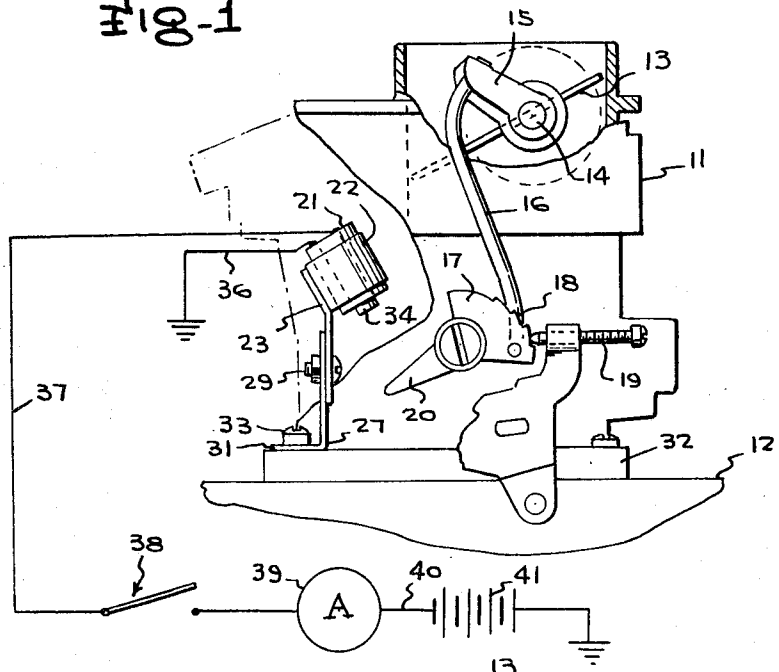
Aug. 2, 1966 J. M. PURCELL 3,263,973

CHOKE RELEASE

Filed Nov. 22, 1963

Fig-1



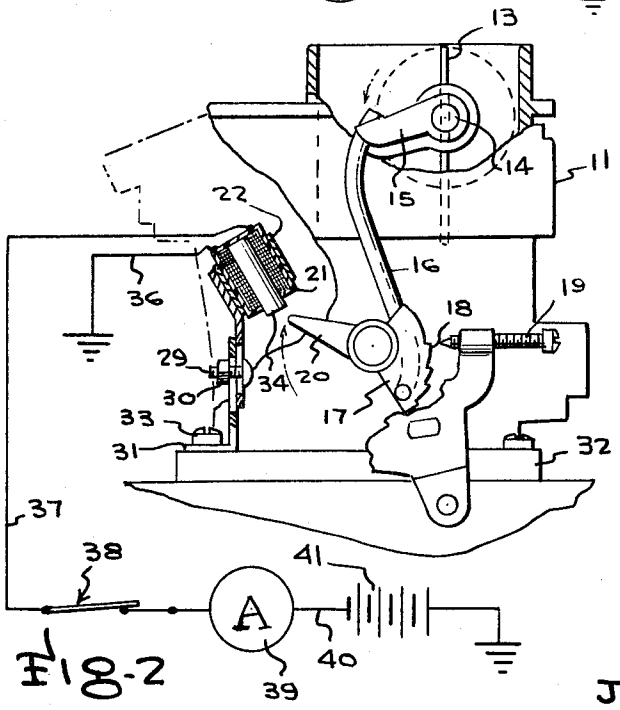


Fig-2

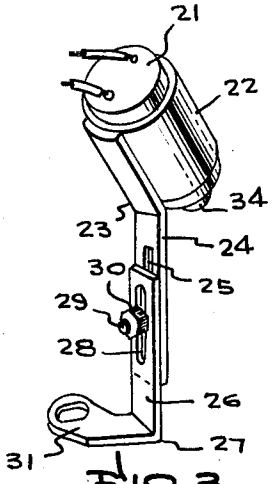


Fig-3

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CHOKE RELEASE

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This invention relates to motor vehicle internal combustion engines, and more particularly to means to control the choke valve of a carburetor of the type provided with an automatic choke, whereby to enable the choke valve to be opened after the internal combustion engine has started.

A main object of the invention is to provide a novel and improved means for controlling the position of the choke valve in a motor vehicle provided with an automatic choke so as to enable the choke valve to be opened after the engine has started and is running, whereby to avoid any tendency for the engine to load up with gas and to avoid flooding the engine with excessive gas in liquid form which tends ordinarily to wash away the lubricating oil from the piston surfaces and causes excessive wear.

A further object of the invention is to provide an improved means for releasing the choke valve of an internal combustion engine provided with an automatic choke after the engine starts and before the automatic choke receives enough heat to cause the choke valve to open by normal operation of the automatic choke, the device being relatively simple in construction, being easy to install on the internal combustion engine of a motor vehicle provided with an automatic choke, and being reliable in operation.

