First Public Exhibition of Edison's Kinetograph.

At the regular monthly meeting of the Department of Physics of the Brooklyn Institute, May 9, the members were enabled, through the courtesy of Mr. Edison, to examine the new instrument known as the kinetograph. The instrument in its complete form consists of an optical lantern, a mechanical device by which a moving image is projected on the screen simultaneously with the production by a phonograph of the words or song which accompany the movements pictured. For example, the photograph of a prima donna would be shown on the screen, with the movements of the lips, the head, and the body, together with the changes of facial expression, while the phonograph would produce the song; but to arrange this apparatus for exhibition for a single evening was impracticable. Therefore, a small instrument designed for individual observation, and which simply shows the movements without the accompanying words, was shown to the members and their friends who were present.

Mr. George M. Hopkins, president of the department, before proceeding to the exhibition of the instrument offered a brief explanation, in which he said: "This apparatus is the refinement of Plateau's phenakistoscope or the zootrope, and like everything Mr. Edison undertakes, it is carried to great perfection. The principle can be readily understood by any one who has ever examined the instrument I have mentioned. Persistence of vision is depended upon to blend the successive images into one continuous ever-changing photographic picture.

"In addition to Plateau's experiments, I might refer to the work accomplished by Muybridge and Anschuetz, who very successfully photographed animals in motion, and to Demeny, who produced an instrument called the phonoscope, which gave the facial expression while words were being spoken, so that deaf and dumb people could readily understand. But these instruments, having but twenty-five or thirty pictures for each subject, could not be made to blend the different movements sufficiently to make the image appear like a continuous photograph of moving things; the change from one picture to the next was abrupt and not realistic. In Mr. Edison's machine far more perfect results are secured. The fundamental feature in his experiments is the camera, by means of which the pictures are taken. This camera starts, moves, and stops the sensitive strip which receives the photographic image forty-six times a second, and the exposure of the plate takes place in one-eighth of this time, or in about one-fifty-seventh of a second. The lens for producing these pictures was made to order at an enormous expense, and every detail at this end of the experiment was carefully looked after. There are 700 impressions on each strip, and when these pictures are shown in succession in the kinetograph the light is intercepted 700 times during one revolution of the strip. The duration of each image is one-ninety-second of a second, and the entire strip passes through the instrument in about thirty seconds. In the kinetograph each image dwells upon the retina until it is replaced by the succeeding one, and the difference between any picture and the succeeding one or preceding one is so slight as to render it impossible to observe the intermittent character of the picture. To explain in a very imperfect way the manner in which the photographs are produced, I will present the familiar dancing skeleton on the screen. You will notice that the image appears to be continuous, but the eye fails to observe the cutting off of the light, and the image simply appears to change its position without being at all intermittent; but when the instrument is turned slowly, you will notice that the period of eclipse is much longer than the period of illumination. The photographs on the kinetograph strip were taken in some such way as this. I will exhibit an ordinary zootrope adapted to the lantern, which shows the principle of the kinetograph. In this instrument, a disk having a radial slit is revolved rapidly in front of a disk bearing a series of images in different positions, which are arranged radially. The relative speeds of these disks are such that when they are revolved in the lantern the radial slit causes the images to be seen in regular succession, so that they replace each other and appear to really be in motion; but this instrument, as compared with the kinetograph, is a very crude affair."

