

Dry plate making for amateurs

George L. Sinclair



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DRY PLATE MAKING

FOR

AMATEURS.

A SERIES OF ARTICLES FIRST PUBLISHED IN THE
PHOTOGRAPHIC TIMES.

BY
GEORGE L. SINCLAIR, M.D.

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PUBLISHERS' NOTICE.

THE following practical instructions for dry plate making were written by Dr. Geo. L. Sinclair, an amateur photographer, with no thought that they would ever be published in a form more pretentious than as contributed articles to the photographic journal in which they first appeared; but the articles attracted to themselves more attention than the modest author would have predicted, and were read not only by the numerous readers of THE PHOTOGRAPHIC TIMES, but by so many others, that our limited supply of the extra copies containing the articles being soon exhausted, we decided to republish them in pamphlet form.

The articles have been arranged in their present form by the editor of THE PHOTOGRAPHIC TIMES with the suggestions and approval of the author.

They were originally written by Dr. Sinclair, in leisure moments, after professional labors, as the fruit of experiments which he had also made in otherwise unemployed hours. It does not pretend to be a scientific treatise, or anything more than a simple narration of experience; but as the outcome of practical experiment, the information given can be relied upon as trustworthy.

We, therefore, present this little book to the photographic fraternity with these few preliminary remarks, confident that it will fill a want in photographic literature.

KK

INTRODUCTION.

IN his work, "Modern Photography," Mr. W. K. Burton says: The amateur will generally find it best to purchase his plates from a manufacturer. He will probably find it cheaper and more satisfactory to do so than to manufacture them himself, unless he has at his disposal considerable time and has great patience and a happy temperament which will enable him to bear frequent disappointment, when, after going through the tedious process of making an emulsion and coating his plates, he finds that the latter are, through some unknown cause, useless.

With much of the above quotation I agree, but I have no hesitation in saying that the failures are much fewer than the successes, and the process of making an emulsion is not by any means the least interesting in connection with photography.

For the benefit of my brother amateurs who may feel inclined to try their skill in this department, I shall record my experiences, giving them the results of any knowledge I may have gained through my own failures.

G. L. S.

DRY PLATE MAKING FOR AMATEURS.

Published in the *Photographic Times*, Vol. XVI.
(Nos. 239 to 243, inclusive).

THE EMULSION.

THE formulas for emulsions are numerous. I shall quote only two.

The first is for a slow emulsion of excellent quality, and is practically the one recommended by Mr. Debenham in his article in the *Photographic News*. The second I obtained from Wilson's "Mosaics" for 1885. It is rapid, and gives negatives which leave little to be desired so far as printing qualities are concerned.

If I appear too rudimentary it is because some of my readers may be novices in the work of emulsion making.

I am fortunate in having a bath-room provided with a basin as well as a tub, and a plentiful supply of both cold and hot water. It opens into a room which is unused in the evening.

I do my emulsion making at night; but some of the operations connected with it—for example, the washing—are occasionally performed by day, so I have made the door of the bath-room light tight.

My non-actinic illumination is by means of a ruby lantern. The apparatus required is of a very simple and primitive kind

and consists, in addition to the graduates and scales—which I presume all amateurs have—of a tin kettle holding about two quarts (mine is narrower at the top than at the bottom, and has a spout closed by a tin flap), with a tight fitting cover. I have an ordinary retort stand, an alcohol lamp with a large wick, one or two common tumblers, and several perfectly clean *yellow* glass pyro bottles, and, lastly, one or two stirring rods of glass.

I may say that I have not been successful in the “cold emulsion process,” and, for certainty, prefer either the “boiling” method or some modification of it.

I advise the beginner to try first the emulsion by the Debenham formula.

It is simply made, requires very little silver, no boiling, and possesses every good quality, except rapidity. For landscapes this is not very necessary. It is also cheap, and if one spoils a batch of plates the pecuniary loss is not great. The chemicals used should be pure, and the gelatines “photographic.” The common cooking gelatine will not answer, or, at best, will give plates which are very defective.

To make an emulsion by this formula proceed as follows:
Take of

Nelson's No. 1 gelatine.....	20 grains
Bromide of potassium.....	15 grains
Distilled water.....	$\frac{3}{4}$ ounce

Put the gelatine in a glass and cover it with the water; allow it to soak for ten minutes, then add the bromide of potassium and stir till it is dissolved. Place the glass containing the bromized gelatine in a basin or dish capable of holding three quarts or a gallon of water, and pour into the basin water at a temperature of about 120 deg. F. If you have a bath-room with a fixed basin and hot and cold water, you can get

along very nicely. Fit a cork to the outlet of the basin instead of an ordinary plug; through the cork pass a piece of brass tube about half an inch in diameter and four inches long. This gives you an overflow to your basin, and by pulling it up or down through the cork you can regulate the height to which you wish the water to rise. Having by some means surrounded your cup or glass containing the bromide, water and gelatine with warm water, allow it to remain until the gelatine is dissolved. This will not take many minutes. While this is going on, prepare, in a second glass (I use an ordinary 2 oz. graduate, as it has a spout for pouring), a solution of

Nitrate of silver (recrystallized).....	20 grains.
Distilled water.....	1 ounce.

Dissolve by stirring with the glass rod; when solution is complete, put this glass also in the basin and raise the temperature to that of the bromized gelatine. When this is done, *in a dark room by ruby light*, pour, in five or six doses, the silver solution into the gelatine solution, stirring with a glass rod all the time. A change in the color is at once visible, caused by the formation of the yellow bromide of silver. When you have thoroughly mixed the two solutions—and *this must be done in the smallest quantity of non-actinic light by which you can see*—pour them into one of the pyro bottles, or into a stoneware opaque bottle of suitable size, and put the bottle or jug into water at a temperature of from 130 deg. to 160 deg. F. In my case I do this by merely turning on the hot water tap of my basin. I test the water with the thermometer and do not let it go higher than 160 deg. F. If possible, I keep it at this temperature for from two to three hours. With this formula you can let the heat vary from 120 deg. to 180 deg. F., without fear of injury. To keep it between these two ex-

tremes is not very difficult. If you have not fixed hot water apparatus, you can put your bottle or jar in the tin kettle which you have filled with hot water, and covered with the lid on the retort stand, then put your alcohol lamp under it and raise the temperature to the required degree. Or you (if you are using an opaque bottle for mixing your emulsion, such as a clean gingerbeer or ink jug) may put the kettle containing it upon the kitchen stove, and accomplish the same end.

It is well to have two stoppers for the bottle, one to fit tight and the other with grooves cut in the sides to allow the escape of steam from the emulsion.

In whatever way you select to get the emulsion raised to the desired temperature (120 deg. to 160 deg. F.), you must remember that it is to be kept at that heat until the blue stage is reached.

The "blue" stage is the sensitive stage, and is obtained in various ways in different formulas.

If, immediately after mixing your silver solution with your bromized gelatine, you take a drop of the emulsion, place it upon a piece of glass and look at a lamp light or gas light through it, you will see that the color is a red-orange. After being subjected to boiling, or to heat for a varying length of time, the color changes gradually until it becomes blue; when this is obtained the emulsion is done. In my experience with formula given, if I keep the bottle in water which is not below 130 deg. F. and not above 170 deg F., the blue color will appear in about two and a half hours.

It is well to remove the bottle from the hot water every half hour, take out the grooved cork, insert the tight fitting one, and shake the emulsion thoroughly for a few minutes. This seems to insure a finer subdivision of the particles and a better emulsion.

Half an hour before the cooking is finished you weigh out

Hard gelatine.....	70 grains.
Nelson's No. 1 gelatine.....	70 grains.

Put this in a cup or wide mouth bottle capable of holding eight ounces; pour upon it three ounces of cold water and allow it to soak. In half an hour the probability is that the water will nearly all be absorbed by the gelatine which will be considerably increased in bulk.

If your emulsion has by this time reached the blue stage, allow the water by which it is surrounded to cool down to 100 deg. F., and while this is taking place put the vessel containing the swelled gelatine in water at the same temperature (100 deg. F.), and allow the gelatine to slowly melt. When this is accomplished and the emulsion has cooled down to 100 deg. F., pour it upon the softened gelatine, stirring thoroughly, and then put the vessel in a dark, cool place and leave it until the contents have become cold, when it will have acquired the consistency of tough jelly. In other words the emulsion has "set."

This is a good point at which to stop. It becomes tedious to attempt the making and subsequent operations of washing, remelting and filtering the same night.

When Mr. Debenham published the formula, from which the above description is a departure in some particulars, he said the emulsion could be used without washing. So it can; but there is crystallization of some of the salts upon the glass, the drying is irregular and the emulsion is not at its best. Far better it is to wash it in the way I shall now describe.

WASHING.

The lump of emulsion which is the result of setting, contains not only the sensitive and insoluble bromide of silver, but also the insensitive and soluble nitrate and bromides. These must be removed. It can be done by washing.

Gelatine holds these soluble salts very tightly in its grasp, and to remove them thoroughly it is necessary to break the jelly up into small pieces so that the water may penetrate them and dissolve the salts.

There are several ways of subdividing the gelatine, but the simplest and best is to squeeze the jelly through the meshes of embroidery canvas. Procure a piece of canvas known as "railway canvas," about eighteen inches square. You can buy it at a shop dealing in worsteds, etc. You must first thoroughly soak it in boiling water to remove the size and starch; then dry it again. I have two common water jugs with mouths wide enough to admit my two hands. They hold a gallon of water each. I have also a hair sieve seven inches in diameter, the use of which I shall explain further on.

When you are ready to wash the emulsion, you again go to the dark room, light your ruby lamp, and with a silver or horn spoon remove the jelly from the vessel in which it has been allowed to set or stiffen. Place it in the center of the square of canvas, gather the canvas up by the four corners, then holding the neck with the left hand, grasp the lump of emulsion with the right, plunge both hands into the jug containing water at a temperature of about 40 deg. F., and twist the canvas till the jelly is forced through the meshes into the water.

It will then be broken into small shreds, which will speedily settle to the bottom of the jug. This material is now to be washed.

I find that by allowing it to settle, then stirring it about with a clean hand, again permitting it to settle, then pouring off the clear water and pouring on fresh, and continuing this for twenty minutes and then pouring the whole into the hair sieve and dousing this with several jugfulls of cold water, the washing is complete. To make the washing more thorough you may again collect the shreds and squeeze them a second time through the canvas. I think it would be safer to do this, though such has not always been my practice.

