said occupant.

6. In a motor-driven vehicle, an internal combustion engine for propelling the vehicle at various speeds, an ignition controller, a device driven in time relation with respect to said engine, connections between said controller and said device for causing the controller to be operated to advance or retard the ignition as the speed of the engine increases or decreases, relatively movable cooperating index and dial members located within reach of an occupant of the vehicle, operative connections between said device and said members for producing relative movements between said members, and said members being so arranged that relative movements between them may be effected by said occupant.

7. In a motor-driven vehicle, an internal combustion engine for propelling the vehicle at various speeds, a controller for regulating the charge, an ignition controller, a device driven in time relation with respect to said engine, connections between said controllers and said device for causing the latter to operate the controllers according to the speed of the engine, relatively movable coöperating index and dial members located within reach of an occupant of the vehicle, and operative connections between said device and said members for producing relative movements between said members.

8. In a motor-driven vehicle, a motor for propelling the vehicle at various speeds, a motor controller, a speed indicator driven in time relation with the motor so as to show the speed at which the vehicle is traveling, operative connections between said controller and said indicator for causing said controller to be actuated upon variations in the speed, said indicator including a graduated dial arranged within reach of an occupant of the vehicle together with an index movable over said dial, said index being arranged so that it may be grasped and moved across said dial by such occupant.

9. In a motor-driven vehicle, a motor for propelling the vehicle at various speeds, a motor controller, a device driven in time relation with respect to said motor, connections between said controller and said device for causing the latter to operate the controller according to the speed of the motor, a graduated dial arranged within reach of an occupant of the vehicle, an index member movable across said dial, and connections between said index member and said device for causing the device to move the index member into such positions on the dial as to indicate the speed at which the vehicle must travel.

10. In a motor-driven vehicle, a motor for propelling the vehicle at various speeds, a motor-controller, a device driven in time relation with respect to said motor, connections between said controller and said device for causing the latter to operate the controller according to the speed of the motor, a graduated dial arranged within reach of an occupant of the vehicle, an index member movable across said dial, connections between said index member and said device for causing the device to move the index member into such positions on the dial as to indicate the speed at which the vehicle must travel, and means for locking said index member against movement on the dial in a position to indicate any desired speed.

11. In a motor-driven vehicle, a motor for propelling the vehicle at various speeds, a motor-controller, a device driven in time relation with respect to said motor, connections between said controller and said device for causing the latter to operate the controller according to the speed of the motor, a graduated dial arranged within reach of an occupant of the vehicle, an index member movable across said dial, and connections between said index member and said device for causing the device to move the index member into such positions on the dial as to indicate the speed at which the vehicle must travel, said index member being arranged so as to permit it to be grasped and moved by such occupant relatively to the dial.

In testimony whereof, I sign this specification in the presence of two witnesses.

THOMAS B. JEFFERY.

Witnesses:

GEO. H. EDDY,

H. W. JEFFERY.