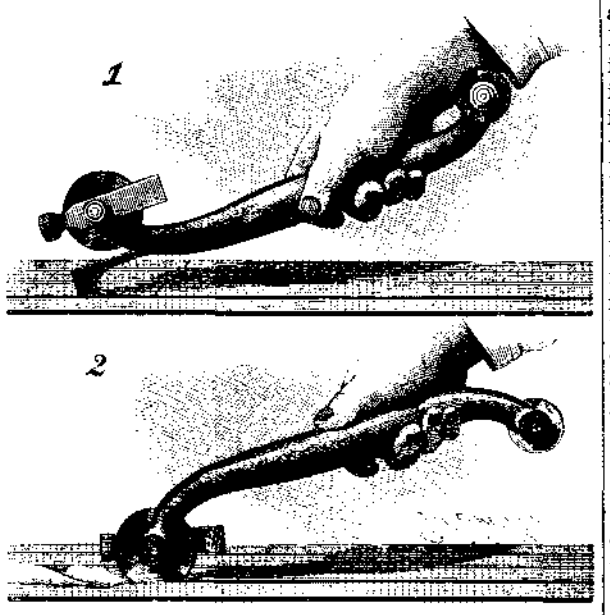
After projecting upon the screen a few sections of the kinetograph strip, the audience—which consisted of more than 400 scientific people—was allowed to pass by the instrument, each person taking a view of the moving picture, which averaged for each person about half a minute. The picture represented a blacksmith and two helpers forging a piece of iron. Before beginning the job a bottle was passed from one to the other, each imbibing his portion. The blacksmith then removed his white hot iron from the forge with a pair of tongs and gave directions to his helpers with the small hand hammer, when they immediately began to pound the hot iron while the sparks flew in all directions, the blacksmith at the same time making intermediate strokes with his hand hammer. At a signal from the smith, the helpers put down their sledge hammers, when the iron was returned to the forge and another piece substituted for it, and the operation was repeated.

In the picture as exhibited in the kinetograph, every movement appeared perfectly smooth and natural, without any of the jerkiness seen in instruments of the zootrope type which have heretofore been exhibited.

The machine in this case was not accompanied by the phonograph, but nevertheless the exhibition was one of great interest. The kinetograph in this form is designed as a "nickel in the slot" machine, and a number of them have been made for use at the Columbian Exhibition at Chicago.

AN IMPROVED CALKING TOOL.

To calk the seams of vessels, tanks, or any article which is to be made watertight, the simple and inexpensive tool shown in the illustration has been devised and patented by Mr. Joseph O. Walton, the tool being also adapted to dig out the calking from old seams when necessary. The handle is shaped to fit the hand nicely, and in its outwardly curved ends are pivoted rollers adapted to run in a seam and jam the calking material into place. One roller has a smooth face and is preferably slightly convex, and the other roller has a grooved or concaved face, forming sharp edges on opposite sides of the groove, enabling it to pack the calking very snugly in a seam, as shown in Fig. 2. The rollers may be made in different sizes to fit different seams if desired. In a longitudinal groove and depression at one side of the handle is pivoted a hook, which lies within the groove when not in use, or may be moved into the position shown in Fig. 1 for use in removing old packing. The pin which forms the pivot of one of the rollers has also pivoted upon it an auxiliary tool or chisel, having at one end a chisel edge and



WALTON'S CALKING TOOL.

at the other a head which may be struck by a hammer, to force calking into a short or transverse seam where the rollers cannot be conveniently operated. This tool may be fastened in the desired position by a thumb nut, and is ordinarily held nearly parallel with the handle, as shown in Fig. 2. The edges of the grooved roller also act somewhat like a chisel, packing the calking as firmly as if a chisel were used, and much more rapidly. Further information relative to this improvement may be obtained of Messrs. Robbins & Graham, Titusville, Fla.

Electrical Process for Boiler Preservation.

Demonstrations of the efficiency of a new method of cleansing and preserving steam boilers against pitting and general corrosion were made on board the steamship Tenasserim, Glasgow, by the Electric Anticorrosion Company, of Cardiff. The process consists of fixing electrodes in the boilers and sending periodically currents of electricity through them under definite conditions, adjusted and controlled by apparatus which is automatic in its action. When the current is passing from the anodes suspended in the boiler to the shell, hydrogen is liberated on the shell and tubes, and oxygen on the anodes; then by means of the depolarizing apparatus the action is changed, and most of this hydrogen and oxygen recombine, the result being that during the first period the hydrogen performs two distinct functions; first, it disintegrates mechanically by its volume the scale formed on the shell and tubes; and, secondly, some of the hydrogen combining chemically with the oxygen of the oxide of iron on the shell and tubes reduces this oxide to metallic iron, thus doing away with the oxidation of the boiler without wearing away the metal. The secondary action, in short, is to facilitate the disintegration of the scale, hasten the mechanical action of the hydrogen in bursting it off, and prevent polarization of the shell and tubes. Oxidation, it is well known, cannot take place in presence of hydrogen gas; consequently, the patentees contend that it will be impossible for corrosion or pitting to take place on the interior surfaces of the boiler so long as this electrolytic action is maintained; and, further, the mechanical action of the hydrogen, which is capable of disintegrating the scale, will likewise prevent its reformation.

