SCIENTIFIC AMERICAN

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INSTANTANEOUS PHOTOGRAPHY.

The perfection in the manufacture of gelatino-bromide sensitive compounds is now so complete that photographs are readily made instantaneously with far less trouble than was required in the days of the daguerreotype or of the more recent wet plate process, and this has led, as one would naturally expect, to the invention of special devices for more effectively utilizing the advantages obtained in the use of highly sensitive compounds.

One of the latest ideas based upon the dry process is the production of an extremely simple apparatus, so arranged that it cannot get out of order and adapted for use by the veriest "greenhorn," if we may so speak, or by one who knows nothing at all about photography. All that is required is to point the instrument at the object, press a button gently with finger, and the picture is made.

Another idea is that when a hundred exposures have been made, all the individual has to do is to send the apparatus to the manufacturers, who do all the work of finishing up the pictures. Thus no manipulation whatever is required by the purchaser, save the making of the exposures; the balance is done by persons especially skilled in the art, resulting, as might be expected, in the production of very uniform and satisfactory work. We believe this system has never been before placed on such an extensive commercial scale as is now commenced, and it promises to make the practice of photography well nigh universal.

The absence of removable bulky plate holders, of the drawing out of slides, of any danger from light streaks, will strike those acquainted with the old style of apparatus as being especially desirable, while the fact that one has a large roll of sensitive material to draw from in making the pictures inspires confidence and freedom, since the exposures may be made rapidly, without previous preparation and apparently without limit.

The novel apparatus shown in our engravings is designed to hold enough sensitive paper to produce one hundred pictures about 2⅝ inches in diameter, yet so compact that it measures but 6½ inches long, 3¼ inches wide, and 3¾ inches high, and weighs less than two pounds. The large engraving represents the actual size of the camera.

The "Kodak," for such is the name given to it by the manufacturers, is essentially a portable camera, intended mainly for making instantaneous exposures, but may be used for time work also when a secure place can be found to rest it upon. Its simplicity and lightness are its chief features. It consists of an outer rectangular case, neatly covered with black leather, having the rear end closed with a sliding box (see Fig. 2) holding the sensitive paper on a spool, from which,

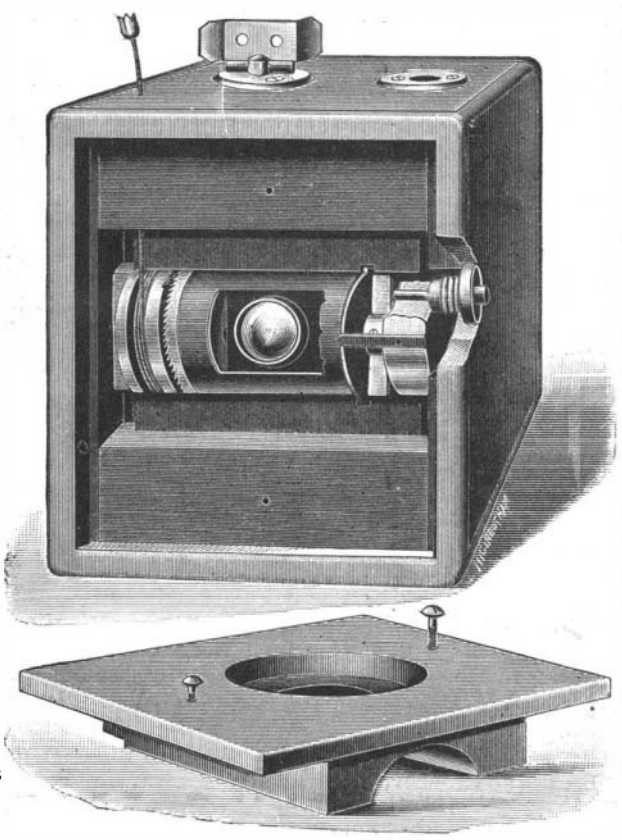

Fig. 1.—THE KODAK CAMERA SHUTTER.

in unwinding, it passes over an index roll, having an indicator mark in the direction of its diameter on the upper end of its axis, and also metal points on its circumference for puncturing the division line between the pictures. From the supply spool the paper passes over a small measuring roll, thence behind the metal mask having a circular opening, and in front of the exposing platform, and is finally wound up on the spool to which the key is attached.

As the light can only impingeon the paper within the circular opening, a circular negative is obtained. When the box of sensitive material is slid home into the rear of the camera case, it is prevented from slipping out by the shank of the winding key, passing through the opening in the case, and screwing into the end or axis of the winding spool. It will be observed that all the parts of the supply box are very simple, easily operated, and readily taken apart.

