

THE ELECTRIC DIADEMS OF THE NEW BALLET "LA FARANDOLE."

The light is produced by an incandescent electric light of very small dimensions and of feeble resistance. The lamp is supplied by two chloride of silver piles which each coryphee carries with her in a scent box attached to her belt.

Fig. 1 shows the apparatus in very much reduced size. When the danseuses are dressed, they come, forty-eight at a time, into a large hall, in which extend long tables upon which lie the various apparatus inclosed in boxes, each bearing the name of a danseuse. Each of the latter then fastens around her waist the belt of silvered metal, containing the two piles inclosed in perfume boxes (Fig. 1), and places her diadem upon her head, while an assistant attaches to the middle of her tresses the conducting wires that connect the piles mounted in tension with the incandescent lamp.

This done, the coryphees are assisted by a maid in adjusting around their waists a muslin scarf that nearly hides the apparatus. The incandescent lamp in the diadem is mounted in front of a metal star covered with green stones that imitate emeralds and form a reflector. To the belt there is fixed, at the side of the piles, a small commutator that permits the coryphee to close or open the circuit in order to light or extinguish her lamp at will. This commutator is very simple, and consists of a small cylinder of the size of a lead pencil, that is pushed into or drawn from a sheath in which it slides with slight friction.

The pile, which is the invention of Mr. Scrivanow, is shown in Fig. 2. It is held in a gutta-percha trough. The two electrodes consist of a strip of silver covered with chloride of the same metal and inclosed in a bag made of parchment paper. The bag is surrounded by a strip of zinc bent double, and from which it is insulated by a piece of perforated gutta-percha. The section of the pile represented to the right of the figure shows its arrangement. The zinc is figured at Zn, and the bag of chloride of silver at AgCl. The exciting liquid is an alkaline solution formed of very dilute potassa. The gutta-percha trough, with the electrodes passing out to the right and left, is hermetically closed by a plate of gutta-percha in which there is an aperture for the introduction and renewal of the liquid. This aperture is closed by a cork. In the engraving these pieces

are shown separate in order to make the details and arrangement better understood.

Such is the ingenious system of electric lighting adopted by the management of the opera. The only objection that we can make to it is that it is wanting in luminous intensity; but, as each pile weighs but ninety grammes, it would be possible to use three instead of two, and thus obtain a much more remarkable effect. However this may be, there is reason for congratulating the organizers or the care

that we now have two speeds for the hoisting of loads, but this advantage is obtained at the expense of simplicity and convenience without avoiding the dangers that are run by the men who operate the apparatus.

The conditions that should be satisfied in the mechanism of a windlass may be formulated thus: (1) There should be as few mechanical parts as possible, and few points of contact with the frame; and (2) the arrangement should be such that stresses exceeding the maximum charge shall be avoided, and that the men who operate the apparatus be protected from accident.

After an attentive study of this question, Messrs. Dujour and Bianchi have found a very ingenious solution of it by the invention of a single axle mechanism with automatic brake, with an automatic limiter of the load, and in which there is no reversal of the winch.

Figs. 1, 2, and 3 of the annexed engraving show the arrangement for a 10 ton crane.

The new mechanism consists essentially of an axle, O, upon which are keyed a pinion, a, and two winches at an angle of 180°. Then of three drums, c, d, f, and a ratchet, g, which revolve by slight friction around this same axis, and, finally, of a sleeve, m, that is capable of moving a friction disk, n, longitudinally along a hollow cone in one of the supports of the shaft.

When the rotation of O is positive, that is to say, when its effect is to lift the load when the winches are turned in the

direction shown by the arrow, the tooth, m (which is beveled), carries along the sleeve, n, to the right and keeps it away from the support of the axle. On the contrary, when the axle revolves in the opposite direction the helicoidal surface, v, thrusts the disk, n, toward the left and puts it in contact with the grooving in the frame. The friction of the cones then acts in such a way as to stop the revolution of the axle. This arrangement may, moreover, be replaced by plane or penetrating surfaces, and even by a ratchet held by means of a click, in the running of the winches in a wrong direction.

