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AUTOMATIC FLUID REGULATING DEVICE.

APPLICATION FILED JAN. 8, 1920.

1,375,555. Patented Apr. 19, 1921.

FIG. 1.

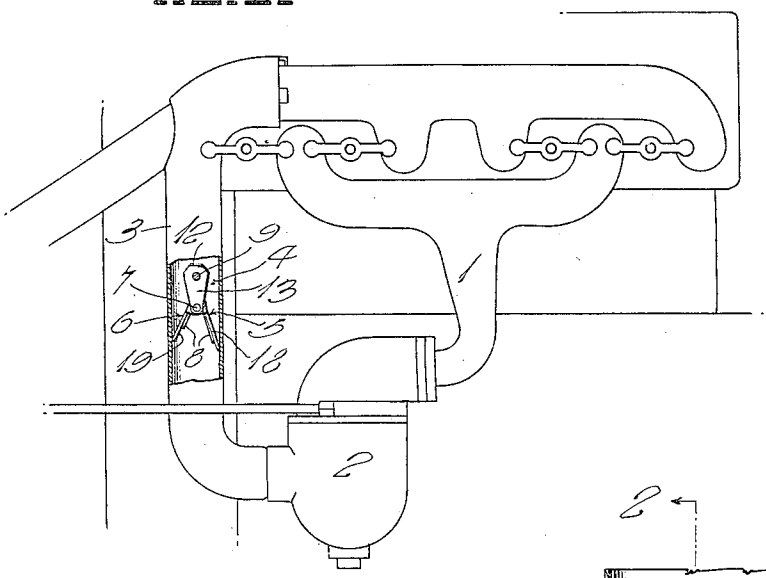


FIG. 2.

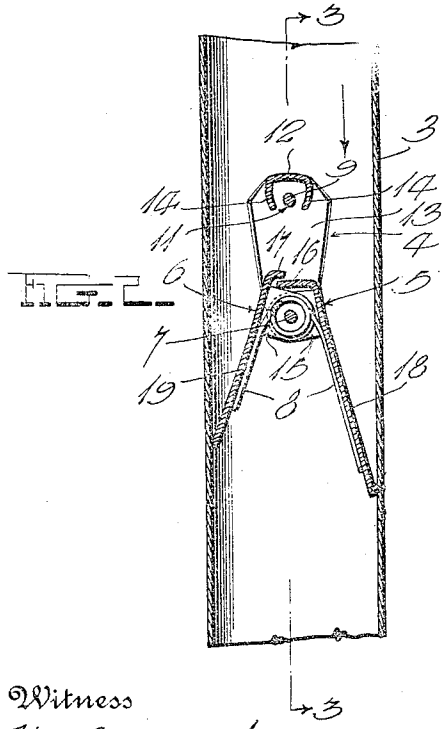
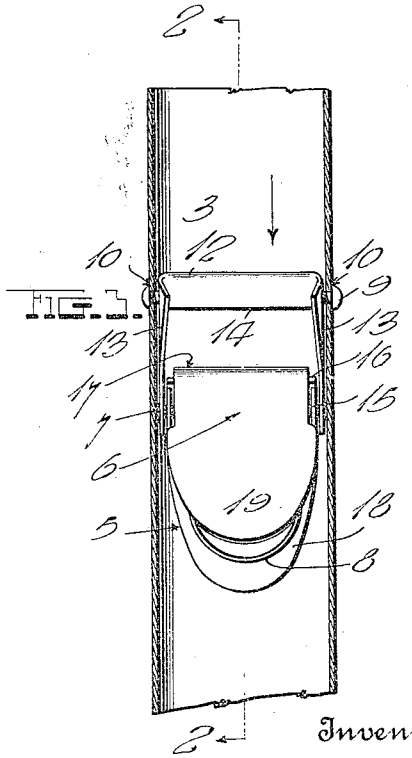


FIG. 3.



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AUTOMATIC FLUID-REGULATING DEVICE.

1,375,555. Specification of Letters Patent. Patented Apr. 19, 1921.

Application filed January 8, 1920. Serial No. 350,080.

To all whom it may concern:

Be it known that I, WILLIAM E. BROWN, a citizen of the United States, residing at Ashtabula, in the county of Ashtabula and State of Ohio, have invented certain new and useful Improvements in Automatic Fluid-Regulating Devices; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to fluid-regulating devices, and more specifically to an improved air-regulating device which is especially useful in connection with the pipe or passage which supplies hot air to the carbureter of an internal combustion engine.

