



Fig. 5.—Foundry.

The brass foundry, 60 x 30 feet, shown in Fig. 7, is located inside the iron foundry, next the cupolas. Seven brass moulders operate 6 pot furnaces, 5=300 pounds, and 1=120 pounds, with underground natural draft fire places. Castings weighing up to 21 cwt. are made even in this small shop; and from the high pressure work going on in the production of brass and bronze parts for standard pumps, air compressors, etc., it is evident that a larger modern shop will be needed in the near future.

The machine shop (Fig. 8) is 300 x 120 feet, and in detached line with the foundry, so that rough castings can be run on trucks direct from one department into the other. The view is taken from gallery at south end, looking towards the foundry. To the right of the middle bay, and immediately in front of the foremen's office, is a partly finished locomotive, about to be lifted by one of the 2=50 ton "Morgan" electric travelling cranes. The large tools and machines are mostly located at the north end, hence are not brought prominently into view. Upon entering the doorway at foundry end, we perceived on the right hand a colossal 22 ft. "Bertram" boring mill finishing a 20 ton turbine intake segment for Niagara Falls. And on the left hand side of track a 30 ft. x 84 in. x 84 in. "Bertram" planer, 52 ft. bed, on which a pair of huge locomotive frames were being planed, with  $\frac{3}{4}$  in. cut,  $\frac{1}{8}$  in. feed. Next to the first named tool is an 8 ft. "Niles" boring mill, followed by a "Bertram" 5 ft. mill. In front of the latter is a large "Niles" multiple drill, with special adjustable table. But the tool which attracted our special attention was a 40 ft. "Bertram" triple-headed slotter (Fig. 9).

A 23 ft. locomotive frame was being squared and straightened with a 1 in. cut, 3-32 feed. Each head is driven by separate  $7\frac{1}{2}$  horse-power C. G. E. motor; indeed all the heavy tools throughout the shop are driven by independent motors. Behind the large slotter is a 30'-0" "Niles" lathe, with 60 in. swing. After passing several minor boring mills, and drill presses by Bickford, N.H., Niles-Bement; London Machine Tool Company, etc., we came to a horizontal boring mill, by Barrett Boring Mill Company, Meadville, U.S.A., on

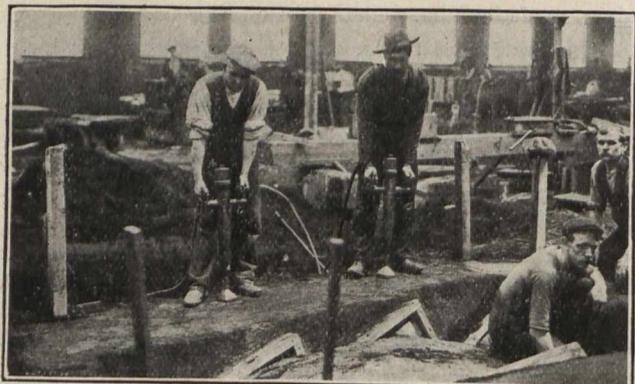


Fig. 6.—Pneumatic Rammers.

which the flanges and interior of a large pipe were being faced and bored simultaneously. Adjoining this machine is a Niles-Bement facer, with 62 cutting tools on a 52-in. head, cutting 9 feet in  $1\frac{1}{2}$  hours. The shop floor on eastern side of track opposite the last mentioned tools is used for erecting purposes, and at the time of our visit the immense turbine intake base segments were being assembled, and an imposing sight they made. Behind this erecting floor, under the drawing office, are 6 planers—some large, 4 shapers, and 1 large "Bertram" horizontal milling machine. Under the western gallery we counted 18 lathes, 8 drill presses, and numerous special tools, such as bevel gear cutter, by Gould & Eberhardt, Newark, N.J., grinders, etc.

Having roughly glanced at the northern half of the shop, devoted to general machine work, we pass by the tool store room situated behind the conveniently placed foremen's office to the southern half, which is reserved for general floor and bench work. Along the wall under eastern gallery are benches fitted with "Parker" vises. Here is done the assembling, fitting and testing of cranes, pumps, air compressors, hydrants, etc. In the middle bay the assembling of locomotives and heavier structures is done. In the foreground of Fig. 8, to the left hand, may be seen the 150 ton "Bertram" press for forcing wheels on axles, and nearby is a 300 ton "Bertram" press for heavier but similar work. Other special tools, viz., wheel borers, pneumatic frame riveters, grinders, etc., are distributed about the floor under the south-west corner under gallery; while down this wing

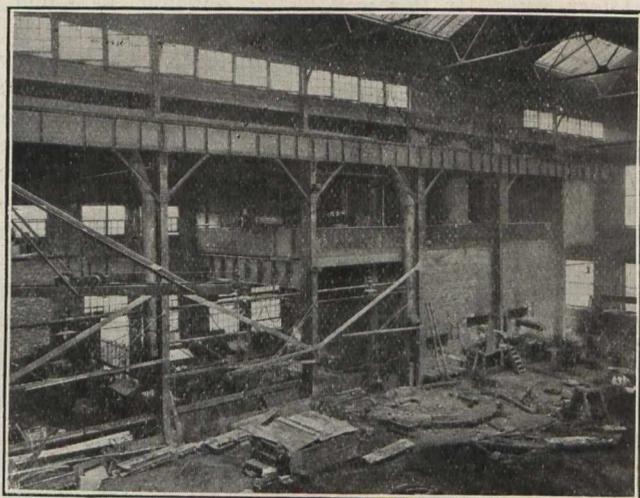


Fig. 7.—Brass Foundry.

towards the middle of shop we counted 8 planers, 2 grinders, 2 slotters, 1 boring mill, and 2 drill presses. Such is a brief description of the fine equipment, and of the cosmopolitan work being done on the ground floor. Ascending one of the convenient staircases we reached the western gallery and counted 46 lathes, drill presses, etc., distributed thereon, all in active operation, finishing the parts for pumps, air compressors, etc. On the opposite side, at south-east corner, is the blue printing department; next to this is the brass finishing section with 27 busy machines, and beyond this part is the tool room with 23 fine machines, lathes, grinders, millers, shapers, drills, etc., the latest and most approved types. The remainder of the eastern gallery is occupied by the production department and engineering offices.

Taking it all in all the like of this machine shop as regards design and equipment can not be seen this side of Niagara Falls. But large though it is comparatively, it is already overcrowded, and the space reserved for extension southwards will soon have to be occupied to meet the demands of the good time coming.

The forge and blacksmiths' shop (Figure 10), is a well lighted, commodious and generously equipped department. The abundance of glass makes it very hot in summer. A few handfuls of liquid air thrown inside on the day of our visit would have been very refreshing for the 55 men working therein. On the eastern side is ranged a series of 11 forges and two pair in the middle of the building, each