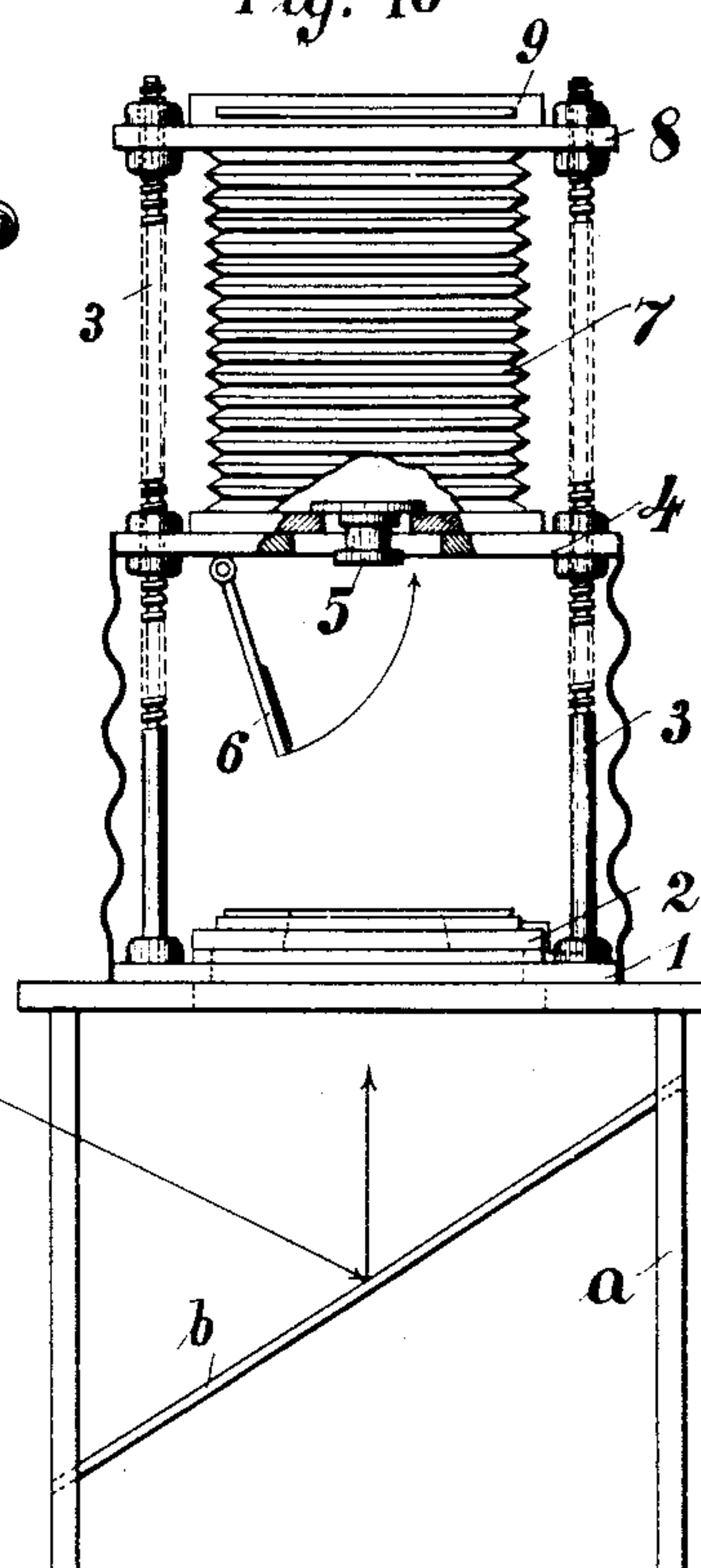
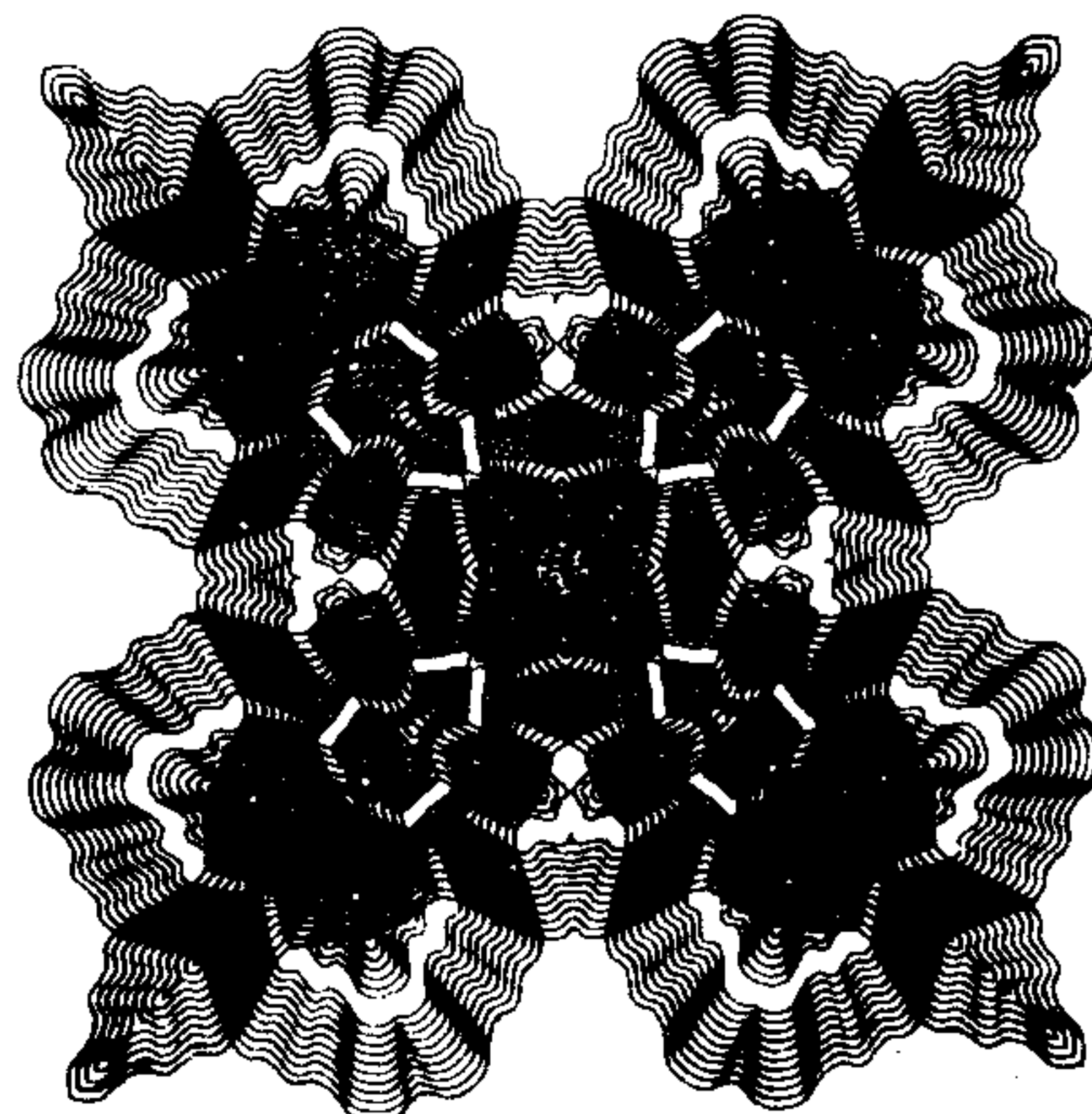
