

should be permitted to habitually violate the law and escape punishment, while those who pay for the roads thus terrorized are deprived of any enjoyment of their own thoroughfares.—*Camden (N. J.) Review*.

### Some "Toledo" Features.

We have recently been favored by a copy of an instruction book which, to use its own language, "was written to give the users of the Toledo steam carriage some idea of a few points in which care must be taken in order to keep the carriage in good running condition; in order to have few repairs and to run the carriage economically." Such instruction books are now issued by nearly all manufacturers of steam carriages, but the present is an especially elaborate one, both as regards detail of directions given and illustrations; and we reproduce from it the following information about the Toledo carriage which has not before appeared in our columns.

Three important points for the user of a Toledo (and all steam carriages) to bear in mind are given as "Don'ts":

Don't turn off the pilot light after starting up; let it burn until you finish your journey.

Don't try to refill the gasoline tank without putting out the pilot light and shutting main gasoline valve.

Don't forget that the engine needs oil.

The accompanying Fig. 1 gives an idea of the general arrangement of the carriage, which is shown with the top off, the seat and the rear deck also, and with the cover of the boiler and the muffler removed. It indicates the main points such as tanks, valves, etc., which the operator should know. Attention is called to the fact that the pipe lines in the carriage are painted different colors. Blue indicates that the pipe carries water, silver that it is used for steam, red that it is an oil pipe, and green that it is for air.

The first move is to fill the gasoline tanks. For this the valve marked "main gasoline valve," which is at the top of the cut opposite the second gasoline tank, is closed, and the caps marked "gasoline fillers," at the end of the tanks, are removed. The two tanks will hold 9 gallons of gasoline. Especial care should be taken to screw the caps down tightly after filling, in order to prevent leaking. A cap wrench is furnished with each carriage.

If the carriage is to be filled on the road, the method of procedure is the same. But special emphasis is laid upon the following instructions: As soon as the carriage is stopped for filling, shut the main burner valve and the pilot light valve. Close the main gasoline valve and also that to the air tank. By closing the air tank valve enough air should be retained in the air tank to fire up the carriage after filling, and the engine pump should work up the pressure to its normal point. When the gasoline tanks are filled, first open the

