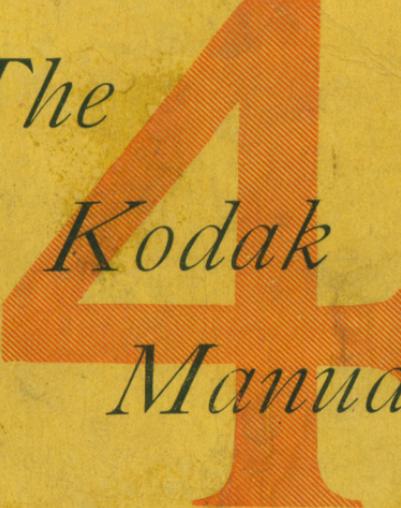


The
Kodak
Manual.



For the 4 x 5 Kodak.

Kodak.

Trademark, 1888.

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THE EASTMAN DRY PLATE AND FILM CO.,

Rochester, N. Y.

1880.

The
Kodak
Manual.

For No. 4 Kodak.

THE EASTMAN COMPANY
ROCHESTER, N. Y.

Jan., 1891.

THE KODAK MANUAL.

- PART I. Directions for making the exposures.
- PART II. Directions for reloading the Kodak.
- PART III. Directions for making the negatives. Sections A. and B.
- PART IV. Directions for making the positives.
- PART V. Directions for making Flash light picture and lantern slides.

Part I.
MAKING THE
EXPOSURES.

CONTENTS.

First. Concerning the Kodak when received by the purchaser, and what should be done before using it.

Second. How to make Instantaneous Exposures in the Open Air when the Sun is Very Bright.

Third. How to make Cap Exposures in the House, and Outside when the light is weak.

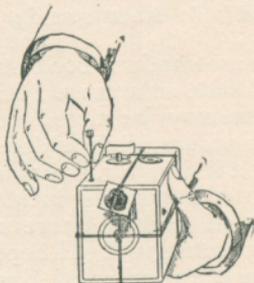
Fourth. General information.—Returning the Kodak to the factory for reloading.

FIRST.

CAUTION.—The Key must not be removed from the Kodak until Part II has been carefully read. The Key holds the Kodak together; if it is taken out and the Kodak opened, the sensitive film may be ruined.

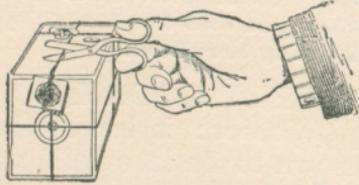
EVERY KODAK is tested and loaded before it leaves the factory and is known to be in working condition. That the purchaser may be assured of this fact it is tied and sealed.

Follow these Directions before breaking the Seal.



1. *Press the button and then Pull the Cord as far as it will go until a click is heard. This will set the Shutter or Blind in front of the lens.*

2. *Remove the seal and tape.*—In doing this the Cap which has thus far concealed the Shutter and lens will be released ; this Cap should be saved for time exposures.



3. Open the front of the Camera and see that the largest hole of the stops is in the lens. See page 17.

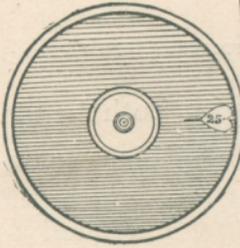
The Kodak is now ready for use.

A memorandum book accompanies the Kodak, so arranged that full particulars may be noted concerning each Exposure, such as date, hour, subject, and if interior, light and time of exposure, and other incidents of interest. Or, if desired, there may be simply a checking off. If kept in either manner the number of Exposures remaining may be known at any time and without trouble of trying to remember.

SECOND.

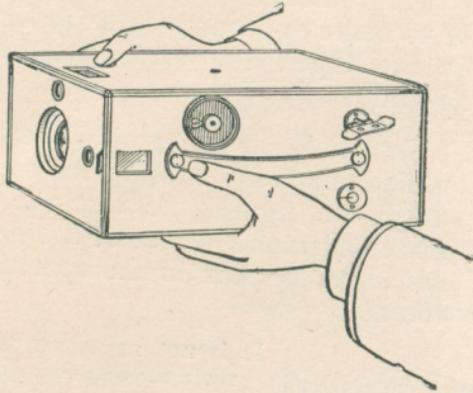
HOW to make exposures with the Kodak in the Open Air when the Sun is Very Bright.

1. *Set the Focus* by turning the large milled head on the top of the camera until the figures nearest the estimated distance in feet of the *principal object* appear in the aperture of the disc.



It is not necessary to estimate the distance with any more than approximate accuracy; for instance if the focus is set at 25 feet (the usual distance for ordinary street work) the sharpest part of the picture will be the objects at that distance from the camera, but everything from 15 to 35 feet will be in good focus. For general street work the focus may be kept at 25 feet, but where the *principal object* is nearer or further away the focus should be moved accordingly. The dial is divided for 5, 6, 8, 10, 12, 15, 20, 25,

50, 100 ft. Everything beyond 100 feet is in the 100 ft. focus. Nothing nearer than 5 feet can be focussed.



POSITION FOR MAKING HORIZONTAL PICTURES (SEE PAGE 15)

2. *Hold it Firmly* with both hands.
3. *Hold it Steady.* In order to do this let the left arm rest against the side, the right being extended to support the front with the thumb on the button as shown above.

Though the time needed for an Exposure is only a fraction of a second, the pressing of the Button requires enough force, that, unless the Kodak is held steady the picture will be blurred.

The Principal Thing

To learn in using the Kodak is to

Hold it steady

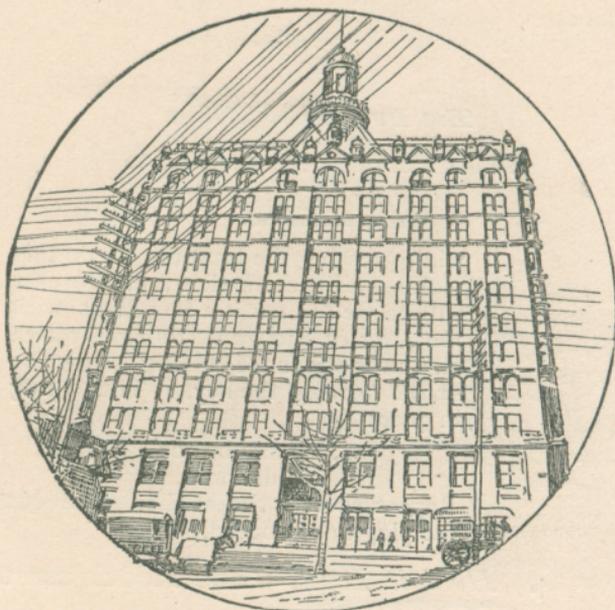
while pressing the button. To do this requires a little practice, and the user will do well to try it a few times with *the plug in* the front, going through all the motions of taking a picture *except turning* the key. Thus (plug in place)

1. Press button.
2. Pull cord.

Repeat several times, then take out the plug and proceed.

4. *Hold it Level.*—The Kodak must be held level.

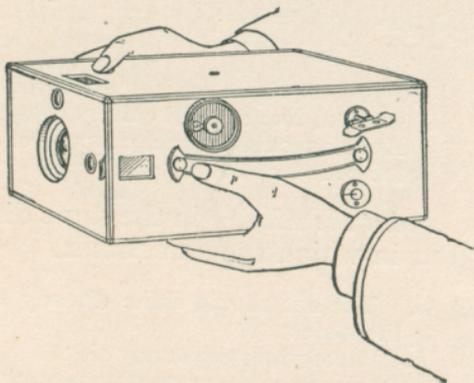
If the operator attempts to Photograph a tall building, while standing near it, by pointing the Camera upward (thinking thereby to center it) the result will be similar to this :



This was pointed too high. This building should have been taken from the middle-story window of the building opposite.

The operator should hold it *level*, after withdrawing to a proper distance, as indicated by the image shown in one of the finders on the camera.

- e. The object must be away from all shade, whether it be that of trees, veranda or anything else. The full, bright sun must shine (unobstructed) upon the side which it is desired to photograph. If the atmosphere is smoky the picture will be dull and flat.
- f. The sun must never shine on the front of the Kodak while the picture is being taken.
- g. By looking at the image in the finder the exact scope of the picture may be seen at a glance.

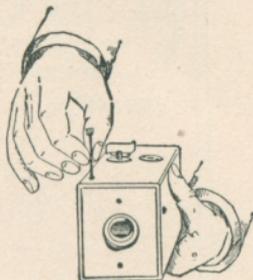


6. *Press the Button.*—To do this without swaying the camera to one side, grasp the Kodak as shown in the cut, with the thumb on the button, and press down gently and

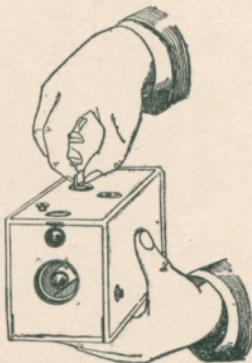
firmly until the click of the falling shutter is heard. Any swaying of the camera will blur the image.

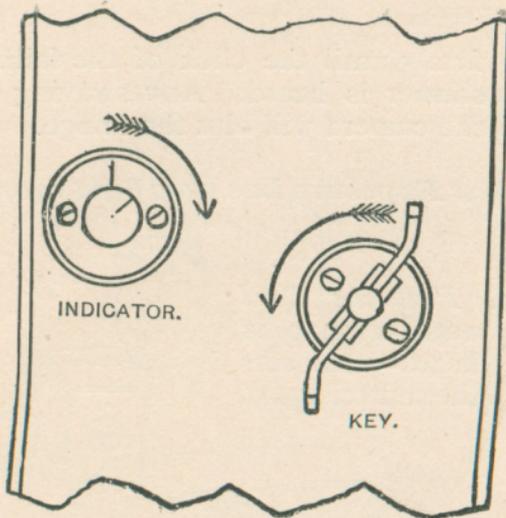
The first Exposure has now been made.

7. *Pull the Cord* until a snap is heard—this sets the shutter again.



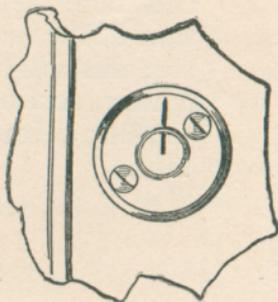
8. *Turn the Key* so as to make one complete revolution of the indicator; this will bring a new section of the film before the lens.





