

C. M. BURTON & R. GARDNER.  
ENGINE STARTING DEVICE.

APPLICATION FILED JULY 20, 1910.

Patented June 27, 1911

2 SHEETS—SHEET 1.

996,060.

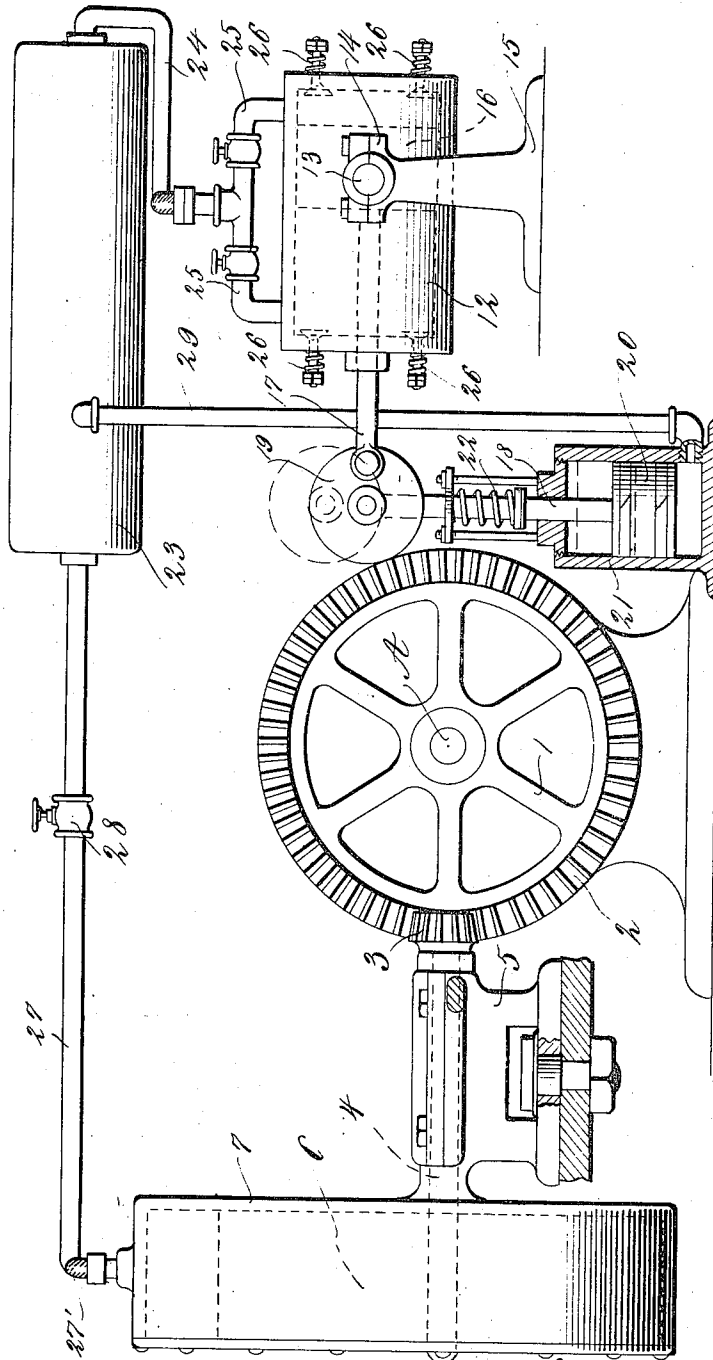


Fig. 1

Witnesses

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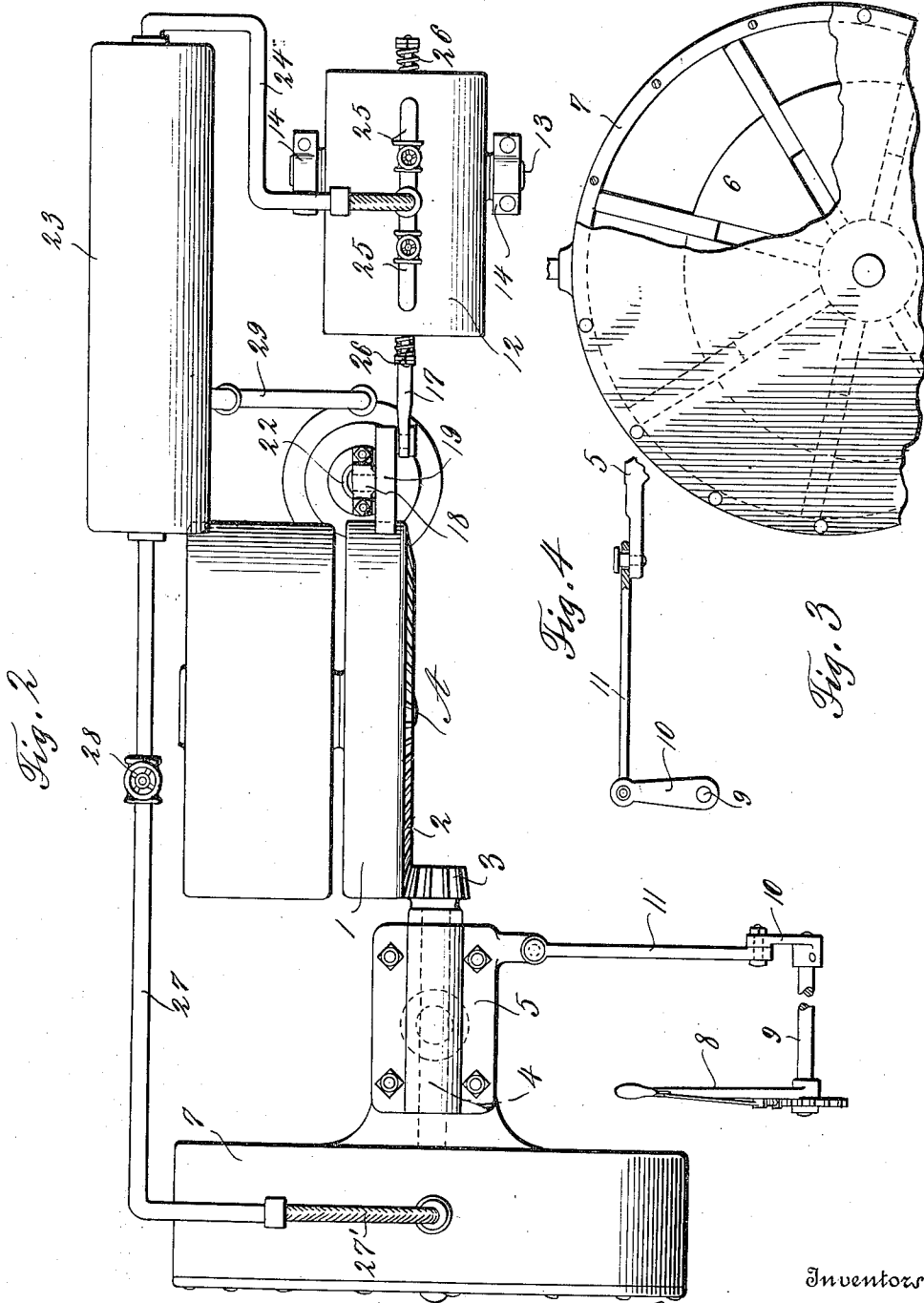


Fig. 1

Fig. 2

Fig. 3

Fig. 4

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# UNITED STATES PATENT OFFICE.

CHARLES M. BURTON AND RIO GARDNER, OF NEW YORK, N. Y.

ENGINE-STARTING DEVICE.

996,060.

Specification of Letters Patent. Patented June 27, 1911.

Application filed July 20, 1910. Serial No. 572,876.

*To all whom it may concern:*

Be it known that we, CHARLES M. BURTON and RIO GARDNER, citizens of the United States, residing at New York city, in the county of New York and State of New York, have invented certain new and useful Improvements in Engine-Starting Devices, of which the following is a specification.

The object of this invention is to provide a comparatively simple and efficient form of starting mechanism for explosive engines, one which is especially adapted to be used on automobiles or the like.

The invention eliminates the necessity of having to crank the ordinary explosive motor in the starting of the same, and an extremely compact and desirable arrangement of parts is embodied in the construction.

