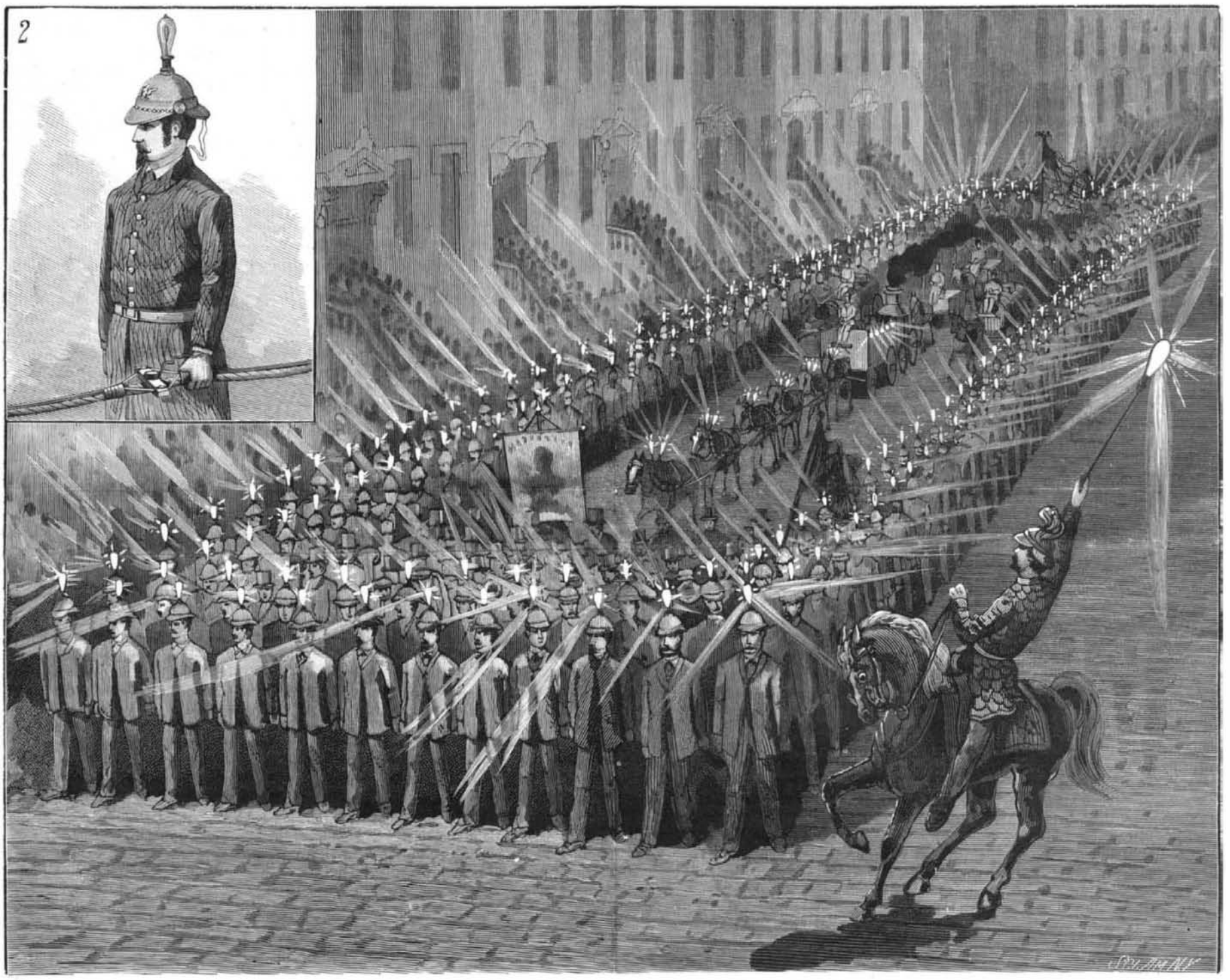
AN ELECTRIC TORCHLIGHT PROCESSION.