Turn the key to the left (the indicator revolves to the right)

until the indicator stands thus.



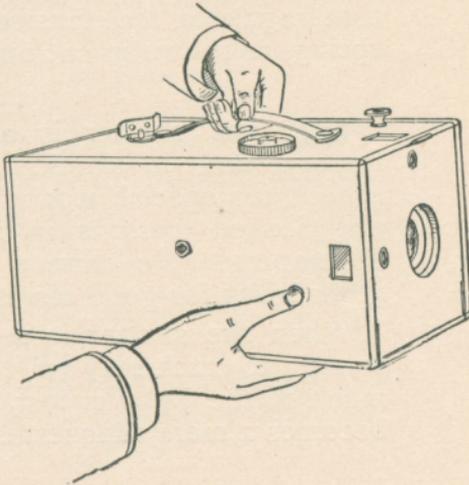
The Kodak is now ready for the next Exposure.

If it is intended to make a note of this Exposure, or other incidents concerning it, do it at once and so keep a record of it.

It will be wise to make this order of procedure a *Habit*, for then the Kodak will be ready for any view that may be presented. You will not need to try to remember whether you "Turned the Key"—let the "Turn the Key" be the last act of the exposure "gone before."

Notice this.

The position for holding the Kodak, shown on page 8, is for making *horizontal* pictures; if a vertical picture is wanted the Kodak should be held with the handle up, as below.



For the majority of pictures the horizontal position will be found the most appropriate, but for high, narrow buildings, full length single figures and similar subjects, the vertical position will be found preferable. The finders on the top and side of the camera will enable the user to determine which is the best position for any given subject.

The Kodak cannot be used for *instantaneous* exposures in the open air (out-of-doors) unless the Sun is Very Bright.

The speed of the shutter can be adjusted faster or slower by turning the milled head that regulates the tension of the shutter spring, as shown in cut on page 19.

 The shutter is adjusted at the factory, and it should not be altered except for special work in the hands of experienced persons who do their own developing. We cannot assume any responsibility for good results if altered.

When the shutter is set to work quick enough to catch *very* swift moving objects, much of the light is lost, and the picture becomes a mere silhouette.

The Stops.—On opening the front of the camera a pivoted disc may be seen close behind the shutter, which has four holes of different sizes. This disc can be shifted from one side to the other, so as to bring either hole in the centre of the lens. These holes admit light to the lens in the proportion of 1, $\frac{1}{2}$, $\frac{1}{5}$ and $\frac{1}{10}$, and they should be used as follows:

1. *The Largest*—For all ordinary instantaneous exposures when the sun shines.
2. *The Second*—For instantaneous exposures when the sun-light is unusually strong and there are no heavy shadows; such as in views on the seashore or on the water, or in tropical or semi-tropical climates; also for interiors (time exposures, the time of exposure required is given in the table on page 25.)
5. *The Third*—For interiors, (see page 25).
Never for instantaneous exposures.
10. *The Smallest*—For cap exposures outdoors in cloudy weather. *Never for instantaneous exposures.* The time required for cap exposures on cloudy days with smallest stop will range from $\frac{1}{2}$ second to 5 seconds, according to the light. See page 25.

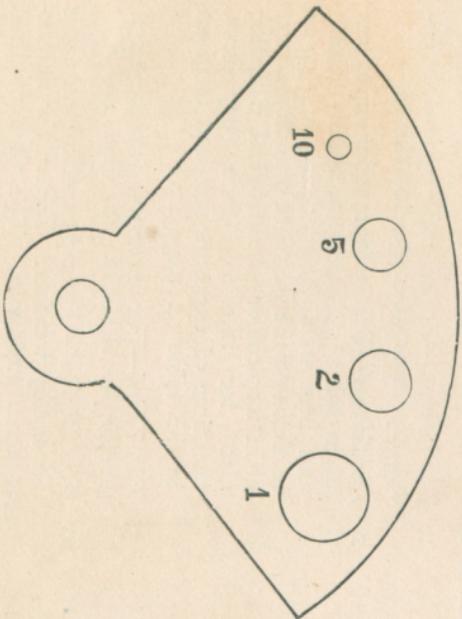
When setting the stops always see that the one to be used is *brought to the centre of the lens* where it catches.

For time exposures
out of doors.

For interiors.

For interiors, and in-
stantaneous pictures *on*
the water in *very* bright
sunlight.

For instantaneous ex-
posures in bright sun-
light.



*Do not try to make instantaneous ex-
posures with stop 5 or 10.*

THIRD.

HOW to make Exposures within the House.

1. To set the shutter open, put in the plug and press the button. This will bring the shutter into the position shown in figure 1.

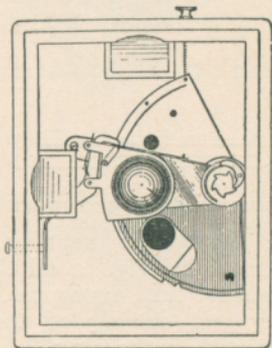


FIG. 1—POSITION OF SHUTTER AFTER INSTANTANEOUS EXPOSURE.

2. Then pull the cord taut and press the button while the shutter is being raised *only* $\frac{1}{4}$ inch, then *remove finger from button*, raise the shutter by the cord until it catches in the first notch, this will bring it into the position shown in figure 2 with the

opening in the lens, so that when the cap is removed the light will shine directly through the lens.

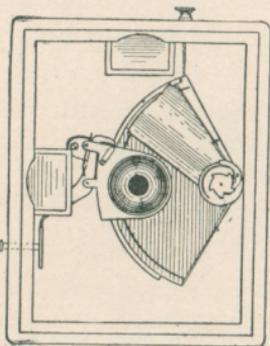


FIG. 2—SHUTTER SET FOR TIME EXPOSURES.

The shutter is kept in the position shown in Fig. 2 all the time when used for time exposures. The opening and closing of the lens being effected by the plug.

When the operator sets the shutter for the first time it will be well to open the front of the camera and stand it on end with the plug laid on top of the lens. The operation of setting the shutter can then be clearly seen. When the shutter has been set place one hand on the plug to keep it in place and then point the camera toward some dark object while putting the plug in the front and closing it.

The shutter is now set in the position shown in Fig. 2.

3. Set the stop as directed on page 17 and the focus as directed on page 7.

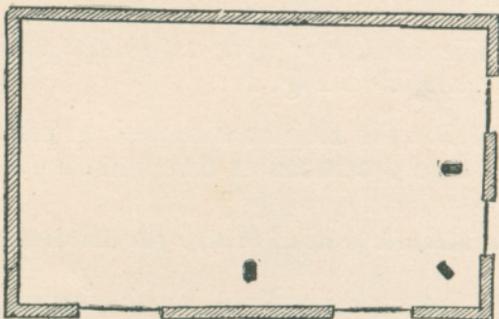
The Kodak is now ready for Interiors.

But as more time is necessary than when working out-of-doors (in the broad, open sun-light) the following directions must be adhered to in order to get satisfactory results.

Bear in mind then, in these "Interior" Exposures, the Cord and Button are not used until all that are intended to be made are made. The button should then be pressed and the cord pulled in order to set the Shutter, before taking out the plug for outside work.

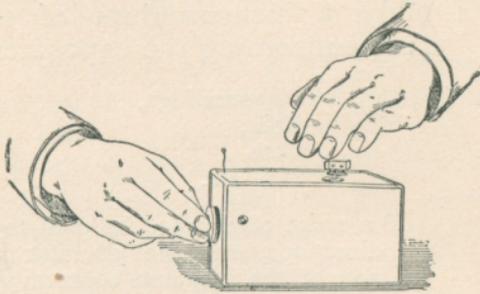
4. Place the Kodak on some steady support—a mantel, table, buffet, etc. (A regular tripod may be used if preferred. See price list).

5. Place the Kodak in the corner of the room, if a general view of the room is wanted.



This is a diagram of a room having windows on two sides, showing positions where the Kodak may be placed with propriety.

6. Do not point it toward an uncurtained window. Where there are windows within range, draw the curtains or close the blinds so as to allow light to enter only at your back ; don't let it come in in front of the Kodak.
7. There must be no sunshine within range of the Kodak.



8. Detach the cap, holding the Kodak steady with the other hand ; hold the cap an instant in front of the lens and remove the other hand ; then when all is steady take away the cap.

Do not rest the hand on the Kodak during the exposure.

9. Time the Exposure by a watch.
10. Replace the cap.

At the same time that *one* hand replaces the cap the *other* hand should be placed on the Kodak that the cap may be inserted quickly and securely.

11. Turn the key

12. Make a memorandum of everything concerning the exposure ;

surroundings,
light,
time,
etc., etc.

If a strict observance be paid to these directions, and the operator makes note of the incidents concerning each exposure, he will learn with little trouble all that is requisite to make this important part of the finest photographs.

The Kodak is now ready for the next Interior Exposure.

13. Follow the directions given heretofore for each successive exposure.
14. When the last Interior Exposure is made, press the button and pull the Cord so that the Shutter may cover the lens and so be set for exposures out-of-doors. *

TIME NEEDED FOR INTERIOR EXPOSURES.

The following table gives the time of exposure required under varying conditions of light with the *second largest stop* in the lens. If the largest stop is used give only one-half the time, if the smallest stop is used give 5 times the time of the table. The smaller the stop the sharper the picture. The second largest stop gives the best results for interiors.

White walls and more than one window :

bright sun outside, 4 seconds,
hazy sun, 10 seconds,
cloudy bright, 20 seconds,
cloudy dull, 40 seconds.

White walls and only one window :

bright sun outside, 6 seconds,
hazy sun, 15 seconds,
cloudy bright, 30 seconds,
cloudy dull, 60 seconds.

Medium colored walls and hangings, and more than one window :

bright sun outside, 8 seconds,
hazy sun, 20 seconds,
cloudy bright, 40 seconds,
cloudy dull, 80 seconds.

Medium colored walls and hangings, and only one window :

bright sun outside, 12 seconds,
hazy sun, 30 seconds,
cloudy bright, 60 seconds,
cloudy dull, 120 seconds.

Dark colored walls and hangings, and more than one window :

bright sun outside, 20 seconds,
hazy sun, 40 seconds,
cloudy bright, 80 seconds,
cloudy dull, 2 minutes 40 seconds.

