EDISON'S IMPROVEMENT IN THE TRANSMISSION OF POWER.

The object of this invention, which is by Thomas A. Edison, is to produce a new mechanical movement by the aid of magnetism which will permit the positive transmission of large powers at high velocities without the excessive noise incident to the use of toothed gearing. In his patent he says: This I accomplish by the employment of smooth face iron pulleys or wheels which are made strongly magnetic by suitable windings connected in circuit with a suitable source of electrical energy, and by the use of endless belts, chains, or ropes which are either themselves magnetic, or carry iron bars (or both), which form armatures to close the magnetic circuits at the pulleys, and are strongly attracted to the faces of the pulleys so as to increase the adhesion and transmit the power without slip. Or, the magnetic bars, instead of being carried directly by the belts, chains or ropes, may be arranged in a frame over the belt, chain, or rope where it passes around the pulley, and be capable of a movement toward the pulley to a limited extent, so as to press the belt, chain or rope upon the pulley.

Referring particularly to Figs. 1, 2, and 3, A and B are two iron pulleys mounted upon parallel shafts and connected by an endless belt, C. Each of these pulleys is provided with several circumferential grooves, shown more particularly in Fig. 2, in which are located windings, *a*, of insulated wire, connected at the ends to insulated rings, *b*, upon which bear contact springs, *c*. These contact springs being connected with a suitable source of electrical energy, indicated by the circuit, 1, 2, each pulley becomes strongly magnetic, as indicated by the letters N, S, in Fig. 2, the circumferential ribs or exposed faces of the pulley on opposite sides of each of the windings being oppositely magnetized. The belt, C, is preferably constructed of a number of thin sheet steel strips placed one over the other as shown in Fig. 3, and upon the outside of these are secured, like the rounds of a ladder, cross bars, *d*, of soft iron which are riveted to the belt, the strips of steel being at the same time riveted together so as to form a continuous belt. The steel belt and the bars, *d*, bridge the windings of the two pulleys completing the magnetic circuits around the windings, thus forming armatures or keepers for the magnetic poles produced upon the pulleys. These magnetic circuits being exceedingly short and of remarkably low resistance, the attraction of the many keepers to the pulleys produces a great adhesion of the belt to the pulleys, thus permitting large powers to be transmitted through relatively small belts. Experience has shown that with a four inch pulley and a belt three inches wide, making contact only over one-half of the circumference, the belt will sustain a dead weight of two hundred pounds without the magnets reaching saturation. It will thus be seen that we have here, by a proper proportioning of the parts, a magneto-mechanical device capable of replacing the toothed wheels in nearly all cases of power transmission.

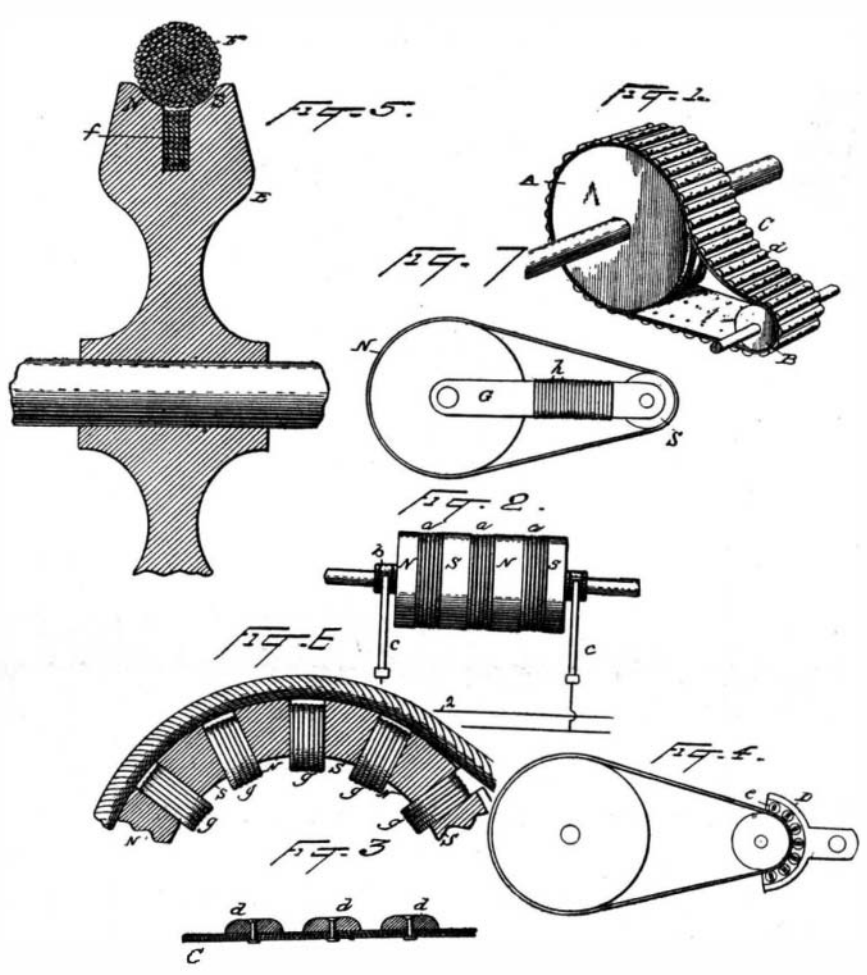
In Fig. 4 is illustrated a construction in which, instead of placing the bars, *d*, directly upon the belt, a frame, D, is placed on the contact side of one or of each pulley, and in this frame are mounted magnetic rollers, *e*, having slotted bearings so as to be capable of a limited movement toward the pulley. The belt passes under these rollers, and by the attraction of the rollers toward the pulley, the adhesion of the belt is increased.