For a full understanding of the invention reference is to be had to the following detail description and the accompanying drawings, in which—

Figure 1 is a side elevation of the mechanism showing the preferred embodiment of the invention; Fig. 2 is a top plan view; Fig. 3 is a fragmentary view of the auxiliary motor having a side portion broken away, and Fig. 4 is a fragmentary view showing more clearly the means connecting the lever with the swiveled bracket.

Specifically describing the invention, in the drawings 1 denotes a drive wheel such as the fly wheel of the engine shaft, said fly wheel being of the ordinary type, constructed, however, with a bevel gear 2 at one side thereof. Meshing with the gear 2 is a pinion 3 carried by a short shaft 4 mounted in a suitable bearing carried by a swivel bracket 5. The pinion 3 is located at one end of the shaft 4 while supported on the opposite end of the shaft for rotation therewith is the rotary piston 6 of an auxiliary motor comprising the casing 7 inclosing said piston 6. A suitable lever 8 is mounted upon a rock shaft 9 the latter having an arm 10 connected by a link 11 with the base of the swivel bracket 5. By operation of the lever 8 the bracket 5 may be turned so as to throw the pinion 3 into and out of engagement with respect to the gear 2. An air compressor is provided in the form of a cylinder 12 having trunnions 13 supported by pillow-blocks 14 on a suitable base 15, permitting the cylinder 12 to rock when its piston 16 is reciprocated therein by means of the connection between the piston rod 17 and a friction

wheel 19. The friction wheel 19 is mounted upon the upper end of the piston rod 18, and a piston 20 is mounted in the cylinder 21. The parts 18, 19, 20 and 21 constitute a regulator controlling the position of the wheel 19 with respect to contact with the fly wheel 1. Normally a spring 22 coaxing with the piston rod 18 tends to force the piston 20 downwardly to cause the wheel 19 to remain in frictional contact with the fly wheel 1. A suitable air reservoir 23 is connected by the main pipe 24, and branch pipes 25, with the cylinder 12, the latter having suction valves 26 at opposite ends. The air from the reservoir is caused to pass therefrom to the auxiliary motor 6 through the pipe 27, and when the valve 28 in the length of the pipe 27 is opened, the pipe 29 connects the reservoir 23 with the lower ends of the cylinder 21 said arrangement of parts permitting of the following operation: Should it be desired to start the engine having the main shaft A on which the fly wheel 1 is mounted, the operator actuates the lever 8 so as to throw the pinion 3 into engagement with the gear 2. The valve 28 is then opened permitting air under pressure to enter the cylinder 7 of the auxiliary motor, said air rotating the piston 6 of said motor and causing the fly wheel to turn and start the engine. It will be evident that as soon as the air pressure in the reservoir 23 lowers a sufficient amount the pressure at the lower end of the cylinder 21 will be relieved and permitting the piston 20 to move downwardly until the wheel 19 is in contact with the fly wheel 1, whereupon the wheel 19 will be rotated operating the piston of the compressor 12 so as to supply additional air under pressure to the reservoir 23. When the pressure in the reservoir 23 becomes increased to the desired maximum said pressure will raise the piston 20 and also the wheel 19. When the wheel 19 is moved from contact with the fly wheel 1 the compressor 12 stops.

It is contemplated that the pipe 27 will have flexible action at 27' with respect to the auxiliary motor, and after the main engine has been started, the lever 8 will be operated to disengage the pinion 3 from the gear 2.

Having thus described our invention, what is claimed as new is:

In an engine starting device, the combination of a drive wheel provided with a bevel gear at one side thereof for rotation there-

with, a shaft, a pinion on one end of said shaft, a swiveled bracket having a bearing in which said shaft is mounted, a motor comprising a casing and piston and mounted  
5 on the other end of said shaft, a pressure reservoir, piping connecting the reservoir with the motor casing to supply a pressure medium to the latter and including a flexible portion permitting movement of the motor,  
10 and a lever operably connected with the swiveled bracket to move the latter into po-

sitions in which the pinion on said shaft will be engaged or disengaged with respect to the gear on the drive wheel.

In testimony whereof we affix our signatures in presence of two witnesses.

CHARLES M. BURTON.  
RIO GARDNER.

Witnesses:

ELMER T. SMITH,  
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