THE CANADIAN THIRESHERMAN AND FARMER IC AUG. '10

## The Thresherman's Question Drawer

G.F. O. Will some one tell me why an engine should not be reversed without shutting off steam? One expert machine agent called me down for doing and said it injured the valve to slide it with the lever when under pressure. I presume I am dense, but I can't see what difference it makes to the valve to draw it with the lever or eccentric. I know it gives the gearing a bad jar to throw the reverse quickly and I would like to know any other reasons. My engine is an old Pitts, used eighteen falls. Has a screw throttle that is slow to use, consequently it is always handled with the reverse lever. The valve has not been repaired and have put in no new rings nor new gears. It works good and steams easily. A. If an engine is well de-

signed, reversing it without shut-ting off steam will not hurt it in any respect. In fact, there is more harm to come from reversing with the throttle closed when the engine is running at a high speed, for when an engine is running in an opposite direction to which the valve gear is set the engine is turned into a pump and it pumps air from the stack through the exhaust nozzle into the boiler. This can be done on a locomotive coasting downhill. However, there are release valves on the steam ports which prevent this on a locomotive; but on a traction engine it can only be done when the engine is pulled by another engine, or by running the engine to a very high speed and then suddenly reversing it. If the flywheel is very heavy more effective than if it is light. This we have said will pump air into the boiler; but if the engine is suddenly reversed while the engine is at a high speed and while the throttle is shut, the air cannot go into the boiler, and if enough power is put to the fly-wheel of the engine something will burst; but if the throttle is left open the piston never has any more pressure than is in the boiler to pump against and that should not hurt it.

**L. A. Q.** In putting on a new engine bed on an engine would you make rigid fastening on pillow blocks when the boiler is cold or would you steam up to about 75 lbs.—working pressure 150 lbs.—to divide the strain on the engine bed equally between expansion and contraction of the boiler, which apparently cracked the lower side of guide of the old bed?

2. The new bed comes with bearing for main shaft babbitted. Opposite bearing has never been opened and seems to be in good order. Would you put it up without rebabbitting both new and old bearings?

3 What h.p. will a 6½ x 10, 10-inch stroke tandem compound engine develop, running 230 revolutions per minute, at 150 lbs. pressure?

**A.** On some engines there is a slip joint where the cylinder is bolted to the boiler which allows the boiler to expand and contract without exerting an undue strain on the castings; but if the cylinder and bed or frame are bolted rigidly to the boiler it certainly would help matters to bolt it up at a medium temperature of the boiler and thus reduce the danger of breaking the frame.

1. The temperature of the boiler at 130 lbs. gauge pressure is about 355 degrees F. Say the average temperature of the atmosphere is 45 degrees, this would make the average temperature of the boiler 200 degrees. Steam at atmospheric pressure, or just before it shows on the steam gauge is 212 degrees; so you see a medium temperature would be at about this point. As there are only about 50 degrees between 75 and 150 lbs. pressure, 75 lbs. would be a medium pressure but not a medium temperature.

2. The main box in the engine frame is square with the cylinder and in the factory the shaft is bolted fast by means of the main bearing cap, so that after the cylinder and frame are bolted to the boiler, the shaft is rigidly held in place and the outer bearing is babbitted. It may be pos-sible that the outer bearing will be exactly in position. This can be found out by close examina-tion, and if it is not exactly in position the babbitt should be cut out and replaced after the cylindder and frame are bolted to the boiler and shaft is securely held by the cap. To insure the shaft being held properly, the liners should be taken out from between the cap, and the box. 3. The nominal h.p., as given

3. The nominal h.p., as given by the manufacturers is 20 and the maximum brake h.p. is 49.

**E. H. Q.** Why is a compound engine more economical than a simple one?

Compound Α. engines are more economical than simple engines mainly because of the high pressure with which they can be worked without involving excessive strains, and partly in consequence of the diminished loss by cylinder condensation. A very early cut-off in a cylinder causes serious condensation. The same number of expansions may be number of expansions may be obtained in one cylinder as in two, by sufficiently early cut-off; but the strain of throwing a high pressure of steam on a large cylinder and cutting off very early necessitates enormous strength in the working parts and hence, when the expansion can take place in two cylinders, the



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