Dark colored walls and hangings, and only one window :

bright sun outside, 40 seconds,
hazy sun, 80 seconds,
cloudy bright, 2 minutes 40 seconds,
cloudy dull, 5 minutes 20 seconds.

The foregoing is calculated for rooms whose windows get the direct light from the sky, and for hours from three hours after sunrise to three hours before sunset.

If earlier or later, the time required will be longer.

CAP EXPOSURES IN THE OPEN AIR.

When the *smallest stop* is in the lens the light admitted is so much reduced that

exposures out of doors may be made with the cap the same as interiors but the exposure must be much shorter.

With Sunshine—The cap can hardly be taken off and replaced quick enough to avoid over-exposure.

With Light Clouds—From $\frac{1}{2}$ to 1 second will be sufficient.

With Heavy Clouds—From 2 to 5 seconds will be required.

The above is calculated for the same hours as mentioned on page 26 and for objects in the open air. For other hours or for objects in the shadow, under porches, or under trees no accurate directions can be given; experience only can teach the proper exposure to give.

FOURTH.

HOW TO MAKE KODAK PICTURES AT NIGHT

WITH THE

FLASH LIGHT APPARATUS.

The recent invention of the flash light apparatus renders easy the taking, with such a camera as the Kodak, photographs at night.

The requisites are

The Kodak Camera.

The Flash Light Apparatus, - \$1.50

One package Flash Powders, - .60

\$2.10

The flash light apparatus consists of a specially constructed alcohol lamp, having in front of it a little tray upon which is poured about a teaspoonful of flash light powder. A rubber tube attached to a blow-pipe in the flame of the lamp, conveys a blast of air from a bulb held in the hand

and serves to project the flame of the lamp upon the powder, when it is desired to take a picture. As soon as the flame touches the powder it flashes up an intense white light, sufficiently strong to make a picture instantaneously.

Many interiors can be taken with the flash light that are impracticable by day light, either by reason of a lack of illumination or because there are windows in the direct line of the view which cannot be darkened sufficiently to prevent the blurring of the picture.

Pictures are taken so quickly that groups of people around a dinner table or card table can be taken as clear and sharp as if they were in the open sunlight. This enables the photographer to obtain souvenirs of many occasions which have hitherto been quite beyond the range of the art.

Photographing a Room.—The camera should be prepared for cap exposure by setting the shutter open and putting in the plug, as directed on page 19 and 20 of this Manual, and placing it on some level support where it will take in the view of the room desired.

Preparations of the Flash Light.—The light should *always* be placed two feet behind and two to three feet to one side of the Kodak. If placed in front or on a line with front of the camera, the flash would strike the lens and blur the picture. It should be placed at one side as well as behind, so as to throw a shadow and give a little relief in the lighting. The lamp should be at the same height, or a little higher than the camera. The support upon which the lamp is placed should not project far enough in front of it to cast a shadow in front of the camera. A piece of card board a foot square placed under the lamp will prevent any sparks from the flash doing any damage. A sheet of white card-board set up behind the flash lamp will act as a reflector and increase the strength of the picture.

TAKING THE PICTURE.

Having the Kodak and lamp both in position, light the lamp and press the bulb to make sure that the flame can be driven to the center of the tray. Then lay the bulb down (to prevent accident) and pour upon the tray in front of the flame the contents of one of the capsules of

powder that accompany the lamp; then uncap the camera, stand at arm's length and press the bulb. There will be a bright flash which will instantly impress the picture on the sensitive film. Then cap the camera and turn a fresh film into place with the key ready for another picture.

NOTE.—The amount of powder required to light a room varies with the distance of the object farthest from the camera, and the color of the walls and hangings. When more than one capsule is to be used, all the powder should be poured in one pile on the tray.

TABLE.

- For 10 *feet distance* and light walls and hangings, use 1 capsule.
- For 10 *feet distance* and dark walls and hangings, use 2 capsules.
- For 15 *feet distance* and light walls and hangings, use 2 capsules.
- For 15 *feet distance* and dark walls and hangings, use 3 capsules.
- For 25 *feet distance* and light walls and hangings, use 3 capsules.
- For 25 *feet distance* and dark walls and hangings, use 4 capsules.

The above is calculated for the largest stop in the lens.

To make a Portrait. Place the sitter in a chair partly facing the camera (which should be at the height of an ordinary table), and turn the face slightly toward the camera. The proper distance from the camera to the subject can be ascertained by looking at the image in the *finder*.

The lamp should be on the side of the camera away from the face, that is the sitter should not face the lamp. The lamp should be placed higher than the head of the sitter.

To make a Group.—Arrange the chairs in the form of an arc, facing the camera, so that each chair will be exactly the same distance from the camera. Half of the persons composing the group should be seated and the rest should stand behind the chairs. If the group is large, any number of chairs may be used, but none of the subjects should be seated on the floor, as sometimes seen in large pictures, because the perspective would be too violent.

Backgrounds.—In making single portraits or groups, care should be taken to have a suitable background against which the figures will show in relief ; a light background is better than a dark one, and often a single figure or two will show up well against a lace curtain. For larger groups a medium light wall will be suitable.

The *finders* on the camera will aid the operator to compose the groups so as to get the best effect. In order to make the image visible in the finder the room will have to be well lighted with ordinary lamp light, which may be left on while the picture is being made, provided none of lights are placed so that they show in the finder.

THE EASTMAN COMPANY,
Rochester, N. Y.

FIFTH.

WHEN the exposures have all been made the key will refuse to turn.

The Kodak is then ready to return to the Eastman Company to be reloaded and the negatives developed and the photographs (positives) printed.

NOTE.—It is taken for granted here that the reader is a novice and does not desire to pursue the art except just so far as absolutely required to make the exposures. If, however, he desires, he can finish his own pictures by following the directions given in Parts 3 and 4 of this Manual. The difficulties being no greater than those of the ordinary dry plate process, and the labor much less.

If it is not convenient to return the camera the Reel of Exposed Film can be taken out and sent by mail to the factory. For directions see part 2.

PACKING THE KODAK.

Put in the plug and *tie a string* around the Kodak to keep the plug in place (see cut page 5); then, having provided a box large enough to contain the Kodak, with plenty of soft packing, enclose the Kodak, put on the cover, and finally, wrap in one thickness of stout manilla paper and tie with a stout cord. (Keep the carrying case.)

Address as follows

The Eastman Company,

Rochester, N. Y.

From

(Put your own name and
address here.)

 **Always put your name on the wrapper.**

Prepay the charges, and don't put any more or any less writing on the wrapper. Then write us a letter as follows :

*To The Eastman Company, Rochester,
N. Y.*

GENTLEMEN :—I send you to-day by express my Kodak Camera to be reloaded and the pictures finished. Enclosed please find \$10.00* in

express order.

postal

postal note.

bank draft.

bills (if bills, letter must be registered). to pay for same.

Yours truly,

..... Name.

..... Post Office.

..... County.

..... State.

*This is the price for 48 exposures only.

On receipt, we will reload the camera and return it at once; the finished pictures will follow in ten days or less.

If the Kodak refuses to work or gets out of order, return it to the EASTMAN COMPANY; it will be repaired free of charge unless badly damaged by accident or carelessness.

If the cord should break the shutter can be set by hand until there is an opportunity to replace the cord.

It must be perfect.

If you have any difficulty with the Kodak, write us. Every Kodak is perfect when it leaves our factory, and it is to our interest to see that it reaches the user in the same condition, and that he is provided with every assistance to work it properly.

THE EASTMAN COMPANY,

Rochester, N. Y.

Part 2.
REFILLING THE
KODAK.

A GREAT FEATURE of the *Kodak System* is the division of labor whereby the user of the Kodak is relieved of the necessity of using a dark room and from all work connected with the taking of pictures, except merely making the exposure.

To carry out this system to its fullest extent, the owner especially if he be a novice, will naturally prefer to return the Kodak to the factory to have it refilled.

There are instances, however, where this will be impracticable, owing to distance, or a desire to expose more than one roll of film on a trip, without waiting to send to the factory and back. In such cases it will be desirable for the owner to know how to refill his own Kodak, then he can keep a supply of extra spools and send the rolls of exposures to the factory whenever convenient.

TO REFILL THE KODAK.

Provide

- a. An extra Spool of Kodak Film.
- b. An extra Reel (5 inch model of '86).*
- c. An Eastman Orange Candle Lamp.
- d. A dark room having a shelf or table.

*NOTE: The extra reel does not accompany the spool, but must be ordered separately. While not an actual necessity, it is a convenience and saves unwinding the exposed film from the old reel, and the consequent liability of fogging the film by exposure to white light. The exposures should be sent to the factory on the first reel. The reel will be returned with the prints and can be used repeatedly. Hence it is necessary to have only as many extra reels as it is desired to send spools at one time to the factory for development.

By a dark room is meant one that is wholly dark—not a ray of light in it. Such a room can easily be secured at night almost anywhere. The reason a dark room is required is that the film is extremely sensitive to white light, either daylight or lamplight, *and would be spoiled if exposed to it* even for a fraction of a second, while being removed from the Kodak.

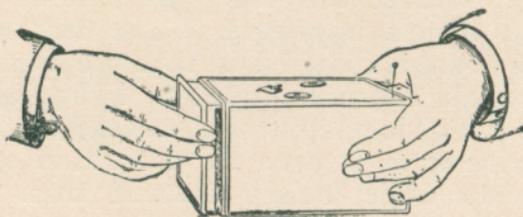
Having provided such a room or closet where, when the door is closed, no ray of light can be seen, set up on the table or shelf the Orange Candle lamp, and light it as directed in the circular which comes in the box in which the lamp is enclosed.

The lamp gives a subdued yellow or orange light which will not injure the film unless it is held close to it.

Set the lamp on the table at least eighteen inches from and with the *side* toward the operator.

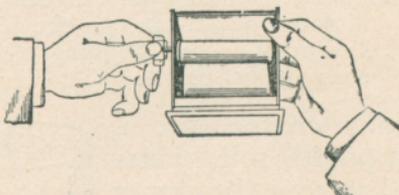
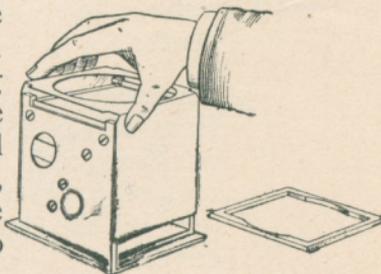
1. Unscrew the key of the Kodak by turning it to the right, press the *button on the bottom* of the camera and pull out the back of the case thus :

NOTE.—The button is under the leather covering in a depression in the bottom of the camera.



