

a lathe, and are made to face each other, while the armature, which consists of an iron casting of varying diameter, according to the size of the machine, is mounted upon a shaft, and placed between the magnets. The shaft also carries pulleys at each of its ends, and is made to rest in bearings in the yokes of the electro-magnets. The armature disk carries on each side, and near its periphery, twenty-five wedge shaped projections, of which there are fifty in all, that face the poles of the electro-magnets, and on which coils of wire are placed. The terminals of these coils are joined together, and a wire, connected with the junctions, leads to the commutator, situated on the same side of the plate—all the coils on one side connecting with one commutator and all on the opposite side with the other.

The commutators are placed upon the shaft, between the legs of the two magnets, and consist of wood or other more durable insulating substance, on which strips of brass, connecting with the wires from the armature coils, are secured. The connections of the machine are so arranged that when external circuit, which may consist of the light apparatus or depositing vats with their leading wires, is completed, the armature and field of force coils are combined with it in one—an arrangement for which Mr. Farmer obtained a patent in 1872, and which, when the external resistance is low, is of very great advantage.

The eight inch machine, so called from the length of its electro-magnet, and which is the one most commonly employed, will produce two lights of about two thousand candle power each, and is so arranged that the two may be combined in one if desired. It weighs six hundred pounds, and requires to drive it about one horse power for every twelve hundred candle light.

The machines made by Messrs. Wallace & Sons weigh from one hundred and twenty-five to three thousand pounds each, and are capable of producing a light equal to that of from one thousand to forty thousand candles. Some of them will even maintain the arc with the carbons three and a half inches apart. Fig. 208 shows another form of the light machine, as constructed by the Telegraph Supply Co., of Cleveland, on a plan devised by Mr. C.