Let the broken-up mass remain in the hair sieve; which can stand on its edge in a basin to allow draining to take place. In an hour the water will have so far passed through the sieve that the consistency of the emulsion is about that of butter. It must now be melted and strained to remove any mechanical impurities.



MELTING.

To melt it, you remove it from the sieve with a horn or silver spoon and put it into a cup or jar (I use a gallipot with a cover) which is placed in water at about 100 deg. or 120 deg. Fahrenheit. When it is about the consistency of thick milk it is ready for straining. To accomplish this I have an ordinary lamp chimney of the pattern in which the upper edge is turned partly over and fluted or scalloped. Over this end I fasten two thicknesses of an old handkerchief, and having previously warmed the extemporized filter, pour the melted emulsion into it. It runs through the handkerchief readily, and if it shows any tendency to stop running, by placing the mouth over the open end of the chimney and blowing with some force, you can drive it with greater rapidity. When all has passed through, into a convenient vessel (I use a pyro bottle for this) you should have about six or seven ounces of emulsion. If less, make it up to that quantity by the addition of warm water.

Finally, add one-half ounce of warm alcohol and your emulsion is ready to be poured on the plate.

You may, if you please, again put the vessel aside in a dark cool place to wait until you can proceed to the coating of your plates. If you do not intend using it for some days, it will be well to add some antiseptic. Thymol is very good, and two grains dissolved in the alcohol above mentioned will keep the emulsion from spoiling for a long time.

I have gone somewhat fully into the *modus operandi*, because it is the same, so far as washing, melting, filtering, etc., is concerned in all formulas.

A RAPID EMULSION.

The emulsion, the making of which I have attempted to describe, as I said, is slow.

For a more rapid, and in every way an excellent one, I give, from "Mosaics," the following modified recipe and description :

Nelson's No. 1 gelatine.....	80 grains
Bromide of potassium (Schering's)	164 grains
Iodide of potassium "	20 grains
Water (filtered).....	5 ounces.

First dissolve the salts and then add the gelatine, and set the vessel containing the solution in hot water (temperature, 120 deg. F.).

Weigh out 232 grains nitrate of silver (recrystallized), put in a bottle ; a pyro bottle or an opaque jug. Now heat both the vessel containing the bromized gelatine and the bottle containing the nitrate of silver to a temperature of about 140 deg. F., by any convenient means ; carry them into your dark room, in which your kettle or saucepan or vessel in which you propose to boil your emulsion, has been filled with water at a boiling temperature, and in a weak ruby light pour in a stream the bromized gelatine upon the dry, hot crystals of nitrate of silver. Insert the tight-fitting stopper and shake vigorously till the silver crystals are dissolved. You can generally tell this by the sound of their striking the bottle ceasing.

Then place the emulsion in the kettle of boiling water ; having previously removed the tight cork and inserted the grooved one. Cover the kettle tightly, place your alcohol lamp under it and let the water and the emulsion boil briskly for half an hour. If boiled longer than this add one or two drops of nitric acid.

To insure the contents of the bottle or jar being at the same temperature as the water, in which it is suspended, it is necessary to completely surround it. I do this by swinging the bottle in the water, so that it does not touch the kettle at either bottom or sides. I take a piece of brass wire, about No. 12, and encircle the neck of the bottle; by a twist this is secured. The free ends I bend like a hook, which I hang upon the side of the kettle. This vessel being narrower at the top than the bottom, the bottle falls away from its side and remains suspended in the boiling water. The small size of the wire used does not prevent your fitting the cover over the kettle securely.

The flame of an alcohol lamp can, I believe, be made non-actinic by adding a little common salt to the alcohol itself. Every ten minutes I remove the lamp from the room, uncover the kettle, take out the bottle of emulsion and again putting in the tight stopper, shake the bottle for a few seconds, then replace it again in the kettle, cover it, and bring the alcohol lamp back to the dark room, put it under the kettle and again boil the water.

I have never had fog in this emulsion, and I have made several batches just as I have endeavored to describe above.

As soon as you have mixed your emulsion and started the cooking, you again return to your outside room and weigh out

Hard gelatine.....	180 grains
Soft gelatine.....	100 grains,

Put this in a cup and pour on a sufficient quantity of cold water to cover it. Let it soak during the boiling of the emulsion, say for half an hour. At the expiration of that time, remove your alcohol lamp, and leaving your bottle of emulsion in the kettle let its contents gradually cool.

While this is going on place the cup containing the softened gelatine in water at about 100 deg. F., and allow it to melt.

By the time this is complete the temperature of the emulsion will have probably reached the same figure ; when it has, pour it upon the softened melted gelatine, and stir thoroughly, till perfectly mixed, with a silver fork or spoon. Finally add to this, with much stirring, one dram of strong water of ammonia, and shake well. Then remove the emulsion to a cool, dark place and allow it to set. Again, it is well to break off operations here.



GELATINE.

In both the latter and Debenham's formula, I used a mixture of hard and soft gelatine in that portion which is added after the cooking.

If you use only hard, as the original recipes suggest, you get a plate with a hard glossy film which is not so easily penetrated by the developer.

To the use of this mixed gelatine, and also to the necessity of adding the emulsion to the uncooked gelatine at a temperature of about 95 deg. F., I believe is due the "mat" surface which is thought best in a dry plate.

The author of this recipe claims that it owes its excellence and rapidity to the fact that he adds his bromized gelatine at a temperature of 140 deg. F., to dry silver crystals of the same degree of heat. At any rate, it is an excellent emulsion. Plates coated with it will be quick enough for drop shutter views.

I do not recommend the same method of mixing in Debenham's formula. I have failed in that emulsion to obtain any increase of speed, either by prolonging the cooking, adding the silver dry, or converting its solution into an ammonio-nitrate. Nor does rapidity ensue by keeping the emulsion some days before coating. In the "Mosaics" formula it does to a slight extent.

The details of washing, filtering, etc., need not be again gone into as they are the same as in the first formula given.

When all this has been done you should have about sixteen ounces of emulsion. If not, make that amount by adding

water. To this quantity you add an ounce and a half of alcohol, warmed, before beginning to coat your plates. It is said to make the emulsion "flow" more easily.

A fault which some emulsions have, is a tendency to frill during development. I have not had this to contend with since I have used Heinrich's hard gelatine and Nelson's No. 1 photographic (soft) gelatine.

If your gelatine is of a frilling kind, either discard it or add to the emulsion, just before beginning to coat your plates, a solution of chrome alum, one-half grain dissolved in one dram of water to each ounce of emulsion. All the emulsion so treated must be used at once, as it will not remelt after once setting.



PREPARING THE GLASS FOR COATING.

Having brought your emulsion to the stage described above, it is ready to be spread upon the glass plate. We take it for granted you propose to coat glass and not paper. And here let me say a word as to the preparation of the glass itself. It is probable that you will make use of spoilt negatives, either your own or some that you obtain from friends. I get all I require from a professional photographer.

To clean the old negatives, dissolve several ounces of common washing soda in two or three gallons of hot water. In this solution place the negatives and leave them, for, say, twenty-four hours. At the end of that time you will probably find many of the films have disappeared, those which still adhere to the glass can be very easily removed by using an old tooth brush as a rubber. After the glasses are denuded of their old films, put them into hot water, to which add a small quantity of hydrochloric acid; let them soak for an hour then transfer them to pure hot water for another hour, after which they will be clean and may be reared up on end to drain and dry.

When ready to coat plates, select the number of glasses of the size you propose to use and polish them with a piece of soft chamois skin.

In my limited experience I have not found any substratum required upon the glass. If I did use one, it would be a weak solution of water glass, which is generally recommended in the books.

We will suppose you have cleaned a sufficient number of glasses for the emulsion you have on hand, you will then re-

quire a place in which to do the coating and the apparatus for it.

In my own case, I perform the operation in the unused room which, as I said, communicates with my dark (bath) room.

There is no reason why the dark room itself should not be made use of if it is large enough.

You require first of all a perfectly level surface on which you are to place the coated plates to "set." I have a piece of plate glass 3 feet long and 18 inches wide, and by means of wedges and a spirit level, I accurately level this upon a table.

If you cannot get a piece of glass or slate of sufficient size, you can obtain a piece of board, and by putting screws into it so as to form triangles large enough to support the plate you propose to coat, by driving the screws further in or withdrawing them, you can, with the board on a flat table, accurately level each plate.

You also require a vessel for your emulsion, from which it may be poured. The books say a small china tea-pot is good. I have a "feeding cup" with a long spout. It holds about 4 ounces, and answers admirably. Then a glass rod for spreading the emulsion over the plate is desirable. Finally, to dry your plates, you need some light-tight box or cupboard which, if it can be arranged to let a current of air through, will be all that you require.

I have dried plates in an ordinary box to which I fitted a light-tight cover, and in which I nailed strips to keep the plates from slipping, leaving space on the bottom in which to put a saucer containing chloride of calcium, which absorbed the water given off by the emulsion in process of drying. Your own ingenuity will enable you to prepare some proper receptacle.

COATING.

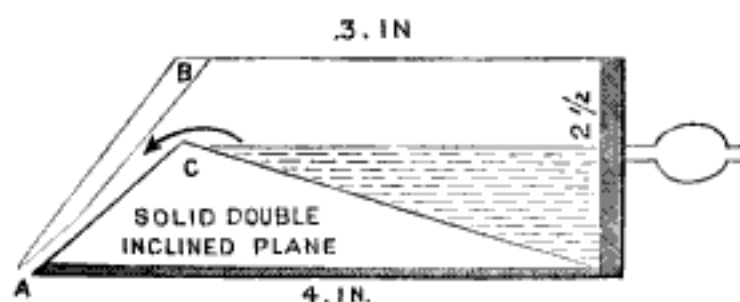
For coating, after trying many methods, I have settled upon the plan of spreading the emulsion upon each plate separately, by means of a glass rod, the plate having first been put upon a little elevated platform on the corner of my plate glass level surface.

Of course you coat at night by the faintest ruby light. When ready for the operation I select an hour in the evening when the house is quiet. My glass having been made level, I put the ruby light in a paper box, about one foot high and eight inches wide, one side of which has been removed, and a piece of oiled yellow tissue paper pasted in its stead.