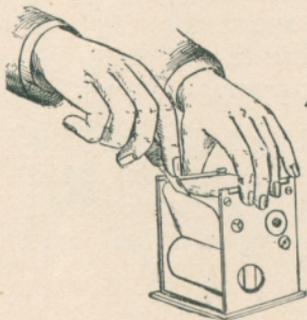
The part removed is the roll holder.

2. Release the pasteboard shield by sliding the wood frame to one side and lifting it off, then screw the key back into its place thus:



The film will be found all wound on the *reel*, (the roller the key turns.)

3. Take a sharp knife and sever the film on the side next the empty spool.



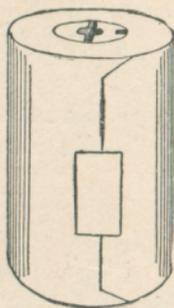
4. Turn the center, No. 1, until the figures meet, and lift it out. The reel, with the exposed film wound upon it, can then be lifted

out of the roll holder. Replace the center.

5. Remove the fresh spool of film from its box, take off the black wrapper and wrap it around the reel of exposures, and put the latter in the box and put on the cover.

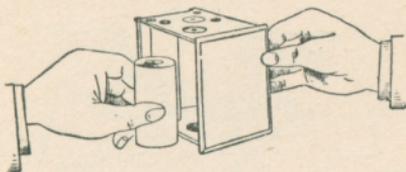
This box is then ready to be tied up in paper and mailed to the Eastman Company. For shipping directions see page 34, part 1.

6. Take center, No. 2, out of the roll holder and remove the empty spool, (which may be thrown away.) The roll holder is then ready for the insertion of the fresh spool. This is the spool as taken from its wrapper.

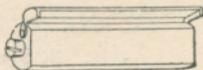


7. Insert the spool by fitting the slotted end upon the tension head, and put the center, No. 2, back in its place, giving it a half turn

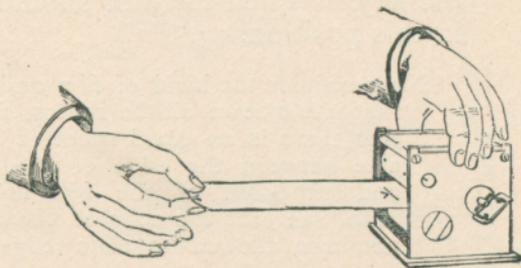
to fasten it. The spool should be set squarely into place as shown in the cut.



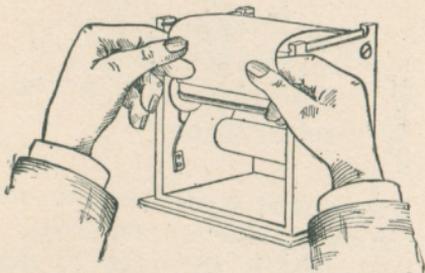
8. Insert the new reel in its place, removing the center No. 1, and replacing it in order to fasten the reel. This is the reel with the clamp raised.



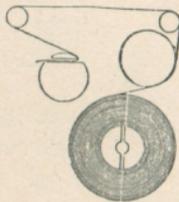
9. Remove the paper band which prevents the film from unwinding, and pull out the end 8 inches, thus:



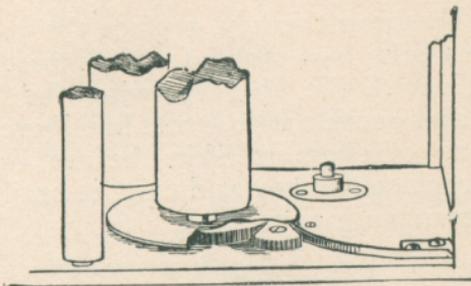
10. Draw the end of the film over the bed of the roll holder like this.



11. Raise the Clamp of the reel and thread the end of the film in *from behind*, shut down the clamp and give the reel a partial turn backward with the key. Then the film should be in this position.



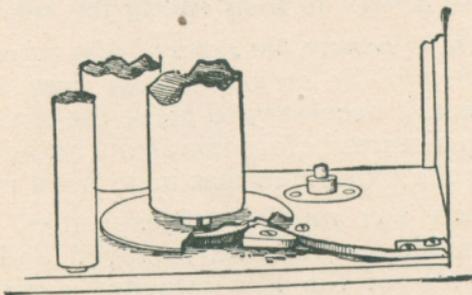
Now examine the band of film and see that it is true on all the rollers, *i. e.*, that there is an equal space at each side between the edge of the film and the side of the roll holder. Also, see that the coils of film have not been allowed to slide edgewise



PAWL OFF.

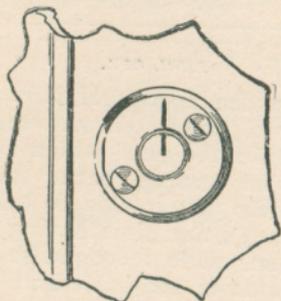
on the spool. If it is not perfectly true, throw off with the point of a knife the pawl which keeps the reel from turning back, (twist the key while doing this to help loosen the pawl), and thus having loosened the film, slide it edgewise with the flat blade of the knife until it is perfectly true, then *throw on the pawl* and turn the key until the film is tight.

 *Do not forget to throw on the pawl.*



PAWL ON.

12. Unscrew the key, replace the paste-board shield and wood frame, insert the roll-holder in the Kodak, (wipe the lens inside and outside with a soft handkerchief or piece of chamois skin before doing this,) replace the key and turn it until the indicator stands thus :



13. Pull the cord to make sure the shutter is in position.

The Kodak is then ready for work.

How to remove the exposed film when only a portion of the exposures have been made.
—It is not necessary to make the entire 48 or 100 pictures before taking out and developing the exposures that have been made.

When any number of exposures have been made they can be removed and the remainder of the film attached again for further exposures, as follows :

1. Cut the film as shown on page 41, then throw back the pawl as shown on the top of page 45, pull the exposed film off from the reel and wind it up on the finger and wrap it up in black paper.

2. Take hold of the end of the unexposed film remaining on the spool and draw it out as shown on page 43, attaching it to the reel as if it were a fresh spool.

The Kodak will then be ready again.

Part 3.
DEVELOPING
KODAK
NEGATIVES.

SECTION A.

NOTE: These directions are for developing negatives made on Eastman's new (non-stripping) *transparent film*. For directions for developing the (paper) stripping films see section "B"

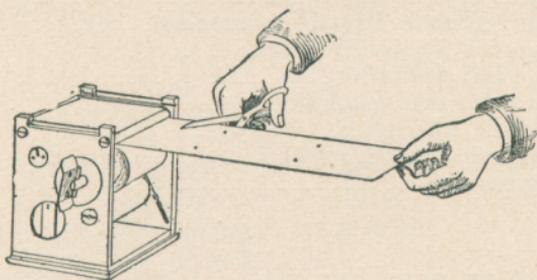
DEVELOPING.

THE strip of flexible material upon which Kodak pictures are taken, is called the *sensitive film*. The film as it passes over the measuring roll in the roll-holder is perforated by an automatic device to mark the division between the pictures; each section is called an "*exposure*." When the exposed film is removed from the camera, as described in the preceding chapter, the image is invisible or latent, and has to be brought out by chemicals, which blacken that part of the film upon which the light has acted. This is called development. When the exposure has been developed, it is called the *negative*, because the lights and shades of the original are reversed. Shadows in the negative appear transparent, and lights are opaque. The finished negative is used to print on sensitive paper, as will be described in Part 4, and thus the *positive* or final picture is made.

If, instead of sending the spool of exposed film to the Eastman Company to be developed and printed, the Kodaker wishes to develop and print his own negatives, he can easily learn to do so by following carefully the directions given.

COMMENCING from that point in the preceding chapter, where the exposed film is being removed from the camera, we will proceed.

Separating the Exposures—Instead of removing the reel with the exposures wound on it, bodily from the roll-holder, as described in Part 2, throw back the pawl so as to allow the film to unwind, and pulling out the film, as here shown,



cut off the film at every perforation. Put the sections in a covered (light tight) box until taken out for development.

The Developing Outfit.—The following is a list of the articles necessary to develop and finish 48, 4x5 Kodak negatives.

(Implements and materials for printing the positives are not included in this list. A list of those articles will be found in the next chapter.)

DEVELOPING OUTFIT.

(See Price List.)

1 Eastman Orange Candle Lamp	\$ 25
3 5x8 hard rubber trays.....	I 68
1 camel's hair brush.....	10
1 four ounce graduate.....	50
1 minim graduate	25
1 package developer powders	50
1 ounce bottle bromide potassium.....	15
1 pound hyposulphite soda.....	10
1 pound powdered alum	10
1 bottle soaking solution.....	35
1 bottle intensifier.....	35
1 sample film negative	
1 glass rod	10

\$4 43

Also, provide a pail of clear, cold water, a dipper, and a pail for slops.

Soaking the Exposures.—Take say six or eight of the sections of exposed film and put them in one of the trays filled with water. Put them in one at a time, endwise, face down, as shown in this cut,



so as to avoid air-bells. Take particular care in laying them into the water not to allow the sharp corners of one strip to injure the surface of another. While they are soaking prepare

The Developer.—Take one of the packets of developer and empty the two powders into the graduate. Fill the graduate up to the mark, 4 oz., with water, and dissolve by stirring with the glass rod.

In case the operator desires to make his own solutions, we give the

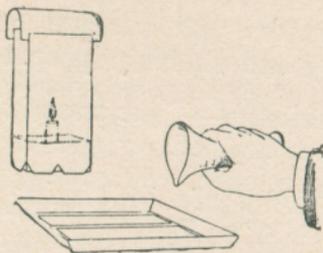
Formula for the Developer :

Pyrogallic acid, 10 grains.
Carbonate soda, 75 grains.
Sulphite soda crystals, 110 grains.
Water, 4 ounces.

NOTE—4 ounces of developer will develop about 8 exposures, if they are developed one after the other in quick succession. Then the developer should be thrown away and a fresh portion mixed,

To Develop.—Take one of the soaked exposures and lay it in one of the empty trays, face up. (The face can be distinguished by the touch, the back being the polished side.) Always handle the exposures by the corners; if the finger touches the center where the image is, it will leave a mark.

