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Construments

THE HOBBY OF TEN
THOUSAND THRILLS

INSTRUCTION BOOK
FOR
CONSTRUMENTS
"10" OUTFIT.

How to make and use
Scientific Optical Instruments.

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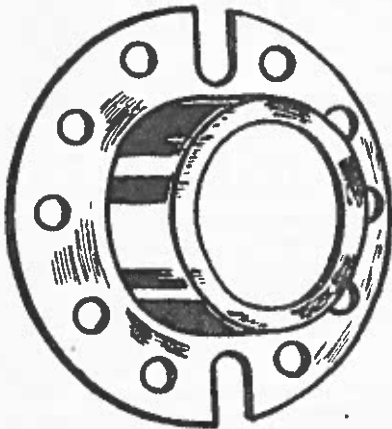
MODELS FOR "10" OUTFIT.

<i>Model No.</i>	<i>Description.</i>
5	Low Power Magnifier (3 Leg type).
6	Low Power Magnifier (4 Leg type).
11	Low Power Magnifier (Stand type).
92	Low Power Magnifier (Stand type).
93 and 93a.	Reflector.
94	Reflector (Lens type).
79	Reflectoscope.
95	Camera Lucida.
96	Pinhole Camera (Pocket type).
96a. and 96b.	Pinhole Camera (Stand type).
97	Lens Camera (Pocket and Stand types).
98	Photo Printer.
99	Photo Copier.
100	Slide Projector.
61	Kaleidoscope (Hand type).
62	Kaleidoscope (Magnifying Hand type).
101	Kaleidoscope (Stand type for transparent objects).
102	Kaleidoscope (Stand type for opaque objects).
103	Periscope.
104	Crazy Mirrors.
105	Crazy Mirrors (Stand type).
106	Ophthalmoscope.

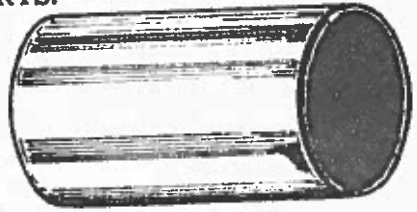
LIST OF CONSTRUMENTS IN A "10" OUTFIT.

	<i>Part No.</i>	<i>Price (each).</i>
2	Ring Mounts	3a 1 0
1	3-in. Optical Tube	4 1 0
1	1½-in. Optical Tube	4a 6
2	Camera Caps	6a 6
1	Distance Ring	8 2
1	Small Pinhole Disc	9 6
2	Split Rings	10 1
2	3-in. Screwed Rods	11 3
4	1-in. Screwed Bolts	12 6 (doz.).
4	½-in. Screwed Bolts	13 6 (doz.).
15	Hexagonal Nuts	15 3 (doz.).
1	Combined Spanner & Screwdriver	16 3
1	Plano-Convex Lens	18 2 6
3	Strip Mirrors	19 2
2	Square Mirrors	19 3
2	Glass Slides	23 1
1	1-in. Frosted Disc	26 1
1	Red Transparent Disc	27 1
2	Rubber bands	37 3 (doz.).
1	Instrument Stand	38 2 0
1	Stop for Lens	37a 3
1	Instruction Book	6

INSTRUCTION BOOK FOR HOW TO IDENTIFY YOUR INSTRUMENTS PARTS.



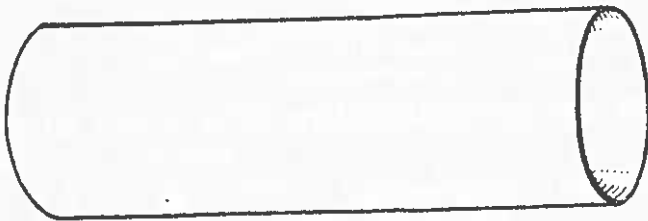
No. 3a.



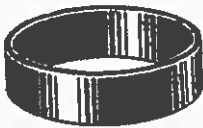
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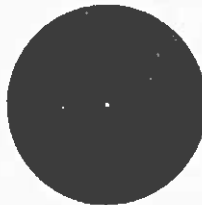
No. 6a.



No. 4.



No. 8.



No. 9.



No. 10.



No. 11.



No. 12.



No. 13.



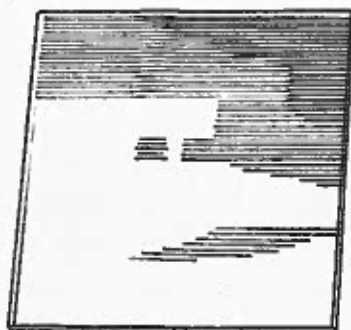
No. 15.

**HOW TO IDENTIFY YOUR CONSTRUMENTS
PARTS.**

No. 16.



No. 18.



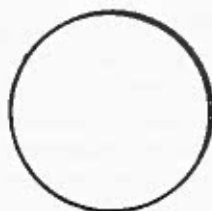
No. 20.



No. 19.



No. 23.



No. 26.



No. 27.

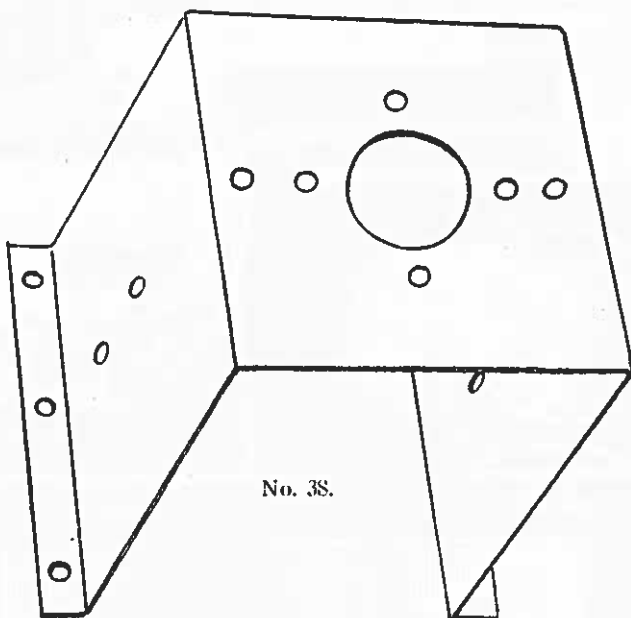


No. 37a.