In the front portion of the camera is the shutter and lens, both very unique in their construction. (See Fig. 1, in which the front end protecting the shutter is removed and is shown just below the box. When in place, it clamps the shutter mechanism and is simply fastened by two screws.)

The shutter is cylindrical, having two apertures diametrically opposite each other, and rotates around the two ends of the lens continuously in one direction. In the engraving (Fig. 1) the rectangular aperture of the shutter with the bright disk of the lens in the center is plainly seen. The shutter is propelled by a coiled flat spiral spring located in one end of it, which is wound up by an adjacent ratchet disk wheel, this being in turn operated through miniature pawls by a winding barrel. The latter is rotated by pulling up on the cord which is seen passing through the outer case of the camera in Fig. 1 and in the large engraving. A spring in the winding barrel rotates it in the opposite direction from the pull of the cord, and winds the latter up when released. Two or three short successive pulls on the cord are necessary to wind up the shutter spring to its full tension.

A very ingenious, simple, and positive escapement device is provided in connection with the release button, or pin, for setting off and holding the shutter. The latter will revolve continuously in one direction, stopping at each pressure of the release pin, for at least four or five times, before the shutter spring is completely unwound. The shutter, as will be seen, is very compact, and yet so complete that it cannot get out of order.

The manufacturers state that the lens is of the rapid rectilinear type. It is mounted in a thin metal tube, having a fine screw thread on its exterior. This is held rigidly in the axis of the shutter, and may be

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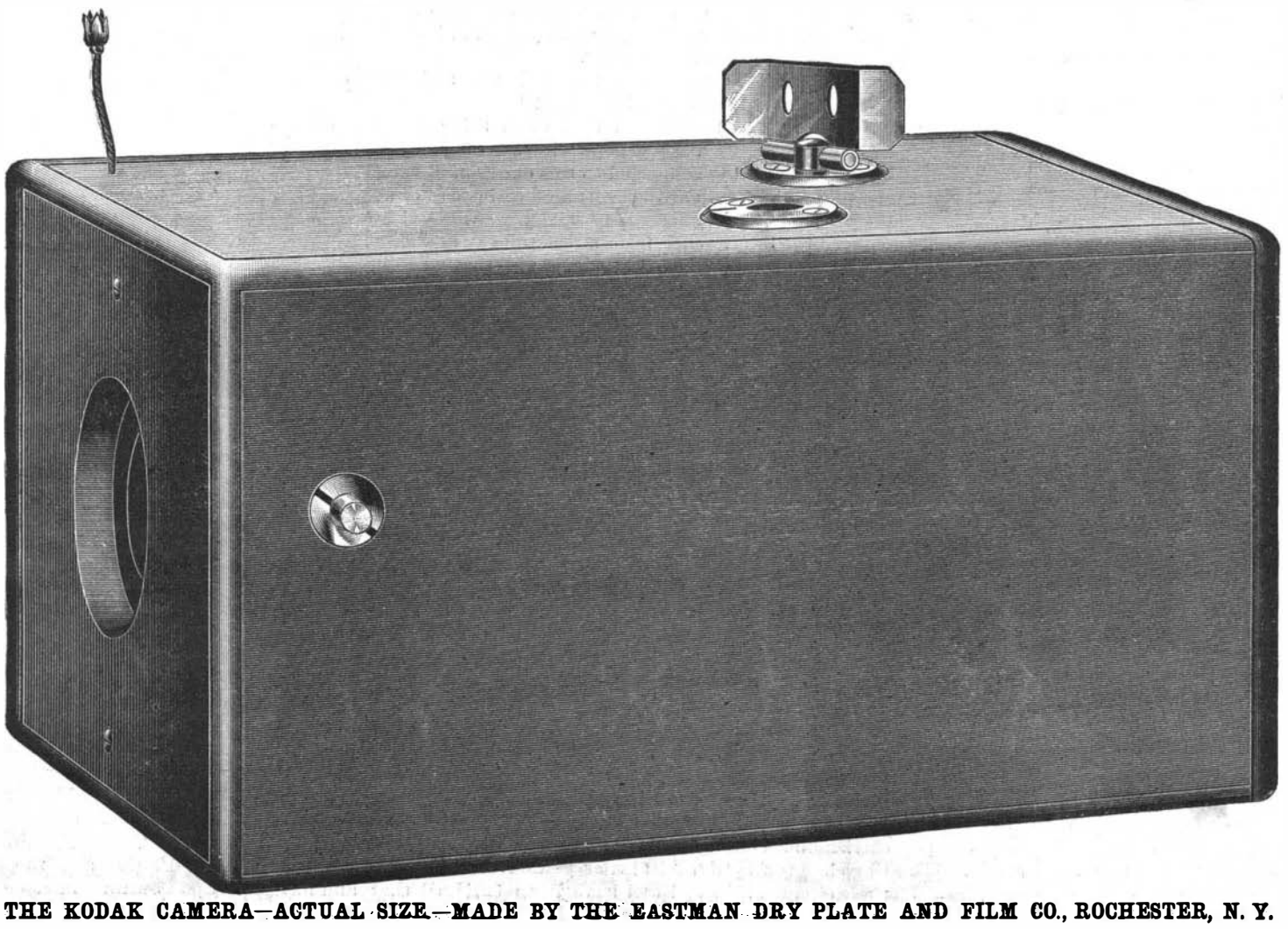