An object of the invention is to generally improve upon devices of this character by providing an improved unitary structure that can be quickly and easily attached to the interior of an air-pipe or fluid-passage without changing the latter except to bore a small hole therethrough to provide a bearing for a rod or pivot which supports the device within the air-pipe or fluid-passage.

A further object is to provide a device of this character which is entirely automatic in operation and provides an exceedingly great range of variations in the volume of air it permits to pass through the passage.

Other objects and advantages will be pointed out and implied by the following details of description in connection with the accompanying drawings in which:

Figure 1 is a view partly in side elevation and partly in vertical section, showing the application of this device in connection with the intake manifold, carbureter and hot-air-pipe of an engine.

Fig. 2 is an enlarged vertical sectional view illustrating my improved fluid-controlling device within a fragmental portion of the air-pipe or fluid-passage, the section being taken along line 2—2 of Fig. 3.

Fig. 3 is a view showing the device in elevation within a fragmental portion of the fluid-passage, the latter being shown in vertical section along the line 3—3 of Fig. 2.

Referring to these drawings in detail, in which similar reference characters correspond with similar parts throughout the several views, and in which the intake manifold 1, carbureter 2, hot-air-pipe 3 and other parts of the engine are shown merely to illustrate the application of my invention, the invention consists of the construction and arrangement of elements hereinafter specifically described as follows:

As a unitary article of merchandise, the device comprises a substantially U-shaped yoke or support 4, two passage-closing plates 5 and 6, a pivot or rod 7 which secures the plates together and to the yoke 4, and a spring 8 which surrounds the pivot or rod 7 and presses outward against the plates 5 and 6. A supporting rod or pivot 9 may also be included as an element of this article of merchandise, and it is only necessary to provide the air-pipe 3 with diametrically opposite apertures 10 in order that the pivot 9 may be passed radially through the circular pipe 3 for pivotally supporting the device within the pipe, apertures 11 being provided in the supporting member 4 for receiving the pivot 9.

The supporting member 4 is preferably formed of a single blank of sheet metal, and it comprises a bight portion 12, two substantially parallel ears 13 and two flanges 14, the latter being turned inward to provide a housing for the rod 9 and to provide abutments at their ends. The ears 13 are braced by the abutments or ends of the flanges 14, and they are additionally braced by means of the pivot 7, the latter extending through apertures in the free end portions of the ears 13 and being headed at its ends to prevent movement of the ears 13 away from one another.

Each of the plates 5 and 6 is preferably formed from a blank of sheet metal and comprises a pair of bearing ears 15, a flange (16 and 17 respectively), and a passage-closing wing (18 and 19 respectively). When assembled, the apertures of the ears 15 are alined and the pivot 7 extends therethrough, and moreover, the flange 17 laps over the flange 16 sufficiently to always coact with the latter in closing the space that would exist between the upper ends of the wings 18 and 19 if the flanges 16 and 17 were absent. The flange 16 normally abuts against the ears 15 of the plate 6 and prevents movement of the wings 18 and 19 beyond a predetermined angle with relation

to one another. The spring 8 holds the wings 18 and 19 yieldingly in the divergent relation or at the angle to one another illustrated in Figs. 1 and 2, and this divergent relation of the wings is preferably such that their free ends touch or nearly touch two opposite sides of the passage 3, and therefore when the device is being inserted in the passage the wings 18 and 19 coact with the ends of the rivet 7 and the arcuate upper ends of the ears 13 for guiding the apertures 11 into registration with the apertures 10, thereby facilitating the attaching of the device by means of the pivot 9. After the pivot 9 has been inserted through the apertures 10 and 11, heads may be formed thereon, or a nut may be applied thereto for securing this pivot in its useful position.