Having one exposure in the tray, pour the developer from the graduate on to it.



Then take the camel's-hair brush, and having first moistened it in clean water, carefully brush over the face of the film to take off any adhering air bells. Rock the tray gently to equalize the action of the developer. The image will appear faintly in about thirty seconds, the sky will appear first and will continue to grow blacker as the development proceeds. In a few seconds more the outlines of the entire image

will show. The development should be continued (in case of instantaneous exposures) until all action ceases, then the negatives should be rinsed in clean water, then put in the alum bath, see page 57.

The time of development of an instantaneous exposure will be about ten minutes. If, in making interior exposures, too much time has been given, the image will darken more quickly and evenly, the shadows almost as quickly as the lightest parts. If the development is allowed to continue, the detail will be lost. In such cases the remedy is in

The Restrainer.—

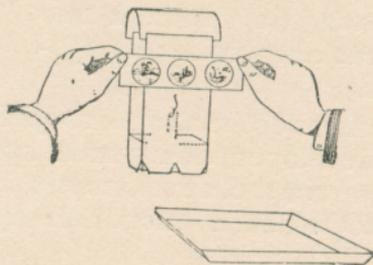
Bromide Potassium, 1 oz.
Water, 8 oz.

Dissolve the bromide in the water, and keep it in a dropping bottle, consisting of an ordinary bottle having in the cork two notches cut lengthwise on opposite sides.



A few drops of the above dropped into the tray of developer, and mixed by rocking it will restrain the development, cause the image to blacken more slowly in the

shadows, and act generally as a neutralizer of the light which has been allowed to act too long on the film. Ten to twenty drops of the restrainer, in four ounces of developer will usually be sufficient. The development must be continued until the image has attained proper density. This can only be determined by the experience of the operator, who will have to be guided somewhat by the appearance of the sample negative supplied with the outfit. A few trials of different density will give a criterion to go by. For this reason we recommend the novice to develop not more than six or eight exposures to start with, and to carry them through the entire course of operations to the final printing of the positives before undertaking the balance of the exposures. The progress of the development can be examined by looking through the film as shown in this sketch.



When fully developed rinse slightly in clear water, transfer to a tray containing a saturated solution of common alum in water. This solution is made by putting 1 pound of alum in a vessel, such as a quart fruit jar, and filling the jar with water; shake thoroughly and allow to settle. Then pour enough of the clear liquid into the tray to half fill it. The jar can be filled up with water as long as any alum remains undissolved. The solution in the tray is to be thrown away when through developing. Leave the negative in the alum bath one or two minutes, then rinse with clear water and immerse in

The Fixing Bath.

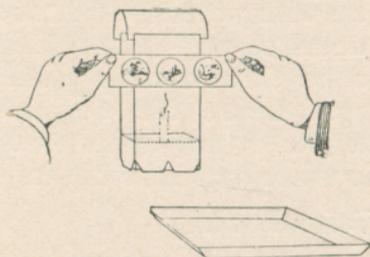
Hyposulphite soda, 4 ounces.

Water, 1 pint.

Fill a tray half full of this solution and then transfer the negatives one by one from the water to it, sliding them in edgewise, as in sketch, face down.



The function of the fixing bath is to dissolve away all that part of the silver where the light of the image has not penetrated, leaving the negative film clear in those portions, and opaque where the developer has blackened the silver. The negatives should lie in the fixing bath about ten minutes or until when examined, as here shown,



no uneven, milky blotches, remain on the film.

All the sensitive silver having been dissolved out of the film, it is no longer sensitive to white light, hence the orange shade may be removed from the candle at this stage, and subsequent operations carried on by a bright light.

As soon as the films are fixed, the fixing solution should be thrown out and the tray filled with pure water, after ten minutes the negatives should be transferred one by one

to a second tray of fresh water and then changed back and forth (into fresh water each time) every ten minutes at least six times.

If a mistake has been made in developing and the negative does not appear strong enough (this can be judged only by experience), the negative can be improved by

Intensification—Lay the film in one of the empty rubber trays and pour over it the intensifier; allow it to act until the film is all of one even color and then pour the intensifier back into the bottle and wash the film in four or five changes of water for fifteen minutes

NOTE: This operation will not usually be required as the novice will soon learn to get the proper intensity in the development.

The films will then be ready for the soaking solution, the object of which is to prevent the films from curling while drying.

In case the operator desires to make his own solution he can use the following

Formula for Soaking Solution:

Glycerine, $\frac{1}{2}$ ounce.
Water, 16 ounces.



Soak the films in this solution two minutes. The negative is then ready to dry. To dry them pin by the corners on a flat board, first taking care to remove all drops of water with a tuft of cotton or soft cloth. *Use no heat in drying.*

When dry rub off the back with a soft cloth.

When finished as above, the negative is ready for printing the positive. Each negative will serve for printing an indefinite number of duplicate positives. The methods for making which are fully described in Part 4 of this manual.

 Trays used for developing, fixing or intensifying must always be washed clean before being used again.

Finished negatives should be kept under pressure in a printing frame when not in use.

Part 3.
DEVELOPING
KODAK
NEGATIVES.

SECTION B.

NOTE: These directions are for developing negatives made on Eastman's American (stripping) film. For directions for developing *transparent films* see section "A."

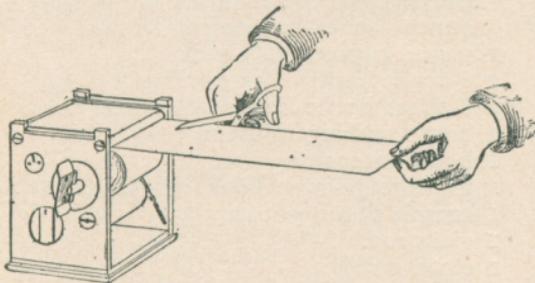
DEVELOPING.

THE strip of flexible material upon which Kodak pictures are taken, is called the *sensitive film*. The film as it passes over the measuring roll in the roll-holder is perforated by an automatic device to mark the division between the pictures; each section is called an "*exposure*." When the exposed film is removed from the camera, as described in the preceding chapter, the image is invisible or latent, and has to be brought out by chemicals, which blacken that part of the film upon which the light has acted. This is called development. When the exposure has been developed, it is called the *negative*, because the lights and shades of the original are reversed. Shadows in the negative appear transparent, and lights are opaque. The finished negative is used to print on sensitive paper, as will be described in Part 4, and thus the *positive* or final picture is made.

If, instead of sending the spool of exposed film to the Eastman Company to be developed and printed, the Kodaker wishes to develop and print his own negatives, he can easily learn to do so by following carefully the directions given.

COMMENCING from that point in the preceding chapter, where the exposed film is being removed from the camera in the dark room, we will proceed.

Separating the Exposures.—Instead of removing the reel with the exposures wound on it, bodily from the roll-holder, as described in Part 2, throw back the pawl so as to allow the film to unwind, and pulling out the film, as here shown,



cut off the film at every perforation. Put the sections in a covered (light tight) box until taken out for development.

The Developing Outfit.—The following is a list of the articles necessary to develop and finish 48, 4x5 Kodak negatives.

(Implements and materials for printing the positives are not included in this list. A list of those articles will be found in the next chapter.)

DEVELOPING OUTFIT.

(See Price List.)

1 Eastman Orange Candle Lamp	-	.25
6 sheets clear glass 5½ x 8½ inches	-	.30
3 5x8 hard rubber trays	- - -	1.68
1 iron tray for stripping, 8 x 10	- - -	.40
1 camel's hair brush	- - - -	.10
1 four ounce graduate	- - - -	.50
1 minim graduate	- - - -	.25
1 8-inch velvet rubber squeegee	- - - -	.50
1 package developer powders	- - - -	.50
1 ounce bottle bromide potassium	- - - -	.15
1 pound hyposulphite soda	- - - -	.10
2 8-ounce bottles Eastman's collodion	-	1.00
1 8-ounce bottle Eastman's rubber solution	-	.25
1 bottle soaking solution	- - - -	.35
1 bottle intensifier	- - - -	.35
1 package gelatine skins, 2 doz., 5 x 8	-	.50
1 sample film negative.	- - - -	
1 glass rod.	- - - -	.10
1 cloth blanket	- - - -	

\$7.28

Also, provide a pail of clear, cold water, a dipper, and a pail for slops.

Soaking the exposures.—Take, say six or eight of the sections of exposed film and put them in one of the trays filled with water. Put them in one at a time, endwise, face down, as shown in this cut,



so as to avoid airbells. While they are soaking prepare

The Developer.—Take one of the packets of developer and empty the two powders into the graduate. Fill the graduate up to the mark, 4 oz., with water, and dissolve by stirring with the glass rod.

In case the operator desires to make his own solutions, we give the

Formula for the Developer :

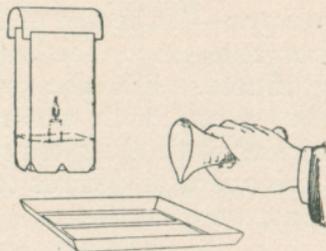
Pyrogallic acid, 10 grains.
Carbonate soda, 75 grains.
Sulphite soda crystals, 110 grains.
Water, 4 ounces.

NOTE—4 ounces of developer will develop about 8 exposures, if they are developed one after the other in quick

succession. Then the developer should be thrown away and a fresh portion mixed.

To Develop.—Take one of the soaked exposures and lay it in one of the empty trays, face up. (The face can be distinguished by the touch, the sensitive side being the smoothest when wet, and the concave side when dry.) Always handle the exposures by the corners; if the finger touches the center where the image is, it will leave a mark.

Having one exposure in the tray, pour the developer from the graduate on to it.



Then take the camel's-hair brush, and, having first moistened it in clean water, carefully brush over the face of the film to take off any adhering airbells. Rock the tray gently to equalize the action of the developer. The image will appear faintly in about thirty seconds, the sky will appear

first and will continue to grow blacker as the development proceeds. In a few seconds more the outlines of the entire image will show. The development should be continued (in case of instantaneous exposures) until all action ceases, then the negatives should be transferred to a tray of clean water to wait for some of its fellows before undergoing the final operations.