THE KODAK CAMERA—ACTUAL SIZE.—MADE BY THE EASTMAN DRY PLATE AND FILM CO., ROCHESTER, N. Y.

INSTANTANEOUS PHOTOGRAPHY.

(*Continued from first page.*)

adjusted to the right focus when rotated to the right or left by the use of a special implement or tool. It is only done when the mechanism is put together, since the lens is placed at a fixed focus, but it goes to show how carefully the matter has been studied. Every object beyond three feet is in focus even to the extreme distance, and it is truly remarkable how distinct each portion of a picture is.

After each camera is finished, it is practically tested by photographing on the film some object like printed matter at four, fifteen, and fifty feet distant. Each resulting negative is then examined with a magnifying glass, and if not perfect, the lens is adjusted and repeated tests again made until it is exact. No finder is attached to the apparatus, it being deemed unnecessary.

In operating the camera we first remove it from the neat leather carrying case, provided with a shoulder carrying strap, shown in Fig. 3, then pull up once or twice, with the fingers, the winding cord, which, as before explained, winds up the shutter spring. We next remove the cap from in front of the lens (not shown in the engravings), and hold the camera steadily with the two hands as in Fig. 4, having the thumb of the left hand resting upon the trigger pin on the side of the camera, and aim the apparatus at the object we wish to take.

Immediately the pin is pressed, the shutter revolves and the exposure is made. We then with the right hand turn the key on top to the left and observe the movement of the little mark on the upper end of the axis of the supply spool, winding until it has made one revolution with respect to the mark on the round plate, as seen on the exterior of the camera case in the large engraving.

The exposed film has thus been wound off and a new film put in its place, ready for another exposure. A pull or two on the little cord winds the shutter spring up, and the operation of exposing is again repeated.

So easy and rapid are all the movements that it is believed from ten to twenty separate exposures may be made in one minute. To fix the shutter for a time exposure, we press repeatedly on the releasing pin until the shutter stops revolving. During this time the front of the camera should be in contact with the clothing to prevent light from entering. We then with the finger move the shutter until its aperture is opposite the lens. The cap is next placed over the lens, and we locate the camera on a table or other convenient resting place, and make the exposure in the ordinary way, by removing and replacing the cap.

Accompanying the apparatus is a very complete printed blank book for recording the exposures, and a card having printed on it an angle diagram to enable one to readily determine how much of a given view will be taken in. There are also ample directions provided for developing and finishing the exposures.

The new "Kodak" system is based on the fact that the purchaser need not work the chemical process unless he wishes to or has the time to spare. After the 100 exposures have been made, or only a part of them, the whole apparatus may be sent to the manufacturers, who will remove the exposed paper, develop the negatives, print the positives and return the camera refilled for another 100 exposures, together with the negatives and the 100 positive prints, in a few days. Or the owner may remove the spool of exposures himself in a suitable dark room, send by mail to be finished, and insert a fresh supply.

The finished negatives, being transparent like glass, may be readily enlarged from on bromide paper, so that there need be no objection as to the small size of the pictures. They also answer admirably for making lantern slides by contact.

It will thus be seen the uses of this little apparatus are numberless; it may be used anywhere and everywhere, so long as there is light enough to make a picture.

Yachting trips may be illustrated; the pleasure of journeys through foreign countries will be increased by knowing that any novel sight the traveler may see can be caught and preserved to show to his friends. The doctor, engineer, scientist, merchant, lawyer, minister, artist, and many other professional persons will find in it a most useful adjunct, while for affording endless amusement to young people, nothing could be devised that would be more profitable and interesting. We have personally tested the apparatus and regard it as most ingenious, simple, and useful. It is certainly a credit to the manufacturers, and we predict for it a very general use.

