E. A. HALBLEIB.

AIR PUMP MECHANISM FOR ENGINES.

APPLICATION FILED AUG. 7, 1914.

**1,198,539.** Patented Sept. 19, 1916.

Fig. 1.

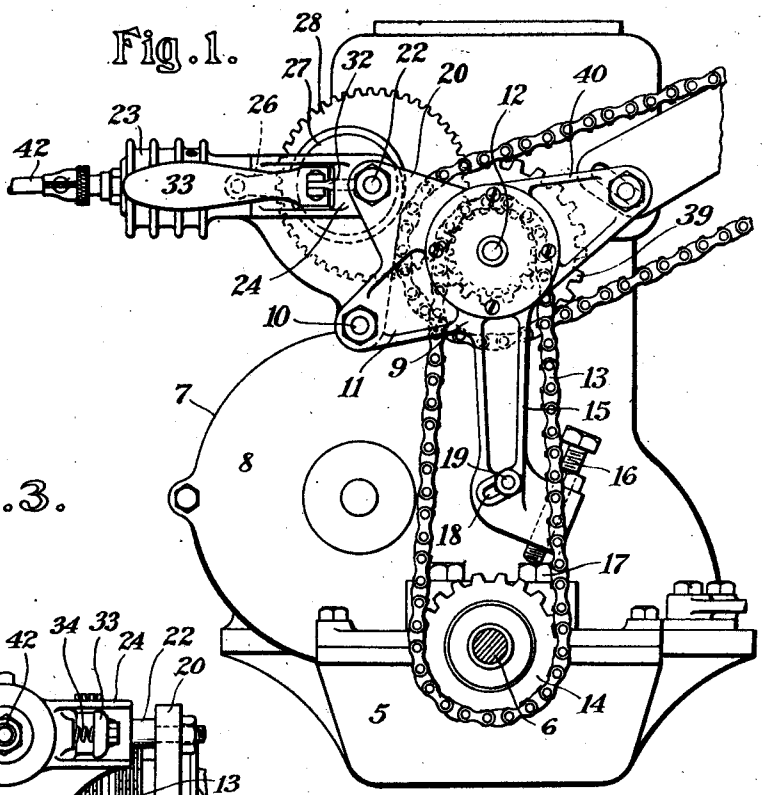



Fig. 3.

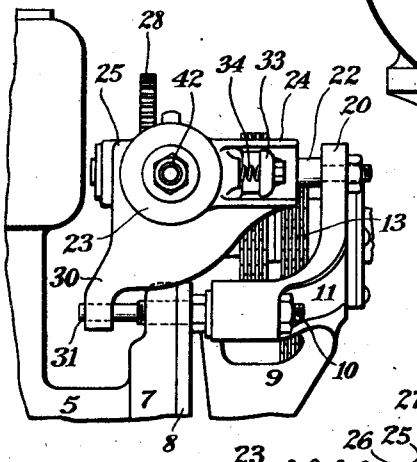
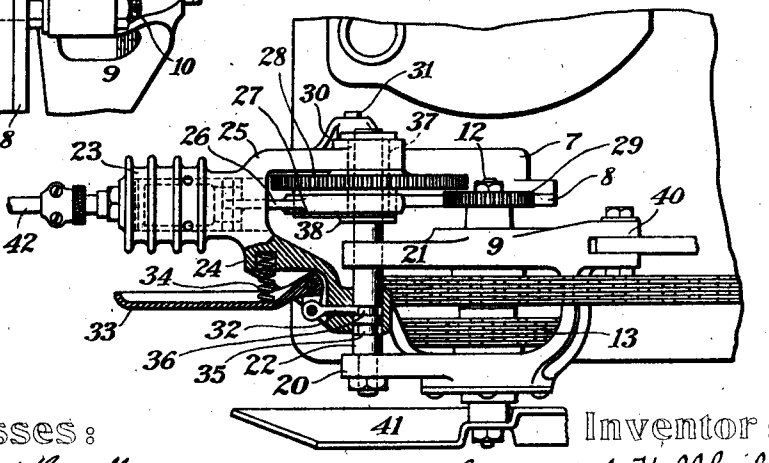



Fig. 2.




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# UNITED STATES PATENT OFFICE.