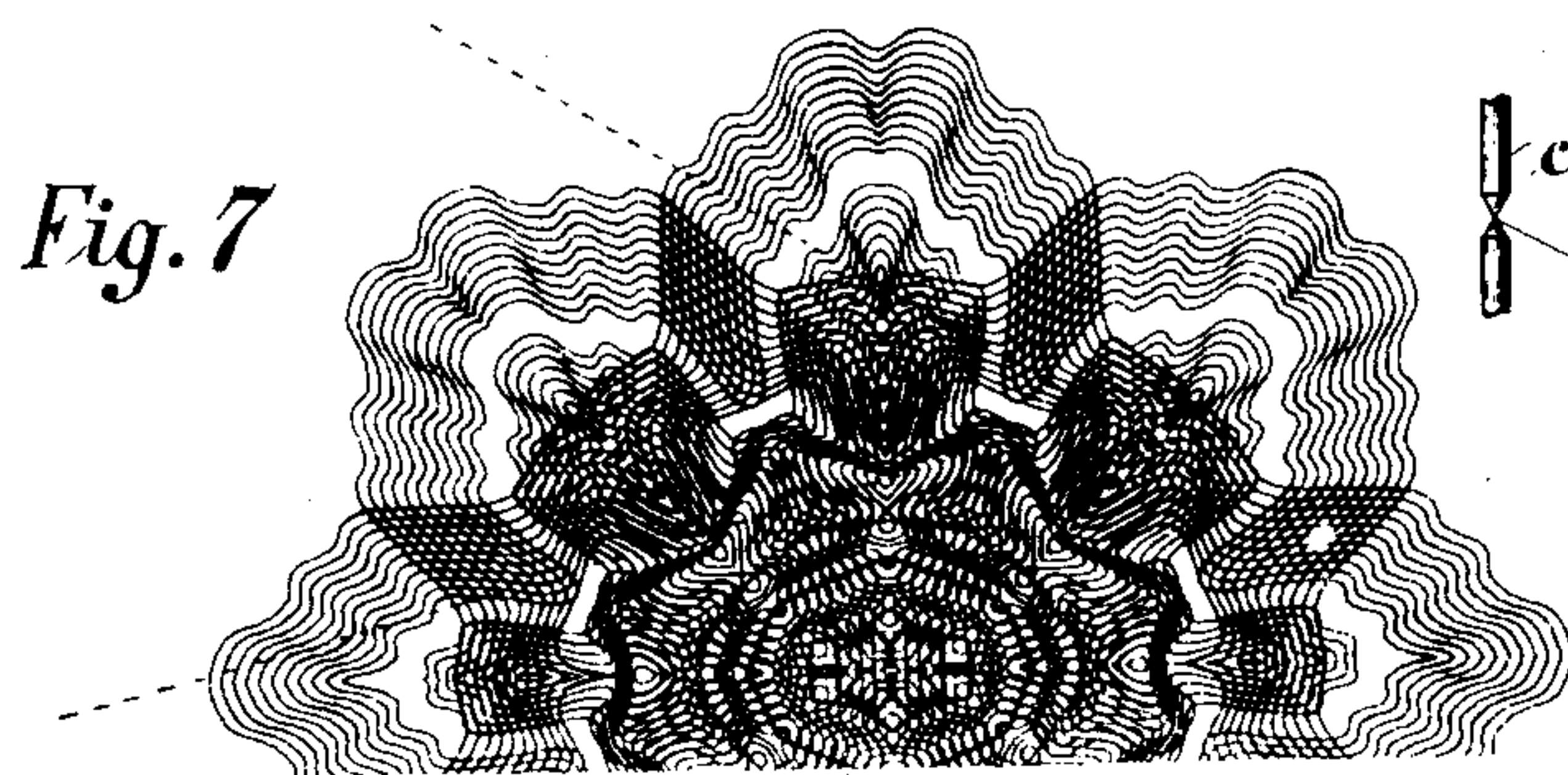
