F. BELLVILLE AND E. A. BELLEVILLE.

AIR FILTER FOR GAS ENGINES.

APPLICATION FILED JUNE 29, 1920.

1,357,140. Patented Oct. 26, 1920.

Fig. 1.

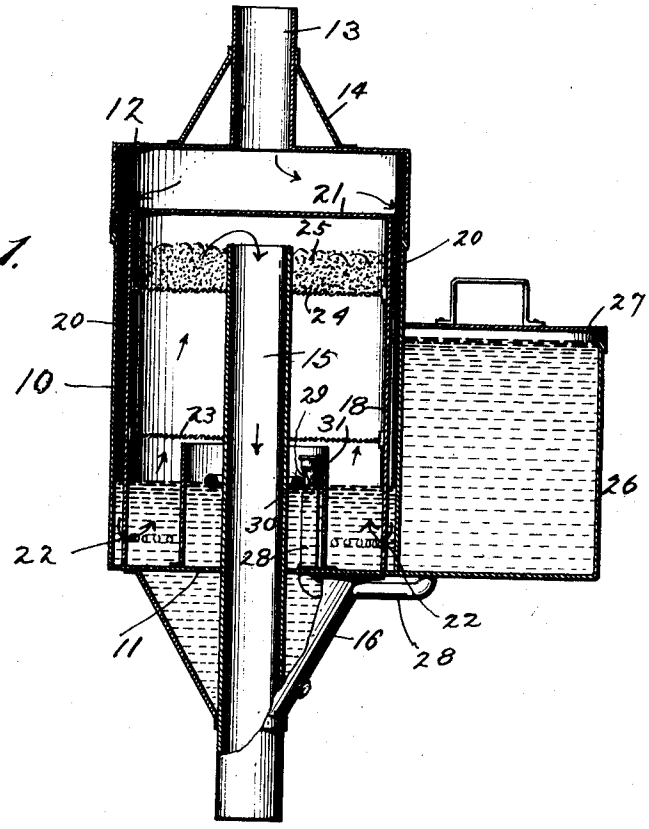
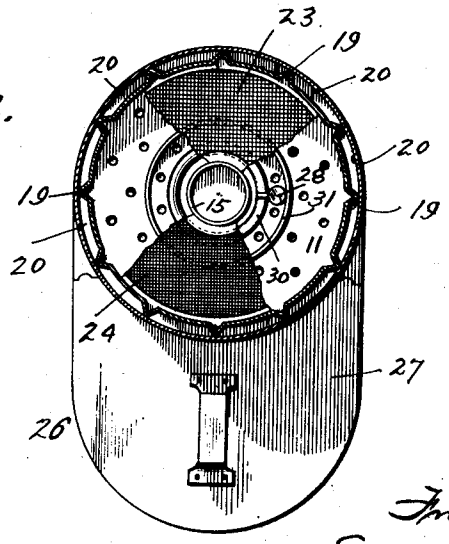


Fig. 2.



Inventors

Frank Bellville

and

Edwin A. Belleville

By Chas. J. Wilson

Attorney

UNITED STATES PATENT OFFICE.

FRANK BELLVILLE AND EDWIN A. BELLEVILLE, OF TWIN FALLS, IDAHO.

AIR-FILTER FOR GAS-ENGINES.

1,357,140. Specification of Letters Patent. Patented Oct. 26, 1920.

Application filed June 29, 1920. Serial No. 392,695.

To all whom it may concern:

Be it known that we, FRANK BELLVILLE and EDWIN A. BELLEVILLE, citizens of the United States, residing at Twin Falls, in the county of Twin Falls and State of Idaho, have invented certain new and useful Improvements in Air-Filters for Gas-Engines, of which the following is a specification, reference being had therein to the accompanying drawing.

It is important that air for mixing with gasoline in the carbureter of gas engines shall be freed from dust or fine grit, and especially is this the case in our western country where alkali dust is so abundant. Such dust or grit injures carbureters and finding its way into the engine, damages the cylinders and pistons causing enormous losses. Frequent reboring of the cylinders and replacement of the pistons becomes necessary, and the injury may be so serious as to necessitate wholly discarding the engine. Damage and loss from this cause are especially the case in farm tractors used in plowing because of the great quantity of the dust they stir up. The object of our invention is the provision of an air filtering, or washing device of such construction that it will efficiently remove dust from air drawn into the gas engine, have a minimum of parts, so that it will be inexpensive to make and not get out of order, permit ready access to its interior parts for such cleaning as may be necessary or for other purposes, and yet be air-tight when its parts are assembled and in working condition, and having means to supply the water that is required in its use, so that frequent replenishing thereof will not be necessary, and to this end our invention consists in the filter constructed substantially as hereinafter specified and claimed.