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## AIR-PUMP MECHANISM FOR ENGINES.

1,198,539. Specification of Letters Patent. Patented Sept. 19, 1916.

Application filed August 7, 1914. Serial No. 855,693.

*To all whom it may concern:*

Be it known that I, EDWARD A. HALBLEIB, a citizen of the United States, and resident of Rochester, in the county of Monroe and State of New York, have invented certain new and useful Improvements in Air-Pump Mechanism for Engines, of which the following is a specification.

This invention relates to mechanism by which an air-pump may be conveniently mounted upon, and connected with, an engine, particularly the internal-combustion engine of a motor-vehicle.

The object of the invention is to produce a simple and compact mechanism for mounting and driving an air-pump, and for throwing the pump into and out of operation as required, this mechanism being particularly adapted for convenient application to engines of well-known form without substantial alteration therein.

To the foregoing end the invention consists in the construction and arrangement of parts hereinafter described, as they are defined in the succeeding claims.

In the accompanying drawings: Figure 1 is a front-elevation of air-pump mechanism embodying the present invention, as applied to an internal-combustion engine of well-known form; Fig. 2 is a plan-view of the air-pump mechanism, partly in section; and Fig. 3 is a side-elevation of the mechanism, looking from left to right in Fig. 1.

The invention is illustrated as applied to an internal-combustion engine of well-known form, having the usual crank-case 5, in which the crank-shaft 6 is journaled, and provided also, at its forward end, with a gear-casing 7 having a removable cover 8. The pump-mechanism comprises a frame 9 which, for convenience of application and simplicity of construction, is pivotally mounted upon one of the studs, 10, which hold the cover 8 in place, this stud being suitably elongated for the purpose, and being embraced by the perforated end of an arm 11 of the frame 9.

The frame 9 supports a countershaft 12, through which the air-pump is driven, this countershaft being connected, by a sprocket-wheel and a sprocket-chain 13, with a sprocket-wheel 14 fixed on the crank-shaft 6. The pivotal mounting of the frame on the stud 10 affords convenient provision for adjusting the tension of the chain 13, and to maintain the parts in adjusted position the frame has a depending arm 15, provided, at its lower end, with a stop-screw 16 of which the lower end bears against any convenient point on the engine-frame preferably, as shown, one of the screws 17 which hold together one of the bearings of the crank-shaft 6. The arm 15 and the screw 16 prevent the frame 9 from swinging downwardly in consequence of the tension of the chain 13, and whenever this chain becomes unduly loose it may be tightened by turning the screw 16 downwardly in the arm 15, so as to swing the latter upwardly and to the right, thus causing the frame, as a whole, to swing upon the stud 10 and raise the countershaft 12.

Owing to the position of the arm 15, nearly in the plane of the chain 13, it will be apparent that this arm sustains almost directly the pull of the chain, and thus effectively resists any tendency of this pull to rock the frame 9 out of its normal plane, the countershaft and the sprocket-wheels being thus maintained in practically axial parallelism with the crank-shaft 6. In furtherance of this last function the arm 15 is guided, near its lower end, to prevent fore-and-aft movement, being provided for this purpose with a slot 18, which loosely embraces another stud 19 which holds the cover 8 in place, this stud being suitably elongated for the purpose and provided, at its forward end, with a nut to prevent forward movement of the arm 15. Since the slot 18 is concentric with the stud 10 it does not interfere with the pivotal adjusting movement of the frame as above described.

For the purpose of supporting the air-pump upon the frame 9 the frame has two arms 20 and 21, in which a rod 22 is fixed.

The cylinder 23 of the air-pump is integral with a frame comprising arms 24 and 25, which are perforated to receive the rod 22 loosely, these arms embracing the rod on opposite sides of the arm 21 on the frame 9. The piston of the air-pump is actuated by means of an eccentric-rod 26, coöperating with an eccentric 27 which is journaled concentrically with the rod 22. The eccentric is integral with a gear 28, which is adapted to be driven by a pinion 29 fixed on the rear end of the countershaft 12.

The rod 22 provides two points of support for the pump-frame, but to prevent the pump-frame from rocking on this rod a further support is provided by means of a downwardly and rearwardly-projecting arm 30 on the frame, which is perforated to loosely embrace the rearwardly-projecting end 31 of the stud 10, as shown particularly in Fig. 3.