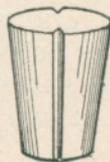
The time of development of an instantaneous exposure will be about ten minutes. If, in making interior exposures, too much time has been given, the image will darken more quickly and evenly, the shadows almost as quickly as the lightest parts. If the development is allowed to continue, the detail will be lost. In such cases the remedy is in

The Restrainer.—

Bromide Potassium, 1 oz.

Water, 8 oz.

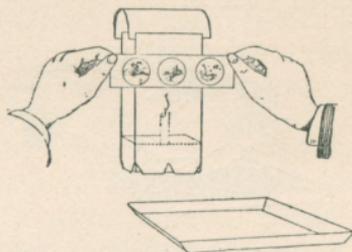
Dissolve the bromide in the water, and keep it in a dropping bottle, consisting of an ordinary bottle having in the cork two notches cut lengthwise on opposite sides.



A few drops of the above dropped into the

tray of developer, and mixed by rocking it will restrain the development, cause the image to blacken more slowly in the shadows, and act generally as a neutralizer of the light which has been allowed to act too long on the film. Ten to twenty drops of the restrainer, in four ounces of developer will usually be sufficient. The development must be continued until the image has attained proper density. This can only be determined by the experience of the operator, who will have to be guided somewhat by the appearance of the sample negative supplied with the outfit. A few trials of different density will give a criterion to go by. For this reason we recommend the novice to develop not more than six or eight exposures to start with, and to carry them through the entire course of operations to the final printing of the positives before undertaking the balance of the exposures. The progress of the development can be examined by looking through

the film as shown in this sketch.



When finished, transfer to tray of clean water as before directed.

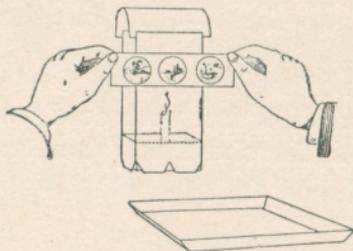
While the developed negatives are lying in the tray the water should be changed from time to time, and the negatives moved about so as to wash them evenly. After the last one is in, change the water three or four times and prepare

The Fixing Bath—Pour out the developer and wash the tray, put into it two tablespoonfuls of the hyposulphite of soda, and fill the tray half full with cold water; rock or stir until dissolved, and then transfer the negatives one by one from the water to

the fixing bath, sliding them in edgewise, face up, as in sketch.



The function of the fixing bath is to dissolve away all that part of the silver where the light of the image has not penetrated, leaving the negative film clear in those portions, and opaque where the developer has blackened the silver. The negatives should lie in the fixing bath about ten minutes or until when examined, as here shown,

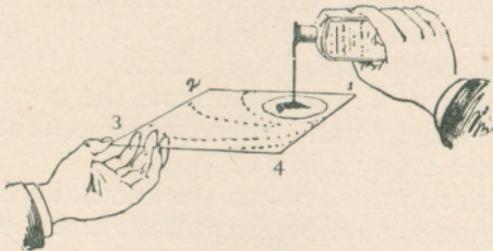


no uneven, milky blotches, remain on the **film.**

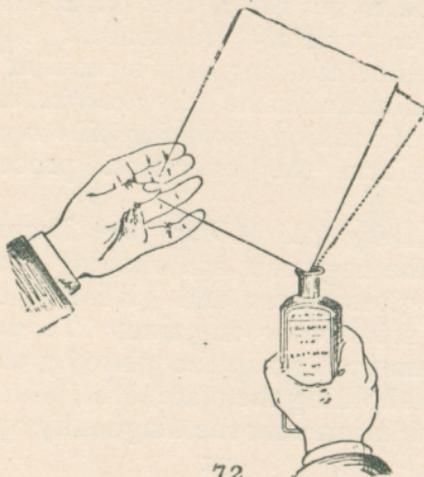
All the sensitive silver having been dissolved out of the film, it is no longer sensitive to white light, hence the orange shade may be removed from the candle at this stage, and subsequent operations carried on by a bright light.

As soon as the films are fixed, the fixing solution should be thrown out and the tray filled with pure water. While preparing for the next operation the water should be changed six times. The negative would now be finished with exception of drying, if it were not for the fact that the image being on paper more or less opaque, it would take too long to print the positive, because the paper obstructs the light. Hence it is desirable to get rid of the paper and substitute a perfectly transparent support. The method of doing this is peculiar to the Kodak film, and is the only *practical* method known of making *stripping film negatives*. To perform the operation proceed as follows :

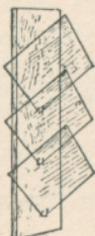
Preparing the Glass for Transfer.— While the negatives are washing, take one of the glass plates and give it a coat of rubber solution on one side. To perform this operation, grasp the plate by one corner, and holding the plate level, pour a pool of the solution near the diagonally opposite corner.



Tilt the plate to make the solution flow clear to the edges, first to corner No. 1, then to No. 2, and then let the solution flow in a broad wave down the plate, as shown by the dotted lines, tilting it slightly to corner No. 3, and finally drain from corner No. 4, as here shown,



at the same time rocking it edgewise, as shown by the dotted lines, to prevent the formation of streaks. As soon as the plate ceases to drip, stand it to dry in a rack formed by driving nails into a piece of board like this :



When the plate is dry it will have assumed an even, smoky appearance, and the coating will be tacky to the touch. It will take about ten minutes to dry. It will not dry hard, and the slightest touch will injure the surface, hence the fingers must be allowed only to touch the edges.

Formula for Collodion :

Ether, 1 ounce.

Alcohol, (or methylated spirit), 1 ounce.

Pyroxyline (soluble gun cotton), 10 grains.

The next step is to coat the plate with collodion on top of the rubber. This operation is performed in exactly the same

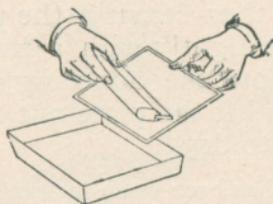
manner as the rubbering. The only difference is, that the collodion is thicker in consistency and sets quickly if not kept in motion, hence the plate must be flowed quickly and carefully rocked while draining. The collodion will set in about one minute (wait two minutes to make sure) and then the plate should be plunged into a tray of water and washed in several changes until, when lifted from the water, no greasy lines appear on the surface. This will take four or five minutes. The plate will then be ready for

The Transfer.—Lay the prepared plate on top of one of the empty trays and pour upon it as much water as it will hold. Then lift the negatives out of the wash water, one by one, and lay them face down on the glass.



Lay the negative down by one corner first and then let it gradually sink down so that the air will not be imprisoned under it. Each glass will hold two negatives each and hence one glass should

be prepared for each two negatives developed. When the two strips are in place, lay on top of them the cloth blanket, and grasping the edges of the plate and blanket, expel all the water from between by the scraping action of the squeegee.



Then take a piece of smooth folded newspaper for a pad and placing it on top of the negative (remove blanket first), lay the plate on a level support and put a heavy book on it for *thirty minutes*.

If a number of plates are being prepared, they should be piled one on top of the other with two or three thicknesses of paper between and the weight on top.

Stripping the Paper.—Provide a pitcher of hot water, and having removed the plate from under its weight, lay it in the iron tray and cover it with cold water, then add hot water until the water in the tray is about as warm as the hand will comfortably

bear (120° Fahr.) or until the paper commences to blister. Rock the tray slightly, and if the paper does not loosen and float off from the plate, lift the corner with a pin and lift it off. If it comes hard, raise the temperature of the water by pouring warmer water into one end of the tray until it comes away freely, then leaving the plate under water, rub it lightly with a tuft of cotton wool to remove the adhering soluble gelatine. Then lift the plate out of the water and allow it to dry.

If a mistake has been made in developing and the negative does not appear strong enough (this can be judged only by experience), the negative can be improved by

Intensification.—Lay the plate in one of the empty rubber trays and pour over it the intensifier; allow it to act until the plate is all of one even color and then pour the intensifier back into the bottle and wash the plate in four or five changes of water for fifteen minutes.

NOTE: This operation will not usually be required as the novice will soon learn to get the proper intensity in the development.

The plate will then be ready for

Applying the Gelatine Skin.—Take one of the gelatine skins from the package and immerse it edgewise in a tray containing the soaking solution.

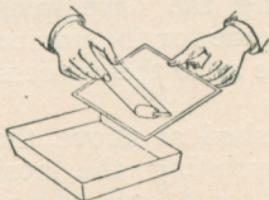
In case the operator desires to make his own solution he can use the following

Formula for Soaking Solution:

Glycerine, $\frac{1}{2}$ ounce.
Wood or grain Alcohol, 8 ounces.
Water, 8 ounces.



Be sure and immerse the film evenly and have the smooth side down; when fully covered wait thirty seconds, then slip the plate bearing the negatives under the skin, and grasping both together, remove from the solution, lay on the cloth blanket and use the squeegee to expel the water.



Remove the blanket and set in the rack to dry. When dry the plate is ready for

Collodionizing.—A final coat of collodion on top of the skin completes the operations. This coat of collodion is applied precisely the same as the first coat, but is allowed to dry without washing. The drying is accomplished in an hour, and when *perfectly dry*, run the point of a penknife around the edge of the skin and picking up one corner first, pull the negative off from the glass. It will come off easily with the coating of rubber adhering to the face. Remove this with a tuft of cotton moistened in benzine, and the negative is finished.

The Finished Negative consists of a very thin image-bearing film, supported on the gelatine skin, and enclosed between two films of collodion varnish, which renders the negatives impervious to the changes of the atmosphere. The sample film negative accompanying the developing outfit will serve as a guide for the novice, and enable him to judge as to the success of his own efforts.

When finished as above, the negative is ready for printing the positive. Each negative will serve for printing an indefinite number of duplicate positives. The methods for making which are fully described in Part 4 of this manual.

Part 4.
MAKING THE
POSITIVE.

CONTENTS.

- Making prints on Ferro-prussiate Paper
(blue prints) ;
Making prints on Sensitized Albumen Paper
(silver prints).

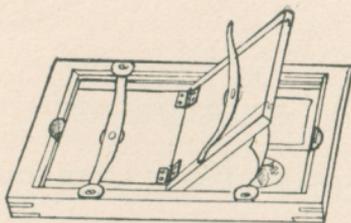
PRINTING ON
FERRO-PRUSSATE PAPER.

Ferro-prussiate paper affords the easiest way of making proofs from Kodak negatives, no chemicals being required. The operation being simply to lay a piece of the prepared paper behind the negative, in the sun, until it is darkened sufficiently, and then wash the print for a few minutes in clean water. The resulting picture is of a very agreeable, bright blue color on a white ground, and is as permanent as the paper itself.

