

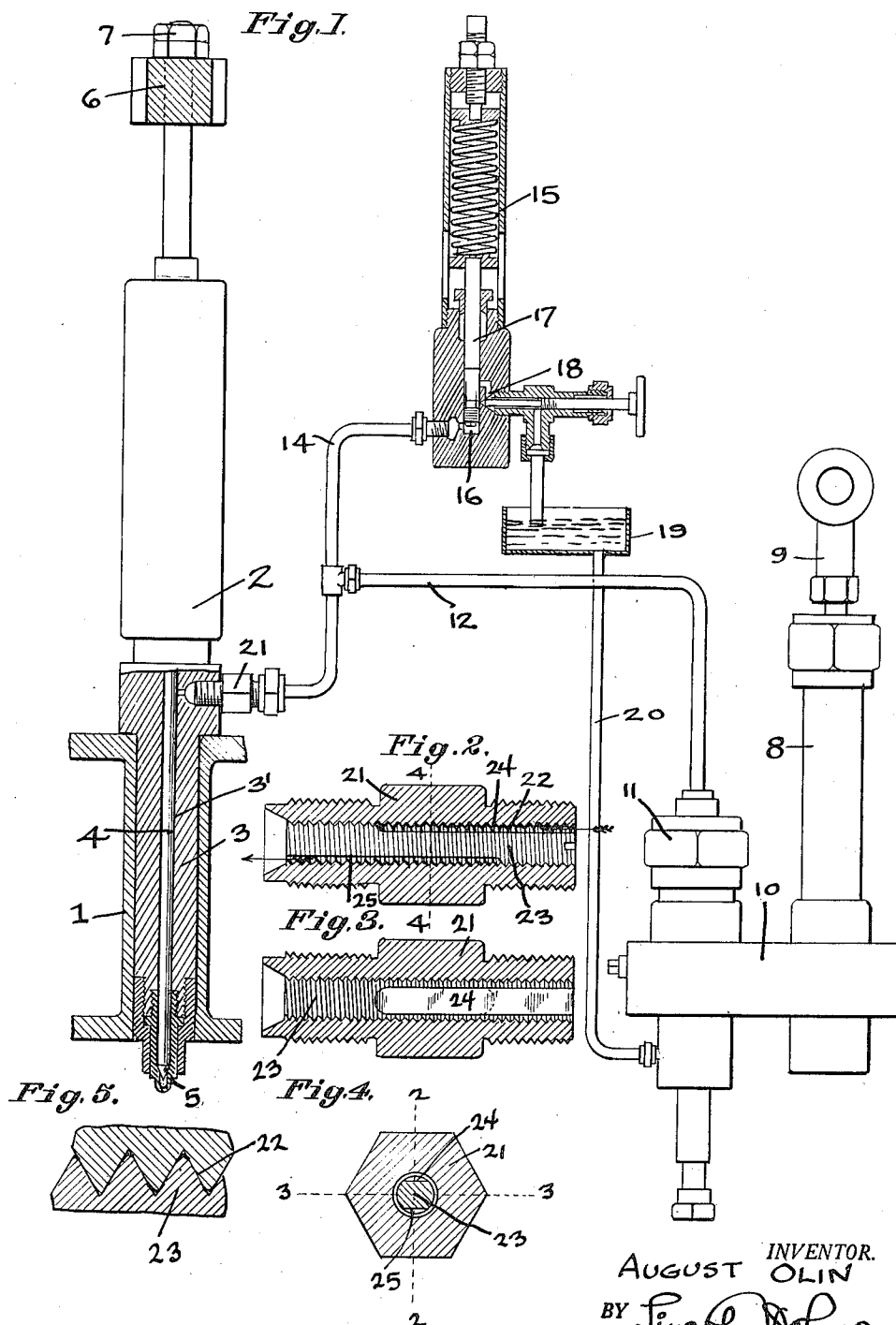
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A. OLIN

FLUID STRAINER

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UNITED STATES PATENT OFFICE.

AUGUST OLIN, OF ALAMEDA, CALIFORNIA, ASSIGNOR TO ATLAS IMPERIAL ENGINE COMPANY, OF OAKLAND, CALIFORNIA, A CORPORATION OF CALIFORNIA.