In the annexed drawings:

Figure 1 is a vertical side of a filter embodying our invention;

Fig. 2 is a horizontal section on the line 2—2, of Fig. 1.

In the apparatus shown in the drawings as one form or embodiment of our invention, we employ a cylindrical cup like shell or container 10, with a fixed bottom 11, and a removable cover 12 in the form of an inverted cup, whose sides telescope over the sides of the shell 10 at the top and form an air-tight joint therewith. At the center of the cover is a vertical pipe 13, that opens into the cover and is the air intake, by which the air is led into the container 10 at its upper end, and a flaring or conical skirt 14 surrounds the portion of the pipe adjacent to the cover, and being attached at its small end to the pipe and at its large end to the cover, forms a brace or support and provides a good finish at that end of the apparatus.

Within the shell or container 10, and concentric therewith, is a vertical pipe 15 that extends from the upper part of the container (but without reaching the top thereof) through the bottom 11, and below the latter and leads to the carbureter (not shown) and which serves to deliver the air, after its treatment in the apparatus, to the carbureter. Surrounding the portion of the pipe 15 below the bottom 11 and attached thereto and to the bottom is a flaring or conical skirt 16 which braces or supports the pipe, and as there are holes 17 in said bottom 11, constitutes a prolongation or extension of the container 10.

Within the container 10 and reaching from the upper part to the bottom thereof is a cylindrical shell 18 that is concentric with and spaced from the container wall and at intervals there are vertically extending ribs 19 on the periphery of said shell 18 that reach to the interior wall of the container 10 which serve as separators and subdivide the annular space between container and shell into a series of vertical passages 20 that reach from the closed top or head 21 of said shell to the bottom thereof and provide passages for the downward flow of air from the space above the head 21 to the lower part of the container from which passages the air flows to the interior of the shell 20 through numerous holes 22 in the wall near the bottom thereof. The lower portion of the shell 20 is submerged in a body of water so that the descending air before reaching the perforations 22 passes downward through such water and then upward through the same within the shell. Emerging from the water, the air will flow upward through the container, in the ample space between the shell and the central pipe 15, and, after passing in succession through a horizontal screen 23 of coarse mesh, and a second horizontal screen 24 of finer mesh, and a filtering body such as a sponge 25 lying upon the second screen 24, will enter the upper end of the eduction pipe 15, and will pass down through

the pipe and on to the carbureter, and be delivered to the latter wholly freed from dust or grit with which it was laden or charged at the time of entering the container 10 at the top. The water in the lower part of the container, besides serving to intercept dust passing into it with the air, provides enough moisture that is carried along with the air to keep the sponge in a moisture-accumulating condition, and swelled to the desired volume to intercept the air in the upper part of the container.

Secured to the side of the container 10 is a water storage reservoir 26 with a removable cover 27, and from the bottom of which a pipe 28 extends that passes upward into the lower part of the shell 20 and at the level to which it is desired the water in the shell shall extend, it has a valve 29 controlled by a float 30 within the float chamber formed by a vertical curb 31 substantially midway between the pipe 15 and the shell 20 and which has holes 32 through which water flows into the space around such curb. It will thus be seen that a large quantity of water may be kept in reserve and which is automatically supplied to the container to maintain the desired quantity of water therein.

What we claim is:

1. Apparatus of the kind described comprising a container, an air inlet at one end, a shell having a head spaced from the air entering end of the container and spaced from the inside of the container, ribs formed upon one of the same and extending between said head and the opposite end of the container and situated in the space between the shell and the container wall, such space being in communication with the interior of the shell, filtering means within the shell, and an air pipe in the shell reaching from the end thereof near its head to and through the opposite end of the container.

2. Apparatus of the kind described comprising a container, an air inlet at one end, a shell having a head spaced from the air entering end of the container and spaced from the inside of the container, ribs formed on the shell extending between said head and the opposite end of the container and situated in the space between the shell and the container wall, such space being in communication with the interior of the shell, filtering means within the shell, and an air pipe within the shell extending from the end thereof near its head to and through the opposite end of the container.

In testimony whereof we hereunto affix our signatures.

FRANK BELLVILLE.
EDWIN A. BELLEVILLE.