

DISCUSSION.

Mr. Auldjo asked whether the object could be accomplished without the use of a pump, condensing directly into the boiler, on the French system.

Mr. Kidd said the pump was the most reliable appliance when work was being done by several vessels at different rates, if only one vessel was working. The water might be condensed right into the boiler again. Mr. Lee asked whether the pump were close to the condensers, he had them placed 750 feet away, and could only get a 212 deg. test.

Mr. Kidd said they knew by the steam gauge, which was 10lbs., that corresponded to 240 deg. The better the pipes were lagged the less fault there would be. They took live steam from the mill boilers, and sent it down 2,000 feet. The pump is only used once a day. The steam trap was at the bottom of the pipe. There were six expansion joints in the pipe, and it expands six feet in its length. But even with this length, and two feet underground, the amount of water running away from the end was very small, and the steam was carried 2,000 feet without serious loss.

Mr. German said the paper was a fair example of close attention to detail, and that six per cent. saving could be effected, proved how valuable such attention was.

Mr. Scoular said it is found necessary in large workshops, such as those for railways, to heat the paint-shops during winter, in order to maintain a temperature of about 70 deg. Fah. for drying purposes, and

to meet this end, steam is used in the case he would refer to. The paint-shop at the Eveleigh Workshops is 400ft. long and 160ft. wide, and is heated by steam generated by an old locomotive boiler at 65lbs. pressure per square inch, and passed through pipes 2in. internal diameter. These pipes are arranged in groups each 18ft. 6in. long with a dip of $\frac{1}{2}$ in. in this length; the pipes leading the steam in one direction are connected with U bends to those on the return side, and there are 11 lengths of piping in each group, and 54 groups in all. Each group of pipes takes steam separately from the main steam pipe overhead, and after passing through the coil, the condensed water is drained off, into the main, leading to steam trap and collecting tank, from which it is again pumped back into the boiler, at a temperature of about 120 deg. Fah. The collecting tank is merely an ordinary 400 gallon tank, and not closed or lagged in any way, placed about 18 inches below the bottom row of pipes. The steam trap is placed above the level of the collecting tank. The pipes are not clothed, as the system has been designed for heating purposes only, and there has not been any aim at getting the most economical effects by arranging for the condensed water to be returned to the boiler at as high a temperature as it might be possible to do so. He merely mentioned this as a case in actual practice, and would like to have the opinion of Mr. Kidd if it would be possible to get this water back again into the boiler at a temperature sufficiently high to prove as economical, as indicated by him, for a system of this kind used for heat radiating purposes.

Mr. Fitzmaurice said they had been heating the feed water by exhaust steam for some time at the General Post Office plant, and had no difficulty whatever. The engines were high pressure, carrying 120 lbs. steam, and running 500 or 600 revolutions. The exhaust passes through a series of coils, and heats the

feed from about 60 deg. to 200 deg. The heated water is then passed through a filter, which collects the sediment, and there was a considerable amount of dirt and slush collected, so that it was necessary to renew the packing weekly. The exhaust then went to the chimney stack, and held a considerable amount of water. He would like to utilise this water for feeding the boiler, but the difficulty was the amount of oil it held in suspension. He had tried the Giepel trap, also the float and the "Midget" expansion trap. The Midget was to his mind much more effective than either of the others. He would like to hear the author's views of an efficient oil separator.

Mr. Kidd, in reply, said the engines he had under control were almost invariably high-pressure, with initial pressures of 75 to 80lbs., and a back pressure of from 10 to 12lbs. The exhaust was used for evaporating in what were called quadruple and quintuple effects, and the great surface of these was very effective as a grease catcher. They paid great attention to filtering the feed water. He thought the feed filters in use mostly too small. The system adopted was to pass the feed through 12 inches of cotton waste. No expansion trap would work well in their case, because it worked by difference of temperature in the inlet and outlet, and they had no difference. The trap mentioned by Mr. Fitzmaurice was an expansion one, and the varying temperatures produced in time a permanent elongation. The float trap they had adopted did the work like an ordinary ball trap. When the float was lifted, it lifted the valve. The oil might be recovered by trapping, and having sufficient diaphragms to retain the grease. They made their own boiler covering out of selected crushed cane fibre mixed with a small amount of very tenacious clay. About 1½in. of this on the pipe secured by wood battens and hoop iron was very satisfactory. They also used asbestos.