HOW TO IDENTIFY YOUR INSTRUMENTS PARTS.



No. 37.



No. 38.

SOME USEFUL SUGGESTIONS AND "DON'TS."

1. Read carefully and study the Figures given in the General Instructions before commencing to build the Models and no difficulty will be experienced.

2. When you have successfully constructed all the Models, try others of your own design; we shall be pleased to see and hear of your efforts, and welcome any suggestions.

3. Remember you can purchase any of the parts separately to increase your Outfit, and additional parts.

4. Watch the *Construmag* for new Models, if you are interested we shall be pleased to forward you a specimen copy.

5. Don't finger Lenses.

6. Don't be in a hurry; a hastily-made Model may prove disappointing.

7. Don't leave small parts lying about, a nut may be missing to complete a model; use the box which has been designed for this purpose.

8. Interest your friends in Construments and the *Construmag*.

Instruction Book for "10" Outfit.

General Notes and Instructions.

BEFORE attempting to construct the models, read carefully the following simple instructions. Having mastered these it is possible, with the help of the illustrations and notes, to construct any of the models within a few minutes.

A full list of parts for each model is given, and these are numbered on the illustrations.

MOUNTING LENS, STOP AND DISCS. (Fig. 1.)

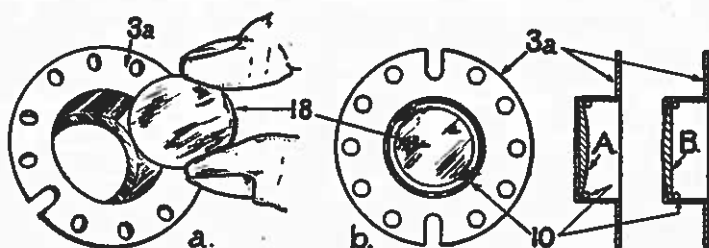


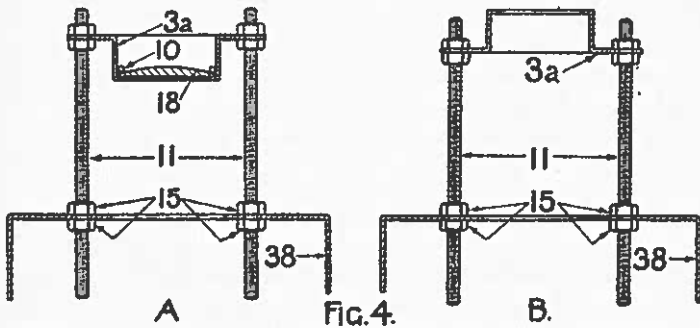
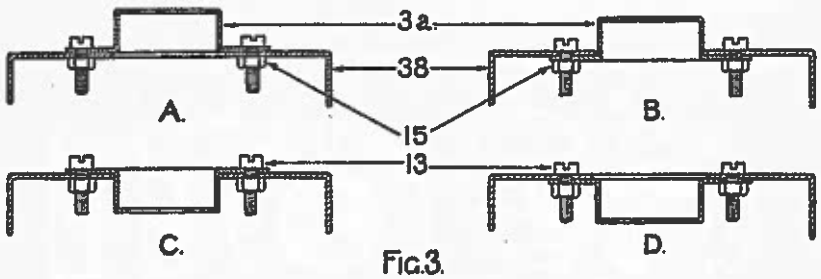
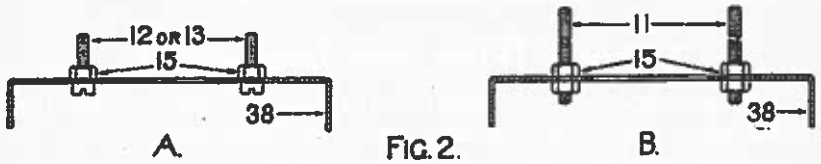
FIG. 1.

Lens (18), Stop (37a), and Discs (9 and 27) are inserted in the Ring Mount (3a) as shown at "a," and secured with a Split Ring (10) pressed down evenly; the completed Mount is shown at "b." The Lens (18), may be mounted with either the Convex or Plane surface facing the front of the Ring Mount (3a) shown in section at "A" and "B." When handling the Lens (18), HOLD BY THE EDGES as at "a," as grease and minute scratches are fatal to the best optical results.

FIXING SCREWED BOLTS AND RODS. (Fig. 2.)

When fixing the Screwed Bolts (12 or 13) in the Instrument Stand (38) these should, wherever possible, be inserted in the holes from the inside as shown at "A" as it is easier to hold the head with the Screwdriver whilst the Nuts (15) are threaded on, than to manipulate the Spanner (16) within the stand. In the case of the Screwed Rods (11), first thread a Nut (15) on

for a short distance, thus forming a "head," then insert in the holes as in the case of the bolts. It will be found, that by holding the Nut on the underside with the fingers, the upper one can be threaded on and screwed down tight. As a rule, Nuts can be screwed down sufficiently tight with the fingers to obtain a firm



fixing, but there may be instances in assembling some of the models where the use of the Spanner (16) is necessary, for instance in awkward positions, but remember not to damage the screw threads by tightening up too much; an over tightened nut may result in twisting a portion right off the bolt or rod leaving

you with a useless nut as well. As a general rule in assembling the models, fix all Screwed Bolts and Rods to the Stand first. If the underside of the Nut is flat and the top is slightly rounded, always see that the "flat" side is in contact when screwed up.

METHODS OF ATTACHING RING MOUNT TO STAND. (Figs. 3 and 4.)