On the evening of October 31, this city was favored with one of the most unique and attractive displays ever seen in a torchligbt procession—that necessary adjunct to a presidential campaign, which brings into active play tbe inventive genius of party managers and enthusiastic followers. That an electric lighting plant, complete in every detail, and in full operation, can be moved at the uneven pace of a procession over the rough paving of a street, without interrupting the current or in any degree changing the brilliancy and steadiness of the light, is a fact which, while of interest to the scientific world, clearly shows the perfection to which electric lighting machinery has been brought.

The work of preparing the display was done by tbe Edison Electric Lighting Company, the expense being defrayed by its own employes, who united witb insurance men of the same political faith. Placed upon the forward part of a large truck was a dynamo—a 200 ampere macbine—bebind which was a 40 horse power engine of the New York Safety Steam Power Company; a belt led from the engine to a pulley on the armature shaft. Secured to the truck was the pole of one of the largest steam fire engines built by the Clapp and Jones Company. The electricians in charge of the display felt assured of the successful working of their dynamo and engine, and in order to have an ample supply of steam, they obtained the fire engine, which they knew to be a rapid and reliable generator while in motion. Extending from this boiler to the engine were two flexible pipes, one leading to the steam chest and the other carrying the exhaust. The latter pipe was provided with a three-way valve, by means of which the steam could be directed either into the smokestack to increase the draught, or into the open air. Following the fire engine were two ordinary watering tanks, bolding 950 gallons, which were connected to the feed pump by lines of bose. Between the tanks were the coal carts. The dynamo truck was drawn by six of the Herring Safe Company's mammoth horses, arranged tandem and guided solely by the word of the driver.

Extending from a switch board on the floor of the truck were four covered copper wires, two of which led to a rope upon one side of the truck and the other two to a rope upon the other side. This rope was 1,200 feet long, and was extended up and down the procession so as to form a hollow square, in the center of which was the machinery, before and behind which marched bodies of men. Placed at each five feet on the rope was an ordinary cut-out, or lamp receptacle, slightly changed to suit the requirements of this work, and within which screwed a safety catch carrying two wires, which led up the sleeve and through the back of the helmet to an incandescent lamp of 16 candle power. Wires also led to lamps hung upon the hames of each of the horses, and to 24 lamps arranged on a frame built around the truck. The leader of the procession, on horseback, carried a staff surmounted by a 200 candle power light. Altogether there were some 300 lamps distributed along the rope and upon the trucks.

Upon the first and last part of the line of march every part of the plant worked most admirably, and the illumination was intense and beautiful, the light flooding every nook and cranny in the streets passed through. But in the intervening distance, which chanced to be lined with people who were particularly anxious to witness the electric light display, this portion of the parade was conspicuous solely on account of the darkness that pervaded it. This interruption was caused by mud from the water tanks clogging the hose leading to the pump. All went well after the hose had been cleaned.



THE ELECTRIC TORCHLIGHT PROCESSION IN NEW YORK.

Fall Plowing.

Joseph Harris thinks that farm horses can be put to no better use in autumn than pulling the plow. In the September *Agriculturist* he says: "There is nothing pays so well as fall plowing, and getting land ready for spring sowing. The longer I live the more I am impressed with this fact. I say nothing on tbe disputed question in regard to breaking up sod land in the autumn. It is possible, as some claim, tbat there is a loss from drainage. But if any one will plow my land in the fall, I will run the risk. But what I have specially in mind is, land not occupied with any crop—corn land, potato land, bean land, stubble land, and weed land. Stick in tbe plow if you can spare the time; if not, harrow or cultivate. Better still, do both. Light sandy land, plowed and prepared in the autumn, can be sown in the spring without plowing. Heavy land, if plowed and worked in the fall, may need plowing again in tbe spring, but the work will be easier and the land better. Keep the horses busy until snow flies. But tbe earlier the work is done, the better. One plowing while the land is dry is worth two plowings when it is wet.

Ventilating Hay Mows.