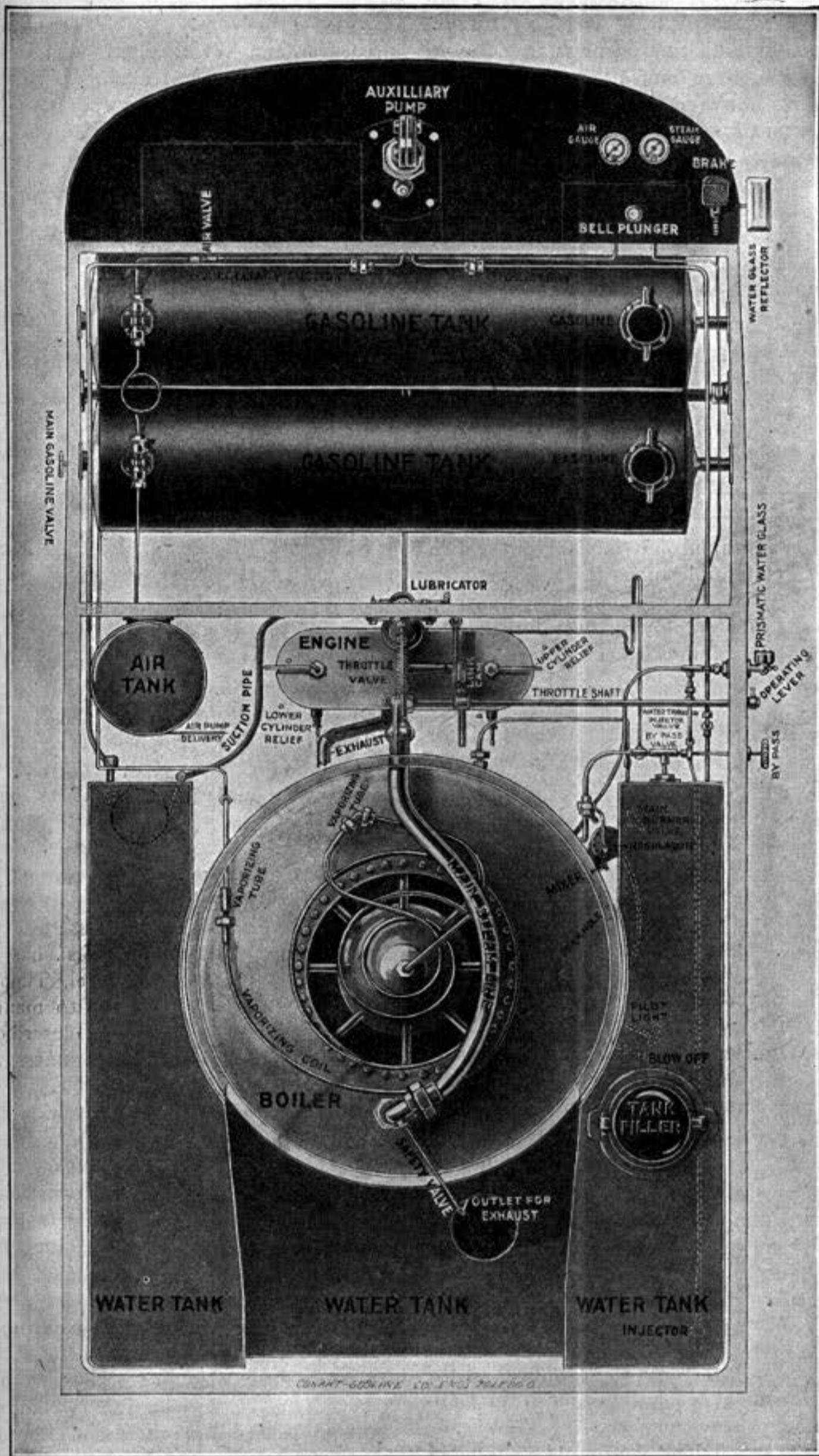


FIG. 1.

air valve, then the main gasoline valve, and proceed as usual with the fire.

To return to the first filling, the air pressure is next worked up. This is done by connecting the hand air pump at the point marked "air valve" toward the front of the carriage, by opening the main gasoline valve, after having made sure that the main burner valve and the pilot light, shown at the side of the boiler, are both shut tight, and opening the valve at the bottom of the air tank. Forty pounds of air will be ample for the starting of the fire.

Next, fill the boiler. This may be done in two ways. If an ordinary garden

hose is handy, connect it at the point marked "blow-off," and open that valve. The try cocks at the front of the boiler may be opened for vents. The boiler will fill rapidly upon turning on the water. When the water shows at half a glass, shut it off, close the blow-off valve and the try cocks and disconnect the hose. If there is no hose handy, the main water tank may be filled at the point marked "tank filler," and the water pumped into the boiler by the auxiliary pump, of which the steering lever acts as a handle. The valve marked "by-pass," on the operating side of the carriage, must be closed when water is to be injected into the boiler, either by the