The box containing the cleaned glass which I wish to coat is in front of me, to my right, the lamp is to the left. On the left upper corner of the plate glass, just under the lamp, I have a little tripod made by gluing strips of glass on another piece, size, 4x5; upon the tripod I lay the plate (we will say it is $4\frac{1}{4} \times 3\frac{1}{4}$). The emulsion having been melted by placing the bottle in water at 120 deg. F., a sufficient quantity, say 2 ounces, is poured into the "feeding cup." This amount should cover twelve quarter plates; about a teaspoonful is poured on to the center of the plate, the glass rod is taken between the thumb and forefinger of each hand, brought down in contact with the pool of emulsion, but not so as to touch the glass (which immediately runs to either lateral margin of the plate), and rapidly moved first forward, then backward, to the edge of the plate, and at each end removed by simply twirling it a little. It is hard to describe this movement in words.

It is very simple and easily acquired. The ball of the index finger resting on the plate glass beneath, gives you a support, and it is surprising how evenly and rapidly you can slide the glass rod back and forth, and spread the emulsion over the plate.

You place the coated plate on the level surface, when in a short time it will "set," and may be removed to your drying receptacle and placed in an upright position if necessary, with no danger of the emulsion running off. You go on until you have used up the amount of emulsion in your cup. As I said, the 2 ounces should cover a dozen $4\frac{1}{4} \times 3\frac{1}{4}$ plates, half that number of $4\frac{1}{4} \times 6\frac{1}{2}$, and six or eight 5×4 . It is desirable that the temperature of your coating room be not higher than 60 deg



F., though it is an advantage to have your plates warmer than that in order to let the emulsion "flow" more rapidly.

It is also well to have at hand a vessel of hot water in which you can place your coating pot, to keep its contents warm, after pouring the emulsion on the plate, and while you are spreading it by means of the rod. In my own practice I have adopted the above mode of working after trying several other plans.

For instance, you may cover a plate by "flowing" it with emulsion as you would varnish. An amateur friend of mine always adopts this method; with me it will not work. Or you may use a "coating box" of some description.

For plates up to $4\frac{1}{4} \times 6\frac{1}{2}$, I prefer the rod and "feeding cup;" for larger sizes I have manufactured a box of this shape. The

illustration on preceding page may make it clear. As I have it, it is only a change in shape of one recommended some time ago by a writer in the *Photographic Journal*, of London.

The illustration represents a sectional view of the box. The outlet A is made by putting a piece of card between the two pieces B and C while the box is being screwed together. The slit thus left is covered when using by a piece of thin cheese-cloth glued on. This filters the emulsion as it runs out and delivers it more regularly. The box is exactly 5 inches wide, is made of walnut coated inside with copal varnish. You pour your emulsion into it, then by tilting it by its handle the liquid runs over the inclined plane down to the opening and upon the plate.

By having a number of plates on the levelled surface you can run the box along and cover them very rapidly. There is a tendency on the part of the emulsion not only to cover the top of the plate where you desire it to go, but to run over the edge and find its way beneath the plate, which it glues strongly to your level slab. To overcome this it is well to stretch across the leveling slab at proper intervals—say 3 inches—fine wire. I use a piece of rabbit wire. I secure each bit by its right end to a double-pointed tack driven into the table. I draw it tight across the surface of the slab and fasten the left end to a screw eye also fixed in the table. I can keep the wire taut by a turn of the screw eye, and as it is in close contact with the level slab it practically makes a platform running the length of the slab. If a little of the emulsion runs off your plate it can run under it without causing its lower surface to become fixed to the leveling slab. You thus avoid getting emulsion on both sides of your plate. I generally use up the 2 ounces of emulsion which I poured into the cup by covering plate after plate. By the time the last is coated the first has set,

and may be taken from the slab and placed in whatever apparatus you have prepared for use as a drying closet.

In my box, drying is complete in about twelve hours. I leave the plates, though for 24 hours—the following night.

This year I have packed many of my plates without any form of mat, film to film. I put them up in bundles of four, wrap each bundle in yellow paper, and then wrapping three bundles in brown manilla, put the package containing a dozen plates in an old box of proper size and label it thus: "Debenham's F. 1 doz. $3\frac{1}{4} \times 4\frac{1}{4}$. Feb. '86."



CONCLUSION.

I think if amateurs having the time and facilities will try their hand at emulsion making and plate coating, they will find it an agreeable occupation for the long winter evenings, and I believe it is within the power of any one who is careful to succeed. I have endeavored to chronicle for their benefit the facts of my experience, laying claims to no originality, but giving the methods, which, after many experiments and some failures and much reading, have, in my hands, proved successful.





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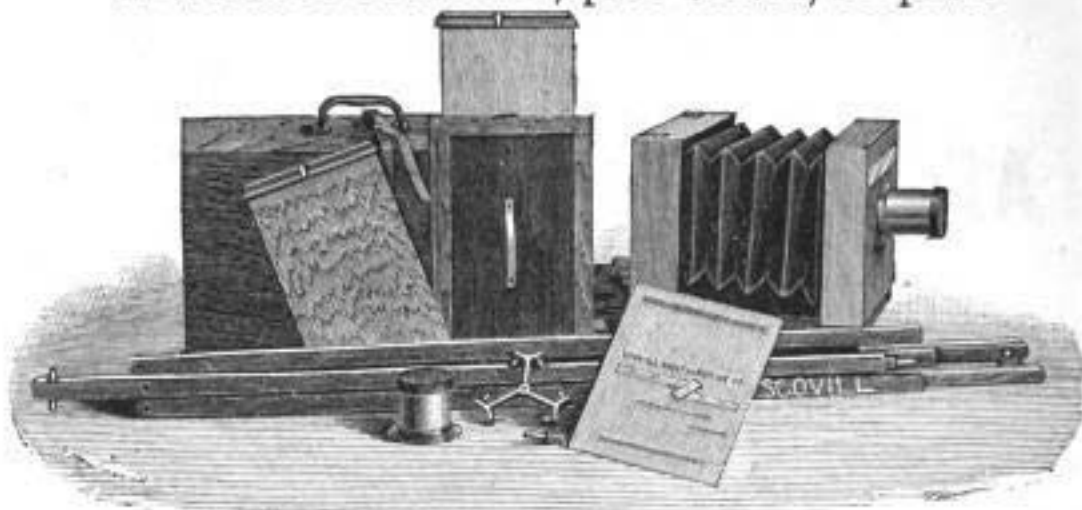
FAVORITE OUTFIT A, price \$10.00, comprises



A FAVORITE VIEW CAMERA with *vertical shifting front, single swing movement*, rubber bellows and folding platform with *patent latch* for making bed rigid instantaneous y, to produce 4x5 inch pictures, with

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- 1 Taylor Folding Tripod.
- 1 No. 1 "Waterbury" Achromatic Nickel-Plated Lens with a set of Stops.
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FAVORITE OUTFIT B, price \$12.00, comprises



A FAVORITE VIEW CAMERA with *vertical shifting front, single swing movement*, rubber bellows and folding platform, with *patent latch* for making bed rigid instantaneously, to produce pictures 5x8 inches ; also

- 1 Patent Double Dry Plate Holder (Reversible), with *patent Registering Slides, and with Kits.*
- 1 Taylor Folding Tripod.
- 1 No. 2 "Waterbury" Achromatic Nickel-Plated Lens with a set of Stops.
- 1 Carrying Case.

FAVORITE OUTFIT C, price \$18.50, comprises



A FAVORITE VIEW CAMERA with *vertical shifting front, single swing movement*, rubber bellows and folding platform, with *patent latch* for making bed rigid instantaneously, to produce 5x8 inch pictures.

This Camera is constructed so as to make either a *Picture* on the full size of the plate (5 x 8 inches), or by substituting the extra front (supplied with the outfit) and using the pair of lenses of shorter focus, it is admirably adapted for taking *stereoscopic* negatives ; also, by the same arrangement, two small pictures, 4 x 5 inches each, of dissimilar objects can be made on the one plate. Included in this outfit are also

- 1 Patent Double Dry Plate Holder (Reversible), with *patent Registering Slides, and with Kits.*
- 1 Large "Waterbury" Achromatic Nickel-Plated Lens, with Stops.
- 1 Pair "Waterbury" Achromatic Matched Stereoscopic Lenses, *each with Stops.*
- 1 Taylor Folding Tripod.
- 1 Carrying Case.

FAVORITE OUTFIT D, price \$14.00, comprises

A FAVORITE VIEW CAMERA with *vertical shifting front, single swing movement*, rubber bellows and folding platform, with *patent latch* for making bed rigid instantaneously, to produce pictures $6\frac{1}{2} \times 8\frac{1}{2}$ inches; also

- 1 Patent Double Dry Plate Holder (Reversible), with *patent Registering Slides, and with Kits.*
- 1 Taylor Folding Tripod.
- 1 No. 2 "Waterbury" Achromatic Nickel-Plated Lens with a *set of Stops.*
- 1 Carrying Case.

FAVORITE OUTFIT E, price \$26.00, comprises

A FAVORITE VIEW CAMERA with *vertical shifting front, single swing movement*, rubber bellows and folding platform, with *patent latch* for making bed rigid instantaneously, to produce pictures 8×10 inches; also

- 1 Patent Double Dry Plate Holder (Reversible), with *patent Registering Slides, and with Kits.*
- 1 Taylor Folding Tripod.
- 1 No. 3 "Waterbury" Achromatic Lens with a *set of Stops.*
- 1 Carrying Case.

EQUIPMENT A-A.

Consists of APPARATUS OUTFIT A, with

- 1 Scovill Focusing Cloth.
 - 1 Dozen 4×5 Dry Plates.
 - 1 W. I. A. Improved Ruby Lantern.
- Complete for field service, Price, \$12.25.

EQUIPMENT B-B.

Consisting of APPARATUS OUTFIT B, with the additional articles enumerated in A-A. (Dry Plates 5×8 size.)

Complete for field service, Price, \$15.00.

EQUIPMENT C-C.

Consisting of APPARATUS OUTFIT C, with the additional articles mentioned in Equipment A-A. (Dry Plates 5×8 size.)