FLUID STRAINER.

Application filed February 18, 1922. Serial No. 536,912.

To all whom it may concern:

Be it known that I, AUGUST OLIN, a citizen of the United States, and a resident of the city of Alameda, county of Alameda, State of California, have made a new and useful invention—to wit, Improvements in Fluid Strainers; and I do hereby declare the following to be a full, clear, concise, and exact description of the same.

This invention relates particularly to a fluid strainer for use on high pressure apparatuses.

An object of this invention is to provide a high pressure fluid strainer which may be used in connection with an apparatus for injecting fluid fuel into an internal combustion engine.

A further object of the invention consists in providing a fluid strainer that will be superior in point of simplicity and inexpensiveness of construction, positiveness of operation and facility and convenience in use and general efficiency. Other objects and advantages will appear as this description progresses.

In this specification and the annexed drawings, the invention is illustrated in the form considered to be the best, but it is to be understood that the invention is not limited to such form, because it may be embodied in other forms; and it is also to be understood that in and by the claims following the description, it is desired to cover the invention in whatsoever form it may be embodied.

In the accompanying one sheet of drawings:

Fig. 1 represents a diagrammatical illustration of a high-pressure fluid system having my strainer interposed therein.

Fig. 2 represents a longitudinal section through a strainer constructed in accordance with my invention and taken on the line 2—2 of Fig. 4.

Fig. 3 represents a longitudinal section partly in elevation, taken through Fig. 4 on the line 3—3.

Fig. 4 represents a cross section taken through Fig. 2 on the line 4—4.

Fig. 5 is an enlarged cross section through the threaded parts of my strainer.

In the manner of operating and injecting fuel into internal combustion engines of the full Diesel type, which may be said to

depend upon combustion obtained by the compression of gasified or vaporized fluid hydro-carbon fuel to a degree where the admission of the same into a cylinder containing heated compressed air combines therewith to ignite the gasified fuel, it is required that the fuel be strained or clarified of all impurities. At the present time a low grade of liquid hydro-carbon fuel, such as "calol" or crude oil, is used entirely, which fuel through treatment accorded it by an apparatus used in combination with my invention breaks the said fuel into a finely divided condition to form a homogeneous fuel mixture, readily ignitable when placed within an engine cylinder, the object being to increase the commercial value of liquid fuels of a relatively low volatility, but which contain a greater heating power per unit and are purchasable at a cheaper price than fuels of a higher gravity.

In detail, the construction illustrated in the drawings includes the cylinder of an internal combustion engine, generally designated by the numeral 1, which cylinder is provided with a conventional mechanism necessary to its operation. The cylinder 1 has a fuel injecting or discharging unit 2 in the head thereof and which comprises a base member 3 drilled centrally as at 3' to provide a guide housing for an adjustable needle valve 4, the tapered end of which seats in a spray nozzle 5 secured to the end of the member 3, and discommunicates the apertures or holes in the spray nozzle 5 from the atmosphere. The end of the needle valve 4 is adapted to normally seat in the spray nozzle 5, and means in the form of a rocker arm 6 is adapted to engage the opposite end 7 of said needle valve, and reciprocate it within its guide housing, thus permitting a communication of the holes in the spray nozzle with the atmosphere. The central passage 3', containing the needle valve 4 is large enough to permit a slight clearance between the needle valve 4 and the wall of the said passage, whereby fluid fuel admitted into said passage under pressure will be enabled to move therethrough and when permitted, injected into the engine cylinder.

In order to place fuel under pressure into the fuel injector unit, I have provided a pump 8 of the plunger type, wherein a