The Ring Mount (3a) can be attached to the Stand (38) in various positions, either above or below as shown; the position of the flange of the Ring Mount should be noted. When the Mount is fixed at a distance above or below the Stand (Figs. 4A and 4B), care should be taken to adjust the nuts so that the Mount is parallel with the top of the Stand. At "A" Fig. 4, the Lens is shown mounted.

MOUNTING OPTICAL TUBES. (Fig. 5.)

Take a Ring Mount (3a), complete with assembled Lens (18), Stop (37a) or Disc (9 or 27), according to the model, and attach the Screwed Rods (11) as shown at "A," complete with two additional Nuts (15) on the free end. Insert an Optical Tube (4 or 4a to suit the model under construction) in the Ring Mount as at "B." Assemble another Ring Mount and pass it over the Screwed Rods until the ends of the Optical Tube are within the Ring Mounts. Thread the Nuts (15) along until they support the second Mount; two more Nuts are then put on and screwed up tight. It is important that the Screwed Rods (11) should be firmly held to the Mounts, which should be parallel. When the Short Optical Tube (4a) is used, Screwed Bolts (12) take the place of the Screwed Rods (11).

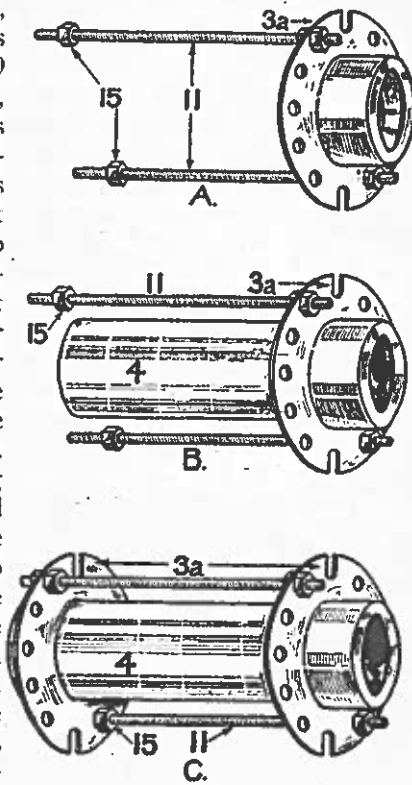


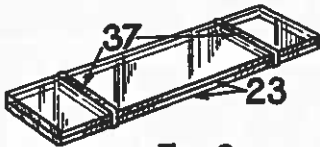
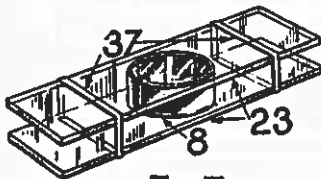
FIG. 5.

MICROSCOPE ACCESSORIES.**SLIDES. (Fig. 6.)**

Specimens for the Microscope such as.—

1. Crystals of sugar, salt, fibres of cotton, wool, silk, etc., cheese, dust, pollen, tiny parts of flowers or insects, and many other minute objects may be placed on the centre of one of the Glass Slides (No. 23) with a needle or knife blade.

2. Flat objects or objects capable of being flattened, such as, legs and wings of insects, small clippings of coloured cellophane (for the Kaleidoscope Models 101, 102), pieces of fabric, silk, grasses, scales of fish, etc., may be mounted between Glass Slides (23) held together by Rubber Bands (No. 37) Fig. 6.

**FIG. 6.****FIG. 7.****FIG. 8**

3. Objects which are fairly flat, such as small insects, minute moss plants, stamens of flowers, and delicate objects generally, which would be crushed by being compressed between Glass Slides can be given sufficient space by first putting a Rubber Band at each end of the lower Slide before inserting the object. A second Slide is then placed on top and another pair of Rubber Bands holds the two Slides together. The thickness of a Rubber Band encircling only one slide, keeps them apart.

LIVE BOX. (Fig. 7.)

For viewing Living Matter. A suitable box can be constructed by using the Distance Ring (8) placed between two Glass Slides (23) and secured by Rubber Bands (37).

AQUARIUM. (Fig. 8.)

For holding specimens of Pond Water, Crystal Solutions, etc., the Aquarium shown is easily constructed. Mount the Distance Ring (8) on a Glass Slide (23) using Candle Wax, Plasticene, Putty, Gum or other suitable material to form a watertight joint.

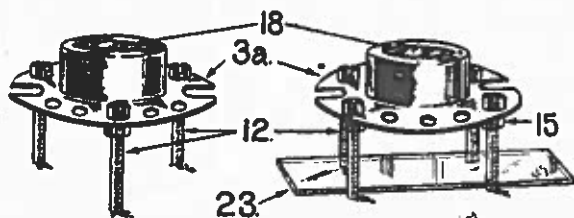
Instruments and Apparatus to Make.

The following pieces of apparatus and instruments may be constructed with the "Construments" "10" Outfit.

MODELS 5 and 6.—LOW POWER MAGNIFIER.

Parts required:—

1 Ring Mount	(3) or (3a)
1 Plano-Convex Lens	(18)
1 Split Ring	(10)
3 lin. Screwed Bolts	(12)
3 Nuts	(14) or (15)



MODEL 5.

MODEL 6.

Model 5 is extremely useful for the examination of detail, where a high magnification is not required, in objects such as postage stamps, crests, coins, maps, pictures, finger-prints, etc. By the addition of another Screwed Bolt (12) and Nut (15); the four bolts to be spaced round the Mount as in Model 6; it is possible to pass Glass Slides (23) between the legs of the Stand.

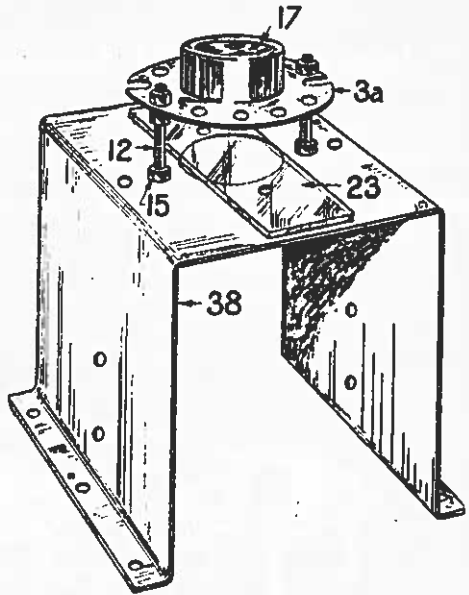
MODEL 11.—LOW POWER MAGNIFIER (Stand Type).