A still further object of the invention is to provide an improved choke valve release attachment for use on the internal combustion engine of a motor vehicle of the type provided with an automatic choke, the attachment involving inexpensive components, being readily adjustable to suit the physical requirements of the carburetor assembly with which it is to be employed, being compact in size, and being adapted to be mounted on the base flange of a conventional carburetor without requiring any modification of the carburetor.

A still further object of the invention is to provide an improved attachment for use on the internal combustion engine of a motor vehicle provided with an automatic choke of the type including a fast idle cam, the attachment being adapted to be installed in a position adjacent a projecting portion of said fast idle cam and to act thereon in a manner to open the choke plate of the associated carburetor when desired, so as to unload unvaporized gasoline from the engine during starting and before the automatic choke has received enough exhaust heat to open it.

Further objects and advantages of the invention will become apparent from the following description and claims, and from the accompanying drawings, wherein:

FIGURE 1 is a side elevational view, partly in vertical cross section, of the carburetor of a typical motor vehicle internal combustion engine, the carburetor being of the type provided with an automatic choke, and the carburetor being provided with an improved chokeplate-releasing attachment according to the present invention.

FIGURE 2 is a view generally similar to FIGURE 1, but showing the electromagnet of the attachment in an energized condition, whereby the adjacent high idle lever arm is attracted thereto and the choke plate is held in an open position, allowing the unvaporized gasoline to be unloaded from the engine.

FIGURE 3 is an enlarged perspective view of the electromagnet and its supporting bracket, as employed in FIGURES 1 and 2.

Referring to the drawings, **11** designates a conventional carburetor employed with an internal combustion engine

12, associated with a motor vehicle. The carburetor **11** is provided with an automatic choke asembly which controls the position of the choke plate **13**, the choke plate **13** being mounted on a shaft **14** having an arm **15** which is connected by a link rod **16** to the conventional fast idle cam **17**, the cam having a stepped peripheral edge **18** which is engageable by the end of a fast idle adjusting screw **19** to limit the closed position of the choke plate **13**.

The conventional fast idle cam **17** is usually provided with a projection or arm, for example, a high idle lever **20**. It will be noted that in a typical arrangement illustrated in FIGURE 1, the choke plate **13** is illustrated in its substantially closed position, namely, in the position it would assume with a cold engine, the automatic choke assembly being provided with thermostatic spring means which, upon receiving heat from the engine, rotates the shaft **14** in a counterclockwise direction, as viewed in FIGURE 1, causing the choke plate **13** to move to an open position. This movement can also be obtained by rotating the fast idle cam **17** in a clockwise direction from the position of FIGURE 1, whereby the link rod **16** acts on the arm **15** to rotate the shaft **14** in a counterclockwise direction.

In accordance with the present invention, an electromagnet **21** is mounted in a position adjacent to the projection **20** of the fast idle cam **17** and arranged so that upon energization thereof it will attract the arm **20**, which is of magnetic material, and cause the arm **20** to swing from the position of FIGURE 1 to the position of FIGURE 2, thus opening the choke plate **13**. The electromagnet **21** is secured in a generally cylindrical supporting sleeve **22** which is in turn fastened on a supporting arm **23**. The arm **23** has an angled lower end portion **24** which is formed with a longitudinal slot **25**. The lower end portion **24** is adjustably secured to the upstanding arm **26** of an angle bracket **27**, the arm **26** being provided with a longitudinal slot **28**, and the slotted arm portions **24** and **26** are secured together by a bolt **29** extending through the aligned slots **25** and **28**. Thus, the member **23** is adjustably secured to the member **27** and is held in adjusted position relative thereto by a nut **30** threaded on the bolt **29**. The member **27** includes the apertured foot portion **31** which is mounted on the base flange **32** of carburetor **11** by one of the fastening bolts **33** employed to secure the flange **32** to the internal combustion engine **12**. As shown in FIGURES 1 and 2 the bracket assembly defined by the members **22, 23** and **27** can be easily installed on the base flange of a conventional carburetor and can be adjusted so that the electromagnet **21** carried thereby will be positioned adjacent to a projecting portion of the fast idle cam associated with the automatic choke of the engine, for example, adjacent to the high idle lever member **20**, as shown in the typical embodiment illustrated in the drawings, the core **34** of the electromagnet being positioned sufficiently close to the arm **20** so that the arm will be attracted thereto when the electromagnet is energized. In the typical installation illustrated in the drawings, the core **34** is located above and adjacent to the projection **20** so that the projection is elevated when the electromagnet becomes energized, causing the choke plate **13** to rotate in a counterclockwise direction from the position of FIGURE 1 to the position of FIGURE 2, as above explained.

Electromagnet **21** has one terminal thereof connected to the frame of the vehicle, as illustrated by the ground wire **36**, and has its other terminal connected by a wire **37** through a manually controlled switch **38** and the motor vehicle ammeter **39** to the ungrounded lead **40** associated with the vehicle battery **41**. The switch **38** is located on the vehicle dashboard or in any other position convenient to the operator. The electromagnet **21** can therefore be energized by closing the switch **38**.

