ECONOMICAL OPERATION OF LOCOMOTIVES.

Pooling, or the "first in, first out" system, is generally accepted as a means for saving large sums in locomotive operation. The advantages are summed up in a recent paper by Mr. M. E. Wells before the Western Railway Club, in an argument which may be summarized as follows:

It enables men to rest while the engines are in use, they are not laid off while the engines are in the shop, the work is better divided up among the men, it makes it possible to do the work with 37 engines that formerly required 52 (in the case cited), which means a saving of $150,000 in the machinery investment; the locomotives may be used almost continuously, the improved methods of inspection result in fewer engine failures on the road, and the greatest possible mileage is made between shoppings.

In the pooling system the question of inspection for defects and loose parts is a most important one. It is equally important whatever system is used, but this discussion brings out the possibility of securing better inspection by providing special round house inspectors for the work. The engineers are not relieved from the duty of looking over their engines before and after runs, but the fact that the special inspectors are never overworked, as are the engineers, by extremely long hours and difficult runs is an important safeguard which has been found effective in preventing break-downs on the road.

Pooling is no longer an experiment. Mr. G. W. Rhodes said that his attention was first drawn to it in 1877. Some objections are made to it on account of difficulties in keeping coal and oil records and it has been criticised because men are supposed to be able to get better results when they always use the same engine. These were given due weight in the discussion and the fact that the details rather than the plan itself concerned the speakers most would seem to indicate that the idea of pooling had gained friends since the subject was before this club in 1896.

Mr. Rhodes cited a case to show that the subject has not received the attention it deserves, as follows:

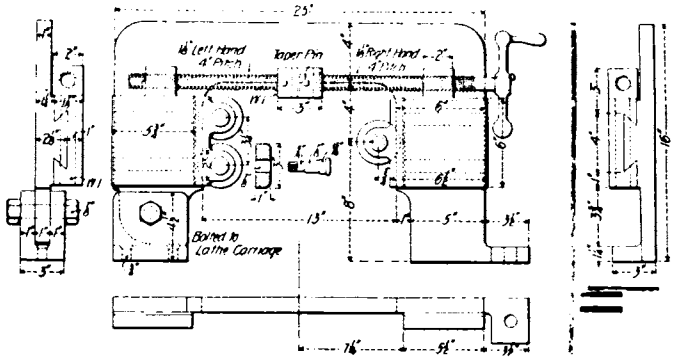
"This spring we had four engines on a certain division, two through passenger trains west and two through passenger trains east. These four engines were worth $10,000 a piece —that is, $40,000. It was found that the run for the round trip was 339 miles, and that the engines could be turned around and brought back to the starting point daily, and by doing so, we would cut the money invested in locomotives in half. Instead of having $40,000 invested in engines we had $20,000. Such economy is wonderful, where it is carried out to great extent. Those two engines now on that run make 339 miles a day, or 10,170 miles a month. What is going to make this method of handling these trains successful? It depends entirely upon the capacity of the engines to make 339 miles a day without a failure."

ROLLER ATTACHMENT FOR AXLE LATHES.

Allegheny Shops, Pennsylvania Company.

The increasing extent of the use of burnishers in the form of rollers for finishing the surface of journals, crank pins and piston rods was commented upon in our May issue of last year, page 156, and through the courtesy of Mr. W. F. Beardsley, Master Mechanic of the Pennsylvania Co., at Allegheny, Pa., we are enabled to illustrate still another burnisher for work of this character.

This device was designed at the Allegheny shops and reference to the drawing shows that it consists of a yoke-shaped frame secured to the carriage of the lathe and supporting three rollers, two at the left and one at the right, which are operated by a right and left hand screw to force the rollers against the axle. The stresses are therefore self contained in the attachment and the thrust due to rolling is not transmitted to the centers, which support the axle. This fixture is hinged on the rear side of the carriage and may be turned out of the way



Roller Attachment for Lathes.

when not in use. It is usually left in position, as its size and form are such that it will clear the tail stock of the lathe.

The rolling is done while the finishing cut is being taken over the wheel fit, whereby time is saved in completing the axle and no time is lost through the application of the burnisher. This arrangement effectually prevents springing the work due to the pressure of the rollers and it entirely relieves the centers from additional stress. It is evident that this feature of the design renders it specially well adapted to work on piston rods and valve stems, in which case the thrust of a single roller would be a serious matter. This attachment is now in use on an axle lathe in the Allegheny shops and is reported to be doing excellent work.

GOOD AMERICAN PRACTICE IN CRANK PINS AND AXLES.

An example of good practice in the design of locomotive details is the comparison, as shown in the "Railroad Gazette," of the axles and crank pins of the main driving wheels of a Lake Shore and Michigan Southern ten-wheeler and a North Eastern (English) ten-wheeler. Mr. L. R. Pomeroy in the June issue of the "American Engineer and Railroad Journal," for 1898, gives two excellent formulas, one for figuring the crank pins and the other for driving axles, from which the following results are derived:

	Lake Shore & Michigan 10-wheeler.	North Eastern 10-wheeler.
Cylinders, in. by in.	20 by 28	20 by 26
Boiler pressure, lbs.	210	200
Maximum fiber stress in main crank pins, lbs. per sq. in.	13,225	20,170
Maximum fiber stress in main driving axle, lbs. per sq. in.	21,700	23,740

In the case of both drivers the crank pins and axles have enlarged wheel fits. The diameter of the Lake Shore axle is 9 inches, with a wheel fit of 9½ inches, while that of the North Eastern is only 7¾ inches, with a wheel fit of 9 inches. The weight on the main drivers of the Lake Shore engine is 44,000 pounds, making a difference of only 1,000 pounds in excess of the North Eastern and has 50 per cent. greater area of journals. The crank pin is also of a larger diameter than that of the North Eastern. Mr. Pomeroy has found from his careful study of the breakages of crank pins and axles a maximum safe fiber stress for iron and steel axles of about 18,000 and 21,000 pounds respectively, and for iron and steel crank pins, 12,000 and 15,000 pounds respectively. From the table it will be seen that the fiber stress in the Lake Shore axles and crank pin are very close to the best practice while those of the English engine are high.

Mr. Thomas Tait, General Manager of the Canadian Pacific, has no misgivings concerning the recent adoption of yellow as a color for distant signal lights on that system. He recently wrote about this important step as follows: "We have adopted the Nels yellow (which I think should be called the Baird yellow) as our standard color for caution, and all of our interlocking plants are now equipped with it and it is giving great satisfaction." Mr. John C. Baird, who was the originator of this glass, informs us that the Canadian Pacific will use green for "all clear" or "proceed" signal, and that a new classification color for locomotive lamps will be adopted.