REQUISITES.

1 Printing frame, 4 x 5, - - - - -	\$.55
1 Sheet of clear-glass, 4 x 5, - - - - -	.05
1 package of Ferro-prussiate Paper, 4 x 5, -	.30
(For twenty-four pictures).	\$.90

Method of Printing.—



Lay the negative (if Transparent film dull side up, if Stripping film bright side up) face up on the clean glass in the printing frame. A piece of the Sensitive Paper should then be laid face down (the face is olive green) on the negative. The hinged back of the printing frame is then to be carefully laid in position and clamped by the springs. The operation of putting on the Sensitive Paper must be performed in a subdued light, that is to say, in an ordinary room, as far as possible from any window. The paper not used must be kept covered in its envelope.

The printing frame, when filled as directed is to be laid glass side up in the strongest light possible (sunlight preferred) until the light, passing through the negative into the Sensitive Paper, has impressed the image sufficiently upon it. The progress of the printing can be examined from time to time by removing the frame from

the strong light, and opening one-half of the hinged back, keeping the other half fastened to hold the paper from shifting.

The printing should be continued until the shadows commence to bronze—a condition which will be readily observed after a few trials.

When the print is done, unfasten the back of the frame and take it out, and immerse it in a bowl of clean water. Change the water every five minutes for half an hour, and then let it soak for half an hour more in fresh water, and dry it between blotters. If the prints curl when dry they can be straightened by the scraping action of a paper-knife applied to the back.

If the prints are too light when washed, it will be evident that the printing was stopped too soon; and if too dark, *vice versa*.

The image, before the picture is washed, is quite indistinct, and two or three trials will be required to enable the novice to judge how far to carry the prints; but when learned with one negative it will be simple with all.

It is recommended to the novice who desires to learn photography by easy stages, that at first he have his Kodak negatives

veloped and printed at the factory. Then when his first negatives are returned to him, he can try to make blue prints from them. After succeeding with them he can try silver printing, and after mastering that process he can try developing his own negatives. If the novice commences by trying to develop his own negatives, he is undertaking a good deal to begin with, and is liable to become discouraged by failures which may occur in any one of the successive stages of developing, printing, toning and mounting.

PRINTING ON SENSITIZED ALBUMEN PAPER.

Silver printing is the method of making prints such as are commonly known as "photographs." They have a warm, brown tone, and are usually mounted on cardboard and highly burnished.

The method of making silver prints differs from that of making blue prints principally in the final operation of fixing and toning, which operations will be hereafter described.

The requisites for making 48 No. 4 Kodak silver prints are as follows ·

KODAK PRINTING OUTFIT.

(See Price List page 100).

1 4 x 5 printing frame, - - - -	\$.55
1 clean glass, for frame, - - - -	.05
*3 5x8 hard rubber trays, - - - -	1.68
*1 4-oz. graduate, - - - -	.50
*1 minim graduate, - - - -	.25
48 mounts, gold bevel edge, - - - -	.60
48 sheets sensitized paper, - - - -	.75
1 15-gr. bottle of chloride of gold and sodium, .35	
*1 lb. hyposulphite of soda, - - - -	.10
1 flat paste brush, - - - -	.10
2 ozs. phosphate of soda, - - - -	.20
1 oz. acetate of soda, - - - -	.20
	<hr/>
	\$5.33

*Duplicates which are not required if operator has developing outfit, page 52 or page 64.

The Sensitized Albumen Paper, having been printed under the negative until the lightest parts begin to turn dark in precisely the same way as directed for Ferroprussiate Paper, the first operation is

Washing.—Fill one of the trays with clean water and immerse the prints one by one until all are in.

NOTE—If the tray has been used for developing or fixing or intensifying it must be carefully washed—a trace of one chemical left in a tray will spoil the action of another.

Rock the tray for one or two minutes and then change the water, repeat this five or six times. Put in the last water a pinch of common salt. This will turn the prints slightly redder in tone so that the progress of the gold toning can be more plainly seen.

Toning.—For the toning bath prepare the following solution :

Gold Solution.—

Chloride of gold and Sodium, 15 grains.

Water, 4 ounces.

Keep in a glass-stoppered bottle.

Alkaline Solution.—

Phosphate Soda, 2 ounces.

Acetate Soda, 1 ounce.

Dissolve in 1 pint of water.

TO MAKE THE TONING BATH.

Take of the Gold Solution, 1 ounce.

“ “ Alkaline Solution, 4 ounces.

Water, 3 ounces.

Pour the toning solution into one of the trays and immerse the prints one after the other in the toning bath. Three or four prints can be toned together if they are kept in motion and not allowed to lie on top of one another. Turn the prints all face down and then all face up; and repeat this all the while they are toning. The prints will begin to change color almost immediately from the reddish brown to purple. The change will be gradual from one shade to another, and the toning should be stopped just before the print gets to the shade desired for the final tone. The washing and toning both lighten the print somewhat, but it will still be too dark and appear over printed until after it is “fixed.”

Eight ounces of toning solution will tone fifteen prints, after that a new solution should be made, same as before. In large establishments the old toning and fixing baths and the first washing water are always saved, and the silver and gold recovered, but the amateur deals with too small quantities to render this advisable.

Fixing.—When the proper shade has been attained in the toning bath, the print should be transferred to a tray of clean water and thence to the fixing bath, which should be ready in another tray.

The Fixing Bath.

Hyposulphite of soda, 1 ounce, or one heaping teaspoonful.
Water, 8 ounces.

The function of the fixing bath is to remove all the sensitive silver remaining in the print, so as to prevent the print turning black when exposed to light again.

All the operations up to this point, except the printing, should be performed in very subdued light, where there is just light enough to watch the change of color in toning. As an additional precaution, the trays in which the prints are put should be kept covered as much as possible with pieces of cardboard, to prevent the light acting on the unfixed prints. The prints will fix in five minutes, and they must be kept moving during that time to prevent spots and streaks.

When fixed, transfer the prints to the washing tray, which should be filled with fresh water from time to time for one hour. Six changes of water will be sufficient.

The prints are then ready for

Mounting.—Take the prints out of the water and lay them one by one, face down, on a piece of glass (it will not matter if they lap over each other). Press the water out of the prints by dabbing them with a towel. Prepare a little thin starch-paste and with the paste-brush spread the paste over the back of the prints ; lift up one of the top prints with a pin and lay it down on the face of a mount in the proper position. Lay a blotter or a piece of newspaper over it and rub it down smooth. Repeat for each print, until all are mounted.

If it is desired to burnish them, take them while still damp to any photographer who has a burnisher, and he will run them through with his own prints for a small sum.

Part 5.
MAKING
LANTERN
SLIDES.

MAKING LANTERN SLIDES.

FROM KODAK NEGATIVES.

No pleasanter occupation can be devised for winter evenings than making lantern slides from Kodak negatives and showing them by means of the magic lantern to one's friends.

Two or three dozen slides made from the negatives taken on a summer's outing will afford an evening's entertainment for a group of friends, and serve to recall the incidents of a pleasant trip.

The method of making lantern slides is now so simple that a little practice will enable the novice to make them successfully.

The requisites are

*	1 Eastman's Candle Lamp,	-	\$.25
*	1 4x5 Printing Frame,	-	.55
*	1 Sheet Clear Glass, 4x5,	-	.05
*	2 4x5 rubber trays,	-	.54
*	1 4-oz graduate,	-	.50
	1 lb. oxalate potash,	-	.40
	1 lb. protosulphate iron,	-	.10

(OVER.)

	Amount brought forward,	-	\$2.39
*	1 lb. hyposulphite soda,	- - - -	.10
	4 oz. citric acid,	- - - -	.30
	1 oz. bromide potassium,	- - - -	.15
	1 package paper lantern slide masks,	-	.25
	1 doz. Eastman's Permanent Bromide transparency plates,	- - - -	.70
	1 doz. cover glasses,	- - - -	.35
			<hr/>
			\$4.24

a dark room, a pitcher of cold water and a dish for slops.

The articles marked * may be dispensed with if the operator has the developing and printing outfits described in Parts 3 and 4.

TO PREPARE THE CHEMICALS.

No. 1.

Oxalate potash,	$\frac{1}{4}$ lb.
Hot water,	12 oz.
Citric acid,	1 dram.

No. 2.

Protosulphate iron,	2 oz.
Hot water,	4 oz.

No. 3.

Bromide potassium,	$\frac{1}{4}$ oz.
Water,	2 oz.

These solutions keep separately, but must be mixed only for immediate use. Use cold.

Printing the Lantern Slide.—Set up the candle lamp in the dark room as directed on pages 39 and 40 of this Manual, and by the *yellow light* open the package of sensitive plates and lay one of them, coated side down, on the negative in the frame, fasten the back of the frame and stand it one foot from and facing the candle lamp. Cover up the remaining plates and remove the hood from the lamp for thirty seconds, (see note hereafter) and let the white light shine on the negative in the frame. Then turn the frame face down on the table and put the hood back on the lamp.

Developing the Slide.—Take the plate out of the frame and lay it in one of the trays, and cover it with the developer mixed as follows :

THE DEVELOPER.

No 1,	2 oz.
“ 2,	$\frac{1}{4}$ oz
“ 3,	2 drops.

The image will appear in a few seconds. The development should be continued until the black parts begin to get opaque by transmitted light, or about 3 minutes, then

the developer should be poured off and the plate flooded with clean, cold water. After rinsing it three or four times it should be put into another tray and covered with the

FIXING BATH.

Hyposulphite soda,	4 oz.
Water,	16 oz.

This should be allowed to act for five minutes, or until the plate is clear and free from milkiness. Then the plate should be soaked in 4 changes clean water for 20 minutes and stood upon edge to dry, when it will be ready for mounting.

NOTES.—The only experience needed to make good lantern slides by this process is to learn just how long to expose in the printing frame. Negatives vary somewhat in density, and the time given in the directions is for the average density. Thicker negatives require more, and thinner less time. Enough time must be given for the light to strike through all but the densest parts of the negatives. A few trials with a good slide for a guide will enable the learner to judge correctly what time to give the different negatives. The developer should be used fresh mixed for each slide. Enough of the fixing bath should be used to fill the tray half full; it should be thrown away at the end of the evening's operations.

