the machine puts one through in one act as you look.

Another notable machine is the automatic grinder of Ransome of London. The tool is set, the work inserted, and the machine is left to itself to grind away until the work is done. These machines make the machine shop most interesting to watch.

One wants to know the timbers used. They are Kauri and Rimu with a little Puriri for the upper work, Jarrah and Blue Gum for the under timbers, and Oregon is used sparingly. For ornamentation there are no importations. "Selected Rimu is the handsomest wood in the world," says the Loco. Superintendent, and PROGRESS admires his good taste as well as his patriotism. Never was a truer word; nowhere are there better corroborations than in the fine panels of selected Rimu that are so remarkable a feature of the railway cars of the Dominion.

Wheel and Axle.

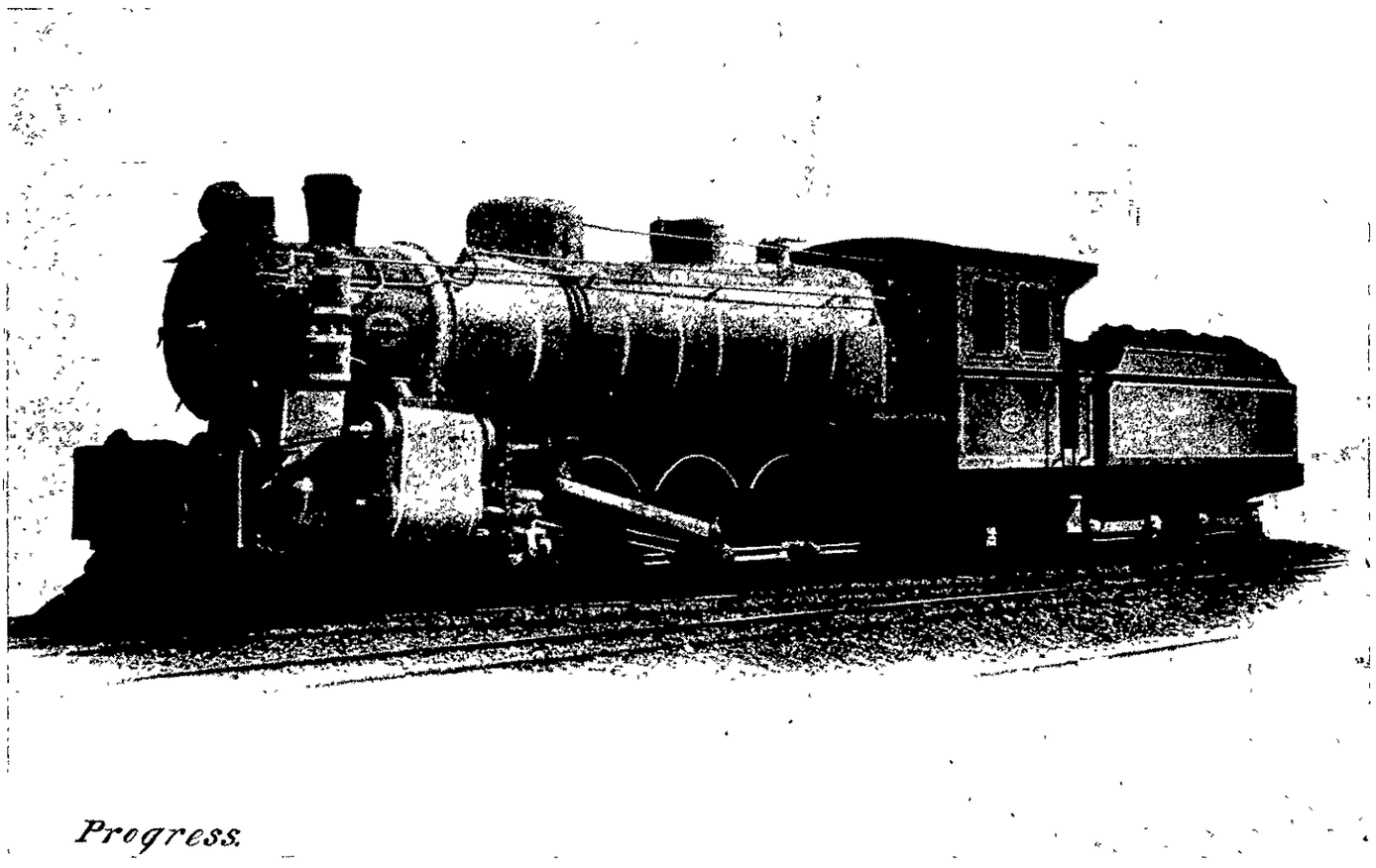
Further on is the shed where the axles are pressed into the wheels by hydraulic power. An air crane lifts the wheel and lowers it into position, the axle is also in its place; the hydraulic press exerts pressure on it, up to 10 tons for every inch of diameter; the axle gets fitted, the pressure is registered upon it, and is useful record for all the contingencies of the future, and the operation is over.

