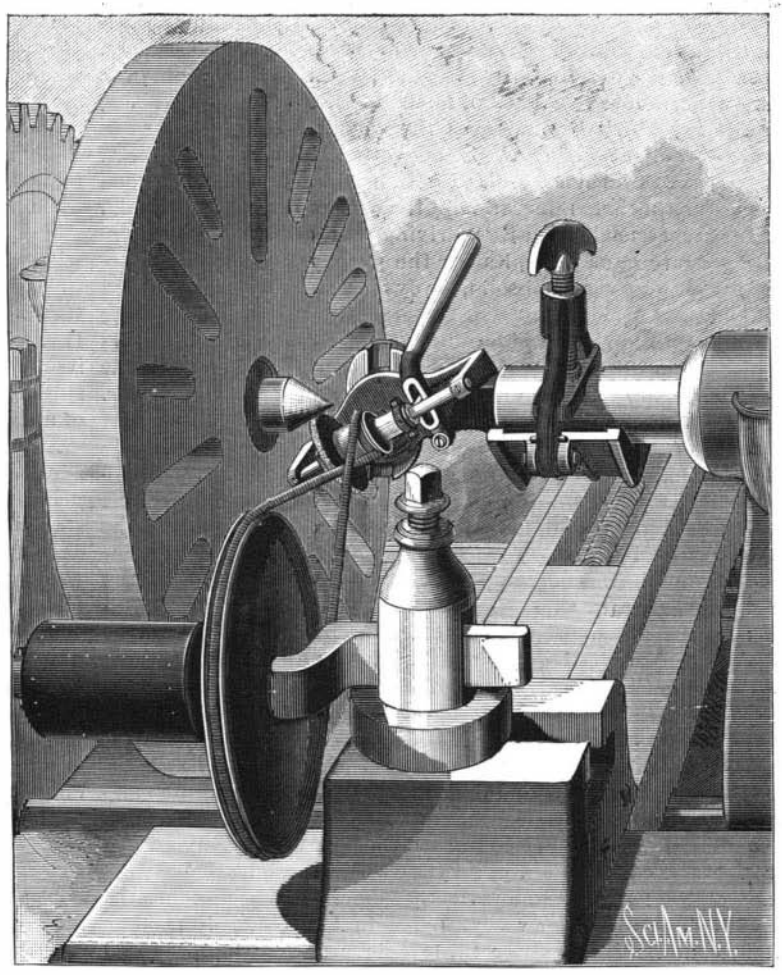
LATHE CENTER GRINDING MACHINE.

The frame carrying the grinding device has at one end a V-shaped socket, applied to which is a detachable clamp yoke, provided with a set screw bearing upon a clamp plate. The frame is held firmly upon the puppet head spindle, which enters the socket, when the set screw is tightened. As the socket is drawn up against the under side of the spindle, the true centering of the frame is insured, irrespective of the diameter of the spindle. Pivoted to the main frame by a bolt is a second frame, having end lugs, in which is mounted a spindle provided with a sleeve carrying a pulley and grinding wheel, the latter being made of emery, and being secured to the sleeve by a nut. Adapted to a groove in the sleeve is a two part ring formed with a pin projecting into a slot in a lever pivoted to the second frame. This lever has a handle by means of which a longitudinal movement can be imparted to the sleeve. Rotation of the ring with the sleeve is prevented by the projection of the pin into a slot formed in the frame. This frame can slide vertically on the other, which is formed with suitable grooves and a slot for the passage of the pivot bolt. In the second frame is a segmental slot, through which passes a bolt screwing into the first frame. The construction permits the second frame to be adjusted on the pivot bolt to different angles, depending upon the taper of the center being ground. The extent of the vertical movement of the frame is governed by the diameter of the center pin.

The grinding wheel is driven from the face plate in a very simple and efficient way. On a spindle, having a projecting arm adapted to the usual slotted tool post secured to the slide rest of the lathe, is a V-shaped pulley, having a long hub carrying a friction drum which is in contact with the periphery of the face plate. A belt passes around this pulley and the one on the sleeve. By turning the usual transverse feeding screw controlling the slide rest, the friction wheel can be moved into or out of contact with the face plate, the rotation of the grinding wheel being thus started and stopped at the will of the operator without stopping the lathe. It will be seen that the adjustment of the grinding disk to the diameter and angle of the center pin is effected without any corresponding adjustment of the driving device. It is apparent that the attachment can be readily applied to the lathe. It is properly centered when the clamp is tightened on the projecting spindle of the puppet head, and no further adjustment is required except that necessary to bring the grinding spindle to bear on the conical end of the pin and regulate the angle of traverse of the grinding disk to agree with the angle of the pin.