In the drawings the gear 28 is shown as out of mesh with the pinion 29, the pump being thus in its normal inoperative position. When it is necessary to use the pump it is thrown into operation by sliding it, as a whole, forwardly upon the rod 22 and the stud 10, thus bringing the gear and the pinion into mesh with each other. To retain the pump in either of its positions it is provided with a latch 32, which slides in the arm 24 and is adapted to engage either of two slots 35 and 36 in the rod 22. This latch is actuated by a hand-lever 33, and by a spring 34 which normally maintains the latch in operative position.

In order to cause the eccentric and the gear to participate in the sliding movement of the pump just described, these parts are not journaled directly upon the rod 22, but are journaled upon a sleeve 37 which is fixed in, and projects forwardly from, the arm 25 of the pump-frame, this sleeve being slidable upon the rod 22 and being provided with a flange 38, at its forward end, to maintain the eccentric and the gear in proper position with respect to the pump-cylinder.

The countershaft 12 is shown as provided with another sprocket-wheel 39, while the frame 9 is shown as provided with another arm 40. These parts may be employed in connection with the operation of an electric generator, but they have no function in connection with the present invention.

Since the countershaft 12 occupies substantially the position normally occupied by a fan-shaft in an engine of the type illustrated, the countershaft may be employed in place of such fan-shaft, being provided, as shown in Fig. 2, with a fan 41 on its forward end.

The air pump above described may be used for inflating tires, or for similar purposes, being provided with a flexible tube or connection 42 for this purpose. When it is desired to throw the pump into operation, the engine being in operation at the time, it is necessary only to grasp the pump cylinder and the handle 33 so as to draw them together and disengage the latch 32 from the groove 36, whereupon the pump may be slid forwardly to engage the gear 28 with the pinion 29, and the pump will be retained in this position by the latch and the groove 35. When the pump is to be thrown out of operation it is necessary merely to push rearwardly upon the handle 33, thus disengaging the latch and at the same time forcing the pump rearwardly to its normal inoperative position.

My invention is not limited to the embodiment thereof hereinbefore described and illustrated in the accompanying drawings, but it may be embodied in various other forms within the nature of the invention, as it is defined in the following claims.

I claim:—

1. In air-pump mechanism, the combination of a fixed shaft; an eccentric and a gear fixed together and rotatable around said shaft; a piston connected with the eccentric; a cylinder in which the piston moves; a frame supporting the cylinder and slidingly mounted on said shaft; and a pinion located adjacent the shaft; the frame and the eccentric and gear being slidable simultaneously along the shaft to bring the gear into or out of engagement with the pinion.

2. In air-pump mechanism, the combination of a cylinder, a piston, piston-actuating mechanism including a gear, and a frame connecting and supporting these parts, of a pinion adapted to mesh with and drive said gear to actuate the pump; a support upon which said frame is mounted to slide in a direction parallel with the axis of said pinion, whereby the gear may be moved into and out of engagement with the pinion, and manually-releasable means for retaining the frame against such movement.

3. In an air-pump mechanism, the combination, with an engine and a sprocket-wheel actuated thereby, of a countershaft provided with a sprocket-wheel; a chain connecting the sprocket-wheels; a frame connected with, and supported by, the engine but movable thereon in a direction to adjust the tension of the chain; an air-pump supported by, and movable with, said frame; and driving-connections between the countershaft and the air-pump, said connections being movable into and out of operative position.

4. In an air-pump mechanism, the combination, with an engine and a sprocket-wheel actuated thereby, of a countershaft provided with a sprocket-wheel; a chain connect-

ing the sprocket-wheels; a frame connected with, and supported by, the engine but movable thereon in a direction to adjust the tension of the chain; a pinion on the countershaft; and an air-pump connected with, and supported by, said frame and provided with piston-actuating mechanism including a gear; the air-pump being movable, upon the frame, to throw the gear into or out of mesh with the pinion.

In testimony whereof, I affix my signature in presence of two witnesses.

EDWARD A. HALBLEIB.

Witnesses:

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FARNUM F. DORSEY.