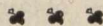


—The steam turbine may now be accepted as the coming type of marine engine, at least for the larger ships. The Cunard Company recently appointed a special commission of experts to investigate the record of the turbine steamships in use on the English Channel, and this commission has reported that under equal conditions the turbine engines show a saving of 10 per cent. in fuel over triple-expansion reciprocating engines. The new Cunarder that is to be next built will have turbine engines aggregating 60,000-h.p., and this great vessel will fairly inaugurate the turbine era in transatlantic navigation.



—Anyone who, after reading the official reports of surveyors and explorers in our north country, takes a map of Canada, will be struck by both the commercial and strategic advantages of running a transcontinental railway well to the north. The opinions of Mr. Frood, quoted elsewhere, are confirmed by the high authority of Sir Sandford Fleming, in a pamphlet just issued in support of the Grand Trunk Pacific. Sir Sandford points out that "a second transcontinental railway opens up the alluring prospect of consolidating the Dominion by establishing a great national highway removed from the frontier. This feature of the scheme alone invests the question with special interest to every intelligent and patriotic Canadian." A route such as this, Sir Sandford points out, would save 1,423 statute miles over any existing route from Yokohama to Liverpool. There is not only this saving in distance in connecting Europe with Asia, by way of Canada, but the northerly route gives easier grades which is an advantage of great practical importance in cost of operating. But more important still is the fact that a new Canada will be created in the region to be traversed which could not be developed except by such an arterial line of transportation. Sir Sandford speaks of the arable land making a belt whose northern edge would be 400 miles away from the frontier. We believe this belt of cultivable land will prove to be more than 700 miles broad, measured from any point west of Winnipeg, and that the forest and mineral wealth of the eastern section will also make it pay to keep north through Ontario and Quebec, possibly terminating eventually at a port on the east coast of Newfoundland or on the coast of Labrador, when science has triumphed over the difficulties of navigation in that part of the ocean. It appears to us that, in the light of the success of State-owned railways in India, South Africa and Australia this great highway should be built and owned by the Dominion; but whether owned by the State or not, the work should go on.



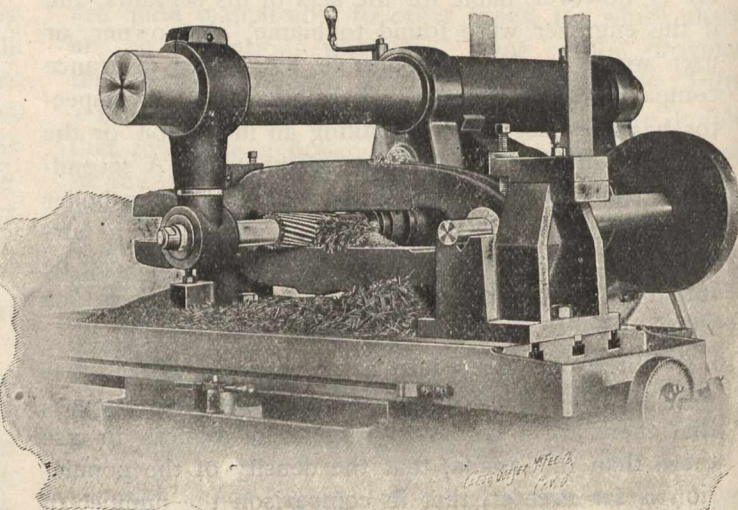
MACHINE SHOP NOTES FROM THE STATES.

III.

While visiting the machine tool shops, in Cincinnati, recently, I saw the Cincinnati Shaper Co. doing some very interesting things by way of rapid processes of manufacture. These people have just moved into their new shops, and have the best tool equipment that is procurable.

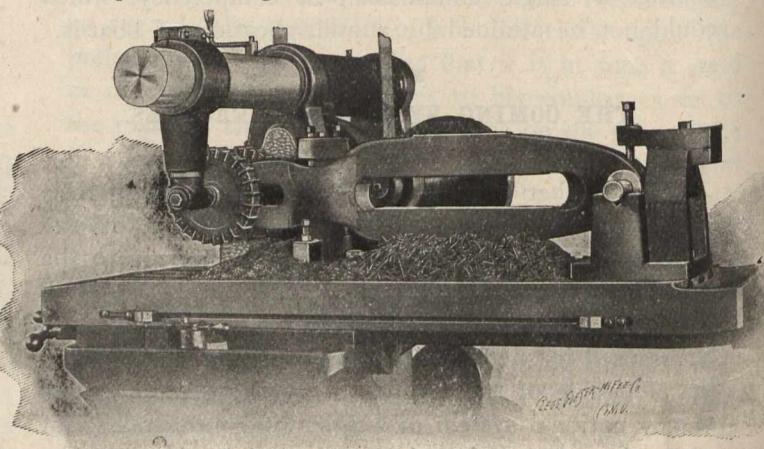
Among the things which I saw, probably the most interesting was the job of milling their rocker arms, which process is made clear by the illustrations herewith. The parti-

cular rocker arm photographed is about 36-in. long over all, and about 10-in. wide by $2\frac{3}{4}$ -in. thick. The work is held in the very simple fixtures shown, and the slot is milled to size by using a spiral mill, as shown in Fig. 1. The slot in forks at the left hand end is also milled to size in the same manner, as are also the pads at the top and bottom of the main body of the rocker arm. The two sides of the piece are finished by using a $9\frac{1}{2}$ -in. diameter face mill to bring the arm to a proper thickness, which is $2\frac{3}{4}$ -in. Then the forked end is



milled by using a gang shown in Fig. 2. All these operations except that of milling the bottom pad and the face of the piece farthest from the body of the machine, are finished without changing the setting. Then the piece is reversed in the fixture and these two surfaces are finished. The job is remarkable because of the simplicity of the fixtures, and the simple way in which the finishing is done.

Although these people make a specialty of building shapers, they find it profitable to finish a large proportion of the parts entering into their product on the Cincinnati



Geared-Feed Miller—the one shown in illustration being one of the half dozen in use. I was told that not very long ago they had been finishing their rocker arms on planing and shaping machines, and in looking over the time cards, we found that they thought they were doing it very well when they got the work done in $14\frac{1}{2}$ hours. They are now milling these pieces by the method which I have just described, in two and one-quarter hours each, which illustrates the saving that can be effected by keeping in close touch with improved tools and methods.



The Scientific American states that at the Jefferson Ironworks, Ohio, a new composition has been tried which is said to have remarkable effect in welding scrap steel. The scrap is placed layer upon layer, with the composition between, after which heat and mechanical pressure are applied, the result being a homogeneous union of the several parts. A billet of steel thus made was put through the furnace and rolled into a sheet, after which the metal was cut up into smaller pieces, from which nails and washers were made. These were found to be of excellent quality. The cost of making the billet, including the composition and labor, is from 25 to 50 cents per ton.