This invention has been patented by Mr. Alfred H. Randall, of 607 Franklin St., Philadelphia, Pa. This patent is for sale.



RANDALL'S LATHE CENTER GRINDING MACHINE.

ELECTRICAL TRANSMISSION OF POWER TO A DISTANCE.

The question of the transmission of motive power to a distance has recently deeply engrossed the attention of the scientific world and of the public, and a new element has been added to the study of this interesting problem by the late experiments of Mr. Hippolyte Fontaine. Before making known the results of these, we shall give a historic summary of the question from the standpoint of the applications made.

We cannot give the exact origin of the *idea* of transmitting power to a distance by electricity, but the first experiment in this line dates back to 1873, and was performed at the Vienna Exposition. The projector of this experiment, Mr. Fontaine, thus describes it in the *Revue Industrielle* (1873, p. 658): "The Gramme machines gave rise at Vienna to an experiment that will possibly be followed some day by very important applications. The first machine was actuated by a gas motor, and the electricity produced was sent into a second machine, which actuated a small centrifugal pump. As we had no measuring apparatus, it was not possible to determine the useful effect. Yet these first experiments have demonstrated not only the possibility of transmitting power to a long distance, but have shown that the performance is notably greater than that given by other apparatus."

Mr. Fontaine thinks that the power transmitted was one-third horse and the distance about 7 ohms.

On the 3d of December, 1886, the same gentleman gave an account, as follows, of the progress of this then nascent industry before the French Society of Physics:

"At Philadelphia, in 1876, the Gramme Society exhibited a transmission of from 2 to 3 horse power traversing a distance of 20 ohms.

"At Paris, in 1878, the same house exhibited a genuine distribution of power, where the same generator actuated, simultaneously or separately, a pump, a blower, and a printing press.

"None of these public demonstrations succeeded in attracting the attention of manufacturers to the new method of transmitting power; and it required the great experiments in plowing by electricity at Sermaize, in 1879, by Messrs. Chretien and Felix, to bring the question into the domain of practice. The Gramme machines used by these gentlemen revolved 1,400 times per minute, and produced a current of 20 amperes and 400 volts.

"Starting from 1879, the industrial applications rapidly increased, and, at the Exhibition of Electricity in 1881, there were to be seen more than fifty machines employed in electrical transmission."

Dating from the exhibition of 1881, we no further count the applications made in different quarters (always with the concurrence of the Gramme machine, or machines of that type), with the object of transmitting power to medium distances.

The difficulty increases with the distance of the transmission, or, more accurately, with the resistance of the line which connects the generators and receivers. It becomes necessary, therefore, in order that all the electrical energy shall not be spent in the line, to reduce the intensity of the current and increase the initial tension, as was pointed out as long ago as 1879 by Messrs. Thomson and Houston, in the *Journal* of the Franklin Institute for January of that year. After well explaining the necessity of using these high tensions, Messrs. Thomson and Houston conclude thus:

"Divested of these theoretical considerations, the important fact remains that with a cable of very limited section an enormous mechanical power can be transmitted to a considerable distance. The combustion of coal at the threshold of the mine, and the transmission of the mechanical power produced by rivers, may, then, be considered as applicable, the fact always being remembered, however, that a loss of 50 per cent will be almost inevitable."