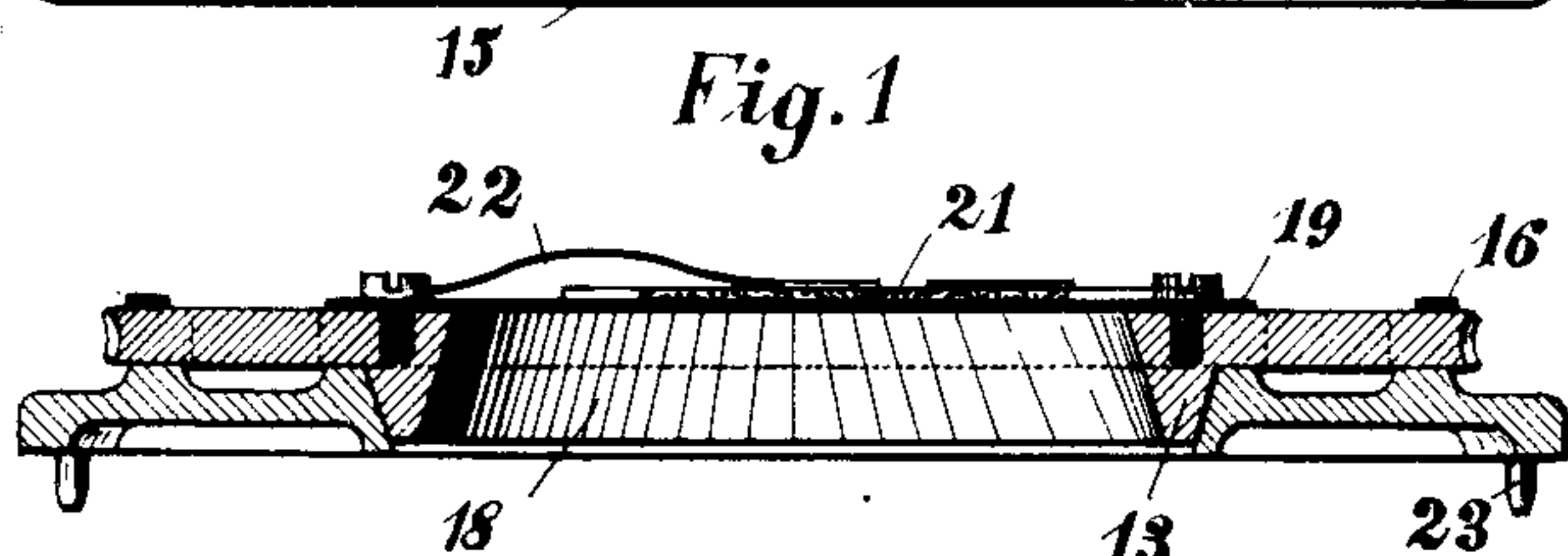
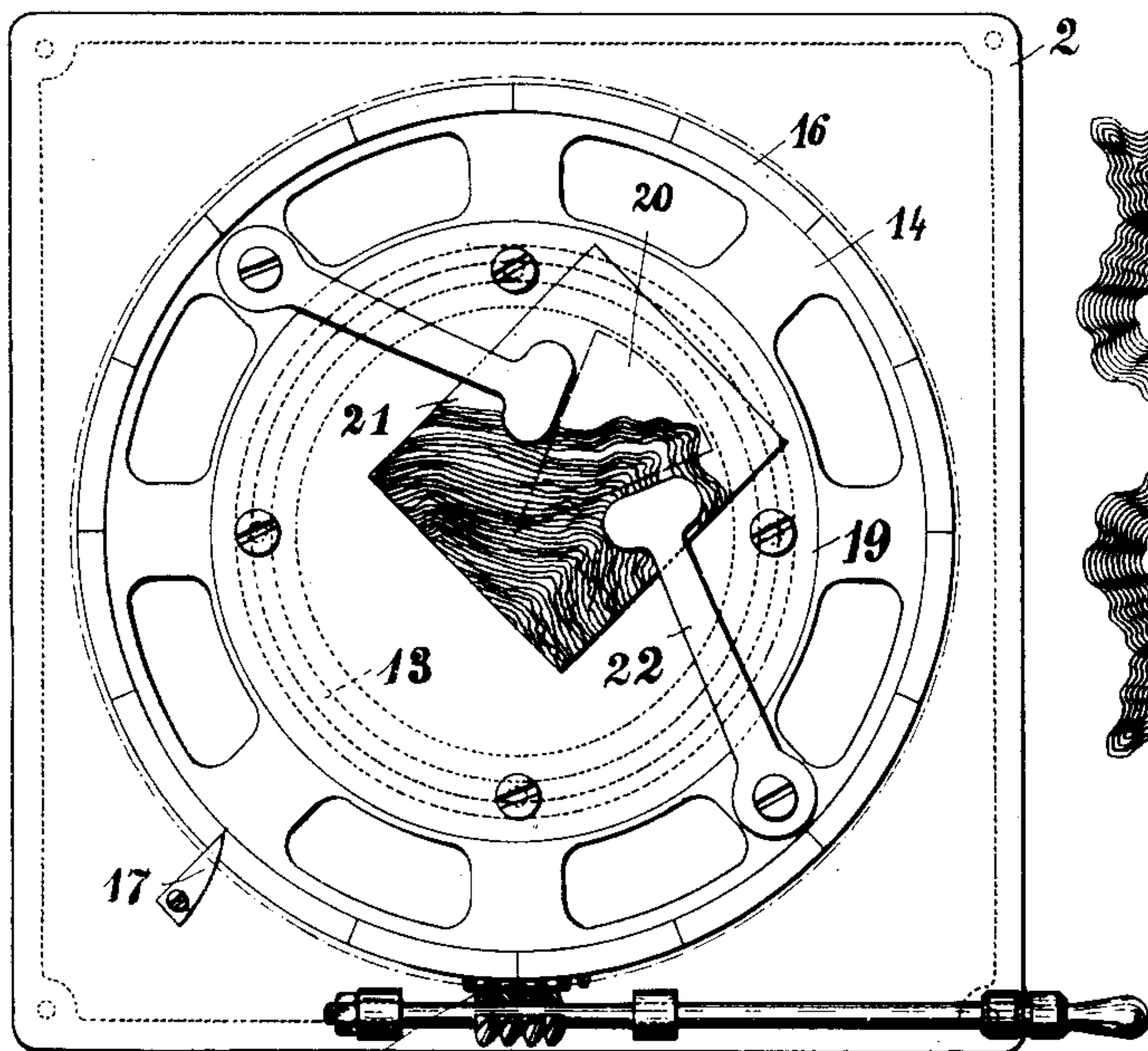