Complete for field service, Price, \$21.50.

EQUIPMENT D-D.

Consisting of APPARATUS OUTFIT D, with the additional articles enumerated in A-A. (Dry Plates $6\frac{1}{2} \times 8\frac{1}{2}$ inches.) Price, \$18.00.

Where sensitive Plates are taken to a photographer's and there developed, printed from, and mounted on card-board, any of the above Equipments lack nothing that is essential. We recommend the amateur to finish his own pictures, and hence to procure one of the equipments on page 6.

SCOVILL'S

Pure Chemicals & Accessories

FOR MAKING NEGATIVES.



We offer for use with any Outfits to make pictures 4 x 5 inches, the following goods packed securely in a wooden case :

- | | |
|---|---------------------------------|
| 1 pkg. S.P.C. Carbonate Soda Developer, | 1 lb. Alum, |
| 2 4 x 5 Glossy Rubber Pans, | 1 bot. S.P.C. Negative Varnish, |
| 1 4 oz. Graduate, | 1 doz. 4 x 5 Dry Plates, |
| 1 Minum Graduate, | 1 Scovill Focusing Cloth, |
| 1 oz. Bromide Ammonium, | 1 W. I. A. Ruby Lantern, |
| 1 lb. Hyposulphite Soda, | 1 Scovill Plate Lifter. |

PRICE, COMPLETE, \$5.25.

For use with any 5x8 Outfit we supply the same goods, with the exception of the substitution of 5x8 Pans and Plates for the 4 x 5 size.

PRICE, 4¼x5½ DEVELOPING OUTFIT, \$5.50.

"	5 x 8	"	"	6.50.
"	6¼x8¼	"	"	7.00.
"	8x10	"	"	8.50.

BLUE PRINTS.

S. P. C.

Ferro-Prussiate Paper Outfit for Printing and Mounting 4 x 5 Blue Print Pictures.

- | | |
|---|-------------------------------------|
| 1 4 x 5 Printing Frame. | 1 Glass Form (for trimming prints). |
| 1 4½ x 5½ S. P. C. Vulcanite Pan. | 1 Robinson's Straight Trimmer. |
| 3 dozen 4 x 5 S. P. C. Ferro-Prussiate Paper. | ½ Pint Jar Parlor Paste. |
| 2 dozen sheets 6½ x 8½ Card-board. | 1 1 inch Paste Brush. |

Price complete, \$2.80. Securely packed in a Wooden Box.

S. P. C.

Ferro-Prussiate Paper Outfit for Printing and Mounting 5 x 8 Blue Print Pictures.

This Outfit is like the one above, but with Printing Frame, Vulcanite Tray, Ferro-Prussiate Paper and Card-board adapted to 5 x 8 Pictures.

Price complete, \$3.50. Securely packed in a Wooden Box.

6½ x 8½ Ferro-Prussiate Paper Outfit. Price, \$4.25.



S. P. C.

Outfit for Printing, Toning, Fixing and Mounting 4 x 5 Pictures.

- | | |
|--|---|
| 1 4 x 5 Printing Frame. | 1 lb. Hyposulphite of Soda. |
| 1 5 x 7 Porcelain Pan Deep. | 2 dozen sheets 6½ x 8½ Card-board with Gilt Form. |
| 1 4½ x 5½ S. P. C. Vulcanite Tray. | 1 ½ Pint Jar Parlor Paste. |
| 2 dozen 4 x 5 S. P. C. Sensitized Albumen Paper. | 1 1½ inch Bristle Brush. |
| 1 bottle French Azotate. } For | 1 Glass Form (for trimming prints). |
| 1 " Chlor. Gold, 7½ gr. } toning. | 1 Robinson's Straight Trimmer. |
| 1 2 ounce graduate. | Securely packed in a Wooden Box. |

Price complete, \$4.87.

S. P. C.

Outfit for Printing, Toning, Fixing and Mounting 5 x 8 Pictures.

This outfit is like the one on preceding page, but with Printing Frame, Vulcanite Tray, Sensitized Paper, and Card-board adapted for 5 x 8 Pictures.

Price complete, \$6.38. Securely packed in a Paper Box.

4½ x 5½	Printing and Toning Outfit.	Price, \$5.00.
6½ x 8½	“ “ “ “	7.00.
8 x 10	“ “ “ “	8.50.

EQUIPMENT A-A-A.

Complete in every Requisite for making the Highest Class Pictures.

LACKING NOTHING FOR VIEW TAKING, DEVELOPMENT AND THE PRINTING AND MOUNTING OF PHOTOGRAPHS.

Consisting of <i>Apparatus</i> Outfit A.....	\$10 00
Also 1 <i>Chemical</i> Outfit 4 x 5 (see page 6.)...	5 25
“ 1 <i>Sensitized Paper</i> Outfit, 4 x 5 (see page 7.).....	4 87

Price, \$20.00.

EQUIPMENT B-B-B.

Complete in every Requisite for making the Highest Class Pictures.

Consisting of <i>Apparatus</i> Outfit B.....	\$12 00
Also 1 <i>Chemical</i> Outfit 5 x 8 (see page 6.).....	6 50
“ 1 <i>Sensitized Paper</i> Outfit (see above)	6 38

Price, \$24.50.

EQUIPMENT C-C-C.

Complete in every Requisite for making the Highest Class Pictures.

Consisting of <i>Apparatus</i> Outfit C.....	\$18 50
Also 1 <i>Chemical</i> Outfit 5 x 8 (see page 6.).....	6 50
“ 1 <i>Sensitized Paper</i> Outfit (see above.).....	6 38

Price, \$31.00.

EQUIPMENT D-D-D.

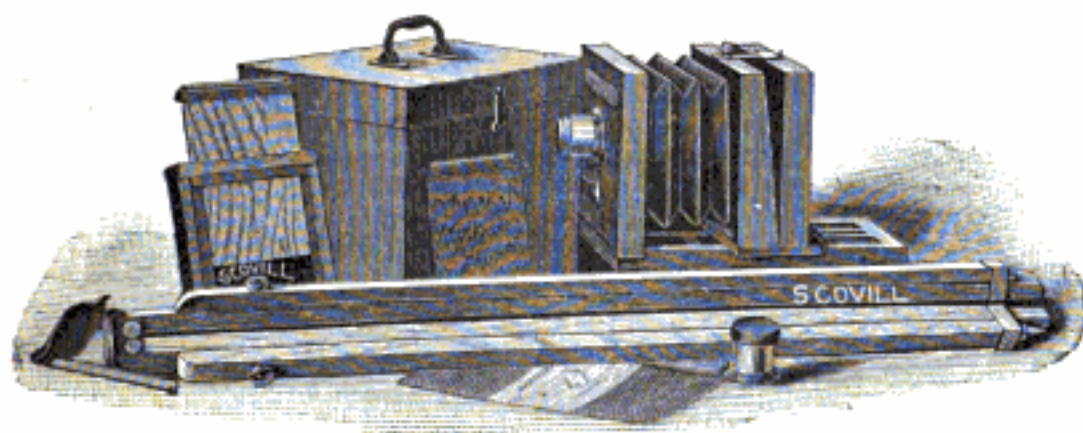
Consisting of <i>Apparatus</i> Outfit D.....	\$14 00
Also 1 <i>Chemical</i> Outfit (see page 6.).....	7 00
“ 1 <i>Sensitized Paper</i> Outfit (see above.).....	7 00

Price, \$28.00.



== DRY PLATE OUTFITS ==

INTRODUCED IN 1884.



These outfits are unsurpassed in neatness, lightness, and compactness, yet there is no question about their durability or serviceable qualities. On this account they have found favor everywhere. Each one is supplied with a patent reversing attachment, which has been styled "the lightning reverser."

New York Outfit 601, size $4\frac{1}{4} \times 5\frac{1}{2}$, consisting of

- 1 Finely Finished Single Swing Camera, with Folding Bed and Improved Dry Plate Holder, *with Kits*.
- 1 No. 1 Extension Tripod, with Patent Reversing Attachment.
- 1 No. 1 Waterbury Lens, *with a set of Stops*, and
- 1 Compact Carrying Case, with Handle. Price, \$12.00.

New York Outfit 601A, size $4\frac{1}{4} \times 6\frac{1}{2}$, same as described above, except in respect to size. Price, \$13.00.

New York Outfit 602, size 5×8 , same as described above, except in respect to size. Price, \$15.00.

New York Outfit 603, size $6\frac{1}{2} \times 8\frac{1}{2}$, same as described above, except in respect to size. Price, \$18.00.

New York Outfits not made larger than $6\frac{1}{2} \times 8\frac{1}{2}$ size.



AMERICAN OPTICAL CO.'S APPARATUS OUTFITS.

This apparatus is manufactured in New York City under our immediate personal supervision; and, as we employ only highly skilled workmen, and use nothing but the choicest selected materials, we do not hesitate to assert that the products of our factory are unequalled in durability, excellence of workmanship, and style of finish. This fact is now freely conceded not only in this country but throughout Great Britain, Germany, Australia, South America, and the West Indies.

OUTFIT No. 202, price \$22.00, Consists of

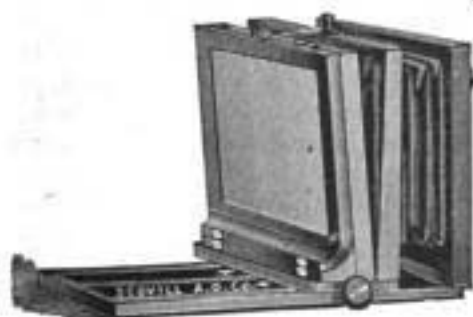
- A MAHOGANY POLISHED CAMERA** for taking pictures 4×5 inches, with *Folding Bellows Body*, single swing, hinged bed, and brass guides. It has a shifting front for adjusting the sky and foreground, with
- 1 Daisy Double Dry Plate Holder, with *Patent Registering Slides*; also
 - 1 Canvas Carrying Case.
 - 1 Scovill Adjustable Tripod.

OUTFIT No. 202 A, price \$24.00,

The same as No. 202, but with Camera for taking pictures $4\frac{1}{2} \times 5\frac{1}{2}$ inches.

OUTFIT No. 202 B, price \$26.00, for pictures $4\frac{1}{2} \times 6\frac{1}{2}$ inches.

