July 26, 1938. D. R. STAPLES 2,124,756

ENGINE CONTROL

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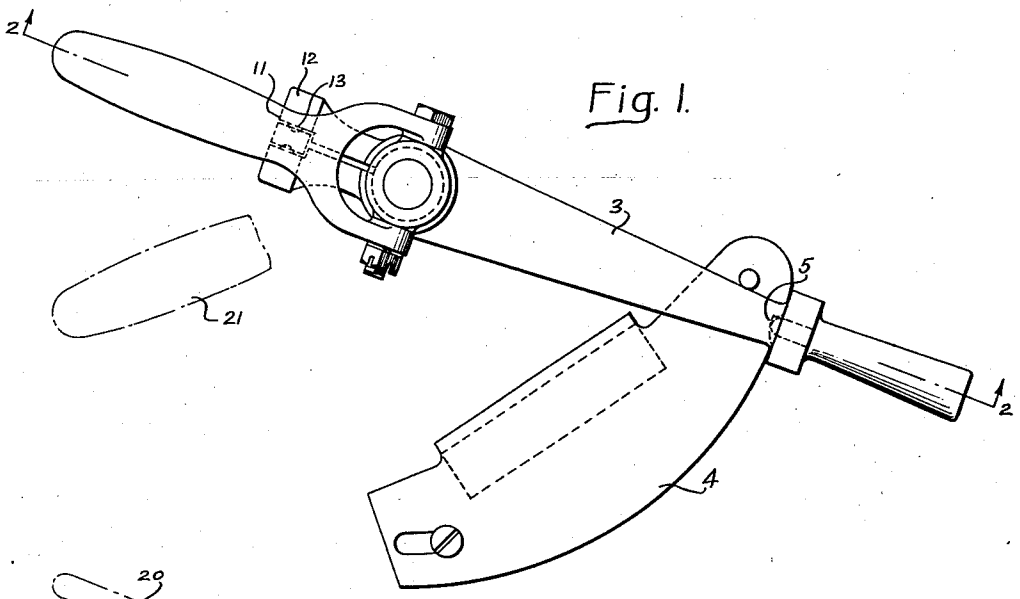


Fig. 1.

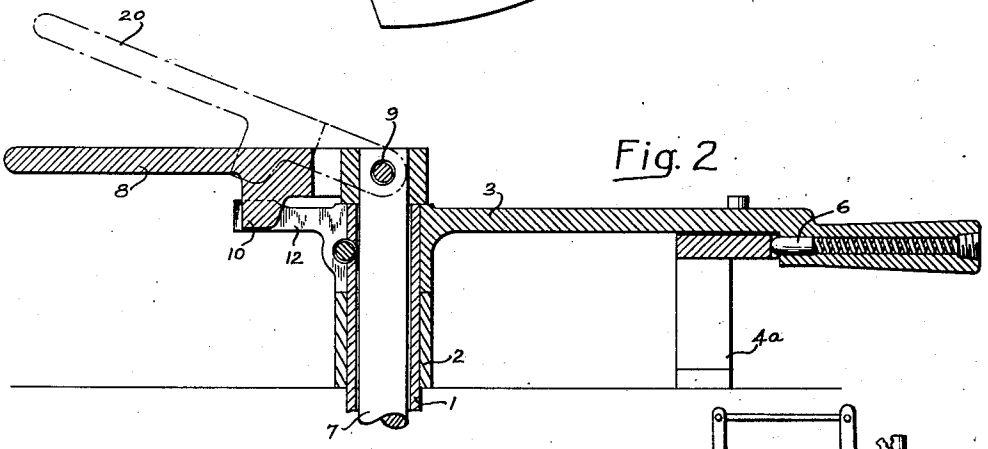


Fig. 2

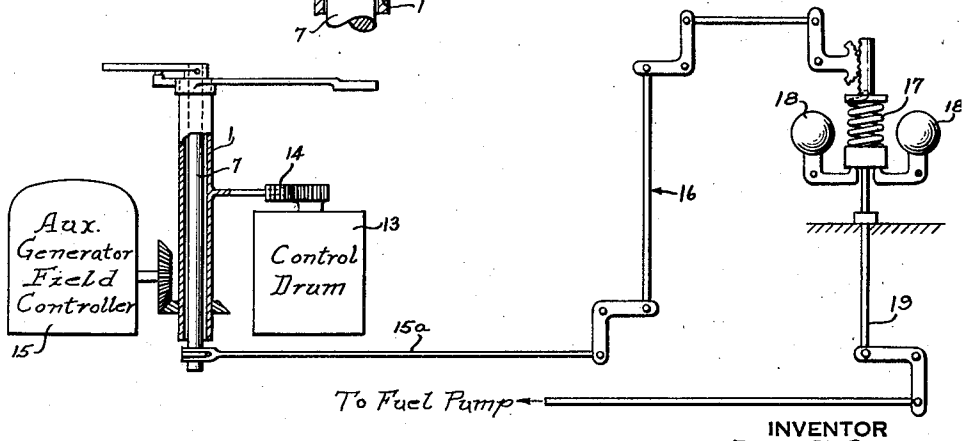


Fig. 3

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ENGINE CONTROL

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1 Claim. (Cl. 74—480)

This invention relates generally to engine speed control means and more particularly to a system of hand levers for controlling the idling, running and shutdown positions of an engine.