E. BACHMANN.

APPARATUS FOR THE PRODUCTION OF PICTURES, PATTERNS, AND THE LIKE
BY PHOTOGRAPHIC METHOD.

APPLICATION FILED MAR. 22, 1906.

2 SHEETS—SHEET 1.



WITNESSES

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No. 870,863.

PATENTED NOV. 12, 1907.

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2 SHEETS—SHEET 2.

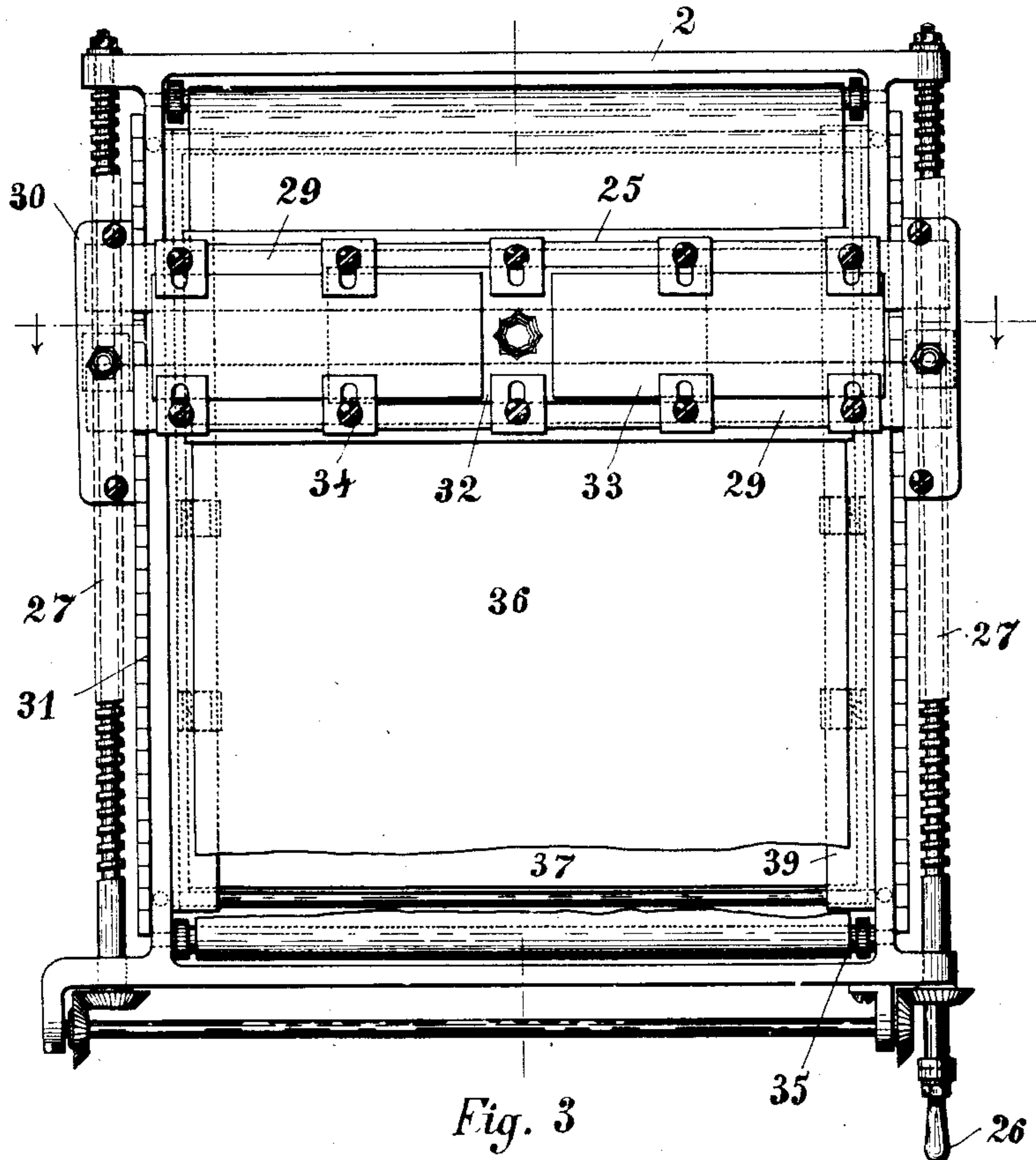


Fig. 3

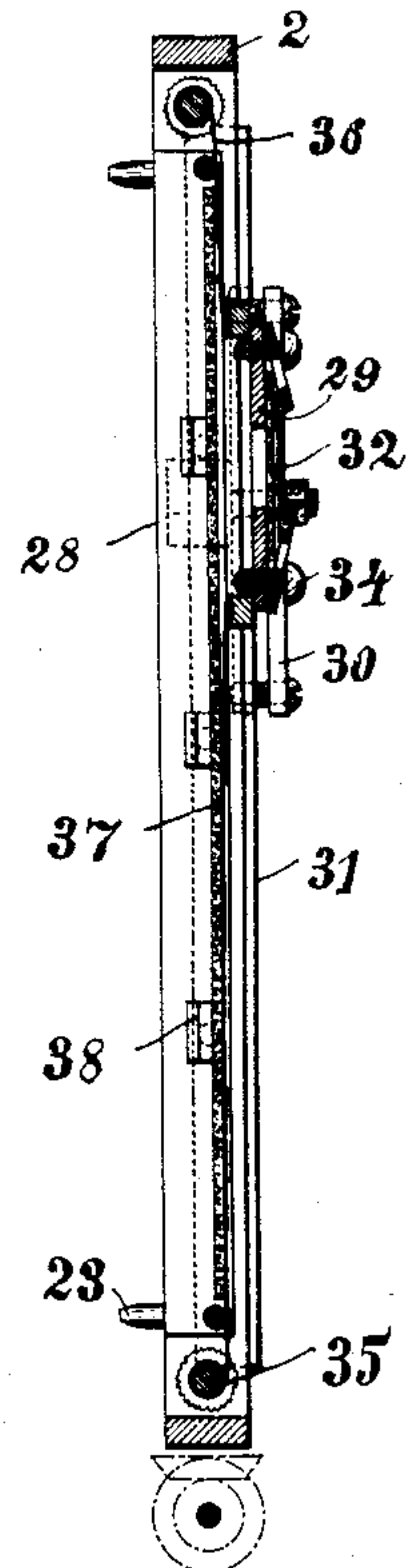


Fig. 5

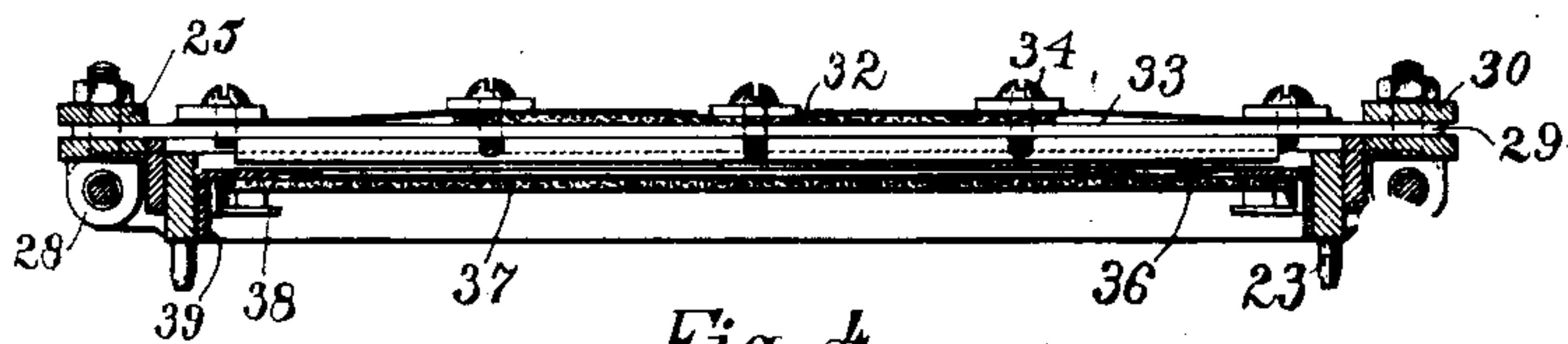


Fig. 4

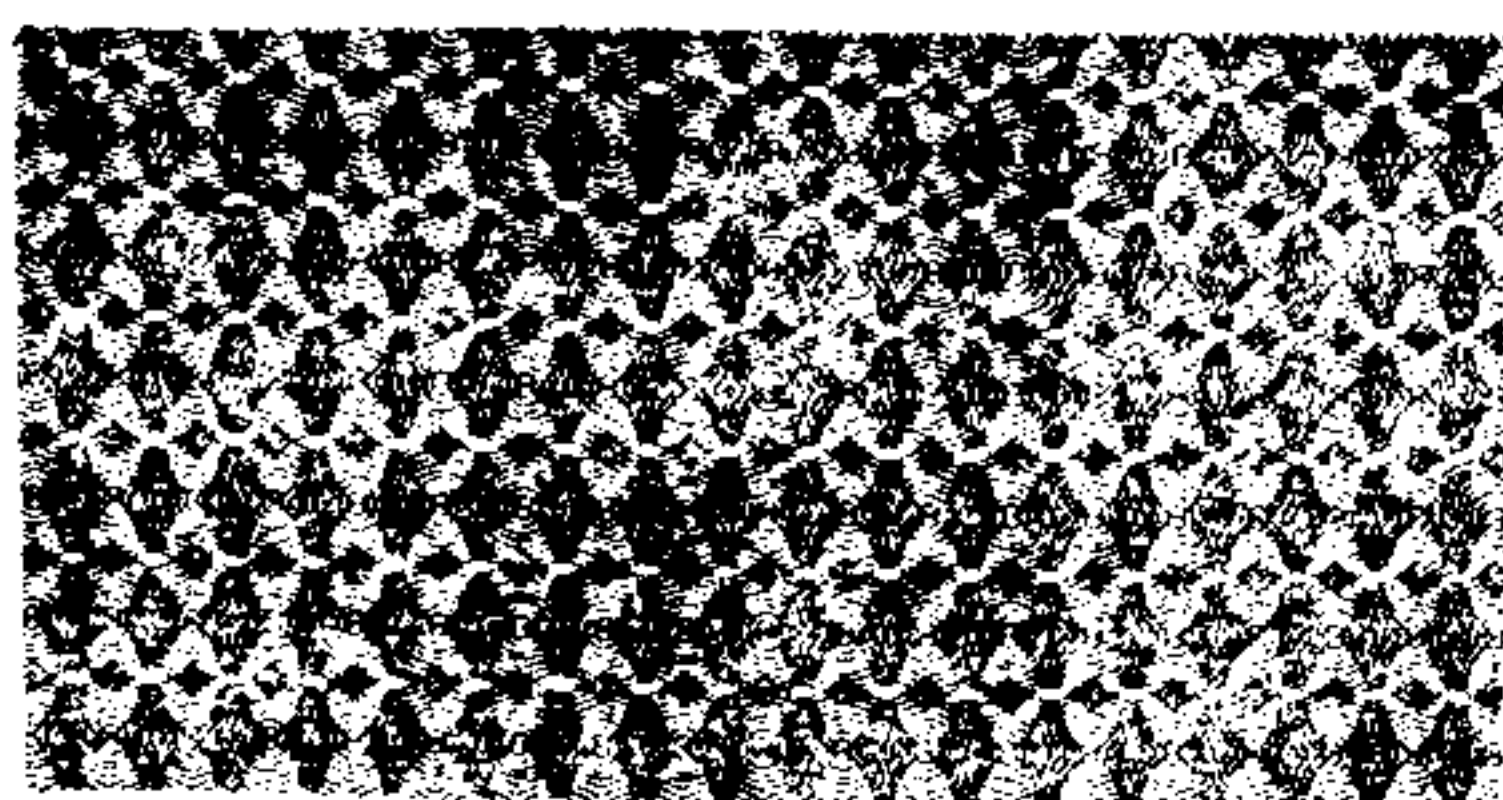


Fig. 9

WITNESSES
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ATTY

UNITED STATES PATENT OFFICE.

