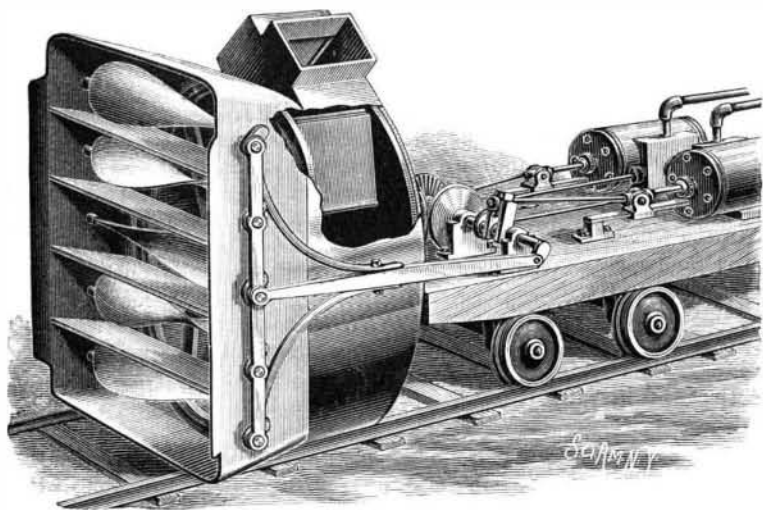


A STEAM SNOW PLOW.

The plow shown in the illustration is designed to work effectively through heavy drifts or deep and solidly packed snow banks, throwing the snow to either side of the track as may be desired. It has been patented by Mr. Arthur Gardiner, of Terrace, Utah Ter. The forward shell of the plow has a circular portion, open at the front and closed at the rear, the front edges of the shell being nearly rectangular in contour and flaring outward, to direct the incoming snow into the smaller or cylindrical portion of the casing. At each side of the flaring portion of the casing the shell is slightly extended, forming a shield to keep the operative parts of the machine free from snow.

Within the flaring end is a series of horizontal partitions, the outer edges of which have a knife edge, to



GARDINER'S SNOW PLOW.

readily cut the snow against which the plow is advanced, and within each of the compartments formed by the partitions a double blade in screw form is horizontally pivoted. The trunnions of the blades extend through the sides of the casing, where they are each connected by a crank arm with a vertical bar secured to the connecting rod of an engine suitably mounted on a truck at the rear. There are also bevel gears upon the drive shafts of the two engines to operate a shaft carrying a conveyer wheel held to revolve in the circular body portion of the casing. The wheel has a solid rear disk, and a forward skeleton disk, and between these disks, some distance from the center of the wheel, are hinged feathering paddles adapted to operate against the snow as the wheel is revolved in either direction. At the top of the casing in which the conveyer wheel revolves are two discharge openings, in which a gate or damper is so arranged that the snow may be directed to either side of the track. The working parts are shown as adapted for use in connection with an ordinary car truck, upon which they are fitted, the car being pushed forward by a locomotive in the usual way.

LONG DISTANCE TELEPHONE CONCERTS.

One of the interesting developments of telephone work is that which is now steadily going on—the transmission of orchestral music over long distances. Our readers will recall the large measure of success attained during the exhibition of the Women's Exchange at the Lenox Lyceum last winter, when, besides the transmission of music from the local theaters, Boston contributed to the entertainment by telephone, in the shape of music and recitations.

This work has been carried on by the American Telephone and Telegraph Company, known as the "Long Distance Company," under the direct supervision of their able engineer and electrician, Mr. F. E. Pickernell, and the results obtained with but a comparatively short experience in so difficult a field are exceedingly gratifying and give promise of still greater success in the near future.

In a lecture recently delivered in the Town Hall at Newton, Mass., Mr. Pickernell described the methods employed in the transmission of music by telephone. His remarks were very forcibly illustrated by the reception in the lecture hall of music transmitted over the long

distance lines from the telephone building, at No. 18 Cortlandt Street, New York, and our engraving, made from a photograph taken at the time, shows the arrangement of the performers.