The practical result of the application of the process is that after the apparatus has been working in an old boiler for a few months, the scale is said to be completely removed, and the surface of the iron is brought into sound and healthy condition by a deposit of metallic iron being formed on the shell and tubes. Where no lighting installation exists, the patentees fix a suitable dynamo, which may be driven from the screw shaft, and be of sufficient capacity not only to supply the boilers, but also to light up the engine room. It would seem to us, says the *Engineer*, that the dynamo had better be employed all the time in this lighting, and the boilers would be best preserved by feeding them with pure water.

Joseph Francis—Inventor of the Life Boat.

Joseph Francis, inventor of the metallic life boat, the life-saving marine car, and other useful inventions, died at Otsego Lake, N. Y., on the 10th of May, at the ripe old age of more than 92 years. He was born in Boston, Mass., March 12, 1801. When quite a lad he exhibited mechanical talent, and later on was the author of various mechanical novelties.

His greatest achievements were in the construction of life-saving appliances. These consisted of life boats, life cars and surf life boats. Of the life boats, the first that he made was of wood, and was called the hydrogen life boat. The interior was fitted with copper air tubes, and the invention proved successful. As a result of later experiments, the use of wood in the construction of his boats quickly gave way to iron, although the use of iron in the manufacture of vessels of any kind was practically unknown at that time. To Mr. Francis may be conceded the first use of iron floating vessels. Another improvement was added by having the spaces at the bow and stern of the boats made into reservoirs of air, as well as the spaces at the sides, thus enabling the boat to sustain a great load in the heaviest sea.

The New York *Sun* says: "The venerable inventor who died at Otsego Lake on Wednesday morning, in his 93d year, had rendered a conspicuous service to mankind, which was long since fittingly honored in foreign countries and more tardily in our own. In the Blue Parlor of the White House, just three years and one month ago, Joseph Francis received at the hands of President Harrison, after an address by Mr. Evarts, a gold medal which had been voted to him by Congress. It was a massive and handsome tribute, the largest medal, we believe, ever given by our government. Three pounds of solid gold were in it.

"That medal told the great work of Joseph Francis' career, in its representation of the metallic life car which rescued the passengers of the Ayrshire. 'You have made it possible,' said the President, in giving it, 'for the shore to send succor to the ship. You have invented and suggested appliances that have saved many thousands of human lives.'

"It is a little odd that Francis as a lad, before he had reached his teens, playing on the wharves of Boston, had fitted up a small boat with cork in bow and stern, which has been not unfairly called the first life boat built in America. The attention given to it, with his subsequent devotion to boat building, set all his faculties at work in that direction.

"When as a young man he came to New York with an unsinkable rowboat, containing cork at the ends and air tubes along the sides and under the thwarts, and gave an exhibition of it in the river at the foot of Wall Street, his career was determined. England, Russia, and Brazil bought such boats of him. But he had another idea working in his mind for saving life on wrecked vessels, and as early as 1838 constructed a wooden car to run forth and back on a hawser, between ship and shore. That, however, did not work well, being dashed to pieces on its trial; and then, in 1842, Mr. Francis achieved his great success of a corrugated iron water-tight car.

"Years passed in attempts to interest the government in this device, with the result only of obtaining permission to try it at the life-saving stations. On the 12th of January, 1850, the British ship Ayrshire came ashore at Squan beach, on the New Jersey coast, with about 200 souls aboard. The life car was near by and was hauled out to the ship. Five persons entered it and landed safely; then another five, and another, till about twoscore trips were made, and every person was saved, except one man who had attempted to ride outside the car and was washed off.

"Honors to Mr. Francis followed from France, Austria and Russia, and from that time forward his life cars and pontoon wagons yielded a comfortable livelihood. In 1885 the New York Chamber of Commerce urged a testimonial to him from Congress, and this was at length secured. In former years a familiar figure at the Stevens House, in lower Broadway, he has passed away at a good old age, after a life made happy by thoughts of the good he had been able to do to his fellow men."