EDUARD BACHMANN, OF SEEBACH, NEAR ZURICH, SWITZERLAND, ASSIGNOR TO NEUGRAPHIC A. G., OF OERLIKON, NEAR ZURICH, SWITZERLAND.

APPARATUS FOR THE PRODUCTION OF PICTURES, PATTERNS, AND THE LIKE BY PHOTOGRAPHIC METHOD.

No. 870,863.

Specification of Letters Patent.

Patented Nov. 12, 1907.

Application filed March 22, 1906. Serial No. 307,402.

To all whom it may concern:

Be it known that I, EDUARD BACHMANN, a citizen of the Republic of Switzerland, residing in Seebach, near Zurich, in the Canton of Zurich, Republic of Switzerland, (whose post-office address is Seebach, near Zurich,) have invented a new and useful Apparatus for the Production of Pictures, Patterns, and the Like by Photographical Method; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters of reference marked thereon, which form a part of this specification.

I have applied for patent in Switzerland on March 28th 1905, Patent No. 31759; and in Germany on January 9th 1906, application No. 8199.

This invention relates to an apparatus for the production of pictures, patterns and the like by photographical method which pictures show a similar regularity in reproducing a ground figure as that of the ordinary kaleidoscope.

This apparatus permits of forming an endless number of pictures different from each other but all of the same plan or ground figure and is therefore very suitable for preparing patterns for embroidery, for the engraving of checks and the like.