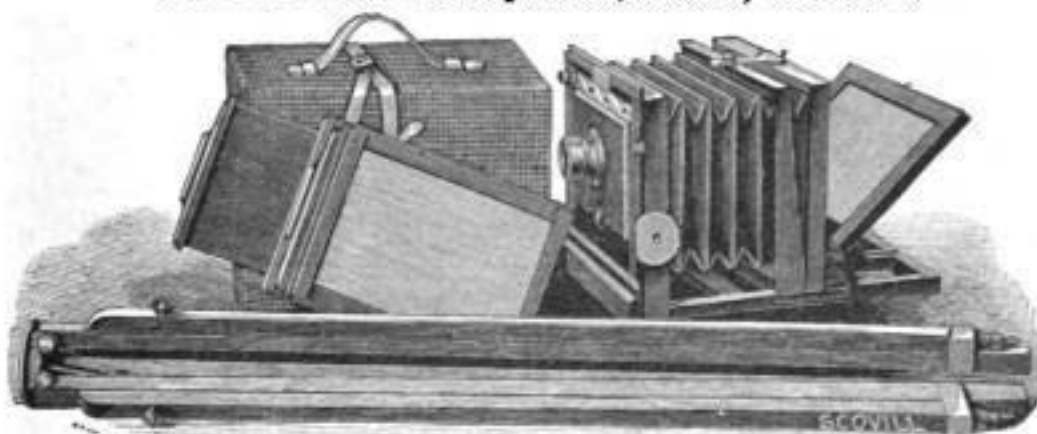
OUTFIT No. 203, price \$30.00, Consists of



A FOLDING MAHOGANY CAMERA, well known as the '76 Camera (see illustration). It is adapted for taking 5×8 inch pictures, and also for stereoscopic views—together with

- 1 Daisy Double Dry Plate Holder, with *Patent Registering Slids*; also
- 1 Canvas Carrying Case.
- 1 Scovill Adjustable Tripod.

OUTFIT No. 204, price \$42.00, Consists of



A FOLDING MAHOGANY CAMERA of finest style and finish for taking $6\frac{1}{2} \times 8\frac{1}{2}$ inch pictures, with

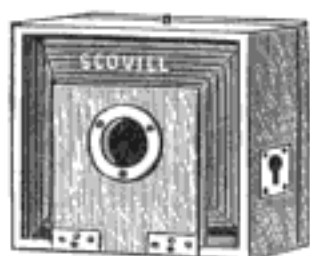
- 1 Daisy Dry Plate Holder, with *Patent Registering Slides*; also
- 1 Canvas Carrying Case.
- 1 Scovill Extension Tripod, No. 3.

For larger or special View Cameras, consult the American Optical Company's Catalogue.

We recommend the purchase and use with the above Outfits of a Lens or Lenses selected from the list on page 24.

For Chemical and Sensitized Paper Outfits to be used with the above, refer to pages 6 and 7.

TOURISTS' POCKET OUTFITS.

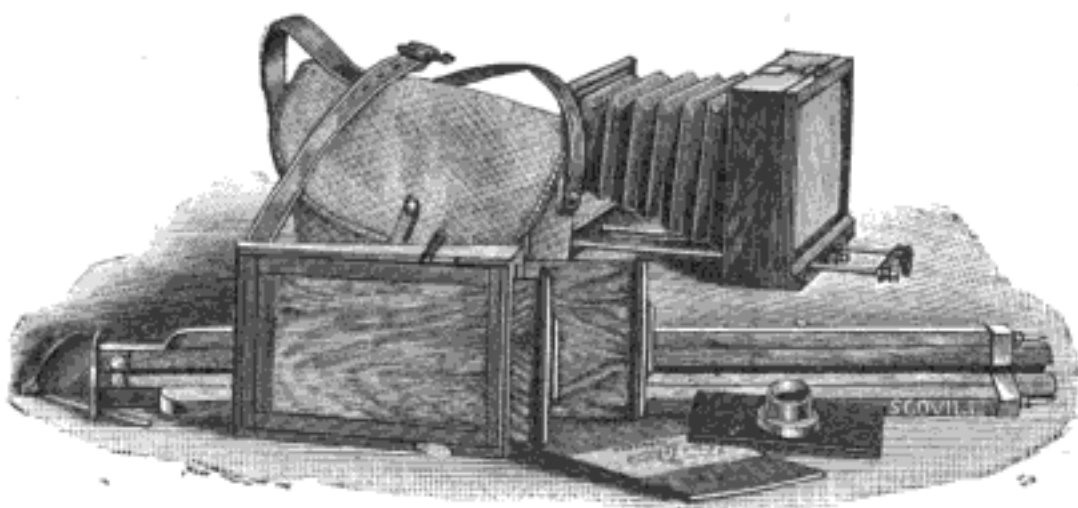


(Extract from PHOTOGRAPHIC TIMES,
March, 1883.)

AMERICAN OPTICAL COMPANY'S TOURISTS' POCKET CAMERA.

TOURISTS' POCKET CAMERA FOLDED.

When folded up, a 4x5 Tourists' Camera measures but $5\frac{1}{2} \times 6\frac{1}{2} \times 2$ inches, and it is without any projecting parts, pins or screws, so that it may be slipped into and not tear a gentleman's pocket. The rods which are used to move forward the front of the camera are easily detached from it and drawn out of the bed. The connector at the other end of the rods is just as readily unset. To replace these three parts when the camera is brought out for service, requires no more time or skill than to take them off. They are nicely adjusted, and are polished and nickel plated, so that they add to the handsome appearance of the camera, and contrast well with its polished mahogany surface and the purple hue of its bellows. The weight of this camera and its dry plate holder (but $1\frac{1}{2}$ pounds for the 4x5 size) is on the center of the tripod. In focusing, the front of the camera and the lens are pushed forward, thus avoiding any disarrangement of the focusing cloth. When the focus is obtained, further movement of the lens is checked or stopped by means of a screw acting on a spring, which is pressed at the ends against the focusing rods."



Tourist's Pocket Outfit No. 0206.—4x5 Tourist's Pocket Camera, with
1 Daisy Double Dry Plate Holder, with *Patent Registering Slides*.
1 Scovill Extension Tripod No. 1, with patent reversing attachment.
1 Canvas Carrying Case with Shoulder Strap.

Price, complete, \$22.00.

Tourist's Pocket Outfit No. 0207.—5x8 Tourist's Pocket Camera, with
1 Daisy Double Dry Plate Holder, with *Patent Registering Slides*.
1 Scovill Extension Tripod No. 2, with patent reversing attachment.
1 Canvas Carrying Case with Shoulder Strap.

Price, complete, \$30.00.

We recommend the purchase and use with the above Outfits of a Lens or Lenses selected from the list on page 24.

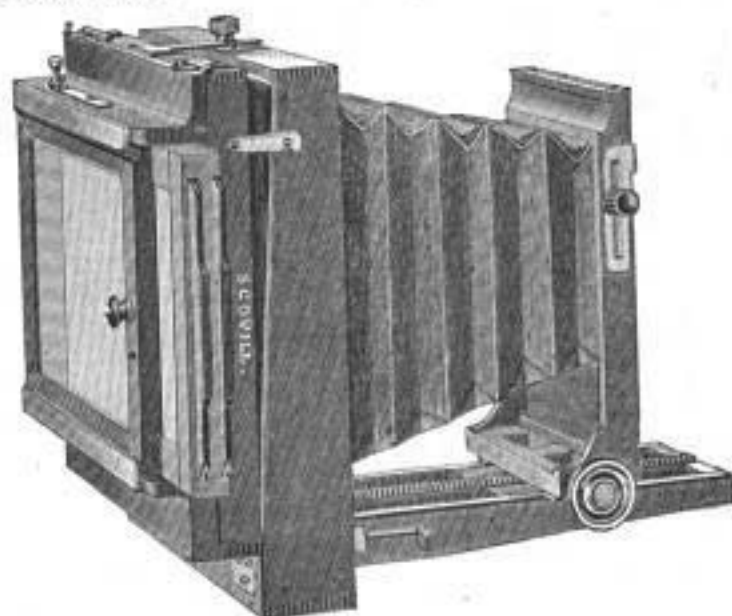
For Chemical and Sensitized Paper Outfits to be used with the above, refer to pages 6 and 7.

NOTE REDUCTION IN PRICE.

SAINT LOUIS Reversible-Back Cameras.

IN addition to the desirable features which the Back Focus Reversible Camera possesses (see description below) the St. Louis Reversible-Back Cameras have the rack and pinion movement, *patent latch* for making the bed rigid instantaneously, and the ground-glass so arranged that the holder may be slid in front of it, as shown in the illustration.

Each Camera is supplied with one Daisy Holder with *patent Registering Slides* and canvas case.



THE growing use of dry plates, and the desire for rapid exposures, led to their introduction, and because they add to the grace and celerity of view-taking they have become vastly popular. A novel arrangement of a detachable carriage at the back combines such a multiplicity of adjustments in itself that a dry-plate holder *may be reversed or be set for either an 8x10 upright or horizontal picture*—all of these movements, without once changing the dry-plate holder in the carriage, which may be made to take an S. G. C., but not a Bonanza Holder.

SAINT LOUIS REVERSIBLE-BACK CAMERAS.

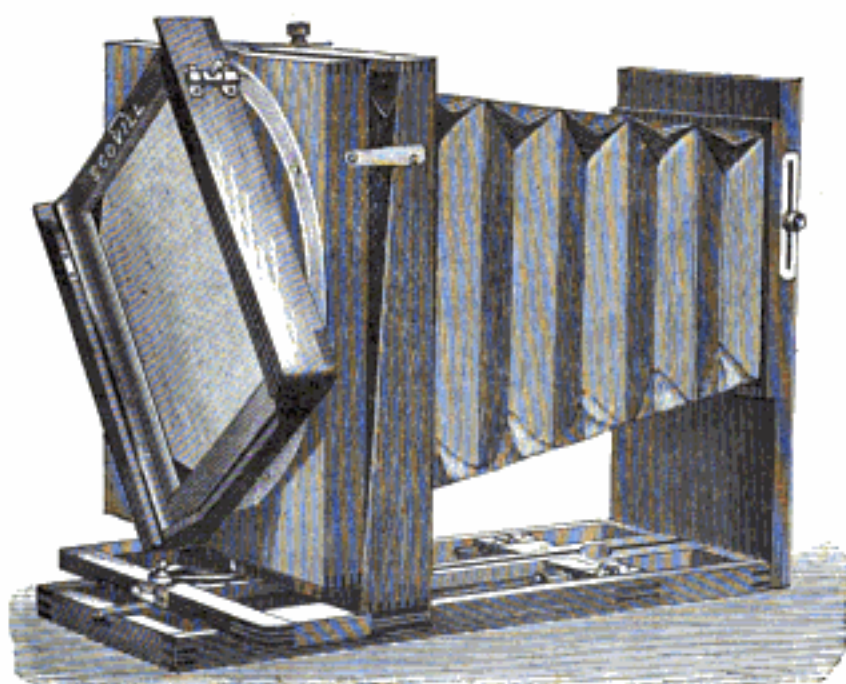
Fitted with Eastman-Walker Roller Holder.
New Model.