Upon examining the engravings it will be seen that the drum, d, carries three axles, o', upon each of which are keyed two wheels, e and b, one of which gears with the wheel, f, fixed to the ratchet, g, and the other with the pinion, a, and the wheel, e. The object of these three identical systems is to distribute the pressure over three gearings

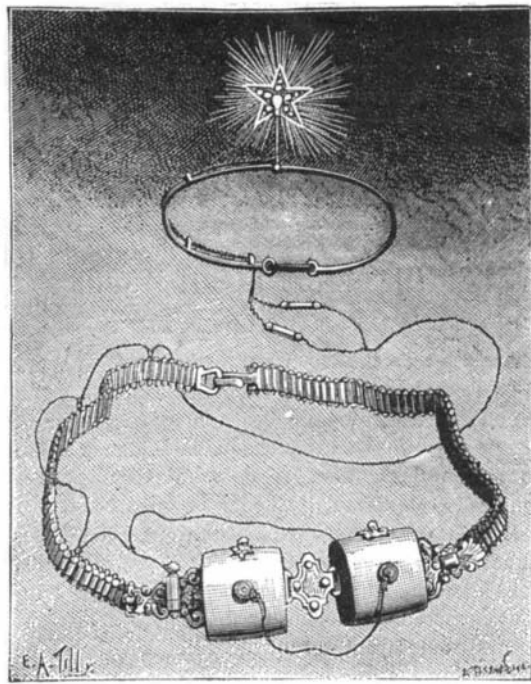


Fig. 1.—ELECTRIC DIADEM AND BELT USED IN THE BALLET OF THE FARANDOLE IN PARIS.