plunger 9 may be suitably reciprocated in active contact with fluid fuel to create a pressure thereon, whereby said fuel is forced from the pump chamber 10 through the back pressure valves 11 and into conduit 12, communicating with the fuel injector unit 2. It is intended that the type of pumping apparatus used shall maintain a substantially continuous pressure throughout the system connecting it with the fuel injector unit 2. In order to maintain constant pressure and eliminate pulsations or variations of pressure, on the fluid fuel in passing from the pump to the fuel injecting valve 2, I find it good practice to by-pass and connect conduit 12, by the line 14 with a pressure regulating device indicated by the reference number 15. The pressure regulator consists of a base having a central chamber 16 adapted to receive the fluid fuel from the line 14. A spring tensioned plunger 17, is arranged to reciprocate within said chamber 16, whereby the spring tension on the plunger 17 will automatically regulate and control the pressure, ranging from zero to four thousand pounds per square inch, at which the fuel will be discharged from the fuel injector unit 2. If the pressure generated by the pump exceeds a predetermined pressure, the regulator 15 acts as a safety valve for eliminating the excess by by-passing the over flow fuel through the bleeder ports 18 into a reservoir 19, from which it is carried through the line 20 back into the pump chamber 10 where it may be again circulated in the system.

I have found it necessarily expedient to interpose a fluid strainer between the fuel injector unit 2 and the pump 8 and pressure regulator mechanisms 15, whereby any sand, dirt, detritus or the like will be prevented from gaining access to the fuel spray nozzle. Experiments with various kinds and types of strainers, such for instance as screens and various other foraminated materials have proven that the excessive pressure which varies from zero to four thousand pounds per square inch in time disrupts the clarifying function of the strainer so as to make its efficiency practically nil, whereas the present strainer 21 is designed to withstand continuous usage under high pressure and also to efficiently strain fuel. The strainer comprises a casing, cylindrical in form and having an internally threaded passage 22 and the exterior opposite ends are threaded for screw engagement with respectively, the fuel valve 2 and the communicating conduit 12. A threaded plug 23 is adapted to be positioned within said passage 22, said plug having flattened surfaces 24 and 25 at diametrically opposite points on opposite ends extending for a distance greater than one-half the length of said plug. Of necessity the cross-sectional

area of the threaded plug will be less than internal cross-sectional area of the threaded passage 22 to, thus, permit the easy and quick removal of the said plug from the casing 21. The clearance or play between the plug threads and the passage threads to permit the reception of one within the other, leaves sufficient room to allow the movement of a fluid medium, especially one under pressure. The inaccuracies of the thread-cutting tools, although infinitesimal, are yet sufficient to allow enough clearance whereby fluid particles may pass or be strained while harder or impure substances will be retained. It will thus be obvious that oil pressure in the conduit 12, entering the space between the flattened surface 24 and the interior surface of the casing 21, will move through the clearance between the threaded engagements and into the passage between the flattened surface 25 and the interior surface of the casing, from whence the fluid travels to the space adjacent the needle valve 4. The volume of fluid passed through the strainer is in a measure controlled by the fit between the engaging threads and by the distance that the respective parallel surfaces on opposite sides of the plug overlap. A strainer of this character permits of an easy removal for cleansing purposes and is designed to withstand high pressure commensurate with the producing of efficient results.

Having thus described this invention what I claim and desire to secure by Letters Patent is:—

1. A strainer comprising an internally threaded casing, adapted to have fluid pressure conduits secured to the opposite ends thereof, and a plug screw threadedly arranged within said casing of a cross sectional area less than that of the internal cross section of the said casing having flattened sides that do not extend the entire length thereof.

2. A strainer comprising a casing, adapted to have fluid pressure conduits secured to the opposite ends thereof, and a plug arranged within said casing, of a cross sectional area less than that of the internal cross section of said casing, said plug having flattened sides at diametrically opposite points on opposite ends that do not extend the entire length thereof.

3. A strainer comprising an integrally threaded casing having a passage there-through; a threaded plug of a lesser cross sectional area positioned within said passage, said plug having parallel planar surfaces on opposite sides that do not extend the entire length thereof.

4. A strainer comprising an internally threaded casing; a threaded plug adapted to be screwed into loose engagement within said casing, and having separate peripher-

ally flattened sides that do not extend the entire length thereof.

5 5. A strainer comprising a casing having a threaded passage therethrough, said casing being arranged to have fluid pressure conduits secured to the opposite ends thereof and a threaded plug adapted to be positioned within said passage, said plug having flattened surfaces on opposite sides, and

on opposite ends that do not extend the entire length thereof. 10

In testimony whereof, I have hereunto set my hand at Alameda, California, this 20th day of January 1922.

AUG. OLIN.

In presence of—
RALPH A. KNAPP.