After adding his testimony to the correctness of our theory as to the cause of frequent fires in barns, an arcbitect from Iowa writes to the *American Architect*, into which paper our article was copied, the following letter: We believe the idea of tbe writer is not new, and that patents have been granted for similar models of ventilating hay mows and grain bins, nevertheless the suggestions of the writer are good.

"As this matter is of more vital importance than most people, even scientific men, are aware of, I will," says the *Architect's* correspondent, "venture to suggest a mode to ventilate hay lofts, and to give veterinary surgeons something to think of. I believe that one-half of thediseases in horses and cattle is brought on by feeding spoiled hay, either taken from hay mows or stacks, also from grain feed that has been heated and spoiled. I believe that the heating process, the mouldy parts and must that it produces, will create germs of various kinds that cause diseases in horses and cattle and perhaps swine. I will now venture to suggest a mode of ventilating hay mows, stacks, or granaries. I will suggest introducing various air ducts through the hay mows, both horizontal and perpendicular, opening directly outside, so as to admit a current of fresh air, which will cool and cure the hay or grain, and leave it in a healthy state. This may be done by building board ducts and perforating them as much as possible, and then running from the horizontal ducts perpendicular ducts up through the mow, not more than eight feet to ten feet from each other. Or this may be accomplished in another manner, by using some round instrument, six inches to ten inches or even larger in diameter, say a galvanized iron tube; stand it over the openings in the main air duct, and as the mow is filled up, draw these pipes up through the hay, until the top is reached. This will afford complete ventilation, which will be increased as the mow becomes heated; hence the fresh air drawn in will cool and cure the hay or grain, and by this process thousands of tons of hay and grain can be saved and a vast amount of property will be saved from the destroying elements."

Manufacture of Wood Pulp.

The author treats the comminuted wood or other vegetable matter with concentrated solution of sulphurous acid and water under a pressure of 5 atmospheres and at temperatures ranging from 75° to 80°.—*Raoul Pictet.*

Restoring Burnt Steel.

At the Nuremberg technical school a series of attempts have been made to restore the original qualities of steel after it has been burnt in the forge. These tests have been carried out with various classes of steel in common use for tools, and with varying degrees of success. Sometimes this accidental burning can be repaired by hammering the piece of steel while hot; but more generally it is only worth returning to the scrap heap. The alteration known as burning is due to a more or less considerable decarburation of the metal. Among the processes that have been devised for restoring burnt steel, the following has given excellent results: The piece of metal is brought to a red heat and suddenly plunged in a mixture composed as follows: Pitch, 2 parts; train oil, 2 parts; tallow, 1 part; with a small addition of common salt. This operation is repeated two or three times.

A Question of Steamship Models.

The speed of the steamer Finance, of the United States and Brazil Steamship Company, which made the trip from St. Thomas to this city in five days, is owing—according to the statement of one of her officers to a *Tribune* reporter—to her model.

"She is nearly flat on the bottom, and has no keel except her two bilge keels, or rolling keels as we call them. This gives her great carrying capacity as well as speed. Her bows have a fine entrance, but the body of the ship is carried well forward under the water-line, so that when she goes into a sea she rises like a duck and does not stagger. I think that American-built ships have a greater carrying capacity and develop more speed with less coal than any others in the world. The swift steamship America is a much larger vessel than the Finance, yet the America only carries about 2,000 tons of cargo to the Finance's 3,166 tons. The America is, of course, the faster ship, but not enough faster to make up for the difference in carrying capacity. The Finance can make 14 knots an hour, and the America 18. The Finance burns from 28 to 30 tons of coal a day, and the America 175.

