

is good, coming from an artesian well. I pump it from a hole made in the ground outside of the buildings about six feet on the right of the engine. I feed with an injector or a small double acting pump with brass valves. So I would like to get your advice on the following: Can I let the exhaust pipe discharge the steam in the water?

A. An injector will not handle very hot water, or water over 100° F., especially if it has to lift it a few feet, and after the water gets very hot a pump will not lift it. The chances are you will have trouble all around by heating the water. Your best plan will be to get an exhaust feed water heater. The principle of such a heater is usually to force the cold water through the heater and after it comes out of the heater and ready to go into the boiler, it will be much hotter than it would be if it were heated before it were pumped. However, there are heaters that heat the water by exhaust steam before it is pumped into the boiler, but this heater must always be higher than the pump so that the water tank can run into the pump, as the pump will not lift hot water very well.

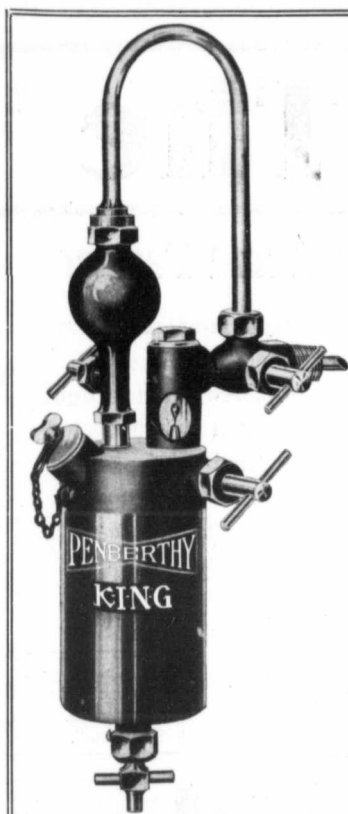
A. It would not be any help to you to reduce the injector connections to one-half-inch. If the three-fourths-inch injector delivers the water too fast, you can reduce the capacity of it by partly closing the suction valve. The injector can be throttled so that it can be working continuously. To reduce it to its minimum delivery, turn on the suction and steam valves full, and after it is at work shut off the suction valve until the injector "breaks," or runs at the overflow; then give it a little more water at the suction valve so that it will again deliver the water to the boiler. After the engine is running and you see that the water is getting low in the boiler, open the suction valve a little more and after working with it a short time you will be able to set the injector at the start, so that it will keep up the water without starting and stopping it so often.

L. T. Q. I wish to ask you what harm cylinder oil which the lubricator feeds while the engine is not running will do?

A. Cylinder oil fed into the steam pipe or steam chest can do no harm to the engine. It is simply a waste of oil.

J. D. Q. If the cylinders happen to run short of oil (not enough to make them squeak) the eccentrics will pound very hard; they are not loose. I would like to know the cause of this.

A. The absence of oil under an unbalanced valve has a tendency to make it run hard. The valve will suffer for a want of oil long before the piston. The oil should be fed continuously. If it were not for the warning "pound" of the eccentric many a valve would be ruined for the lack of oil.



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R. A. Q. Knowing that the exhaust nozzle increases the back pressure and that back pressure reduces the power of an engine, how would it work to let the exhaust go free and produce an artificial draught by means of a fan or steam jet? Would the difference in the power make up for the energy taken to produce the draught without the exhaust steam?

A. No. It takes very little back pressure to produce enough draught to make a fire burn in a traction boiler. In some engines the most of the back pressure is caused by a poor distribution of the steam, and if the exhaust nozzle were taken off there would be little difference in the back pressure. We expect to find some back pressure in every engine, and since the exhaust, even if it is let go free, without a nozzle, has a certain velocity and this we get without costing anything, and it takes very little reduction in the nozzle to increase velocity of the steam to make sufficient draught. To create the draught by means of a jet, the whole amount would have to be done with live steam, and it would take more extra energy than to sharpen up the exhaust with a little back pressure. If, however, the exhaust could be used to get more power by means of a condenser as in stationary practice, there would be more than enough energy gained to either run a fan or steam jet.

E. W. Q. Is there any advantage for a straw stoker for a traction engine other than a labor saver?

A. With a good straw stoker much of the trouble of leaky flues will be avoided; as in firing by hand, at times too hot a fire is made, and often the fire is allowed to die down suddenly. With the stoker a more steady fire can be had and there should not be any more tendency to leaky tubes than with coal for fuel. The accumulating of ashes on the tube sheet will also be reduced as there will not be so much stirring of the fire and thus reduce the tendency of the straw to fly through the fire.

F. A. Q. The governor on my engine does not control it satisfactorily. I have to set speeder spring very tight to get proper speed for threshing. When separator is empty it runs too fast. A new valve did not better it. It is a Pickering. Would it do to raise the valve a little, so as not to have the spring so tight?

A. If you raise the valve it may not shut the steam off when the engine is running light. The governor should cut off the steam when the balls are spread. To adjust the valve correctly you can take the governor belt off and without any belt on the fly-wheel, have some one turn on full steam while you pull the governor balls

out by hand. You can readily tell where the valve is in relation to the seat by this method. If the engine runs at high speed when the balls are pulled out to the extreme, this would indicate that the valve is set too high; if the engine is shut down before the balls are pulled out to the extreme, this would indicate that the valve is set too low. Adjust the stem so that the valve comes to the seat when the balls are out. To tell when you have this adjustment, you will find that the engine stops just as the balls strike the outward position, or to make the engine run steadily, while running without a load the valve should admit enough steam (when under full steam from the throttle and when the balls are pulled out) to run the engine very slowly. In other words, the valve should be slightly off the seat when the balls are pulled out to the extreme. After this is done and if you do not have the proper speed for giving the speed spring a reasonable amount of tension, the diameter of the pulleys should be changed. If you want to run the engine faster, the pulley on the governor should be increased in diameter. If you want to run slower the pulley on the crank shaft should be increased. As it is likely not to take much, one or two thicknesses of belting put around the pulley will likely be sufficient. The pulley may be wrapped with other things to increase the diameter.