In starting the engine, the choke plate **13** will normally

be in a closed position, such as shown in FIGURE 1, and upon starting, in many instances, the engine will tend to load up with gasoline before the automatic choke receives enough heat from the engine to open the choke plate 13 to prevent such loading. The operator can avoid the loading up of the engine with gasoline after the engine has started by closing the switch 38, which energizes the electromagnet 21, whereby the core 34 of the electromagnet exerts an attractive force on the projection 20, rotating the fast idle cam 17 from the position of FIGURE 1 to the position of FIGURE 2, thereby swinging the choke plate 13 to its open position. The electromagnet 21 may be maintained energized as long as necessary, for example, until the automatic choke has received enough heat from the engine to hold the choke plate 13 in its open position.

As will be readily apparent, the bracket assembly supporting the electromagnet 21 can be readily adjusted by adjusting the connection between the members 24 and 26 to position magnetic core 34 sufficiently close to the projection 20 to insure attraction of said projection by the electromagnet when the electromagnet is energized. Furthermore, the choke plate 13 can be opened to any desired degree by energization of electromagnet 21 by adjusting the bracket assembly relative to the projection 20 to a position such that upon energization of the electromagnet the projection 20 will be swung through an angle sufficient to open the choke plate 13 to the desired degree.

The choke plate release attachment described herein may be employed mainly for holding the choke plate 13 open during the warm-up period of the engine before the automatic choke receives enough heat to open the choke plate sufficiently to prevent loading up of the engine with gasoline. It may also be employed to open the choke plate in the event that the automatic choke becomes inoperative or becomes sluggish in operation.

While a specific embodiment of an improved choke release attachment for the internal combustion engine of a motor vehicle has been disclosed in the foregoing description, it will be understood that various modifications within the spirit of the invention may occur to those skilled in the art. Therefore, it is intended that no limitations be placed on the invention except as defined by the scope of the appended claims.

What is claimed is:

1. In a motor vehicle having an internal combustion engine provided with a carburetor including an automatic choke, said automatic choke being of the type comprising a pivotally mounted fast idle cam connected by a link to the choke plate of the carburetor, said cam being adapted to rotate to a position substantially closing the choke plate when the engine is cold, an arm of magnetic material rigidly secured to and projecting from said cam, an electromagnet mounted adjacent said cam in a position to attract said arm and rotate said cam toward a position opening the choke plate, and a manually controlled energizing circuit connected to said electromagnet, whereby said electromagnet can be at times energized to rotate said cam toward said last-named position and open the choke plate to prevent loading the engine with unvaporized fuel.

2. In a motor vehicle having an internal combustion engine provided with a carburetor including an automatic choke, said automatic choke being of the type comprising a pivotally mounted fast idle cam connected by a link to the choke plate of the carburetor, said cam being adapted to rotate to a position substantially closing the choke plate when the engine is cold, an arm of magnetic material rigidly secured to and projecting from said cam, an adjustable bracket mounted on the engine adjacent said cam, an electromagnet mounted on said bracket in a position to attract said arm and rotate said cam toward a position opening the choke plate, and a manually controlled energizing circuit connected to said electromagnet, whereby said electromagnet can be at times energized to rotate said cam toward said last-named position and open the choke plate to prevent loading the engine with unvaporized fuel.

3. In a motor vehicle having an internal combustion engine provided with a carburetor including a bottom mounting flange secured to the engine and an automatic choke, said automatic choke being of the type comprising a pivotally mounted fast idle cam connected by a link to the choke plate of the carburetor, said cam being adapted to rotate to a position substantially closing the choke plate when the engine is cold, an arm of magnetic material rigidly secured to and projecting from said cam, an adjustable bracket mounted on the mounting flange adjacent said cam, an electromagnet mounted on said bracket in a position to attract said arm and rotate said cam toward a position opening the choke plate, and a manually controlled energizing circuit connected to said electromagnet, whereby said electromagnet can be at times energized to rotate said cam toward said last-named position and open the choke plate to prevent loading the engine with unvaporized fuel.

4. In a motor vehicle having an internal combustion engine provided with a carburetor including a bottom mounting flange secured to the engine and an automatic choke, said automatic choke being of the type comprising a pivotally mounted fast idle cam connected by a link to the choke plate of the carburetor, said cam being adapted to rotate to a position substantially closing the choke plate when the engine is cold, an arm of magnetic material rigidly secured to and projecting from said cam, an adjustable bracket mounted on the mounting flange adjacent said cam, said bracket having a vertically adjustable top portion, an electromagnet secured on said top portion in a position to attract said arm and rotate said cam toward a position opening the choke plate, and a manually controlled energizing circuit connected to said electromagnet whereby said electromagnet can be at times energized to rotate said cam toward said last-named position and open the choke plate to prevent loading the engine with unvaporized fuel.

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