"There is the ship San Pablo, a typical American ship. She has developed a speed of 16 knots an hour with a consumption of 32 tons of coal. She carries a dead weight of cargo of 4,500 tons. She recently made the fastest passage on record between here (New York) and Gibraltar. She is now running between New Tacoma, on Puget Sound, and San Francisco. The round trip takes 10 days. In 30 days she made three round trips and started on her fourth, and has landed 12,500 tons of coal. In nine months she has cost only $26 for repairs in the engine-room. She is built something on the model of the Finance, but has a keel. The City of Rome burns 320 tons of coal a day and can only carry 1,000 tons of cargo. The great freight ship of the National Line is the England, which carries 3,500 tons of cargo. She makes about 12 knots an hour, and can be pushed to 13.

The England is 437 9 feet long, 42½ feet beam, and 35 feet depth of hold. The Finance is 300 feet long, 38·4 feet beam, and 23·6 depth of hold. The Finance is not, of course, a fast ship, compared with the greyhounds of the sea, but, as you see, attains a respectable speed, has great carrying capacity, and besides that is a passenger ship. And look at the San Pablo with a speed of 16 knots, a carrying capacity of 4,500 tons, and consumption of only 32 tons of coal. It is all in the model. I believe that a ship as large as the Oregon or America and with much less engine power, built on the flat bottom model, would beat their time badly, and have twice or three times their carrying capacity."

Cocaine Hydrochlorate.

The honor of discovery of this new local anæsthetic is due to Dr. Kollar, a young medical student, still engaged in his studies at Vienna. Hydrochlorate of cocaine has been used in this city with success in many cases, especially in ophthalmic surgery. A few drops applied to an injured eye allays the pain, produces immediate insensibility of the parts, and enables the surgeon to operate with success. This discovery forms an important step in the progress of medical knowledge. The hydrochlorate has been used in the opening of felons, for sensitive throat, etc.

THE Pacific coast has nearly doubled its crop of hops this year over that of last, without materially increasing its consumption.

TWO NEW OPTICAL ILLUSIONS.

All optical illusions which have for result the exhibition of an isolated portion of a live human body, such as a head separated from the trunk, a bust without a body, or a body without a head, always surprise and interest the spectator.

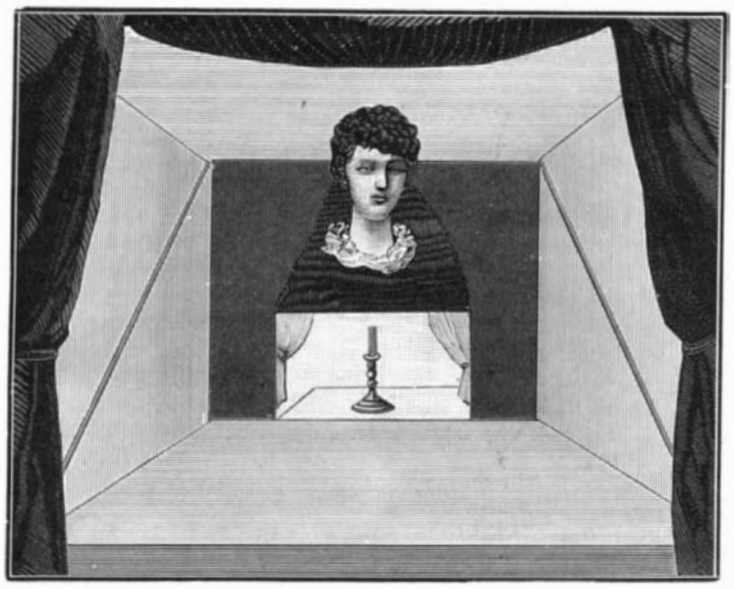


Fig. 1.—AN ISOLATED HEAD IN THE CENTER OF A STAGE.

We learned in early childhood that life is impossible under such circumstances, and yet, if the experiment be well presented, we distinctly see the reality of what our judgment and experience are in accord in declaring impossible. We are tempted then to doubt the evidence of our eyes, notwithstanding our daily confidence in those organs.