In Fig. 5 the device is an iron wheel, E, provided with a grooved face in which runs a wire rope, F. The wheel is slotted circumferentially and provided with a magnetic winding, *f*, which strongly magnetizes the wheel, giving the opposite sides of its rim opposite polarities. The wire rope acts as an armature or keeper to the magnetic poles, forming a magnetic circuit of exceedingly low resistance and resulting in a powerful adhesion of the rope to the wheel.

Instead of winding the wheel, E, circumferentially, its rim may be provided with transverse grooves in which windings, *g*, will be placed, making the projecting surfaces of the wheels between these windings alternately of opposite polarity, as indicated in Fig. 6. The wire rope acts as an armature or keeper for all the magnets thus formed.

Instead of winding each wheel or pulley, in cases where the wheels or pulleys are sufficiently near to permit of the employment of the construction, the pulleys are connected by an iron frame, G, which is provided with the magnet winding, *h*, thus making one pulley of one polarity and the other of the other polarity, a magnetic belt, rope or chain being used to complete the magnetic circuit between the two pulleys or wheels. This construction does not produce as powerful magnets as in the constructions already described. It is simply given as an illustration of the fact that the invention is capable of being carried out in many forms of construction, and is not limited to the special constructions illustrated.

It is obvious that while a belt of magnetic material such as the laminated steel belt described is desirable, in order to secure the full advantages of the invention, yet the invention may be used to increase the adhesion of belts of non-magnetic material, such as leather, rubber cloth and the like. If the endless belt, C, of Fig. 1 were a leather or rubber cloth belt, it is evident that the magnetic bars, *d*, would increase the adhesion of the belt to the pulleys, while if the belt of Fig. 4 were of non-magnetic material, the magnetic rollers, *e*, would increase its adhesion.