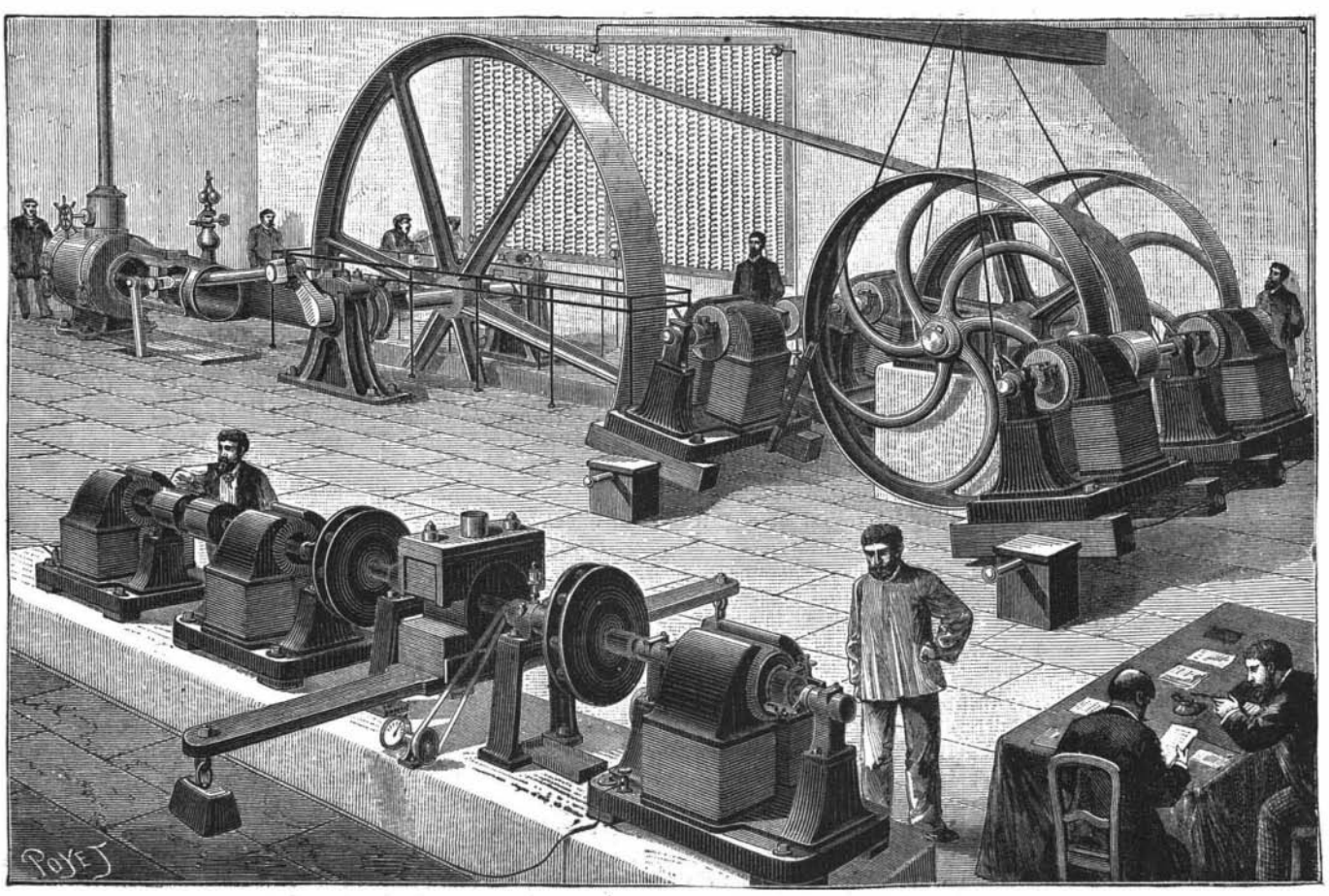
This prophetic figure of 50 per cent is to be remarked, for it makes its appearance approximately in most of the experiments that have been performed up to the present, without any one being able to sensibly exceed it.

But the error of Messrs. Thomson and Houston that we think it well to dwell upon, since it is still too widespread, is relative to the utilization of rivers, waterfalls, and, in a word, of natural motive powers, to a distance; and our opinion upon this point agrees with that of Mr. Fontaine, who cannot be accused of not having a certain amount of practical knowledge of the subject. We continue to cite:

'Mr. Hippolyte Fontaine does not believe that the utilization of waterfalls to a distance is as advantageous as has been often said. Taking into account the expense of setting up the hydraulic motors and dynamos, of the construction of dams and sluices, and of keeping in repair, and the interest on the capital invested, and the performance of the dynamos, etc., we quickly reach a otal expense that is greater than that occasioned by a steam engine of the same power, especially when we reckon in the cost of the fall itself, which rarely wants an owner. The question, when looked at from the standpoint of transmission, is entirely another affair. In this case, the intervention of electricity presents numerous advantages over the systems now in use."

We may naturally ask, then, why the experiments that we are to describe were undertaken, seeing that their projector did not himself believe in their industrial success. Another extract from his communication will explain this:

"Although Mr. Fontaine undertook some new experiments on transmission to a great distance, it was merely to



ELECTRICAL TRANSMISSION OF POWER TO A DISTANCE.