Parts required:—

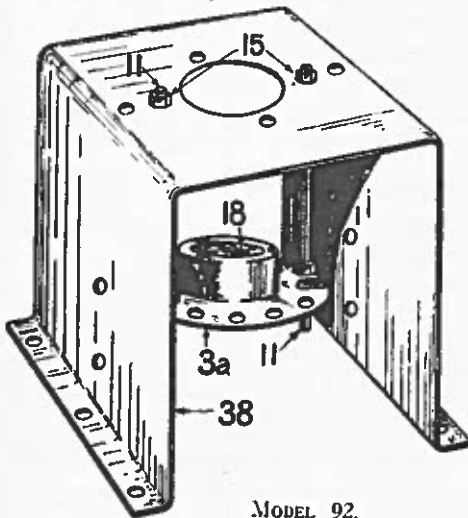
1 Ring Mount	(3) or (3a)
1 Plano-Convex Lens	(18)
1 Split Ring	(10)
2 lin. Screwed Bolts	(12)
8 Nuts	(14) or (15)
1 Glass Slide	(23)
1 Instrument Stand	(38)

This is intended for viewing small objects such as insects, crystals and flowers, or prepared slides. When viewing opaque

objects, place the instrument so that as much light as possible falls on the object and very little from below the Stand (dark ground illumination). If the object is transparent or semi-transparent, it may be viewed with bright ground illumination or illuminated from below. Bright ground illumination may be obtained by placing a Reflector (Model 93) below the Instrument Stand or standing the model on a sheet of white paper or card in a position where as much light as possible is reflected upwards. It will be found interesting to view crystals or small flowers by the two types of illumination.



MODEL 11.

MODEL 92.

MODEL 92.

Parts required as for Model 11, but 2 3in. Screwed Rods (11) instead of Screwed Bolts (12).

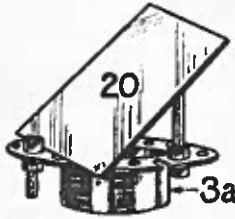
When viewing objects which are too large to pass in between the supporting Rods (11) in Model 11, the magnifier should be mounted in the Instrument Stand as shown. Note that the Lens is uppermost.

Adjustment for Focus, in both Models 11 and 12 is made on the Screwed Bolts or Rods.

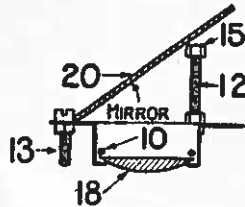
MODEL 93.—REFLECTOR.

Parts required :—

- | | |
|----------------------|--------------|
| 1 Ring Mount | (3) or (3a) |
| 2 1in. Screwed Bolts | (12) |
| 1 ½in. Screwed Bolt | (13) |
| 5 Nuts | (14) or (15) |
| 1 Square Mirror | (20) |



MODEL 93.



MODEL 94.

Adjustment of the angle of the Mirror (20) is obtained by raising or lowering the two Nuts (14 or 15) on which the Mirror (20) rests.

This model is useful as a reflector for Model 11.

Model 93A is as Model 93, but with the face of Mirror (20) reversed.

MODEL 94.—REFLECTOR (with lens).

Parts required :—

As for Model 4, and in addition :—

- | | |
|--------------|--------------|
| 1 Lens | (17) or (18) |
| 1 Split Ring | (10) |

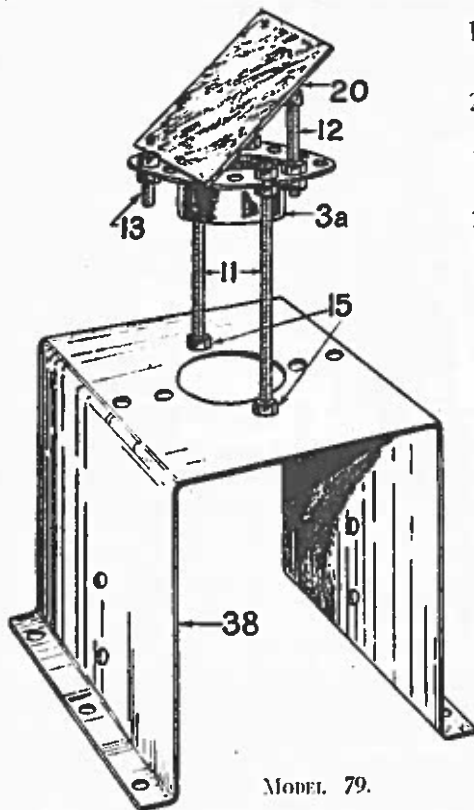
For Model 94 a Plano-Convex Lens (18) can be mounted as shown or with the convex (curved) side uppermost. Note that the Mirror (20) should make an angle of 45 deg. with the Ring Mount.

For Model 94A a Bi-convex Lens (17) is used instead of the Plano-Convex Lens (18) of Model 94.

MODEL 79.—REFLECTOSCOPE.

Parts required :—

- | | |
|--------------|--------------|
| 1 Ring Mount | (3) or (3a) |
| 1 Split Ring | (10) |
| 1 Lens | (17) or (18) |
| 1 Mirror | (20) |



MODEL 79.

Parts required

(continued) :—

- 2 1in. Screwed Bolts (12)
- 1 $\frac{3}{4}$ in. Screwed Bolt (13)
- 2 Screwed Rods (11)
- 13 Nuts (14) or (15)
- 1 Instrument Stand (38)

The Ring Mount (3 or 3a) should be fixed at a suitable height above the Instrument Stand (38) so that the object viewed is in focus.