The spring 8 is preferably formed of a single length of wire and is coiled around the pivot 7, the uncoiled portions pressing against the wings 18 and 19 with substantially equal pressure. Therefore, if the wings 18 and 19 were of the same length and were of the same area, the fluid-pressure on one would be equal to that of the other, and each would be opened simultaneously and to an equal extent. However, such is not the case with this device, for the wing 18 is not only considerably longer than the wing 19 and affords a greater leverage against the action of the spring 8, but it is also of considerably greater area, and therefore, a considerably greater fluid pressure is exerted against the plate 18 than against the plate 19. In other words, the area of the part of the plate 18 from its free end to its pivot is considerably greater than the area of the similar part of the plate 19. Therefore, when air is sucked through the passage 3 in the direction of the arrow, its pressure upon the relatively short and long wings causes the latter to provide an opening before an opening is provided between the wing 19 and the adjacent wall of the passage. The greater the pressure, the farther will the wing 18 swing toward the longitudinal center of the passage, thereby increasing the capacity of the air-passage. However, when the wing 18 has moved to a substantially vertical position, the pressure which is necessary to move it to this position is also sufficient to begin to move the wing 19 away from the wall of the passage and provide an additional space for the air to pass through, this space increasing in capacity in proportion to the increase of pressure.

One reason for securing the device within the passage by means of a single pivot is to permit a slight lateral movement of the pivot 7, so that dust and dampness will not accumulate between the ears 13 and the contiguous portions of the passage 3 and cause rusting of these portions. Another important reason is to provide the simplest and most easily attachable means which is thoroughly efficient and reliable.

By referring to Fig. 3, it will be seen that the free ends of the wings 18 and 19 are properly curved for conforming to the shape of the arcuate inner surface of the cylindrical passage 3. Although it is desirable to provide a clearance between the edges of the wings and the passage, this clearance is exaggerated in Fig. 3 for the sake of clearness of illustration.

Although I have described this embodiment of my invention very specifically, it is not intended to limit this invention to these exact details of construction or arrangement, but changes may be made within the scope of the inventive ideas as implied and claimed.

What I claim as my invention is:

1. In a device for controlling the flow of fluid through a passage, two plates pivotally supported, elastic means to hold said plates against fluid-pressure, said device being attachable to the interior of a fluid-passage in such relation that said plates extend from their pivotal support toward opposite sides of the passage, one of said plates having a greater area between its outer end and its pivotal support than the area of the similar part of the other plate, whereby a greater fluid-pressure is exerted on one of said plates than on the other.

2. In a device for controlling the flow of fluid through a passage, two plates pivotally supported and diverging from their pivotal support, elastic means to hold said plates in their diverging relation, this device being attachable to the interior of a passage in such relation that the free ends of the plates extend to opposite sides of the passage, the one of said plates having a greater area between its pivotal support and its free end than that of the other one of said plates.

3. In a fluid-controlling device, the combination of two plates each provided with a passage-closing flange, a passage-closing wing and a pair of bearing-ears, a pivot-rod extending through said ears and movably securing said plates together in such relation that their passage-closing flanges are lapped one over the other, and a spring extending around said pivot and bearing against said wings for holding them in their normal diverging relation to one another.

4. In a fluid-controlling device, a U-shaped supporting member formed of a blank of sheet metal and comprising a pair of pivot-supporting ears and a pair of flanges between and abutting against said ears to brace the latter, a pivot extending through said ears, a pair of fluid-controlling plates pivotally mounted on said pivot, and elastic means to hold said plates in their normal fluid-controlling position, said U-

shaped member being attachable to the interior of a fluid-passage.

5. The combination with a fluid-passage which is circular in cross section, of a yoke pivotally secured in said fluid-passage in a position to permit fluid to pass on opposite sides thereof, said yoke having depending ears, a pivot extending through said ears and substantially abutting against diametrically opposite sides of said passage, a pair of passage-closing plates mounted on said pivot and diverging toward opposite sides of the passage, and a spring mounted to exert its pressure against both of said plates in opposition to the fluid-pressure.

6. The combination with a fluid-passage which is circular in cross section, of a yoke pivotally secured in said fluid-passage in a position to permit fluid to pass on opposite sides thereof, said yoke having depending ears, a pivot extending through said ears and substantially abutting against diametrically opposite sides of said passage, a pair of passage-closing plates mounted on said pivot and extending toward opposite sides of the passage, and a spring mounted to exert its pressure against both of said plates in opposition to the fluid-pressure, the distance between the free end of one of said plates and its pivot being greater than the distance between the free end of the other one of said plates and its pivot.

7. The combination with a fluid passage; a pair of valve plates positioned in said passage and pivotally mounted at one end on an axis extending transversely of said passage, said valve plates diverging from their pivotal axis into contact with the wall of said passage and being of different lengths, and a spring for normally forcing said valve plates outwardly into contact with said wall of said passage.

In testimony whereof I have hereunto set my hand.

WILLIAM E. BROWN.