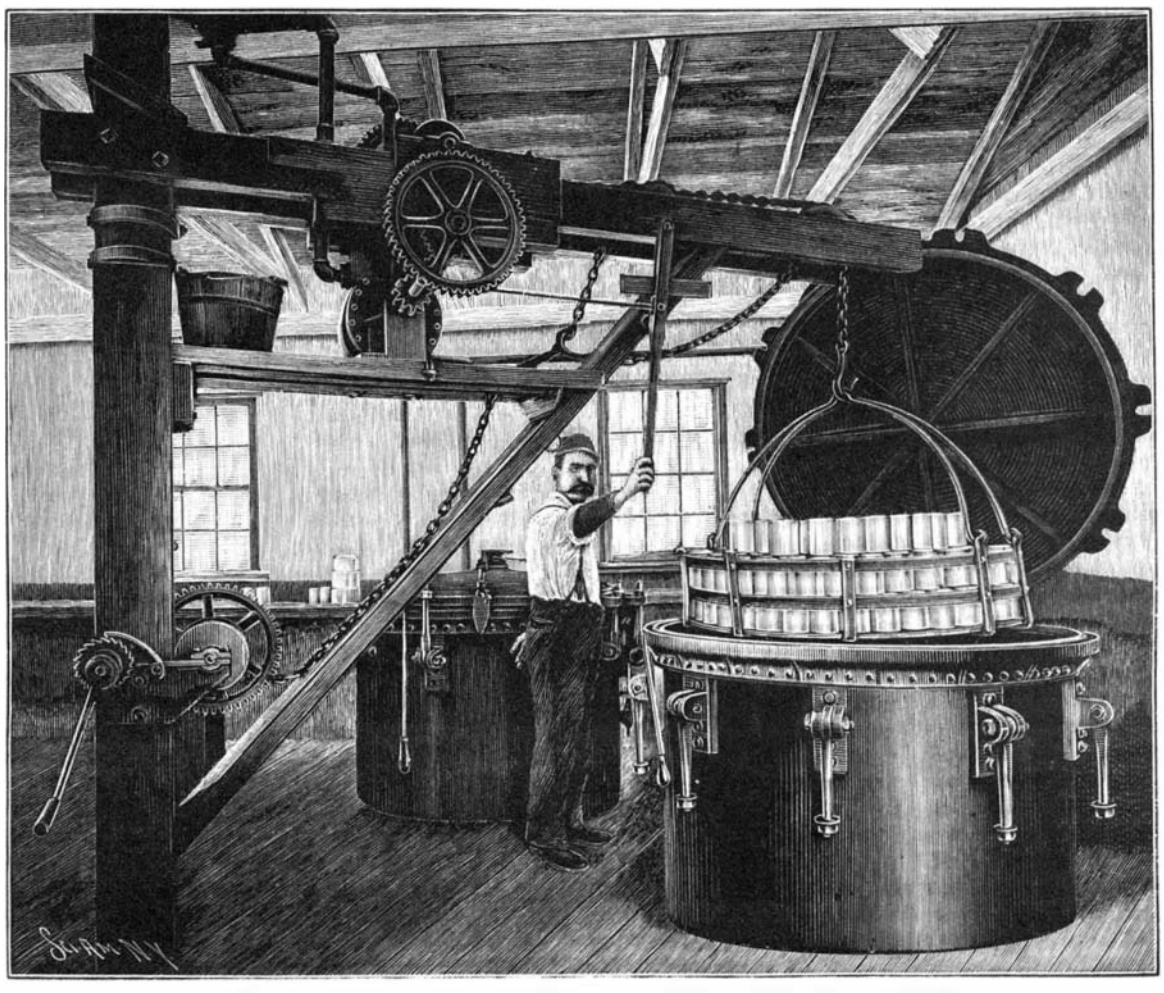
EDISON'S IMPROVEMENT IN THE TRANSMISSION OF POWER.

Electro-Mechanical Light.

An interesting illustration of the production of light by small mechanical effort is furnished by Mr. E. C. Rimington, in a description of a novel electroscope published in the *Electrician*. The writer refers to a paper entitled "Experiments in Electric and Magnetic Fields," read by himself in conjunction with Mr. Wythe Smith before the Physical Society last November, in which an experiment was given showing the illumination of an electrodeless vacuum tube rotated in a constant electric field between two charged plates. Mr. Rimington has since found that this experiment can be much more simply shown by bringing a rubbed ebonite or glass rod near to the rotating tube, when the set of double fan-shaped images of the tube will be developed nearly as brilliantly as when charged plates are employed. It is stated that an ebonite rod excited by being drawn once through a piece of dry flannel will produce one image when held at a distance of more than a foot from the tube, thus forming an exceedingly novel kind of electroscope. The tube is made of a straight portion 5 inches long of about the bore of a spirit thermometer, terminating in two bulbs. It is made T-shaped by the outlet, where it was connected with the air pump, and which serves as a means of attaching the tube to the motor that revolves it. "It is not, however, even necessary to employ a motor, as twiddling the tube between the finger and thumb by the T-piece when holding it near the excited rod enables the effect to be obtained." The illustration is an interesting one from the fact that the extra power, infinitesimally small, required to rotate the tube when in the electric field is "practically converted directly into light."

THE CANNED FOOD INDUSTRY.

At the oyster-canning establishments in Baltimore, where hundreds of tons of canned oysters are annually put up, the oysters are first canned and then partially cooked, whereby the air is expelled, the sealing of the cans is then effected, and the contents will then keep good for a long period. Our illustration shows the mode of cooking a large number of the oyster-filled cans. They are placed on the platform of a large swinging crane as shown, and then lowered into a great cooking boiler, the cover thereof is then closed and securely fastened by means of lugs as indicated in our engraving. Steam is then turned on, and when the mass of oyters is thoroughly heated through, the operation is finished. This general method of cooking is very expeditious and is followed n various other branches of the canned food industry.



THE CANNED FOOD INDUSTRY—THE COOKING BOILER.

ONE million three hundred and eighty-six thousand three hundred and thirty-two pounds is the estimated revenue of the French Ministry of Telegraphs for the present year, which is about £10,000 more than in the previous twelve months.