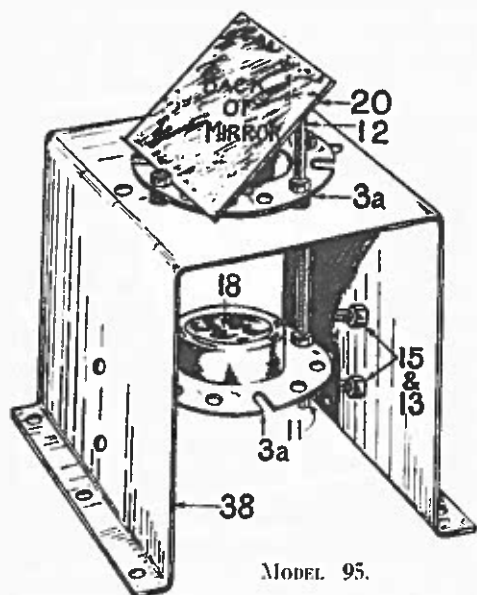
This instrument is a "peep-show" for viewing small pictures, and can be used as a "Movie scope" for cinematograph films, which are passed beneath the lens.

MODEL 95.—CAMERA LUCIDA.

Parts required :—

- 2 Ring Mounts (3) or (3a)
- 1 Split Ring (10)
- 1 Lens (17) or (18)
- 1 Square Mirror (20)
- 2 1in. Screwed Bolts (12)
- 3 $\frac{3}{4}$ in. Screwed Bolts (13)
- 2 Screwed Rods (11)
- 15 Nuts (14) or (15)
- 1 Instrument Stand (38)

Stand the Model on a sheet of white paper, with the Mirror facing towards the light and the inside of the Instrument Stand shielded from the light. Now hold a lighted candle in front



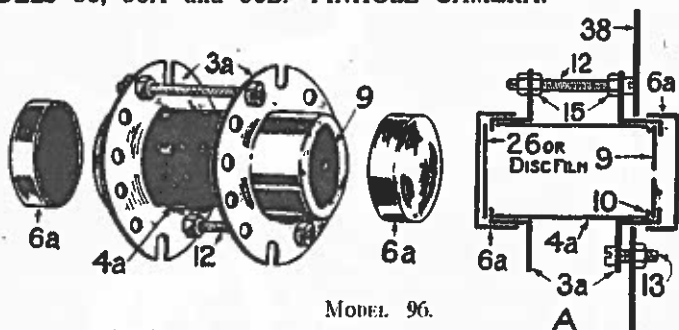
MODEL 95.

of the mirror, varying the distance until a clear image is reflected on the white paper. A clear image may also be obtained by varying the height of the Ring Mount carrying the Lens in the Instrument Stand. Well illuminated objects, placed at a suitable distance from the mirror, will be reflected on the paper and can be traced or photographed.

For some distances of object the Lens (17 or 18) may be mounted in the upper Ring Mount

and in this case the lower Ring Mount need not be used.

MODELS 96, 96A and 96B.—PINHOLE CAMERA.

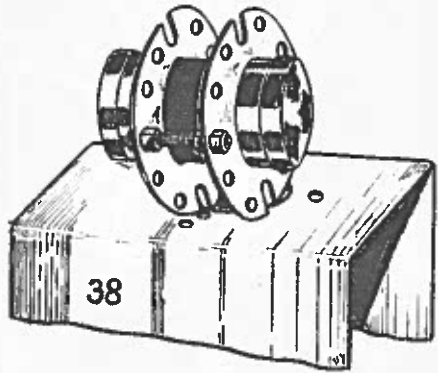


MODEL 96.

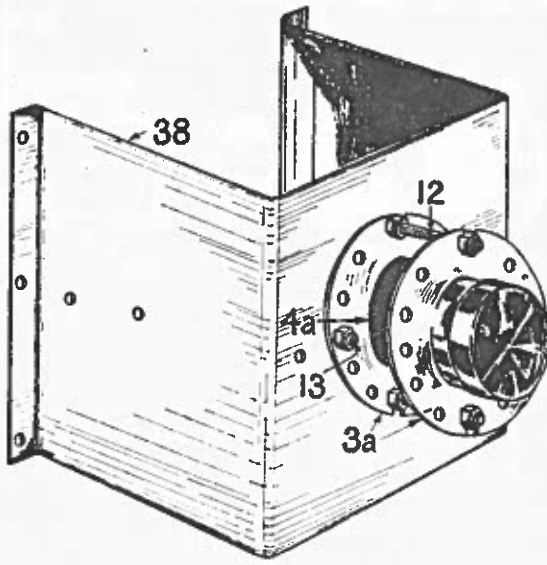
Parts required:—

- | | | |
|---|--------------------|--------------|
| 2 | Ring Mounts | (3) or (3a) |
| 2 | Camera Caps | (6) or (6a) |
| 1 | Pinhole Disc | (9) |
| 1 | Frosted Disc | (26) |
| 1 | Optical Tube | (4a) |
| 2 | 1in. Screwed Bolts | (12) |
| 6 | Nuts | (14) or (15) |
| 1 | Split Ring | (10) |

In assembling the Camera (shown diagrammatically at A) care should be taken that the Optical Tube is firmly held between the Ring Mounts, which must be parallel (see Fig. 5, A, B, and C). When taking photographs, it is necessary to support the Camera so that no movement takes place during the exposure. This may be done by resting the model on the Instrument Stand (38), as shown in Model 96A. Note that the two slots in the Ring Mount (3 or 3a) rest in the large hole of the Stand. The Camera may also be mounted on the Stand as shown in Model 96B. To take a trial photograph, remove the Camera Caps and point the pinhole to a good source of light. Hold the frosted disc over the free end and adjust the distance between the pinhole and the object until the image on the Frosted Disc is of suitable size.



MODEL 96A.



MODEL 96B.

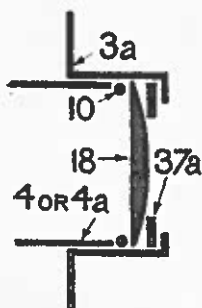
MODEL 97.—LENS POCKET CAMERA.