In the operation of internal combustion engines, especially of the Diesel type such as are employed in Diesel locomotives, it is desirable to conveniently and quickly shut down the engine, particularly without undue interference with various control mechanisms normally associated therewith.

It is an object of my invention to provide an improved system of hand levers that will permit the engine to be operated at an idling speed and yet will permit the engine to be shut down quickly and conveniently without disturbing the idling setting. Another object is to provide such an improved hand lever system that is relatively simple and economical in construction, maintenance and operation and is compact and rugged, combined with flexibility and ease of manipulation while at the same time being positive in its action.

Other objects and advantages will be more apparent to those skilled in the art from the following description of the accompanying drawing in which:

Fig. 1 is a plan view of my improved lever system;

Fig. 2 is a vertical sectional view taken substantially on the line 2—2 of Fig. 1;

Fig. 3 is a diagrammatic view illustrating the application of my improved lever system to an engine governor and fuel control.

In the particular embodiment of the invention such as is disclosed herein merely for the purpose of illustrating one specific form among possible others that the invention might take in practice, I have shown in Fig. 2 an external hollow shaft 1 suitably journalled in a bearing 2 while a main speed control lever 3 is secured to shaft 1. This lever is movable over a quadrant 4 suitably supported by a bracket 4a on any stationary part of the locomotive. A notch 5 is formed in the outer surface of quadrant 4 to receive a spring pressed detent 6 when the lever is in its idling position. This lever is normally connected to an inner shaft 7 for simultaneous rotation therewith through a shutdown lever 8 pivotally connected at 9 to shaft 7. A lug 10 depending from lever 8 is receivable in a slot 11 of a projection 12 which extends radially from main lever 3. A suitable yieldable detent generally indicated at 13 is normally adapted to engage lug 10 to frictionally hold lever 8 when in its down position as shown in Fig. 2.

As a result of the foregoing lever construction, it is seen that movement of main lever 3 will simultaneously rotate the outer and inner shafts 1 and 7 thereby simultaneously actuating any usual type of control drum 13 through a gear segment and pinion 14 together with operation of an auxiliary generator field controller 15 and of a governor adjusting link 15a. It will be understood that the control drum and field controller are merely diagrammatically illustrative of any usual and well-known types of electrical control apparatus for the electric motors of an internal combustion engine electric locomotive and need not be described further as they do not per se form a part of my present invention. Governor control link 15a is diagrammatically illustrated herein as being connected through a bellcrank and linkage system generally indicated at 16 to adjust a governor spring 17. As is well-known, adjustment of spring 17 varies the reactive forces against centrifugal flyballs 18 thereby requiring an increased or decreased speed for vertically moving a fuel pump adjusting rod 19.

In operation, the engine operates at an idling speed when lever 3 is in the position shown in Fig. 1. To increase the speed, lever 3 is moved clockwise over quadrant 4 thereby adjusting control drum 13, controller 15 and reducing the reactive force of spring 17 whereby the engine will operate at a higher rate of speed by effecting a greater vertical movement of rod 19. However, with the main lever 3 preferably in its idling position it is desirable to be able to conveniently and promptly shut down the engine and to effect this shutdown without operating other control elements such as the drum 13 and controller 15. This is easily accomplished herein merely by the operator raising shutdown lever 8 to its dotted line position shown at 20, Fig. 2, and thereafter moving the same in a counterclockwise direction to the dotted line position shown at 21, Fig. 1. This movement of lever 8 rotates inner shaft 7 independently of outer shaft 1, thereby operating the governor linkage 15a and 16 to increase the force on governor spring 17 to move rod 19 downwardly to its full shutdown position. Such shutdown movement thereby supplements any speed reducing movement of lever 3 when the same is moved from a point of higher adjustment to the idling position.

From the foregoing disclosure, it is seen that my improved lever system is not only simple and compact in its construction, operation and maintenance but is also most convenient, accessible and positive in operation while still maintaining full coordination between the two levers. Also the arrangement is such that shutdown lever 8 is directed in the opposite direction from lever 3 so that there is no probability of the operator's clothing accidentally catching in shutdown lever 8 and thereby inadvertently manipulating this lever to shut down the engine.

It will of course be understood that various changes in details of construction and arrangement of parts may be made by those skilled in the art without departing from the spirit of the invention as set forth in the appended claim.

I claim:

In combination, a pair of coaxial shafts, a main control lever secured to one of said shafts and provided with a vertically extending recess, a supplemental lever pivotally connected to the other of said shafts for movement in a plane containing the shaft axis, and a lug projecting from said supplemental lever so as to move axially into engagement with said recess whereby during said engagement said supplemental lever lies in a plane substantially normal to the shaft axis and is adapted to be moved axially to a slightly inclined position wherein said lug is disengaged from said recess thereby to allow said supplemental lever to move independently of the main lever.

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