One form of construction of the present invention is shown in the accompanying drawings and two forms of a part of the same with patterns that have been prepared thereby.

Figures 1 and 2 show a ground plan and a middle sectional elevation respectively of one form of such part. Figs. 3, 4 and 5, plan, longitudinal section, and cross section respectively of the other form. Fig. 6 is a view of the whole apparatus in partial section. Figs. 7, 8, 9 and 10 are patterns prepared by the apparatus.

The base plate 1 rests on a frame *a*, which carries a reflecting surface *b* sloped towards a source of light *c*. The ground plate 1 has an opening and receives a frame 2 which carries the ground figure serving as base for the production of various figures. A plate 4, is carried by four columns, 3, fitted to the base plate 1. An objective 5, directed downwards is arranged in the middle of the plate, 4, and can be covered over by a flap, 6. A photographic camera, 7, is arranged above the objective and has a back, 9, resting on a plate, 8. The plates 4 and 8 may be moved relatively to each other along the columns, 3.

According to Figs. 1 and 2, the frame, 2, is provided with a conical shaped aperture in which a rim, 13, arranged on a disk, 14, fits. This serves as a guide for the disk, 14, when turning the same; the turning of the disk being effected by worm gear, 15. In order to have an exact measure for this turning, the disk, 14, has a scale provided on a ring, 16, over which a pointer,

17, fastened on the frame, 2, projects. The central opening, 18, of the plate, 14, is for the most part covered over by a disk or mask, 19, firmly screwed to the plate, 14. The disk or mask, 19, has a recess or opening, 20, with a central angle of 45° while the scale, 16, shows sixteen equal divisions. The opening, 20, is covered over by a photographic negative, 21, which carries the ground figure and is held to its support by clamps, 22. Four pins, 23, serve for fixing the frame, 2, to the base plate, 1.

With the arrangement shown in Figs. 1 and 2, the photographic negative, 21, on which a ground figure of any kind has been applied by hand, by means of a relief copying apparatus or a Rose-engine or the like, is laid on the mask, 19, so that that part of the ground figure which has to be utilized for the production of the pattern is situated above the opening, 20, and is then fastened in the manner described. Then the whole arrangement is placed on the base plate, 1, and is sealed from above against the light in the manner shown in Fig. 6; while the light coming from the source of light, *c*, can enter through the above-mentioned opening of said plate. The part of the ground figure situated above the slot, 20, is then photographed and afterwards the objective is covered over by the flap or cover, 6, and the disk, 14, turned through a certain angle. In the present case this is taken corresponding to the central angle of the slot, 20, viz., 45°. The corresponding part of the ground figure is now again photographed so that in addition to the picture already existing on the plate in the back, 9, the same picture is directly photographed beside it. In this manner eight pictures are formed consecutively on this plate. As these, however, taken together do not in this special case form any figure complete in itself, they are formed on a second plate in a similar manner. Both the plates are then developed and so placed with their picture sides together, that the part pictures of the one plate fit as mirror picture to those of the other plate and so form a rosette shaped figure and then both the plates are again photographed together. The pattern shown in part in Fig. 7 is an example prepared in this manner. Instead of two ground figures of the same kind, two ground figures of different kinds prepared in this manner may be combined to form a picture.

The meaning of the expression "mirror picture" (reflected image) will be understood at once, if, for instance, along the lower radius of slit 20 (Fig. 1) a flat mirror is erected perpendicularly to the picture surface. In the same manner as the picture appearing in the mirror will join the bounded part of the ground figure of the negative, the single pictures of the one photographic plate are joined to those of the other photographic plate and then the plates are photographed together as described. An endless number of various patterns may be formed from one and the same ground

figure, according as one or other part of the same is placed over the slot, 20, and according as this slot or its central angle is larger or smaller. According to the displacement the partial figures may be more or less interwoven or may be arranged at definite distance from each other. For example, each second part of the scale may be skipped over when exposing. From the first pattern produced from the ground figure, according to the same process, the most numerous variations can be obtained, as is shown by holding any desired part of Fig. 7 between two flat mirrors standing vertical to the plane of the picture and arranged at an angle to each other, for instance, if two flat mirrors are placed on the dotted lines on Fig. 7 and held perpendicularly to the drawing, a figure like that shown in Fig. 10 will appear in the mirrors, which figure is obtained on the photographic plate by photographing in the manner described the part of the ground figure which is bounded by the dotted line. Besides, however, pictures obtained in this manner, as has already been referred to, others may be obtained by interweaving the same. In order to obtain a completely uniform picture, the above mentioned angle, which is represented by the amount of the displacement must naturally be a perfect fractional part of 360° but within these limits may be as large as desired. The scale 16, might also be otherwise divided up. Of course the slot 20 may be of any suitable size. Either a separate mask, 19, may be used for each slot, 20, or several slots may be arranged in the same mask. Further the construction may be such that for the purpose of producing a figure as shown in Figs. 7 and 8, after the first round the mask, together with the plate, can turn and then can be so adjusted by repeating the same process that each new part figure is superimposed on the figure already formed on the plate by the first exposure. This was done in the first process described by combining together the two part figures on the two separate plates. Furthermore, by dispensing with the mask, 19, the slot, 20, can be arranged direct on the disk, 14, or the ground figure may be arranged in the mask, 19, itself without any special slot, 20. This ground figure can be transferred in the form of unconnected tracings or holes passing through the whole mask. Naturally the means for displacing the mask as well as the form of the latter may vary from that described.