Parts required :—

As for Model 96; in addition :—

- 1 Plano-Convex Lens (18) instead of Pinhole Disc (9);
- 1 Stop (37a).

This model is constructed exactly as Model 96, the Lens (18) and the Stop (37a) being used in place of the Pinhole Disc (9). Mountings for this model are the same as for Model 96. See Models 96A and 96B.

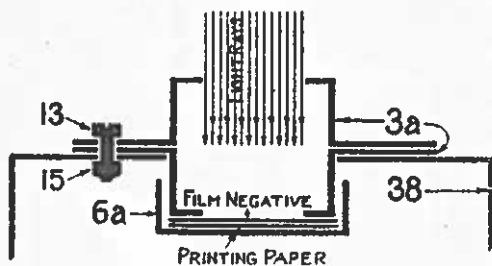


MODEL 97.

MODEL 98.—PHOTO PRINTER.

Parts required :—

- | | |
|-------------------------|--------------|
| 2 Ring Mounts | (3) or (3a) |
| 2 Camera Caps | (6) or (6a) |
| 1 Instrument Stand | (38) |
| 2 1/2 in. Screwed Bolts | (13) |
| 2 Nuts | (14) or (15) |



MODEL 98.

The Photo Printer is for obtaining positives from a negative taken with either the Pinhole or Pocket Lens Camera, Models 96 and 97.

Put a Disc of Photographic Printing Paper with

the sensitive side uppermost, in the lower Cap (6 or 6a), and place the Disc Negative over this, and replace the loaded Cap on the Ring Mount (3 or 3a). All is now ready for printing. Remove the upper Cap and place the model immediately below an electric lamp. The time taken to obtain a satisfactory print will depend upon the brightness of the lamp and the distance between it and the model, a little practice will soon give you the correct length of time for exposure. After exposure, the top Cap should be replaced, and the Model taken to a dark room, where the print may safely be removed and finished by developing and fixing in the ordinary way.

MODEL 99.—PHOTO COPIER.

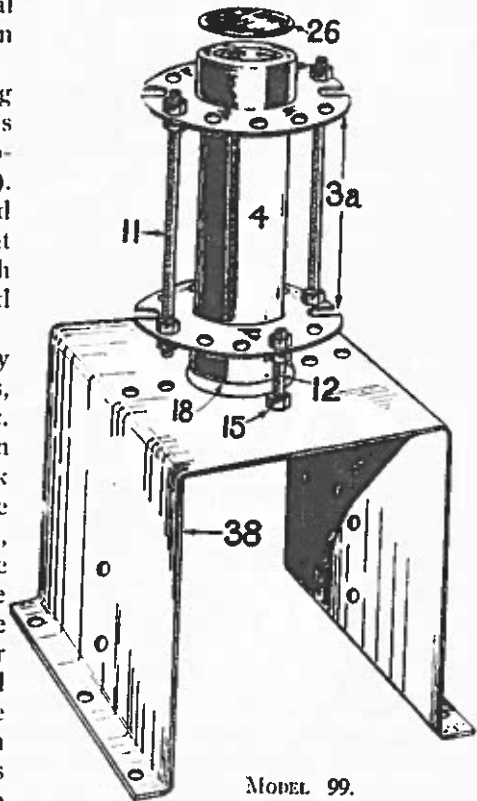
Parts required :—

2	Ring Mounts	(3) or (3a)
1	Plano-Convex Lens	(18)
1	Split Ring	(10)
2	Camera Caps	(6) or (6a)
1	Frosted Disc	(26)
1	Optical Tube	(4)
2	3in. Screwed Rods	(11)
2	1in. Screwed Bolts	(12)
14	Nuts	(14) or (15)
1	Instrument Stand	(38)
	Sheet of Black Paper	

Assemble the Optical Tube (4) as shown in Fig. 5 A, B, C.

The Lower Ring Mount (3 or 3a) is fitted with the Plano-Convex Lens (18). Mount the completed unit on the Instrument Stand (38) with Screwed Bolts (12) and Nuts (14 or 15).

This Model will copy small pictures, coins, stamps, diagrams, etc. Place the Model on black paper or a dark baseboard, with the object to be copied, immediately below the Lens, and resting on the black paper. Cover the upper Ring Mount (3 or 3a) with the Frosted Disc (26) and place the Model in a position where as much light as possible falls on the



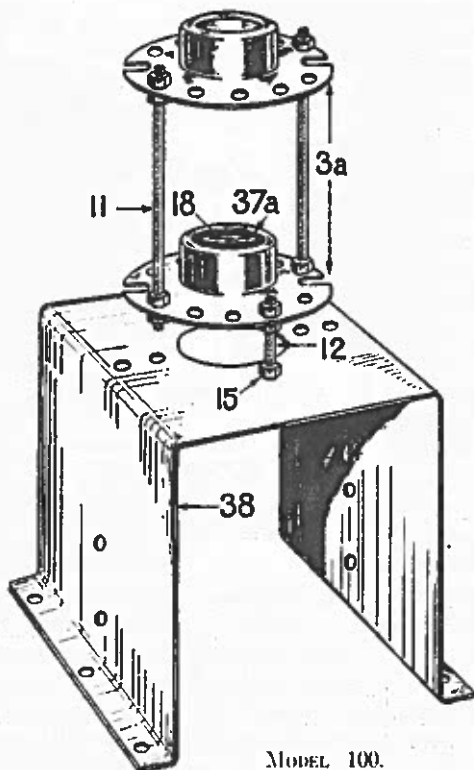
MODEL 99.

object. An image of the object will then be seen on the Frosted Disc. The Nuts (15) on Screwed Bolts (12) should be adjusted

until a sharp image is obtained. Now place a Camera Cap (6 or 6a) on the lower Ring Mount and remove the Frosted Disc (26). Take the Model into a dark room, and place a Disc Film or Disc of Photographic Printing Paper over the upper Ring Mount and cover with a Camera Cap. Replace the Model over the object and expose for a suitable length of time. After exposure, develop and fix as usual.