Considering the many advantages to be derived from the apparatus, its expense is very small. It was recognized quite recently as one of the most important inventions of the year at the Minneapolis Convention of the Photographers' Association of America, in July; a special medal having been awarded at that time to its manufacturers.

Furnished with the apparatus is an illustrated primer, containing specimen photographs and other useful hints about the use of the camera. We understand this attractive book will be sent gratis to all interested.

Further information may be had by addressing The Eastman Dry Plate and Film Company, Rochester, N. Y.

Self-Extinguishment of Fires.

The apparatus which is most promptly used in cases of burning buildings, and also with the least efficacy, is the human voice, notwithstanding the historical fact that blowing has accomplished nothing since the days of Jericho. Yet there are numerous instances where fires have been extinguished through causes connected with their origin, and so completely outside of precedence that they serve as instances of the happening of the unexpected. In this connection we do not refer to the fires extinguished by automatic sprinklers, where the result is clearly what has been expected to happen. Notwithstanding the fact that when a fire occurs on property protected by automatic sprinklers, those present avail themselves of all the means of grace in the shape of the usual fire apparatus at hand, yet there are numerous instances where fires have occurred at night or in rooms vacant at the time, where the fact has been made known only by water percolating through the floors, or the sound of the automatic fire alarms, or from the sprinklers which have already come into active operation, the fire having called down means for self-extinguishment. But the instances which we have in mind are those where the means of extinguishment were not expected, as in the well known Cathedral building in Boston, where a fire, caused by spontaneous ignition in a store room, melted the lead water pipes, and the water issuing from them extinguished the fire. A similar instance happened in a building in Market Street, Philadelphia. Some sheet metal pails were returned by the purchaser to a tinsmith in Chester, Pa., with the complaint that they were not tightly made. The manufacturer resoldered them, and in order to test his work filled them with water and hung them upon hooks at the ceiling. While the men were at dinner during the noon hour, a fire heated the upper part of the room so that the bails connecting the handles to the pails became unsoldered, and the dropping of the pails of water dashed out the fire.

Some waste left upon the top of a steam pump at Watertown, Mass., blazed from spontaneous ignition, and this in turn set fire to the lagging around the steam cylinders and the feed pipe, where it melted the soldered attachments of a continuous automatic oiler. The steam from the feed pipe was discharged through the small tubes formerly leading to the oiler, and extinguished the fire. There have been numerous instances of fires which have ceased for want of air. During the war of the rebellion, attempts were made to burn New York City, as the result of a conspiracy, fires being started in several hotels; but in order to prevent premature detection, the culprits closed up the rooms so tightly that the fires were smothered. At a hotel in Woonsocket the steam pipes caused a fire in the spaces in the walls of the building, which was extinguished for want of air to support combustion. The time of the fire is unknown, as its occurrence was not discovered until some time afterward, when in the progress of an alteration to the building the facts were made apparent. It may be interesting to know that in this instance the steam heating service was ordinarily used at a pressure of about 4 lb. to the square inch during the coldest weather, and that the safety valve was so arranged that the pressure could never exceed 10 lb. A spark of static electricity proceeding from a belt ignited leaking gas, and this in turn set cotton on fire, which operated the automatic sprinklers and extinguished it. An attempt was made to destroy a block of new dwellings at Brookline, Mass., before the buildings were entirely finished. Some people, alarmed by the smoke which was seen in each division of the structure, rushed in to save doors and portable fixtures, when it was noticed that the fires did not appear to gain any headway, and when the smoke had entirely died away, it was found that the incendiary had placed lighted candles in sawdust and other inflammable material in drawers and closets, but with such limited supplies of air that combustion could not be supported and the fires became smothered.—*Engineering.*

