To all whom it may concern:

Be it known that I, LEE S. CHADWICK, citizen of the United States, residing at Pottstown, Pennsylvania, have invented certain new and useful Improvements in Muffler Cut-Out Mechanism, of which the following is a specification.

My invention relates to improvements in muffler cut out mechanism for automobiles driven by internal combustion engines.

Among the objects of the invention are to provide a perfectly muffled car that can be readily converted into a racing car absolutely free from back pressure in the exhaust, thereby securing maximum power; to provide a cut-out that can be easily opened and in a manner which will permit of the operator testing the firing of each cylinder without removing the exhaust manifold; and to provide a valve arrangement by which perfectly tight joints may be secured, and the manifold or valves from their position on the engine.

With these and other objects in view, the invention includes the novel features of construction and arrangement and combination of parts hereinafter described and particularly pointed out in the claims.

The invention is illustrated in the accompanying drawings, in which—Figure 1 is a side elevation showing the exhaust manifold and attached parts, the exhaust pipe and part of the muffler, and the operating pedal with its connections to the valves, the cylinders and automobile frame and body being omitted for clearness of illustration of the parts constituting the present invention. Figure 2 is an enlarged view of one of the exhaust outlets, and Figure 3 is a transverse sectional view taken centrally through the outlet port of Figure 2 and through one of the cylinders to show the relative arrangement of the parts.

Referring by reference characters to these figures, the numeral 4 designates the exhaust manifold and 5 the exhaust pipe connecting the manifold with the muffler 6 of the ordinary or any desired construction. The manifold 4 is connected in the ordinary or any desired manner to the exhaust ports of the engine cylinders as clearly shown in Figure 3, in which 7 designates the cylinder, 8 the inlet valve, and 9 the exhaust valve. The manifold is provided, opposite each connection 9, with the exhaust port, with a port or passage discharging directly into the open air. This port or passage is preferably formed by a pipe 10 arranged to discharge through an opening in the engine hood, a portion of which is shown at 11.

At the juncture of each pipe 10 with the manifold is provided a valve seat 12, against which seats a valve 13 which is carried by an arm 14 mounted on a rock shaft 15 extending longitudinally of the manifold beneath all the valves. The valve is normally held closed by the action of one or more springs 16 having their opposite ends connected respectively to devices such as eye pieces 17 and 18 on the arm 14 and engine respectively.

The rock shaft 15 is rotated on its axis to open the valves and permit the engine cylinders to exhaust directly through pipes 10 into the open air by a bell crank lever which has one arm 19 connected by a link 20 with an arm 21 on the rock shaft, the other arm 22 being connected to any suitable device within reach of the operator. A convenient means of operation is a foot pin or pedal 23 pivotally connected at its lower end with one arm of a bell crank lever 24, the other arm of which is connected by a rod 25 with the bell crank arm 22.

The pedal 23 is preferably provided with a shoulder 29 for engaging the edge of the opening in the guide plate 26 for retaining the valves in open position.

It will be observed that as the valves are opened they are swung inward and downward until they rest in the bottom of the manifold in the position shown in dotted lines in Figure 3, leaving a free and unobstructed passage for the exhaust. When, however, the valves are seated, the pressure of the exhaust gases tends to force them even more tightly against their seats, thus avoiding any danger of leakage.

In order to enable the valves to be readily ground when necessary, each valve is rotatably connected to its carrying arm by fastening it securely on the inner end of a pin 27 which is journaled in the end of the arm 14, the head of the pin being provided with a notch 28 for the engagement of a screw driver or like tool by which the valve may be rotated upon its seat without disconnecting any of the parts.

It will be obvious that this invention is applicable to engines comprising any number of cylinders. With six cylinder engines, it is not absolutely necessary to provide an ex-
haust pipe for each cylinder, as I might provide three exhaust pipes, one for each pair of cylinders.

By arranging this system of cut outs on a racing car, it becomes possible to drive a high speed racing car through crowded city streets without danger of frightening people and teams due to excessive noise, the engine running as quietly as any large car designed for city use, and yet the car may be instantly converted into a racing car with all the advantages of the racing car with the manifold removed.

Having thus described my invention what I claim is:

1. In a motor having a plurality of cylinders, an exhaust manifold common to all said cylinders and connected thereto, a muffler connected with said manifold, said manifold having ports substantially opposite the exhaust ports of the engine whereby the cylinders may exhaust directly into the atmosphere, and valves for closing said ports in the manifold.

2. In a motor car, an exhaust manifold, a suitable muffler connected thereto, said manifold having discharge ports provided with suitable valve seats, a rock shaft in proximity to said manifold having arms corresponding to said ports, valves rotatably mounted on said arms with means whereby they may be rotated while seated on the valve seats, and means for operating the rock shaft.

3. In a motor car an exhaust manifold, a suitable muffler connected thereto, a plurality of discharge ports opening laterally from said manifold, a rock shaft journaling below said ports, curved arms on said rock shaft projecting into the ports, valves mounted on the ends of said arms, and means for rocking said shaft to cause the arms to carry the valves into the bottom of the manifold to open said exhaust ports.

4. In a motor car the combination with a plurality of engine cylinders, of an exhaust manifold connected to the exhaust ports of said cylinders and having discharge ports substantially opposite said exhaust ports of the engine whereby the cylinders may exhaust directly into the atmosphere, valves for normally closing said ports, said valves being arranged to swing into the manifold out of line with the exhaust and means for simultaneously operating all said valves.

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

LEW S. CHADWICK.

Witnesses:
F. A. BELLows,
JESSE R. EVANS.