Mounting the Slide.—When dry lay one of the black masks on the coated side of the slide and put over it one of the cover glasses. Then bind the edges together with one of the gummed strips accompanying the masks. The masks are white on one side and printed with blank space for the maker's name and the subject.

Transferotypes. — Instead of printing from the negatives directly onto a glass plate, Eastman's Transferotype Paper may be used and the print transferred to a clean piece of glass, or to a great variety of other surfaces such as porcelain, plaques, ivory, tile, celluloid, wood, leather, etc., for decorative purposes. The method is as follows: A piece of Transferotype Paper is laid upon the negative printed, developed, fixed and washed precisely as described for the glass plate. While still wet the print is laid upon the surface to which it is desired to transfer it, and allowed to dry. When dry, the paper is removed by soaking in warm water (110° to 140° Fahr.) leaving the print upon the new support. Or, the print on the transferotype may be dried and mounted and used as our ordinary photograph, the tone being a grey black.

DEVELOPING AND PRINTING.

The Eastman Company was the first to render commercially possible the separation of the developing and printing from the *picture taking*. The division of labor inaugurated by them has brought picture taking within the reach of thousands of persons throughout the world who could not otherwise practice the art.

Carrying the division of labor still further in our own factory we employ trained operators in every branch of the work. Men who do nothing but develop, girls who do nothing but print, men who do nothing but silver paper, men who do nothing but tone, girls who do nothing but mount, girls who do nothing but "spot" prints, men who do nothing but burnish, etc., etc. As a consequence each becomes skilled in his or her particular branch, and the result, under good superintendence, is good work—better work in particular and in average, than can be done except under these favorable conditions.

ENLARGING.

In this department we also claim to excel. We are the largest manufacturers and users of Bromide paper in the world, and our operators are skillful and experienced. Kodak negatives lend themselves to enlargement with equal facilities.

Any Kodak negatives that will make a good contact print, will make a good enlargement of any size. A No. 1 Kodak negative $2\frac{1}{2}$ inches in diameter can be enlarged perfectly by us up to 35 inches in diameter, or of course to any smaller size. By judicious management a negative can often be made to give a better enlargement than contact print. This is owing to the opportunity enlarging affords for "dodging" and extra printing.

Kodak enlargements 12 to 14 inches diameter, make attractive pictures for framing.

THE EASTMAN COMPANY,
Rochester, N. Y.

THE EASTMAN PHOTOGRAPHIC
MATERIALS COMPANY, Limited.
No. 115 Oxford St.,
London, Eng.

NO. 4, (4 X 5) KODAK
PRICE LIST.

	For Transparent Films.	For Stripping Films.
No. 4 Kodak Camera, covered with black morocco, rapid rectilinear lens, with rack and pinion for focusing, shifting stops, 2 finders, and loaded with film for 48 negatives, (capacity 100 exposures) with sole leather carrying case and shoulder strap, complete, - - - -	\$50.00	\$50.00
Reloading Camera, developing and finishing negatives, and furnishing one silver print from each negative, mounted and burnished (48 finished photographs)	10.00	10.00
NOTE.—Where there are any failures we finish enough duplicates from the good negatives to make up the full number.		
Developing and Reloading only, -	6.00	6.00
Developing and printing without reloading, - - - -	7.00	.780

PARTS OF SPOOLS.

Developing and printing only, each,	.15	.17
Developing only, “	.08	.09
Printing “	.10	.10

On orders for less than one dozen 25c. extra will be charged.

NOTE.—Any number of exposures made can be removed from the camera and the remaining film threaded up for further use.

(NO. 4 KODAK PRICE LIST CONTINUED.)

	For Transparent Films.	For Stripping Films.
Spoils of Kodak Film for 48 negatives, - - - -	\$ 3.00	\$ 2.20
Spoils of Kodak Film for 100 negatives, - - - -	6.25	4.50
Reloading, Developing and Printing 100 exposures, - - - -	20.00	20.00
Extra Reels, each, - - - -	.50	.50
Developing outfit for 48 negatives, - - - -	4.43	7.23
Printing Outfit for 48 prints, - - - -	5.33	5.33
Combined Printing and Developing Outfits, - - - -	7.00	10.00

SUNDRIES.

Tripods for time exposures, - - - -	\$1.50 to 5.00
Albums to hold 100 Kodak Pictures, 4 on each page.	
No. 4, Style A, Cloth Bound, - - - -	2.00
" " B, Half Morocco, Gilt Edges, - - - -	2.50
" " C, Full Morocco, Gilt Edges, - - - -	3.50
(Send for special Album Catalogue).	
Extra Plugs, for time exposure, mail, prepaid, - - - -	.25
Extra Shutter Springs, per pair, " " - - - -	.25
Printing Frames, 8 x 10, - - - -	.70
Glass, for Lantern Slides, per doz., - - - -	.35
Transferotype Paper for Lantern Slides, per doz. - - - -	.20

(No. 4 KODAK PRICE LIST CONTINUED.)

SUNDRIES.

Masks and Gummed Paper Strips for Lantern	
Slides, per doz., - - - -	.25
Ferro-prussiate Paper, per 2 doz. sheets, 4 x 5,	.30
Sensitized Albumen Paper, 2 doz. sheets, 4 x 5,	.40
Gold bevel edge Mounts, per doz. (\$1.20 per 100), - - - -	.15
Gelatine skins per pkg. 24 5 x 8, - - - -	.50
(For 48 No. 4 Kodak negatives on strip-ping film.)	
Soaking solution, per 8 oz. bottle, - - - -	.35
Plain Collodion, per 8 oz. bottle, - - - -	.50
Rubber solution, " " " - - - -	.25
Flash Light Apparatus, - - - -	1.50
Powder, extra, per pkg., 20 capsules, - - - -	.60
Intensifier, per 8 oz. bottle, - - - -	.35
Bromide Potassium, per oz., - - - -	.15
Hyposulphite Soda, per lb., - - - -	.10
Powdered Alum, per lb., - - - -	.10
Developer powders, per package of 12, - - - -	.50
Proto Sulphate of Iron, per lb., - - - -	.10
Oxalate of Potash, per lb., - - - -	.40
Citric Acid, 4 oz. bottle, - - - -	.30
14 x 17 ENLARGEMENTS from No. 4 Kodak	
Negatives mounted on 18 x 22 card, - - - -	1.50

THE EASTMAN COMPANY,
ROCHESTER, N. Y.

PATENTS.

THE KODAK CAMERA, ROLL HOLDER,
Film and processes and machinery
for manufacturing same, are covered by
the following patents owned by THE
EASTMAN COMPANY :

- No. 248,179, Oct. 11, 1881.
- No. 306,594, Oct. 14, 1884.
- No. 316,933, May 5, 1885.
- No. 317,049, May 5, 1885.
- No. 317,050, May 5, 1885.
- No. 355,084, Dec. 28, 1886.
- No. 358,893, Mch. 8, 1887.
- No. 370,050, Sep. 20, 1887.
- No. 370,110, Sep. 20, 1887.
- No. 370,111, Sep. 20, 1887.
- No. 370,216, Sep. 20, 1887.
- No. 388,850, Sep. 4, 1888.
- No. 405,454, June 18, 1889.
- No. 407,396, July 23, 1889.
- No. 407,647, July 23, 1889.
- No. 408,596, Aug. 6, 1889.
- No. 414,735, Nov. 12, 1889.
- No. 417,202, Dec. 10, 1889.

Other patents pending. Infringers will
be prosecuted.

THE EASTMAN COMPANY,
Rochester, N Y.

KODAK AGENCIES.

- Adelaide, Australia, BAKER & ROUSE.
Amsterdam, Holland, E. FISCHER, JR., 88 Gelderschekade.
" Holland, GROOTE & ZN., Kalverstraat.
Antwerp, Belgium, L. VAN NECK, Rue Klapdorf.
Auckland, New Zealand, J. B. BROOMHALL & Co.
Basel, Switzerland, R. CARLS.
Brussels, Belgium, SEB. GECELE, 86 Marche Aux Herbes.
" Belgium, J. MARYNEN & Co., 22 Montague Aux
Herbes Potageres.
" Belgium, J. VANDENSCHRIEK, 141 Chaussee
d'Anvers.
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" Norway, J. L. NERLIEN, Skippergaden 28.
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Meidandjik, Stamboul.
Copenhagen, Denmark, BUDTZ MULLERS EFTERFOLGERE,
Bredgade 21.
Honolulu, H. I., HOLLISTER & Co.
Jubbulpore, India, JOHN BLEES.
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Lisbon, Spain, J. J. RIBEIRO, 222 Rua Aurea.
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COMPANY, Limited, 115 Oxford St.
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Melbourne, Australia, BAKER & ROUSE.
Mexico, City of, JULIO LABADIE SUCRS Y CIA., Calle de la
Profesa 5.
Milan, Italy, LAMPERTI & GARBAGNATI, Via Omenoni 4.
Odessa, Russia, JOSEPH POKORNY, Rue de la Poste.
~~Paris, France, NADAR, 51 Rue d'Anjou.~~
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San Francisco, Cal., U. S. A., SAM C. PARTRIDGE, 226 Bush St.
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St. Petersburg, Russia, JOCHIM & Co., Mali Morskai 4.
Sydney, Australia, BAKER & ROUSE.
Sydney, Australia, LICHTNER & Co., O'Connell St.
Valencia, Spain, A. GARCIA, Pa. Sn. Francisco 10.
Vienna, Austria, R. LICHNER, 31 Graben Wien.
Yokohama, Japan, COCKING & Co.
**Paris, France, THE EASTMAN PHOTOGRAPHIC MATERIALS
COMPANY, Limited, 4 Place Vendome.**

THE EASTMAN COMPANY,

ROCHESTER, N. Y.,

MANUFACTURERS OF

KODAK CAMERAS,
VIEW CAMERAS,
ROLL HOLDERS,
ENLARGING APPARATUS.

PERMANENT * BROMIDE * PAPER

For Enlarging and Contact Printing.

TRANSPARENT * FILMS

For Roll Holders.

AMERICAN * STRIPPING * FILMS

For Roll Holders.

TRANSFEROTYPE * PAPER.

DEVELOPING, FILM AND GLASS NEGATIVES, PRINT-
ING, ENLARGING AND FINISHING.

“You press

The button,

We do

The rest.”