For View.	Single Swing-back.	Double Swing-back.	Single Swing-back.	Double Swing-back.
4¼x5½...	\$26 00	\$30 00
5 x7	32 00	35 00	\$52 00	\$55 00
6½x8½.....	36 00	40 00	60 00	64 00
8 x10	40 00	44 00	70 00	74 00
11 x14	60 00	64 00	102 00	106 00

Not made front focus above 11x14 size.

Flammang's Patent Revolving-Back Cameras.

Each Incased in a Canvas Bag, with Handle.

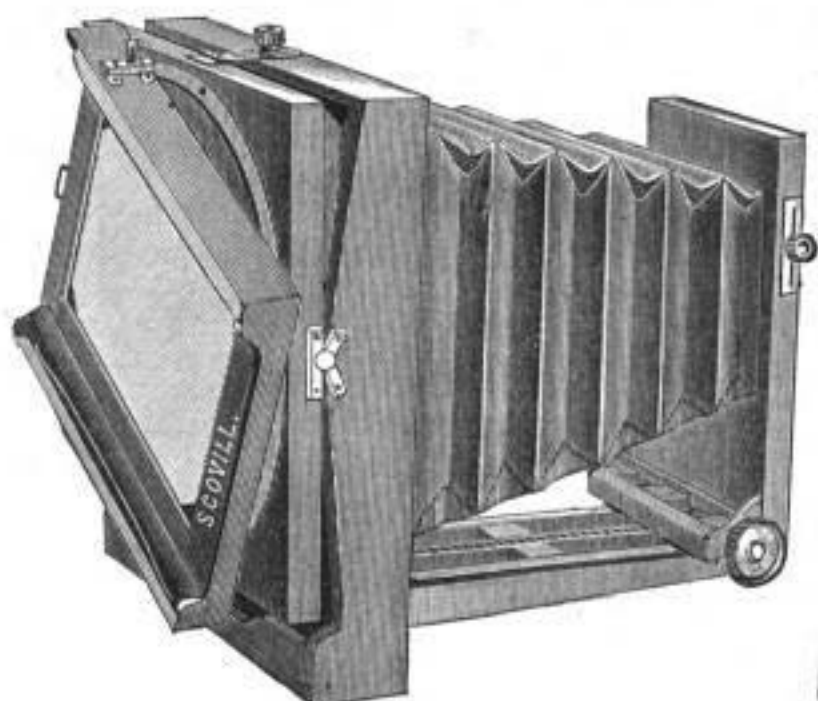


"These are the finest View Cameras ever constructed," so says every photographer who has examined any of them, and this exclamation is not merely a tribute to the beauty and grace of their design, for invariably the desire has at the same time been expressed to possess one of these truly novel and substantial Cameras.

Wherein lies the merit and attractiveness of the Revolving-Back Camera, that photographers want to cast aside cameras now in use and procure one of this new pattern? Briefly stated, it enables the view taker to secure either an upright or a horizontal picture without changing the plate holder after it has been slid into the carriage. No other camera can with such wondrous ease and celerity be changed from the vertical to the upright or *vice versa*. The carriage is simply turned about in the circle and automatically fastened. By this latter provision the carriage may be secured at either quarter of the circle. Ordinarily, the slide will be drawn out of the holder to the right; but in certain confined situations, the ability to withdraw the slide to the left enables the photographer to obtain a view which he could not get with the usual provision in a camera. The photographer of experience is well aware of the difficulty, when taking an upright picture with a large camera, of reaching up to draw out the slide at the top, and, what is more essential, of getting out the slide without fogging the plate in the holder.

Grace and strength are combined in the Revolving-Back Camera, and its highly-desirable features are gained without the sacrifice of steadiness or any other essential principle in a good camera. Indeed, its merit is such that out-door photography has been advanced and made more attractive by its introduction.


For a more detailed description consult Scovill's general catalogue.

Revolving-back Camera, Front Focus.**PRICE LIST.**

Revolving-back Cameras each incased in a canvas bag, with handle, above 11x14 size, with two handles.

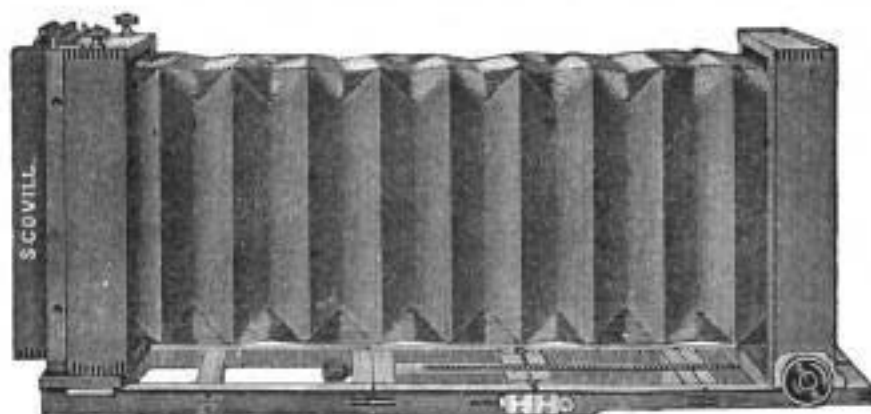
				Fitted with Eastman-Walker Roll Holder New Model.	
REVERSIBLE.		Single Swing.	Double Swing.	Single Swing.	Double Swing-back.
550A.	For View 4 x 5 in.	\$31 00	\$36 00	\$46 00	\$51 00
551.	" 4 1/4 x 5 1/2 "	33 00	38 00
551AB.	" 4 1/4 x 6 1/2 "	34 00	39 00
551A.	" 5 x 7 "	35 00	40 00	55 00	60 00
551B.	" 5 x 8 "	35 00	40 00	55 00	60 00
552.	" 6 1/2 x 8 1/2 "	45 00	50 00	69 00	74 00
553.	" 8 x 10 "	50 00	55 00	80 00	85 00
554.	" 10 x 12 "	65 00	70 00	101 00	106 00
555.	" 11 x 14 "	77 50	82 50	119 50	124 50
556.	" 14 x 17 "	90 00	95 00	140 00	145 00
557.	" 17 x 20 "	105 00	110 00	170 00	175 00
557A.	" 18 x 22 "	110 00	115 00	185 00	190 00
558.	" 20 x 24 "	120 00	130 00	200 00	210 00
559.	" 25 x 30 "	165 00	175 00

These Cameras are fitted with Daisy Dry-plate Holders.

 Please state, when ordering any size below 10x12, whether front or back focus is desired.

Revolving-back Cameras with front focus not made above 8x10 size.

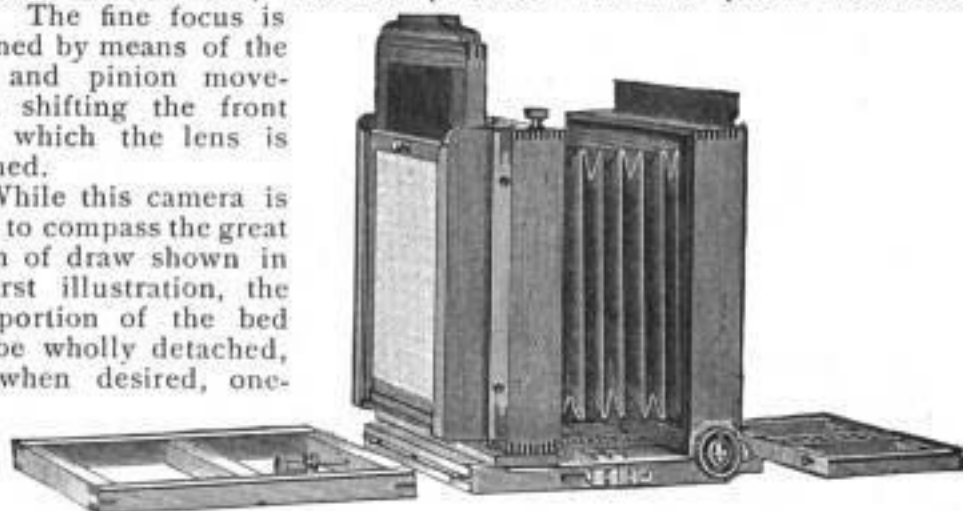
THE SCOVILL MANIFOLD CAMERA.



The Manifold Camera has special advantages peculiar to itself and possesses the greatest number of desirable features which can be combined in a camera

without sacrificing lightness and compactness, or having complicated adjustments. The unique device which controls the horizontal and vertical swings was patented by Mr. W. J. Stillman, of the editorial staff of the PHOTOGRAPHIC TIMES. *To this has been added a central latch for the purpose of bringing the swing movements within perfect control of the operator.* An approximate focus is obtained quickly with the rear portion of the camera, which is provided with the patent reversible back. The fine focus is obtained by means of the rack and pinion movement, shifting the front upon which the lens is attached.

While this camera is made to compass the great length of draw shown in the first illustration, the rear portion of the bed may be wholly detached, and when desired, one-



third of the remaining portion of the platform; a great advantage when photographing interiors, when an obtrusive tail board renders focusing almost an impossibility. With one-half of the bed taken off, this camera is still of the usual length of draw. The ground glass, when not in use, is displaced, *not detached*, by having the plate holder slid in front of it. This arrangement of ground glass and plate holder is shown in the second view. Still another noticeable feature is the absence of clamping screws from the front boards, to move which one needs but to press firmly against the lens. The bed folds in front of and behind the camera, and has the side latch recently devised at the American Optical Co.'s factory. While this camera serves manifold purposes, as its name indicates, nothing could be more simple or more easily manipulated.