This sort of contest between the senses and reason lasts a longer or a shorter time, according to the spectator. It is quick in some, and slower in others; but it may be said that in almost all, this kind of spectacle strongly excites the curiosity. For this reason, ever since the first exhibition of the decapitated talker by Colonel Stodare at London, prestidigitators and physicists have been exerting their ingenuity in order to obtain analogous effects by varied processes; and so there has appeared a large number of decapitated talkers, living busts, half-women, persons with two or three heads, men cut in pieces, and decapitated bodies of all sorts. As an example of the apparent realization of several of these physiological impossibilities, we may cite a singular exhibition that is now being held at London, in Egyptian Hall. A physician and his patient are upon the stage, and engage in a very animated conversation; the sick man seats himself in an arm chair, and the physician cuts off his head and lays it upon a table. The head speaks, and threatens the physician with the vengeance of heaven, and then the headless body rises, and, by expressive mimicry, joins its reproaches to that of the head. Then it takes the latter upon its arm, and the dialogue goes on—the head always talking, and the body gesticulating.

After seeing this sort of spectacle a certain number of persons go away indifferent to the processes by means of which such effects are obtained, while others, on the contrary, are interested therein. It is for the latter that we shall describe in this article two new tricks, that have recently been shown in Paris, at the theater Folies Bergeres, under the names of *Stella*, and *The Mystery of Dr. Lynn*.

Stella.—The spectator, upon entering, sees in front of him a large panel in which there is an aperture about 5 feet square closed by a silk curtain. When the latter is drawn aside, there is seen a small and elegantly decorated stage, whose sides may be perfectly distinguished. In the center of this stage, suspended in space, there is a young girl's head, the neck of which starts from a satin collar (Fig. 1). This head is well isolated on every side; one sees the rear of the stage, the sides, the top, and the bottom, and the light leaves no portion in shadow. The head is living; it speaks and smiles, the eyes move, and the exhibitor further proves it by presenting to it a lighted candle, which it extinguishes by blowing it out. The exhibitor then disappears behind the side scenes along with the candle. He now, as it seems, draws out a panel in the back of the stage, and through the aperture thus formed, the spectator very distinctly sees the top of a table, and, upon it, the candle that the head has just extinguished. Now this aperture is directly under the head, but much farther off, and is in the direction that the body would occupy if the head possessed one. The absence of the body is therefore well demonstrated, and the curtain drops.