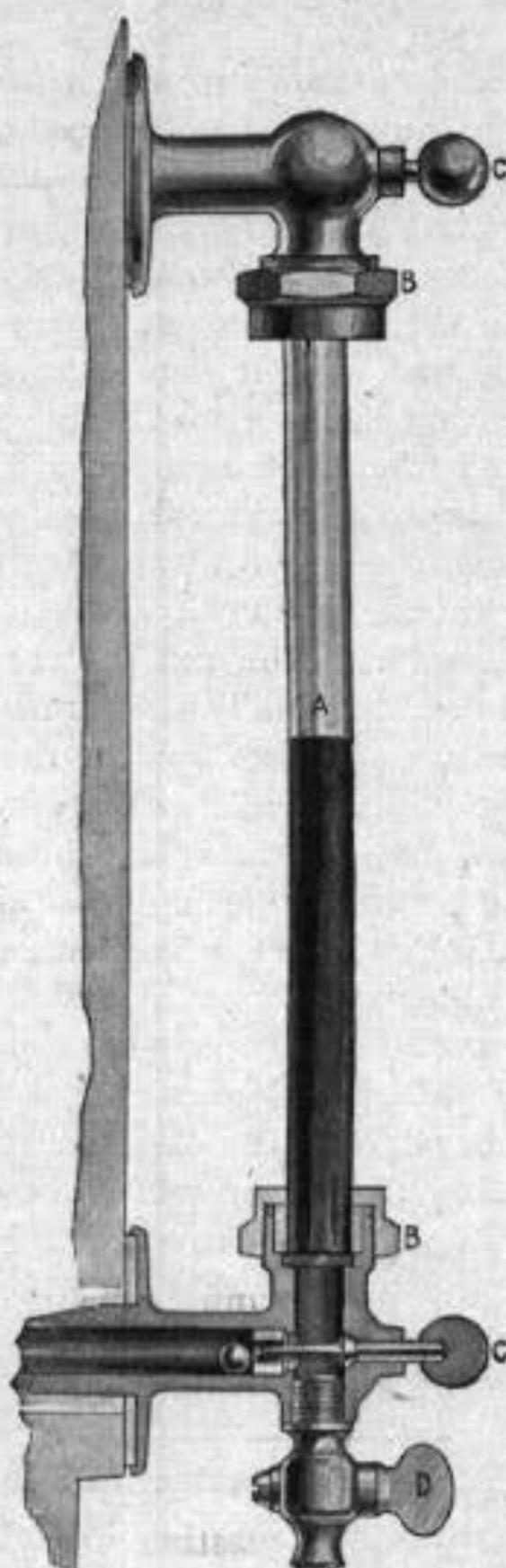


FIG. 2.

engine pump or by the hand auxiliary pump. The main water tank should be filled full.

There is another way for filling the water tank when steam is up. At the rear of the carriage there is a small fitting underneath the water tank marked "water tank injector." The valve for this is under the seat, toward the front, on the right hand side. Connect the suction hose, which is supplied with each carriage, to the injector and throw the end into a water trough or whatever receptacle for holding water may be handy. Open the valve under the seat and the water will be sucked into the tank. With 150 pounds of steam up, water can be lifted the full length of the hose. The operator should always be careful to close the injector valve before disconnecting the hose or taking the end out of the water.

The book then takes up in succession the various parts of the carriage, viz., the cylinder lubricator, the engine and its parts, the burner, the operating devices, the automatic fuel regulator and the water gauge glass, describing the function of each and giving directions how to proceed in case of failure. We select for description here the water gauge glass, which in some particulars differs from those on other steam carriages. It is shown, partly in section, in Fig. 2.

The manufacturers say that like every other water glass in use this one will sometimes break; but when it does, the automatic valves C will close and prevent the escape of steam. A new glass is put in as follows:

Pet cock D is first opened and the nuts

B loosened from the top and bottom fittings. The nuts are first placed on the new gauge glass, and outside of them the packing ring. It is always well to put in new packing rings whenever the gauge breaks, as the old ones are likely to become hardened, and if put back will not hold the steam. The glass is placed in the fittings and the nuts screwed on. Care should be taken to have the glass set midway between the two fittings. If the glass is nearer to one fitting it is likely to be carried along with the nut, as the nut is screwed on until it finally strikes the metal. If the gauge glass rests against the metal, it is almost sure to break with a very slight jar. When the two nuts have been made tight, take a wrench or a piece of wood and press in on the top automatic valve. This will allow the steam to rush through—the pet cock being open—and warm up the glass. When the glass is thoroughly warmed, the pet cock is closed, and first the top and then the lower valve are pressed in. This should allow the water to enter at the lower end and the steam at the top end of the glass, and the water should come to a level.