In transmitting music of this kind, it has been found desirable to have a separate transmitter for every instrument, and further, that, where a considerable number of instruments are used, it is necessary to so arrange the induction coils that their joint resistance will bear a fixed ratio to the resistance of the receiving instruments and line, all the induction coils being connected by the same line in multiple series. For this class of work the storage battery is admirably adapted for operating the transmitters, and by using cells of this type, it is possible to run 20 long distance transmitters from the same battery without drawing a current sufficiently heavy to injure the storage battery.

By using separate transmitters for each instrument, due prominence may be given to each of the instruments at the receiving end. If one transmitter is arranged to transmit music emanating from 50 instruments, it has been found that it must be so adjusted that the average result will be fair. Under these conditions, the lighter violin parts are heard but very indistinctly, while the heavier parts produce very great noise, but the purity of the sound is affected. This, of course, gives very unsatisfactory results.

At the receiving station, when it is desired to fill halls of considerable size, as many as six loud-speaking receivers are used. These are connected in multiple series, so that their joint resistance bears a definite ratio to the resistance of the transmitters. These are distributed about the hall, being usually attached to the chan-

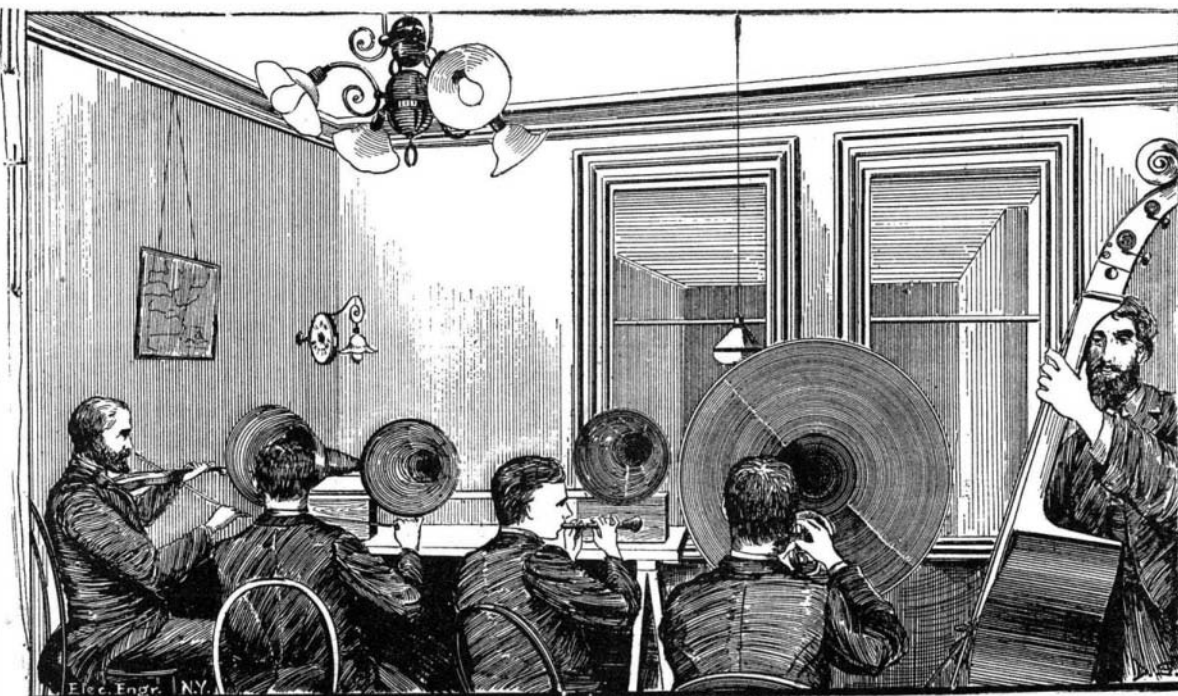
deliers. On the occasion above referred to, the music transmitted from New York over a distance of 250 miles was listened to by an audience of over 1,000 persons.