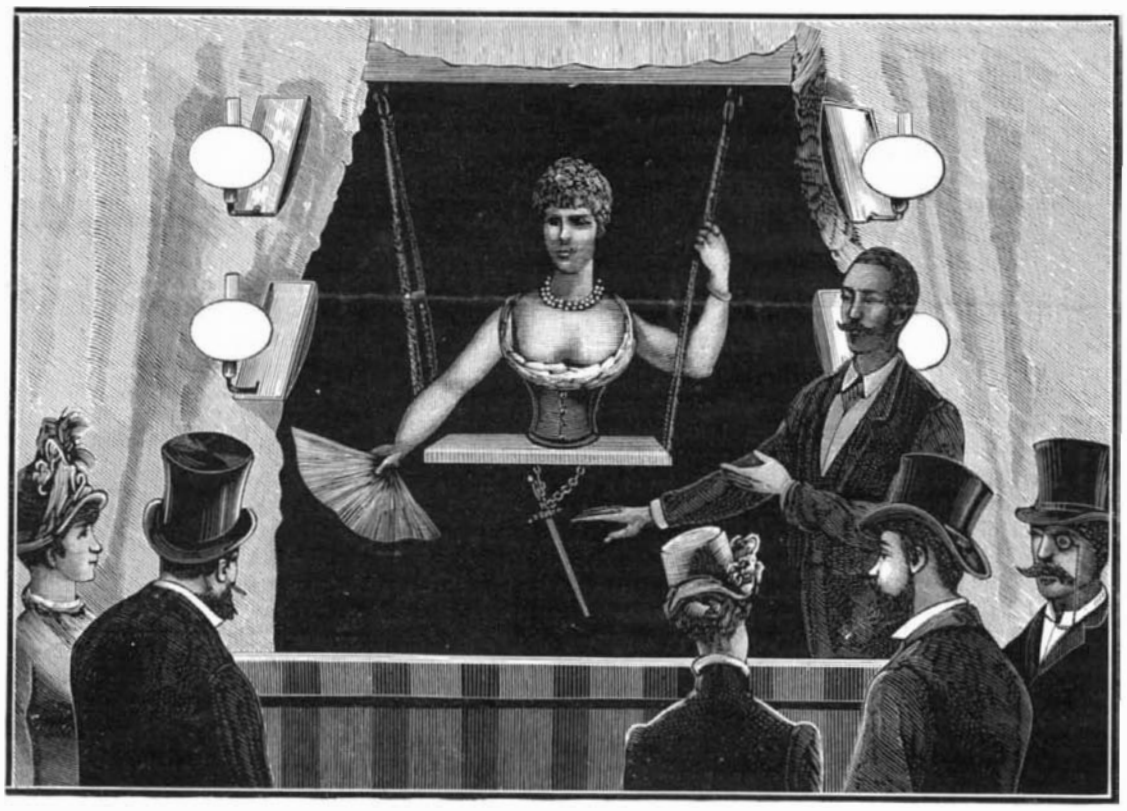


Fig. 2.—THE WOMAN WITHOUT A BODY.

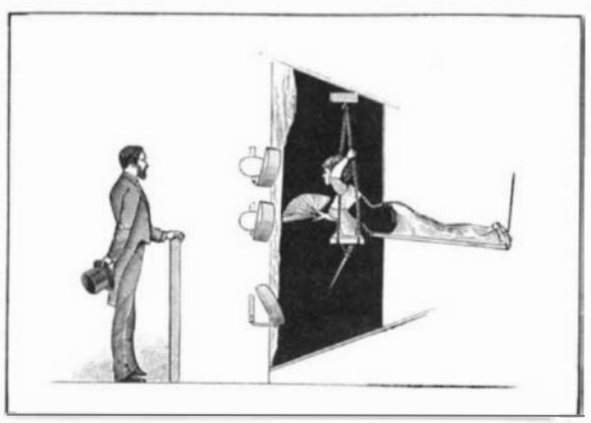


Fig. 3.—EXPLANATION OF THE PHENOMENON.

Such was the evidence of the eyes, but the reality was entirely different. The head was indeed real, and was seen directly, and the same was the case with the top and a part of the sides of the stage, but aside from this the rest was only an illusion. The stage had no back, no floor, no sides, and the aperture seen in the rear was not in that place.

The illusion was obtained by means of a simple mirror, which, starting from the upper part of the back of the stage, descended obliquely to the front. In the center of this there was an opening which was concealed by the satin collar of which we have just spoken, and through this the young girl passed her head. The inclination of the mirror was very easy to determine; it was in fact indicated by a gold rod designed to hide the line of junction of the mirror and side. Through their reflection in this mirror the anterior part of the top seemed to be the bottom, and the posterior part of the same produced the back of the stage. The sides, of which only the upper portion was seen, seemed to be prolonged and join the bottom. As for the aperture through which the table was seen, that was in reality at the top; the table was vertical, and the candle, which was firmly fixed to it, was horizontal. The farce of blowing out the candle and carrying it behind the scenes was only designed to make the spectators believe that it was the same candle that was seen at the rear of the stage, while it was only a duplicate.

The arrangement of the top and sides with respect to the mirror may be perfectly ascertained by means of a very simple experiment. Take a small, square mirror and incline it at an angle of about 35° or 40°, while it rests upon a book; then place above it a piece of cardboard, or anything else, and it will be found by experiment what inclination should be given it in order to obtain, through reflection, the semblance of a vertical back.

Upon bringing the same cardboard near to the sides of the mirror, the part that will be above the latter will seem to be prolonged beneath. If one wishes to take the trouble to fix several pieces of cardboard in these different positions with pins, he may produce the semblance of a space which is apparently completely empty, while it is cut into two by an inclined mirror. It would be easy thereby to get an idea