PRICE LIST, including Canvas Case for Camera and one Holder, with *patent Reg. Slides*.

3 1/4 x 4 1/4 size... \$34 00	4 3/4 x 6 1/2 size.... \$41 00	6 1/2 x 8 1/2 size... \$52 50
4 x 5 size..... 38 00	5 x 7 size..... 42 00	8 x 10 size..... 58 00
4 1/4 x 5 1/2 size.... 40 00	Other sizes made to order.	

Fitted with Eastman-Walking Roll Holder, New Model:

4x5 size, \$53 00; 4 1/2 x 6 1/2, \$58 50; 5x7, 62 00; 6 1/2 x 8 1/2, \$76 50; 8x10, \$88 00

Photographic Outfits for Bicyclists,

WITH WHICH TO SECURE MEMENTOES OF
PLEASANT EXCURSIONS.

So popular has amateur photography become among wheelmen that the two amusements are now often combined. The "Wheel" allows unbounded opportunities to the amateur photographer to gather choice landscape views, which he could not get otherwise.

"NE PLUS ULTRA" BICYCLISTS' PHOTO-OUTFIT (COMPLETE).

PRICE, - - - \$10.00.

Consisting of a $3\frac{1}{4} \times 4\frac{1}{4}$ Imitation Mahogany Camera with Vertical Shifting Front, Folding Bed, *with patent latch*, Double Dry Plate Holder, with *patent Registering Slides* and Hinged Ground Glass.

A UNIVERSAL JOINT BICYCLE ATTACHMENT,

A No. 1 WATERBURY LENS, *with Stops*,

A CANVAS BAG TO CARRY THE ABOVE, *with Shoulder Strap*.

The advantages of this outfit are its Lightness and Compactness, and the ease with which it can be brought into use—a new device on bed of the Camera permitting it to be made rigid, or to fold instantaneously. There are no loose pieces. The outfit complete weighs 2 pounds 3 ounces.

NICKEL-PLATED BICYCLE ADJUSTABLE SUPPORT.....\$1.50

This has no loose pieces and is so accurately made as to have no side play.

THE "MIGNON" BICYCLISTS' PHOTO-OUTFIT (COMPLETE).

Consisting of a $3\frac{1}{4} \times 4\frac{1}{4}$ Finely Polished Mahogany Camera, with Swing Back, Vertical Shifting Front, Hinged Ground Glass, Folding Bed with *Patent Latch*, Rack and Pinion Movement (Front Focus). In improvement, and has no loose pieces. Nothing finer, short, it has every more attractive and yet simple was ever made.

A Universal Joint Bicycle Attachment.

A $5\frac{1}{2}$ inch Morrison Wide-Angle Instantaneous Lens, pronounced by authorities on optics to be without a peer. The Rotary Shutter with this Lens is the Most Compact and the Lightest known.

A Canvas Saddle Bag lined with flannel to prevent marring of the fine finish of the camera.

THIS OUTFIT COMPLETE WEIGHS LESS THAN TWO POUNDS.

Price of "Mignon" Bicyclists' Photo-Outfit Complete, \$70.00.
Without Lens, \$25.00.

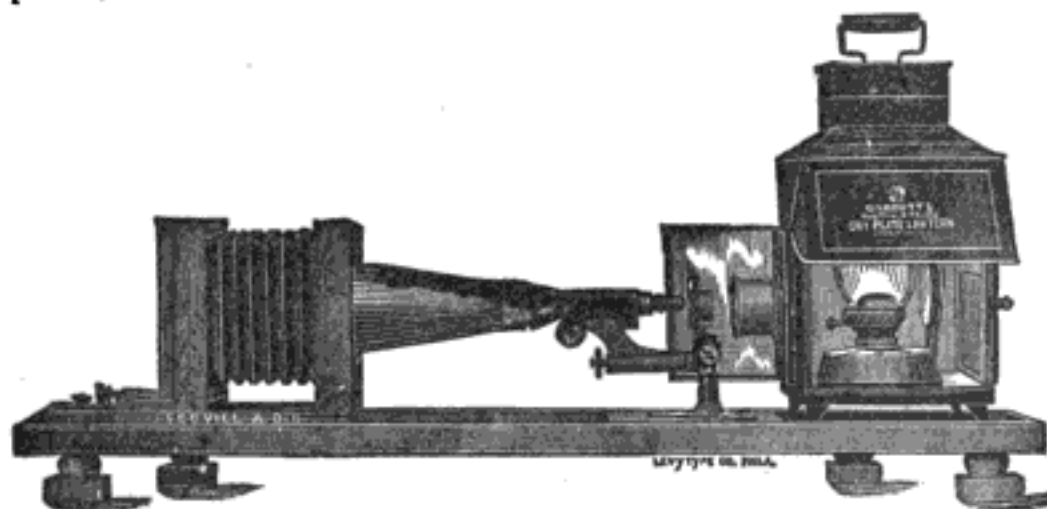
With the lenses just described, clear, sharp pictures can be obtained which will make fine transparencies and lantern slides, or which can be enlarged up to 8x10 size.

SCOVILL'S OUTFIT

For PHOTOGRAPHING with the MICROSCOPE.

Photographing with the microscope has hitherto been accomplished by the aid of elaborate and costly apparatus, and been applied chiefly to making illustrations for scientific magazines. The process used, that of wet collodion in connection with sunlight, involved the procurement of an expensive heliostat to produce a steady illumination, for with any less powerful light the exposure would necessarily be so prolonged that the coating of the plate would dry and become useless. Now all this is changed, for with the modern improvements in photography which are the result of the introduction of gelatine dry plates, the photographing of microscopic objects becomes as easy of accomplishment as the photographing of the beautiful and visible in nature is with the popular amateur outfits.

The scientist and microscopist, instead of spending hours in making imperfect drawings, aided by the camera lucida, may in a few minutes, with the assistance of photography, produce a more perfect representation of a minute object than it is possible for the hand of man to do, working conjointly with the eye. Not only can an enlarged image of a microscopic object be formed for illustration, but professors in colleges will find it a ready means to produce negatives of a suitable size from which may be made transparencies or magic lantern slides for exhibition to classes or the public.



If this is done in the daytime, a room from which all white light is excluded should be selected; but if used at night, as in most cases it would be, the operations may all be performed in the midst of a family group for their interest and amusement, and to impart to them knowledge of the minute life or organisms of the world which the microscope alone can reveal.

Scovill's Photomicroscopic Equipment,

— CONSISTING OF —

- 1 Scovill Special Half Plate Camera.
- 1 Multum in Parvo Lantern, with Double Condenser.
- 1 dozen $4\frac{1}{2} \times 5\frac{1}{2}$ size B Keystone Plates to make Negatives; also
- 1 dozen $3\frac{1}{2} \times 4\frac{1}{4}$ size A Plates for Transparencies.

Price, Complete, \$18.00.

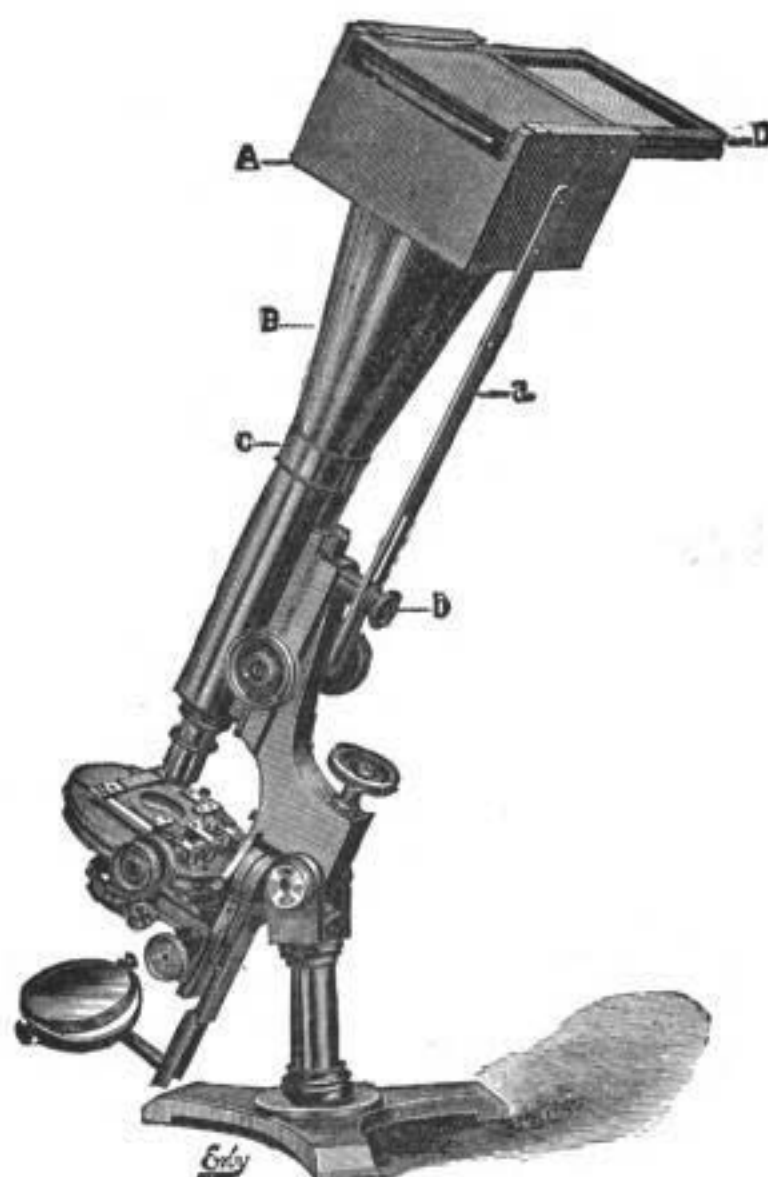
The presumption is that you are provided with a microscope. If not, we recommend the purchase of one from a regular dealer in microscopical goods.

Circular containing directions for use sent with each outfit.

MERCER PHOTOMICROGRAPHIC CAMERA.