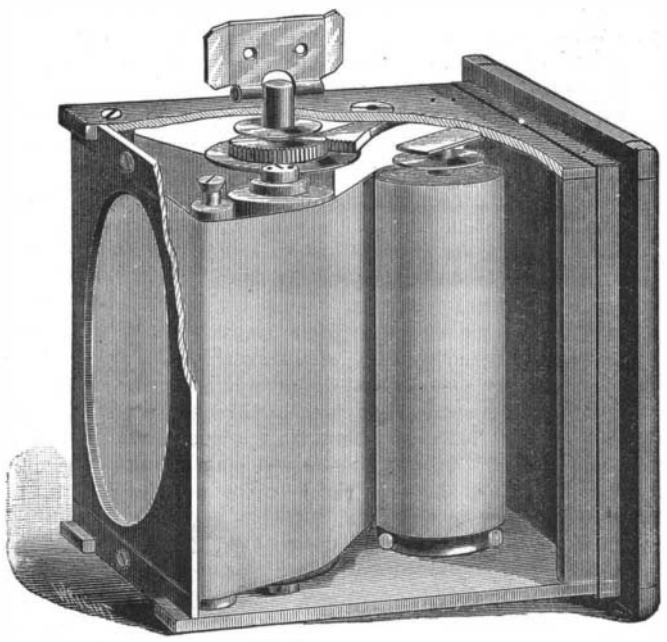

Fig. 2.—SUPPLY BOX OF THE KODAK CAMERA.

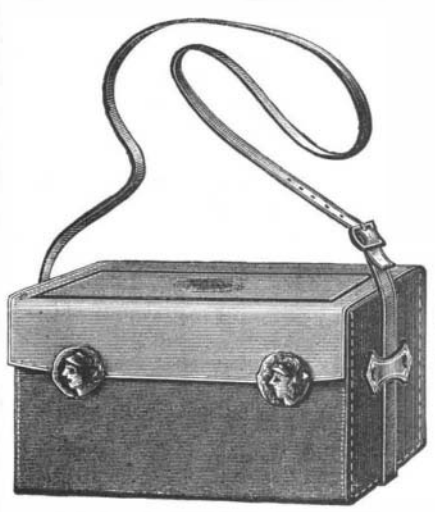

Fig. 3.—THE KODAK CAMERA CARRYING CASE.

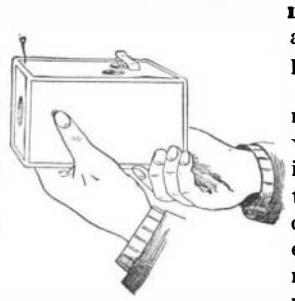

Fig. 4.

Fires Caused by Kerosene.

The annual report of the fire marshal of Boston has caused much interest in the fact which it develops that nearly one-tenth of the fires that occurred in Boston during last year were due, directly or indirectly, to the explosion or accidental lighting of kerosene oil.

The number of fires occasioned by the use of kerosene oil suggested the possibility that the oil used in lamps and stoves was not as safe an article as it might be. Purchases of oil were accordingly made at the places where those who had suffered a fire from this cause alleged that they obtained their supplies, and the samples thus collected were submitted for test to Professor Norton, of the Institute of Technology, and to Professor Chandler, of Columbia College. These two authorities reported that the samples of kerosene oil submitted to them for examination were far below the standard required by the State for lighting purposes, that is, a flashing point of at least 100 degrees Fah. and a burning point of at least 110 degrees Fah. This is certainly a low enough standard, and ought to be raised.

A curious thing about the matter is that similar samples were submitted to one of the oil inspectors, with the result that he found that the oil tested far above the standard which the State had established. It has been found that greatly varying results may be obtained in these tests by different methods of procedure, and it seems reasonable that means should be required, by law, to be used in making tests of the flashing and burning point of oil, which should afford an absolutely safe criterion by which to judge the oil. Safety to the public would seem to demand that an oil which gave off an explosive vapor, no matter how these conditions were reached, at less than 100 degrees should be classed as an unsafe oil, even though it might be manipulated by an official inspector so as to keep its vapor to itself until a higher temperature had been reached.

The Boston *Herald*, in commenting upon this matter, criticises the provisions of the law under which inspectors operate. The fees for inspecting the oil are paid by the owner of the oil, and this places inspectors practically under the employ of the Standard Oil Company, and there are ways enough to make it unpleasant for inspectors who make a report unsatisfactory to the great monopoly. It is likely that the laws of Massachusetts are very much the same relating to this matter as those of other States. It is desirable that the position of oil inspector should everywhere be independent, so there shall be no hindrance to a rigid and righteous inspection. This much the public has a right to demand in the interest of its own safety.—*American Artisan.*

What is a Sleeper?

The Boston *Journal of Commerce* thus defines it: A sleeper is one who sleeps. A sleeper is that in which the sleeper sleeps. A sleeper is that on which the sleeper runs while the sleeper sleeps. Therefore, while the sleeper sleeps in the sleeper, the sleeper carries the sleeper over the sleeper under the sleeper until the sleeper which carries the sleeper jumps the sleeper and wakes the sleeper in the sleeper by striking the sleeper under the sleeper, on the sleeper, and there is no longer any sleeper sleeping in the sleeper on the sleeper.