Tarpaulins.

Still further on among the buildings is the tarpaulin room where the making and mending of tarpaulins goes on apace—one looks in upon men in all the attitudes of sail-making as one remembers them in the old sailing liners and men-of-war, and one passes on impressed by the sight of industry but not of any novelties.

hammers. It was a process needing time as well as hard labour, to say nothing of a straight eye. To-day the piece is placed in the hydraulic persuader—Vertical Hydraulic Press is its official title—a handle is touched, the weight comes down with gentle but tremendous force, the iron wilts into shape in one breath, and emerges with absolute truth in every dimension. The machine does dozens for every one under the old system and does it under the control of two boys. One begins to understand the problems of labour-saving solved by the machineries of our time. In punching the holes through this solid iron there is the same contrast between the old and the new. Sixty-eight holes punched by the steady and apparently slow machine in thirteen minutes—it is a performance which leaves unaided man out of sight.

One understands a little too in this way how machinery makes for the use of ma-



THE NEW X ENGINE (90 tons), CONSTRUCTED AT ADDINGTON; ERECTED AT PETONE.
4-Cylinder Balanced Compound Locomotive, 4—8—2 type, specially designed for working heavy grades on Northern Main Trunk Railway, diameter of coupled wheels, 3ft. 9in., working steam pressure, 250lbs per square inch

Bogie Shop.

Hard by is the building in which the bogies are put together, before being taken into the erecting shop for the rolling stock to be mounted on them. Under the old system it took the men here a day to put one bogie together, so complicated was the process of squaring and building. To-day the daily capacity is five. The difference is due to the adoption of a frame on which the bogies are built. It is known in the world of work as a "Jig." There are four corner posts duly set, and the frame between them. The axle boxes are set up on the posts and the rest of the bogie is built up in the ordinary course, and when the parts are together they are riveted. There are two Jigs; so that while the riveting is being done at one, the other is the scene of a building operation. The Jig is the device of Mr. Pearson, the loco. engineer at these works of Petone.

Vertical Hydraulic.

We run against another hydraulic giant, a "multum in parvo" giant, working with great apparent slowness and much fascinating deliberation. Observation of the results, however, proves that the slowness is an assumed defect. The pace of the work is simply tremendous when you compare it with the results of previous methods. The machine straightens channel-bars, angle-irons, and all things of iron that require to be made true and fit for their duties, in the running of locomotives, passenger-cars, goods wagons, cranes, and the rest Likewise does it do all the work of punching holes. Take the straightening of angle-irons cut by a wonderful machine in the machine shop into short lengths. Of old the custom was for men to take the pieces up with tongs, place them on anvils, and move them while other men hammered them with great

chinery. The secret is well understood here at Petone, where many machines have been designed for the saving of cost and the expediting of work. In the brass finishing room, for instance, we saw a machine for stamping out the ventilator grids for operating the ventilators of the railway carriages. This machine stamps them out at the rate of 100 an hour. The old system under which they were cast turned out ten in the day.

Blacksmith's Shop.

This is the most interesting in the whole place, deriving its interest from big machinery and big men. Twenty-two forges are ranged half of them on each side with fires bright and roaring, while men are handling hot metal in masses on the anvils, hammering, turning, moving back and forth, the brilliant metal taking shape like putty, or cutting like butter, or opening