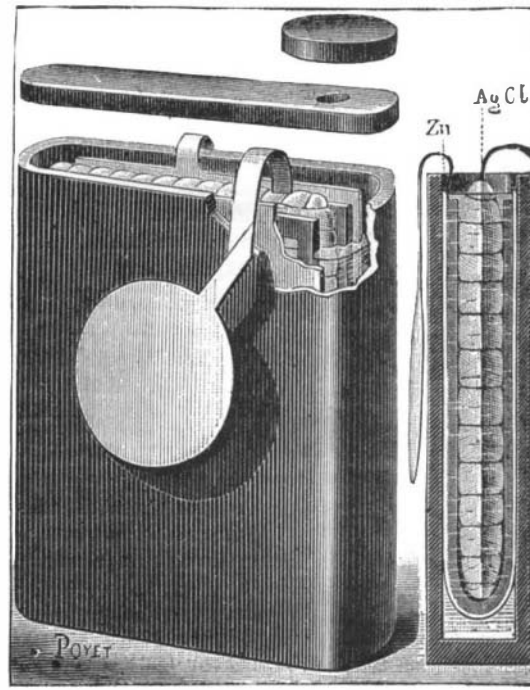
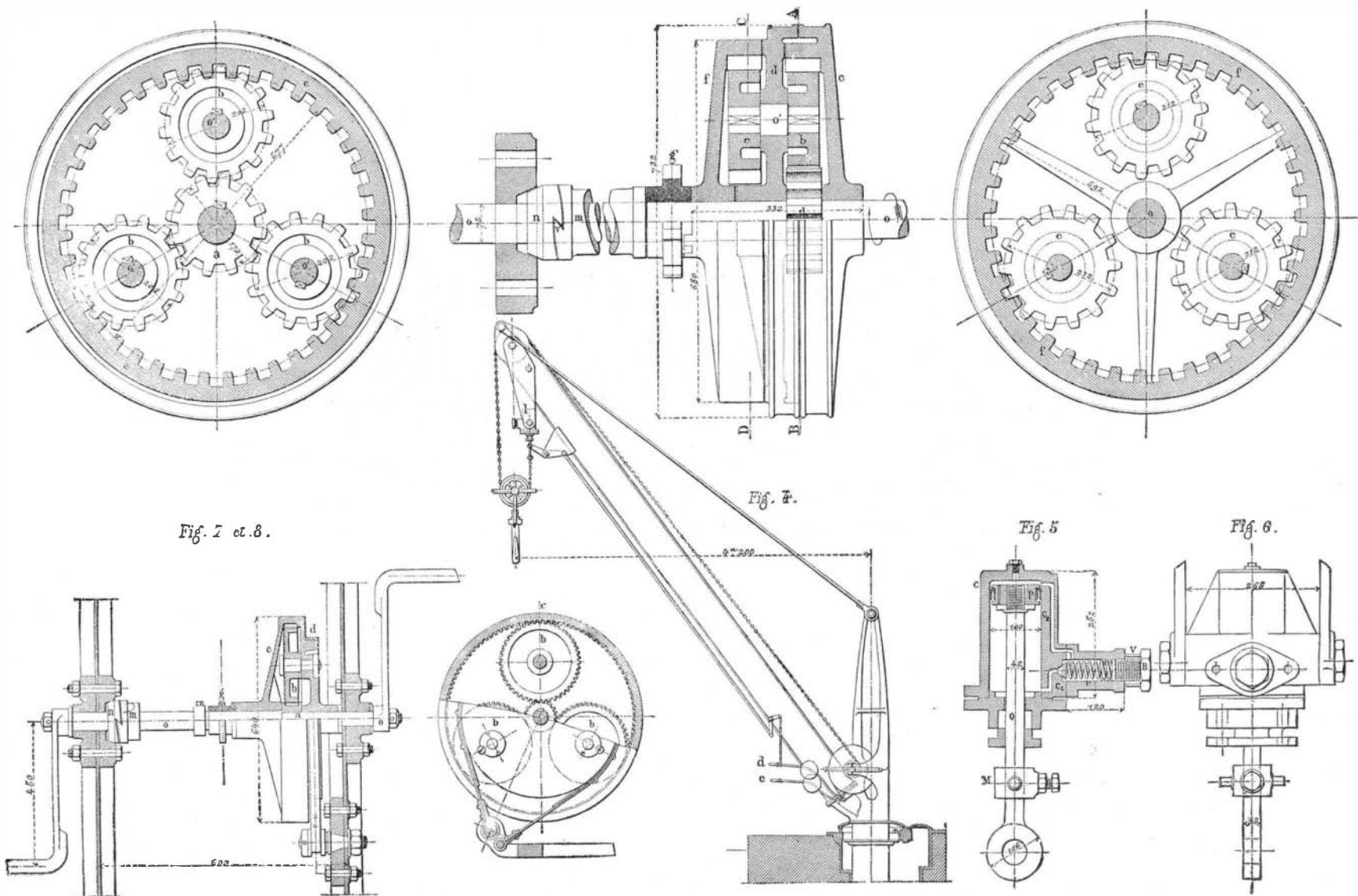


Fig. 2.—BATTERY USED WITH THE ELECTRIC DIADEM.

that they have taken in this happy application. No so important experiment as this has hitherto been made upon a French stage in lighting a ballet electrically. The apparatus is light and portable, and may find an application in this winter's cotillons.—*La Nature*.

DUJOUR AND BIANCHI'S SINGLE AXLE WINDLASS.

Upon comparing our present mechanisms for hoisting with those that were formerly used, we find that the improvements that have been introduced into these apparatus are not numerous, despite the powerful devices that are brought into play in our time for the construction of mechanical pieces. For example, the windlasses in block and pulley 10 ton cranes have at least four axles and a dozen gearings (some of them 1.2 m. in diameter), while in the most remote times there was a differential wheel and axle that permitted of quite large loads being raised. It is true



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