Model 99 may be used to project small magic lantern slides, cinematograph pictures (cut out and sandwiched between two Glass Slides (23) encircled by Rubber Bands (37), prepared

slides of crystals, insect parts, etc. The Photo Copier (without Camera Cap) is placed on white paper immediately below an electric lamp. The Slide is placed on the upper Ring Mount with the object over the hole in the Mount. An image of the object will be projected on to the white paper and may be sketched or photographed.



MODEL 100.

MODEL 100.—

PROJECTOR.

Model 99 may be slightly modified as shown in Model 100, in which the Optical Tube (4) is omitted and the lower Ring Mount is reversed. This Model is not quite so suitable for photography.

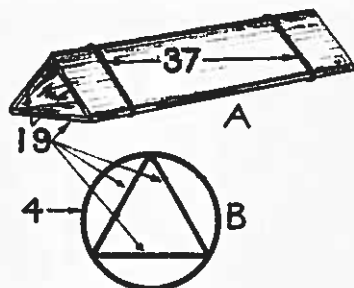
MODELS 61 and 62.—HAND KALEIDOSCOPE.

Parts required:—

- | | |
|-----------------|-------------|
| 2 Ring Mounts | (3) or (3a) |
| 2 Split Rings | (10) |
| 1 Optical Tube | (4) |
| 3 Strip Mirrors | (19) |

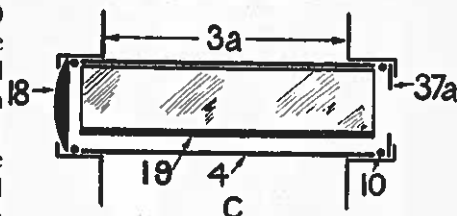
2 Rubber Bands	(37)
1 Lens	(17) or (18)
2 3in. Screwed Rods	(11)
8 Hexagonal Nuts	(15)

Take the Strip Mirrors (19) and place them in the form of a triangle and secure with Rubber Bands (37) as shown at "A." Note that the Mirror surfaces should all face inwards. Insert the triangle of Mirrors in the Optical Tube (4) as at "B." Fix the Lens Stop (37a) in one of the Ring Mounts (3a) with a Split Ring (10) (this is the eye piece). Mount the Optical Tube (4); complete with Mirrors; between the two Ring Mounts as described and illustrated in Fig. 5, A, B, C.



MODEL 61.

The Model can be converted into a magnifying instrument (Model 62) by fixing a Lens (17) or (18) in the opposite end to the Stop; the completed Model is diagrammatically shown at "C."



MODEL 62.

The Hand Kaleidoscope may be used to view all manner of small objects either black and white or coloured. Place the objects where they are well illuminated from above and look at them through the Kaleidoscope. Move either the objects or the Kaleidoscope or revolve the Optical Tube and observe the effects obtained. Suitable objects for examination are—black threads on a white background or white or coloured threads on a black background, match sticks, wire, wool, sweet wrappings, tinsel, coloured inks on blotting-paper, etc.

MODEL 101.—STAND KALEIDOSCOPE FOR TRANSPARENT OBJECTS.

This is Model 102 without the Cardboard Disc and Mount.

Parts required:—As for Model 62. in addition—

2 1in. Screwed Bolts	(12)
6 Hexagonal Nuts	(15)
1 Instrument Stand	(38)

Mount the Hand Kaleidoscope (Model 62) on the Instrument Stand (38) as shown.

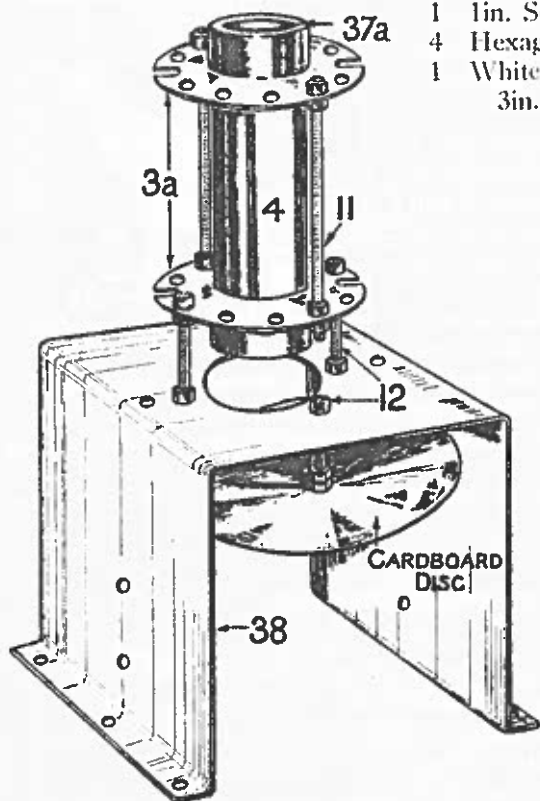
Stand the instrument on a well illuminated white card and place the object to be viewed over the hole in the top of the Stand. Slides containing coloured cellophane clippings, pieces of cinematograph film, etc., can be mounted between Glass Slides (23), as shown in Fig. 6; and placed on the Instrument Stand.

MODEL 102.—STAND KALEIDOSCOPE FOR OPAQUE OBJECTS.

Parts required:—

As for Model 101—in addition:—

- | | | |
|---|----------------------|------------|
| 1 | 1in. Screwed Bolt | (12) |
| 4 | Hexagonal Nuts | (15) |
| 1 | White Cardboard Disc | 3in. diam. |



MODEL 102.

Mount the Cardboard Disc as shown. See that the two Nuts (15) on the top of the Disc are locked together to prevent them screwing up when turning the Disc.

Adjustment for focus can be made on the two Screwed Bolts (12), securing the Kaleidoscope to the Stand, and also on that on which the Disc is mounted. Place the objects to be viewed on the Disc and revolve the Disc.