According to Figs., 3, 4 and 5 the frame, 2, has a carriage or slide, 25, which can be moved forwards or backwards by means of crank, 26, and screw spindles, 27, on which nuts, 28, work or turn. The slide, 25, has two flat rails, 29, situated across the frame, 2, said rails being parallel to each other and are firmly clamped at both ends between the small plates, 30, carrying the nuts, 28, and can be moved as desired towards each other in the direction of movement of the slide, 25. A scale, 31, is arranged on both sides of the frame, 2, in order to be able to exactly measure the displacement of the slide, 25. On the rails is situated the photographic negative, 32, carrying the ground figure, above which photographic negative two opaque strips, 33, are placed and like the negative, 32, are firmly held to the rails, 29, by the screws, 34. Under each of the rails, 29, is situated one end of each of two opaque covers, 36, the other ends of which are situated on a spindle, 35, arranged in the frame, 2. These covers can as desired be moved with the slide, 25, or moved alone or wound

up and down. A glass plate, 37, serves as support for them, which glass plate is held by angles, 38, on angle iron, 39, situated along the side walls of the frame, 2. Pins or studs, 23, serve for fixing the frame, 2, on the base plate 1.

With the arrangement shown in Figs. 3, 4 and 5, the patterns may be produced for example in the following manner, the principle of which will be understood by observing a figure between two mirrors parallel to each other. The ground figure is successively drawn along under the objective and photographed. When one has thus prepared a strip of desired length on the photographic plate, the plate is developed and then tightened up in place of the plate, 32, so that this negative serves as ground figure. This strip is then photographed in a similar manner, so that finally a complete rectangle results (see Fig. 9). If the ground figure itself is of oblong shape, then the desired pattern can in certain cases be prepared in one course of the slide, 25. With this arrangement also the most varied figures or patterns may be produced, when for example, only a fractional part of the ground figure is photographed; or when moving along the same, even when the whole ground figure is exposed by an amount which is smaller than the extension of the same in the direction of the motion, as was done in producing the pattern shown in Fig. 9. It also serves for arranging various pictures or drawings on each other on the same plate, such for example as may be desired for producing a number of smaller negatives on one large plate for the purpose of reproduction in photolithography, autotypy and the like. There is also the great advantage of being able to expose pictures, which finally have to be arranged on the one and the same plate, for various periods corresponding to their various characters. In this method a fresh picture is inserted as ground figure each time the arrangement is moved.

The patterns produced with the device according to Figs. 1 and 2 may be further extended or vice-versa with the arrangement above described. Here also the individual parts may be modified in their arrangement and construction as desired.

The whole apparatus may be so constructed that it can be used horizontally and in certain cases, as for example when using a constant source of light, the exposure may be effected directly.

Quite irregular figures may be used as ground figures, as also various formations, such as flowers and parts of plants, according to the object one has in view. The transfer of the ground figure on the sensitive plate can also be made by contact, in which case the objective is not employed.

The pictures produced by this apparatus may be of quite another type than the ground figure, according to the various parts thereof, which may be photographed in any suitable arrangement. The pictures may be different from the ground figure in such a degree, that it will be impossible to get an idea of all the pictures which can be made of this ground figure by looking at said ground figure or to reconstruct the ground figure from such a picture.

What I claim is:

1. In an apparatus of the class described, the combination with a camera, of a movable support for a ground figure to be photographed, and means for moving such

support determined successive distances with relation to the camera to permit repeated, sharply adjoining, more or less interwoven or disconnected photographic impressions to be taken thereof upon a single sensitive surface.

5 2. An apparatus for the production of pictures comprising a support for a ground figure, means for photographing said figure, means for moving the support in relation to the photographic means so as to photograph said figure in various positions and a scale for determining the movement of the ground figure.

10 3. An apparatus for the production of pictures comprising a support for a ground figure, means for moving this support along a determined line, means for sharply bounding such part of the ground figure to be exposed to the action of the light and means for photographing said part so exposed upon different places of a single sensitive plate in any desired arrangement for the purpose to produce from a fractional, irregular and imperfect ground figure a great number of complete regular and manifold

26 pictures.

4. An apparatus for the production of pictures comprising means for taking a photographic reproduction of a ground figure or a part thereof upon a single sensitive plate, a frame provided with an aperture, and a disk

fitting in said aperture and adapted to rotate therein, said disk having a central opening partly covered by a mask, and partly by the ground figure held on the mask, substantially as described. 25

5. An apparatus for the production of pictures and the like, comprising a frame provided with an aperture, a disk provided with a rim fitting in said aperture, means for rotating the disk on the frame, a mask fixed on this disk and covering the greater part of the central opening of the disk, and means for holding the ground figure on this mask. 30 35

6. An apparatus for the production of pictures and the like, comprising a frame provided with an aperture, a disk having a rim adapted to rotate in this aperture, a mask fixed in this disk and having a circular sector, the radii of this sector serving to limit the part of the ground figure to be photographed. 40

In testimony whereof, I have signed my name to this specification in the presence of two subscribing witnesses.

EDUARD BACHMANN.

Witnesses:

WALTER SCHENCK,
HERMANN HUBER.