When we add that similar entertainments have been given with music transmitted over a distance of no less than 460 miles it will be clear that if the same progress is made in the future as that characterized by the work of the last few months, the telephone will occupy



an important position in our future entertainment, both public and private.—*Electrical Engineer.*

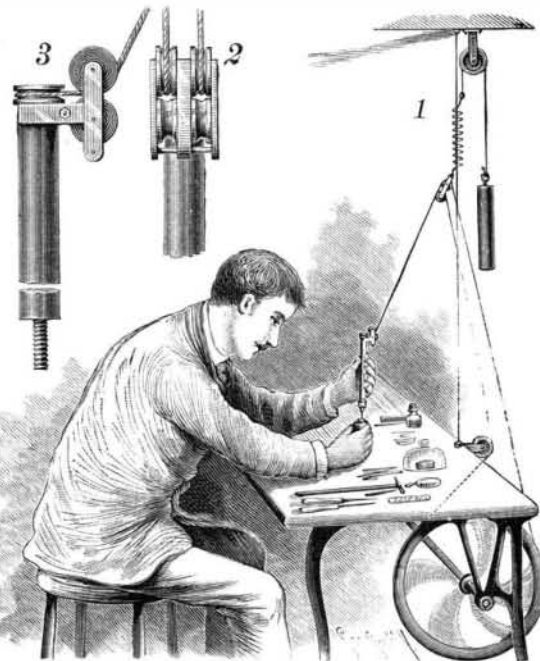
ONE of the latest proposed applications of electricity is a policeman's club that contains a galvanic battery. When the rowdy seizes the club, thinking to wrest it from the policeman, the rowdy receives an electric shock, which astunishes and paralyzes him, rendering his capture easy.



A LONG DISTANCE TELEPHONE CONCERT—PERFORMERS IN NEW YORK, AUDIENCE AT NEWTON MASS.

A DRIVING MECHANISM FOR HAND DRILLS.

A simple and economic mechanism is shown in the cut whereby a drill may be driven at a high speed, and at the same time be conveniently held to work on the top, bottom, or sides of objects. It has been patented by Mr. J. W. Knapp, of Cross River, N. Y. The drill is held by a suitable chuck on the lower threaded end of a shaft adapted to revolve in a small casing, the upper end of the shaft carrying a horizontal grooved pulley, near which a bracket on the casing affords support for the journals of four grooved pulleys, as shown in Figs. 2 and 3, the pulleys being journaled in pairs. In Fig. 1 a driving pulley, to be rotated by a treadle or other approved means, is shown journaled



KNAPP'S DRIVING MECHANISM FOR HAND DRILLS.

beneath the work table, on the outer edge of which is an idler or guide pulley, above which, and suspended from the ceiling, is a frame carrying two pulleys. This frame is attached to the lower end of a spiral spring, a cord from the upper end of which passes over a pulley near the ceiling, the other end of the cord having a weight to counterbalance the spring. A guide rod extends from the ceiling to the table, passing down on the inside of the spiral spring, to keep the pulleys in the suspended frame in proper alignment with the driving pulley. The endless driving belt passes from the idler over one of the upper pulleys, thence to engagement with one of the pairs of pulleys on the bracket of the drill casing and the pulley on the drill shaft as shown in Fig. 3, over the other upper pulley, and again around the driving wheel. By means of the two pairs of pulleys in the bracket of the drill casing, the driving belt is always led to engagement with the pulley on the drill shaft, without regard to the position in which the drill is held, and by means of the balanced spring supporting the frame carrying the upper pulleys, the amount of tension will be constant upon the belt, as regulated by the weight, no matter how much lower or farther away the drill is taken. This mechanism is especially adapted for use with jeweler's tools and for dental purposes, as well as with an ordinary drill for working metal or wood.

The Treatment of Dandruff.

Dr. Edward Clarke, in the *Lancet*, states that he has had good results in persistent dandruff from the following treatment: The scalp should first be thoroughly washed with soap and hot water and then thoroughly dried with a warm and soft cloth; there should then be rubbed into the scalp a glycerole of tannin, of the strength of ten to thirty grains to the ounce. Very obstinate cases will require the higher strength of tannin. This process should be repeated twice a week at first, once a week afterward. If tannin fails, as it will in some cases, then resort is had to resorcin. After the formation of dandruff has ceased, the head should be rubbed daily with olive oil containing, to the ounce, ten grains of carbolic acid and a drachm of oil of cinnamon.

ONE volt of electromotive force is generated for every 100,000,000 lines of force cut per second.