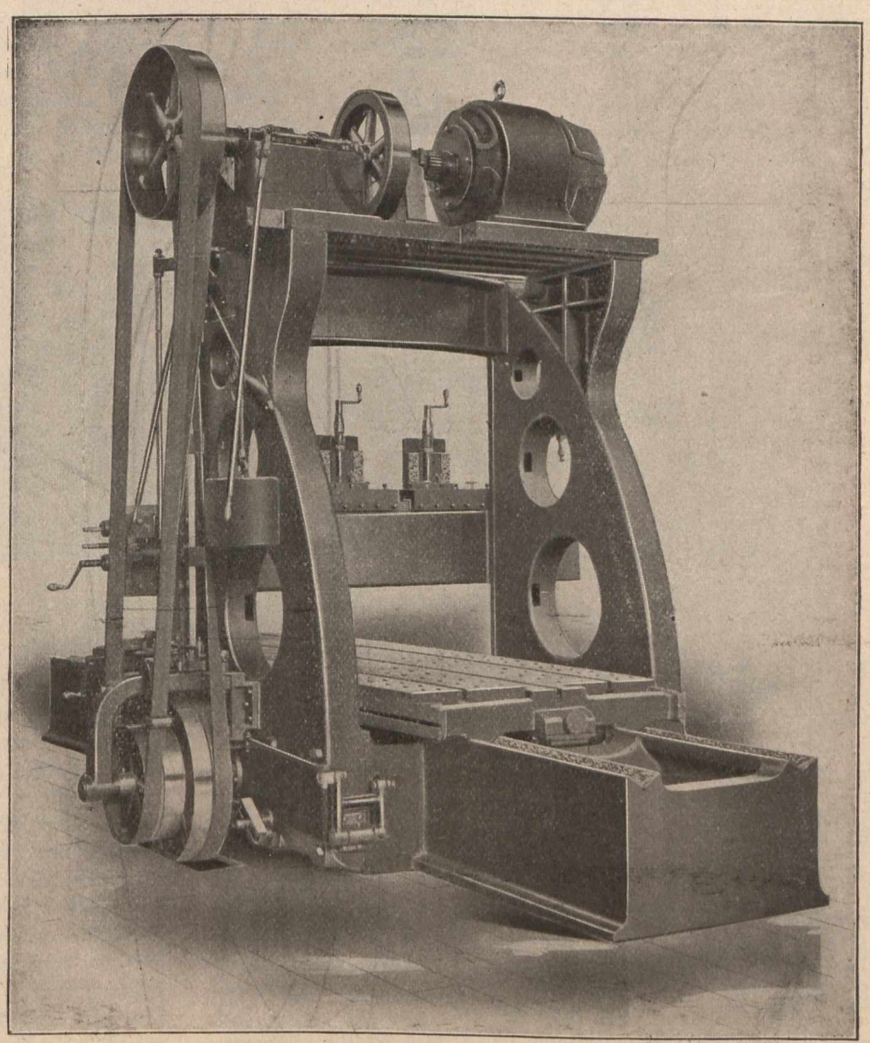
in 1874. Up to June, 1876, only laboratory experiments had been made with the instruments, and the transmission of speech was from one room to another in the same building. The first transmission of speech over a real telegraph line was effected in Brantford in the autumn of 1876, on the lines of the Dominion Telegraph Company, by means of instruments which I had brought from Boston. In one experiment speech was transmitted from Brantford to Mt. Pleasant, in another from Brantford to Paris, and in a third from Brantford to my father's house on Tutela Heights, where the results were witnessed by a large company of Brantford people. These experiments were made August 10th, 11th, and 12th, 1876, according to an account published in the Toronto Globe and quoted by the Scientific American of September 9th, 1876. In these experiments the transmission was effected only in one direction, the instruments employed not being well adapted for reciprocal communication. As to citizenship, I was born in Edinburgh, Scotland, and was, therefore, a British subject by birth. I landed in Canada from Great Britain on the 1st of August, 1870, and after a few days spent in Paris, Ont., I removed to Brantford, where I resided with my parents at Tutela Heights until March, 1871. The telephone was invented in Brantford in the summer of 1874. . . During the whole period of the development of the telephone, therefore, my political status was that of a British subject, who had taken out his first papers of naturalization in the United States, and who, although not a full citizen, was entitled to the rights and privileges of citizenship. The telephone went into commercial use in 1877. We now have more than three million miles in use in the United States."

FORTY-TWO-INCH HEAVY PATTERN CINCINNATI PLANER.

The accompanying illustration shows a new 42-in. heavy pattern planer, made by the Cincinnati Planer Co., Cincinnati, O. The bed is of the modern deep pattern, resting direct upon the foundation, and is thoroughly braced throughout by the box girders. The V's are wide, and fitted with automatic roller oiling devices. The table has their dirt-proof feature, and is so designed that the rack is extended at each end permitting of a longer piece being planed than the stated capacity of the machine. Complete shafting mechanism is furnished on both sides. The housings are of the popular box form, securely bolted to the sides of the bed and are of such proportion as to insure the greatest stiffness. The cross rail is accurately fitted to the housings, and strengthened by an arch-shaped brace on the back. It is made of sufficient length to admit of an extra head being attached at any time, allowing either head to have full traverse across the table. Provisions are made for raising and lowering it by power. The heads are carefully fitted to the rail, and are graduated for swiveling and provided with automatic feeds in all directions. They can be operated from either end of the cross rail. The down feed screws are provided with micrometer adjustment and ball bearings. Side heads can be furnished on one or both housings, with independent power and hand vertical feed, and can be run below the top of table when not in use. The handles, which control the feeds, travel up and down with the heads, always convenient to the operator. The combination friction is a new feature in planers, insuring positive feed when heads are taking their heaviest cuts. The shifter is so constructed that the table reverses without shock or jar and all disagreeable noise of the belts is obviated. It is also provided with a safety locking device, preventing the table from starting except at the will of the operator. The rear dog is fitted with a latch, so the table can be run from under the cutting tool when desired. The driving shafts are made of special crucible steel, accurately ground, and run in long boxes fitted into bored holes in the bed. This construction provides the best facilities for lubrication, and makes it possible to remove any shaft with gears intact. The gearing is very powerful, cut from solid stock and all placed on the inside of the bed. The rack is also cut from the solid, is of extra width, and is bolted and pinned to the table in short sections. The countershaft is fitted with self-oiling patent adjustable hangers.



42" Cincinnati Planer.

FOURTEEN-INCH HYDRAULIC BORING LATHE.

The machine illustrated herewith is intended to bore gun forgings, marine shafts and ingots generally. It will take in a shaft 60 feet long, 30 inches in diameter, and bore a hole out of the solid 12 inches in diameter the full length, or 14 inches for short length. Two boring bars are used, one at each end, while the work is being held in a hollow spindle or revolving chuck. Two revolving steady rests on each side of the centre chuck support the work. The feed pressure required to do such extremely heavy work is so great that it becomes impractical to feed by rack and pinion or screws. For this reason the boring-bars are fed in by hydraulic pressure. The boring-bar itself is clamped in a head by means of hydraulic pressure, in addition to lever and toggle joint. The hydraulic pressure against the piston is 720 lbs. per square inch, giving a total pressure of 200,000 lbs. against the piston. It is obvious that an arrangement like this would allow the tool to gouge into the work should the metal be soft, and, generally speaking, would not