Size, $2\frac{3}{4} \times 3\frac{1}{4}$.

— Price, \$6.50. —



This Camera is provided with a Brass Cone and Plate Holder with Ground Glass attached, to slide back and forth in the carriage, as desired.

THE SCOVILL DETECTIVE CAMERA.



It has not come to be generally known, but such is the fact, that Artists of renown and shrewd Detectives carry about these Cameras, and pictures are secured by them for their different lines of study through their instrumentality in a manner which is perfectly simple—in fact, it requires no skill other than to get within the range of focus of the unsuspecting victim. As the party, whether man, woman, or child, is not aware that anything unusual is transpiring, the expression of the countenance and the pose are not arranged with reference to their appearance in a picture. A quick working lens is hidden in the camera, and also a few plate holders. By pressing on a spring the whole operation of exposure is completed.

It followed naturally upon the introduction of the Roll Holder that it should be applied to the peerless SCOVILL DETECTIVE CAMERA, and this has been done in a manner that displays the greatest ingenuity. Instead of three double dry-plate holders, but one will accompany the Roll Holder.

Scovill's Roll Holder Detective Camera, for $3\frac{1}{2} \times 4\frac{1}{2}$ Pictures, with Morrison Lens.....	\$65 00
Scovill's Roll Holder Detective Camera, for 4×5 Pictures, with Morrison Instantaneous Lens.....	75 00
The price for the $3\frac{1}{2} \times 4\frac{1}{2}$ Scovill Detective Camera, with Morrison Lens, three double Dry-plate Holders, and room in the case for six double Holders.....	50 00
The price for the 4×5 Scovill Detective Camera, with Morrison Lens, three double Dry-plate Holders, and room in the case for six double Holders.....	60 00

Scovill's Outfit for Making Lantern Slides consists of

- 1 doz. Thin Crystal Glass.
- 2 " Black Mats.
- 1 package Black Adhesive Paper.
- 1 doz. $3\frac{1}{2} \times 4\frac{1}{2}$ Gelatino-Albumen Dry Plates.
- 1 package S. P. C. Pyro and Potash Developer.
- 2 $4\frac{1}{2} \times 5\frac{1}{2}$ Solid Glass Pans.
- 1 lb. Hyposulphite Soda.

The above, packed in wooden case, price complete..... \$3 50

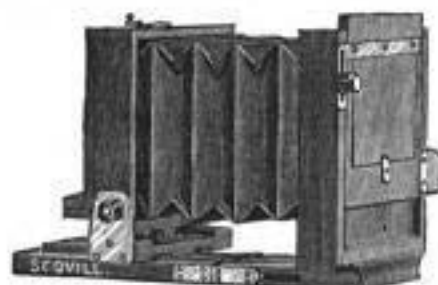
For enlarging, reducing, or copying Negatives to make Lantern Slides, we recommend the use of one of the Scovill Enlarging, Reducing and Copying Cameras.

Many amateurs have declared that the pleasure of picture-taking was not fully revealed to them until they had procured and tried one of the SCOVILL DETECTIVE CAMERAS.





THE PETITE CAMERA.



This camera was made to suit the refined taste of one of Vassar's fair students. The design on the part of the manufacturers was to reduce the impedimenta for an outing to the minimum, providing a $3\frac{1}{2} \times 4\frac{1}{2}$ camera (to make negatives of suitable size for lantern slides), with single swing, folding bed with *patent latch*, vertical shifting front, and other desirable improvements. So well has the design been carried out that many ladies will follow the example of Vassar's pupils, and learn the fascination of picture-taking with one of these finely-polished mahogany cameras. Gentlemen in search of a pocket camera need not seek further. The Petite Camera and an enlarging camera will by many be considered a satisfactory and complete equipment for such photographing as they desire to do.

PRICE.

Petite Camera with one double dry-plate holder, and <i>patent Registering Slides</i>	\$12 00
Same Camera with Scovill's adjustable (feather weight) tripod and canvas bag, with shoulder strap.....	17 00

WATERBURY LENSES.

Provided with a Set of Stops.



Notwithstanding what may be said or imagined to the contrary, it is a fact that many of the most exquisite photographs ever produced have been taken by the single achromatic lens, which is composed of a bi-convex lens made of crown glass, cemented by a transparent medium to a plano-concave lens formed of flint.

PRICE.

No. A, Single.....	\$3 50	No. B, Single.....	\$4 50
" A, Matched pair.....	7 00	" C, ".....	8 00



Morrison's Wide-Angle View Lenses.

PATENTED MAY 21, 1872.

These Lenses are absolutely rectilinear; they embrace an angle of fully 100 degrees, and are the most rapid *wide-angle* lenses made.

No.	Diameter of Lens.	Size of Plate.	Equivalent Focus.	Price, Each.	
00....	$\frac{1}{2}$ inch...	$2\frac{1}{2} \times 2\frac{1}{2}$ inches..	$1\frac{1}{2}$ inches...	\$25 00	These 3 sizes will fit into 1 flange.
0....	$\frac{1}{2}$ " ...	3 x 3 " ..	$2\frac{1}{4}$ " ..	25 00	
1....	$\frac{1}{2}$ " ...	4 x 4 " ..	3 " ..	25 00	
2....	1 " ...	4 x 5 " ..	$3\frac{1}{2}$ " ..	25 00	These 5 sizes will fit into 1 flange.
3....	1 " ...	$4\frac{1}{2} \times 7\frac{1}{2}$ " ..	4 " ..	25 00	
4....	1 " ...	5 x 8 " ..	$5\frac{1}{4}$ " ..	25 00	
5....	1 " ...	$6\frac{1}{2} \times 8\frac{1}{2}$ " ..	6 " ..	25 00	These 2 sizes will fit into 1 flange.
6....	1 " ...	8 x 10 " ..	8 " ..	30 00	
7....	$1\frac{1}{4}$ " ...	11 x 14 " ..	$10\frac{1}{2}$ " ..	40 00	
8....	$1\frac{1}{4}$ " ...	14 x 17 " ..	14 " ..	60 00	These 2 sizes will fit into 1 flange.
9....	$1\frac{1}{2}$ " ...	17 x 20 " ..	17 " ..	80 00	
10....	$1\frac{1}{2}$ " ...	20 x 24 " ..	22 " ..	120 00	

REMARKS.—Nos. 1 to 6 are all made in matched pairs for stereoscopic work. The shorter-focused Lenses are especially adapted for street and other views in confined situations. For general purposes, a pair of No. 5 Lenses will be found most useful.

Morrison's Instantaneous Wide-Angle View Lenses.

With full opening, these lenses have all the extreme depth for which the Morrison Regular Wide-Angle Lenses are noted. They work with extreme rapidity, and will cover an angle of 90 degrees sharp. Furnished with a pneumatic drop and a set of diaphragms.

Diameter of Lens.	Size of Plate, Full Opening.	Size of Plate when Stopped Down.	Focus.	Price.	With Rotary Exposer.
$\frac{7}{8}$ inch.	4 x 4 inches.	5 x 7 inches.	$5\frac{1}{2}$ in.	\$30 00	
1 " "	4 x 5 " "	8 x 10 " "	8 " "	35 00	
$1\frac{1}{4}$ " "	5 x 8 " "	10 x 12 " "	10 " "	40 00	\$60 00
$1\frac{3}{8}$ " "	8 x 10 " "	14 x 17 " "	13 " "	45 00	65 00

Protectors for any of above Lenses.....	\$12 00
" C Group Lenses.....	12 00
CC " "	17 00

Darlot Hemispherical Wide-Angle Rectilinear View Lenses.



These Lenses embrace an angle of 90 degrees, and are valuable for taking views of buildings, interiors, etc., in confined situations, where those of longer focus cannot be used.

	Back Focus.	Size View.	Price.
No. 1,	2½ inches.....	For Stereoscopic Work, each	\$12 50
" 2,	3 "	" "	15 00
" 3,	5 "	8 x 10.....	20 00
" 4,	8 "	10 x 12	25 00

Darlot Rapid Hemispherical View Lenses.

These Lenses embrace an angle of from 60 to 75 degrees; are quick-acting, perfectly rectilinear, and provided with central stops. Will be found very fine lenses for landscape and outdoor groups; also for copying engravings, maps, architectural subjects, etc.

	Back Focus.	Size View.	Price.
No. 1,	5½ inches.....	5 x 6.....	\$15 00
" 2,	9 "	5 x 8.....	25 00
" 3,	10½ "	8 x 10.....	35 00

No. 1 can be had in matched pairs for Stereoscopic work.

Scovill's "Peerless" Quick Acting Stereoscopic Lenses,

FOR PORTRAITURE OR VIEWS.

The Lenses are especially designed for Stereoscopic Photography, and are so constructed that they will work well for interiors or exteriors.

They are particularly adapted for instantaneous work.

Diameter of Lenses, 1½ inch; focal length, 3½ inches.

By removing the back lens and substituting the front combination, a focal length of 5½ inches is obtained.

They are supplied with six Waterhouse diaphragms in morocco case.

Price, per pair..... \$25 00 | Waterbury View Finder..... \$3 00

ALL STYLES OF LENSES SUPPLIED.

A New Departure in Morrison Wide-Angle Lenses.

(Extract from PHOTOGRAPHIC TIMES, Vol. xiv, page 277.)

Opening the velvet-lined morocco case presented to us for our inspection, we find partitioned-off space containing an ordinary 5-inch Morrison Wide-Angle Lens, on which the front and back combinations are distinctly marked with the figure 5. Beside this, in cells, are four mountings with lenses of varying focal lengths, each marked in white with a number. By unscrewing the back combination marked 5, and putting in its place the mounting marked 6, a lens of 6-inch back focus is obtained. Again, by removing both these cells and replacing them with the two marked 8, a lens of 8-inch back focus is the result. By screwing in the front combination marked 5 and the back combination marked 4, a lens of 4-inch back focus is obtained. Putting a front combination marked 8 and a back marked 6, a focus of 7 inches is produced. Thus the operator has a choice of five focal lengths with the one lens. Price for the whole, \$80.

A complete descriptive Price List of Outfits, Accessories, Dry Plates, Chemicals, Transparency Frames, Dry Plate Holders, and View Albums, accompanies each Outfit, or is mailed free upon application.



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