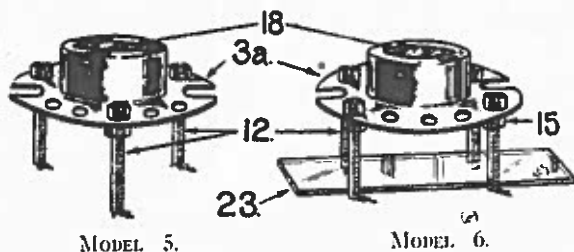
Instruments and Apparatus to Make.

The following pieces of apparatus and instruments may be constructed with the "Construments" "10" Outfit.

MODELS 5 and 6.—LOW POWER MAGNIFIER.

Parts required:—

1 Ring Mount	(3) or (3a)
1 Plano-Convex Lens	(18)
1 Split Ring	(10)
3 1in. Screwed Bolts	(12)
3 Nuts	(14) or (15)



MODEL 5.

MODEL 6.

Model 5 is extremely useful for the examination of detail, where a high magnification is not required, in objects such as postage stamps, crests, coins, maps, pictures, finger-prints, etc. By the addition of another Screwed Bolt (12) and Nut (15); the four bolts to be spaced round the Mount as in Model 6; it is possible to pass Glass Slides (23) between the legs of the Stand.

MODEL 11.—LOW POWER MAGNIFIER (Stand Type).

Parts required:—

1 Ring Mount	(3) or (3a)
1 Plano-Convex Lens	(18)
1 Split Ring	(10)
2 1in. Screwed Bolts	(12)
8 Nuts	(14) or (15)
1 Glass Slide	(23)
1 Instrument Stand	(38)

This is intended for viewing small objects such as insects, crystals and flowers, or prepared slides. When viewing opaque

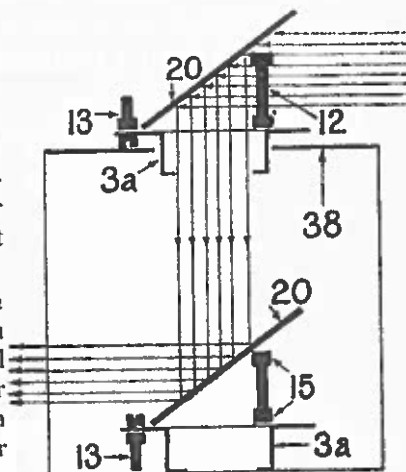
MODEL 103.—PERISCOPE.

Parts required:—

2	Ring Mounts	(3) or (3a)
4	1 in. Screwed Bolts	(12)
2	$\frac{1}{2}$ in. Screwed Bolts	(13)
10	Nuts	(14) or (15)
2	Square Mirrors	(20)
1	Instrument Stand	(38)

This Model is composed of the Mirror Stands (Models 93 and 93A) and Instrument Stand (38). One Mirror Stand (Model 93A) rests in the large hole of the Instrument Stand, and the other (Model 93) is placed below it as shown.

Stand the Periscope on a table; objects on the table in front of the lower Mirror will be seen in the upper one, or objects above the table in front of the upper Mirror will be seen in the lower one. You can arrange the Peri-



MODEL 103.

scope so that you can watch what your friend is doing outside a window without being seen by him.

Try the effect of revolving the upper Mirror whilst looking into it.

Use the Periscope to read the cards in a pack held behind and above the head.

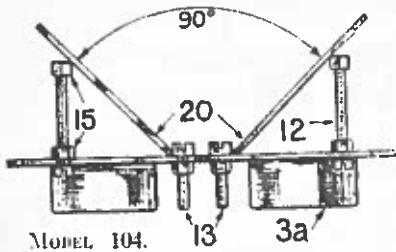
MODELS 104 and 105.—CRAZY MIRRORS.

Parts required:—

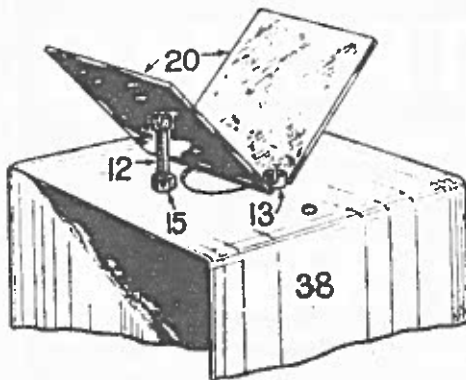
As for Model 93 (but two of these). In addition:—

2	1 in. Screwed Bolts	(12)
2	$\frac{1}{2}$ in. Screwed Bolts	(13)
6	Nuts	(14) or (15)
1	Instrument Stand	(38)

Arrange two Reflectors (Model 93) as shown in Model 104. An alternative arrangement is Model 105.



MODEL 104.



MODEL 105.

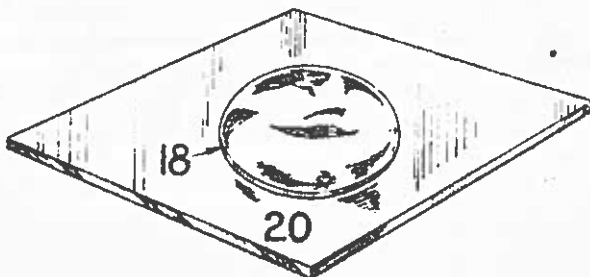
Look downwards into the Mirrors so that half of the face is seen in each. Move the Mirrors until the image of the nose is not distorted. Now close one eye, the "other eye" appears to close in the Mirrors. Place a printed card with the print facing one of the Mirrors, the print can be read in the other Mirror. Many other experiments may be carried out.

**MODEL 106.—
OPHTHALMOSCOPE.**

Take a Square Mirror (20) and place a Plano - Convex Lens (18) with the flat side on the Mirror; the Lens

may be lightly stuck on if desired, with a little Canada Balsam.

Stand in a position where a strong light enters the eye, and hold the Ophthalmoscope close up. A highly magnified eye image will be seen, as well as some of the internal structure.



MODEL 106.

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