

No. 709,480.

Patented Sept. 23, 1902.

C. P. GOERZ.
FOLDING STEREOSCOPIC CAMERA.

(Application filed May 1, 1901.)

(No Model.)

4 Sheets—Sheet 1.

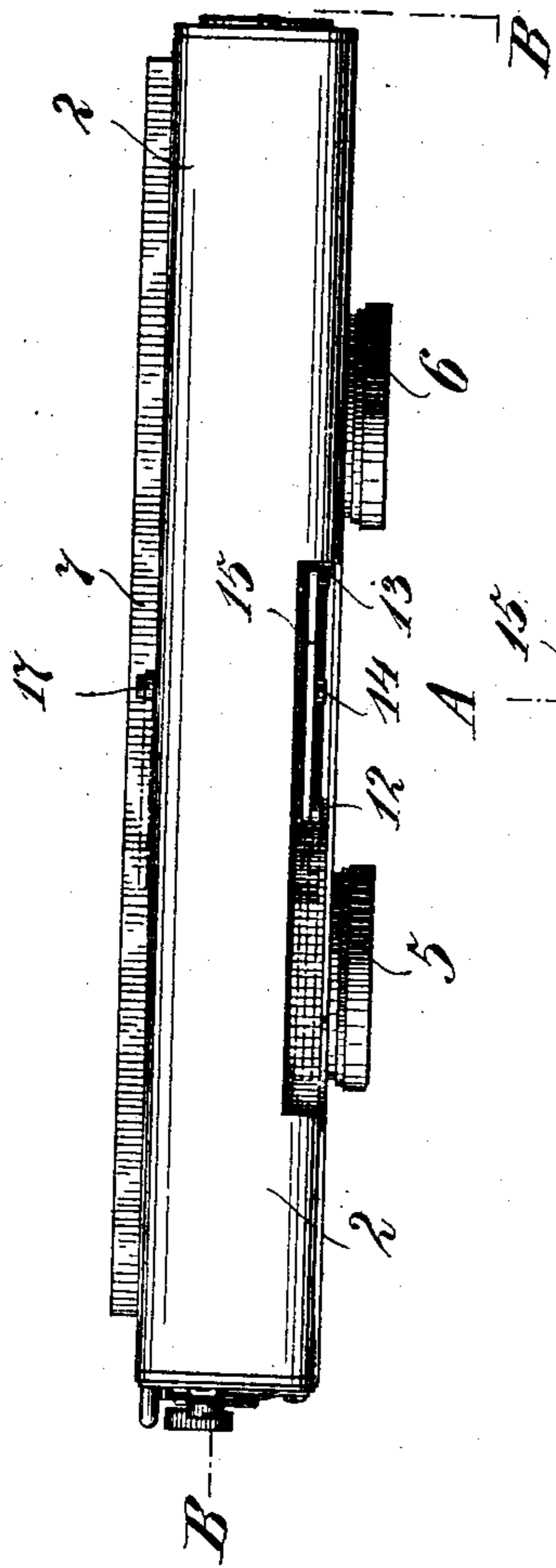


Fig. 1.

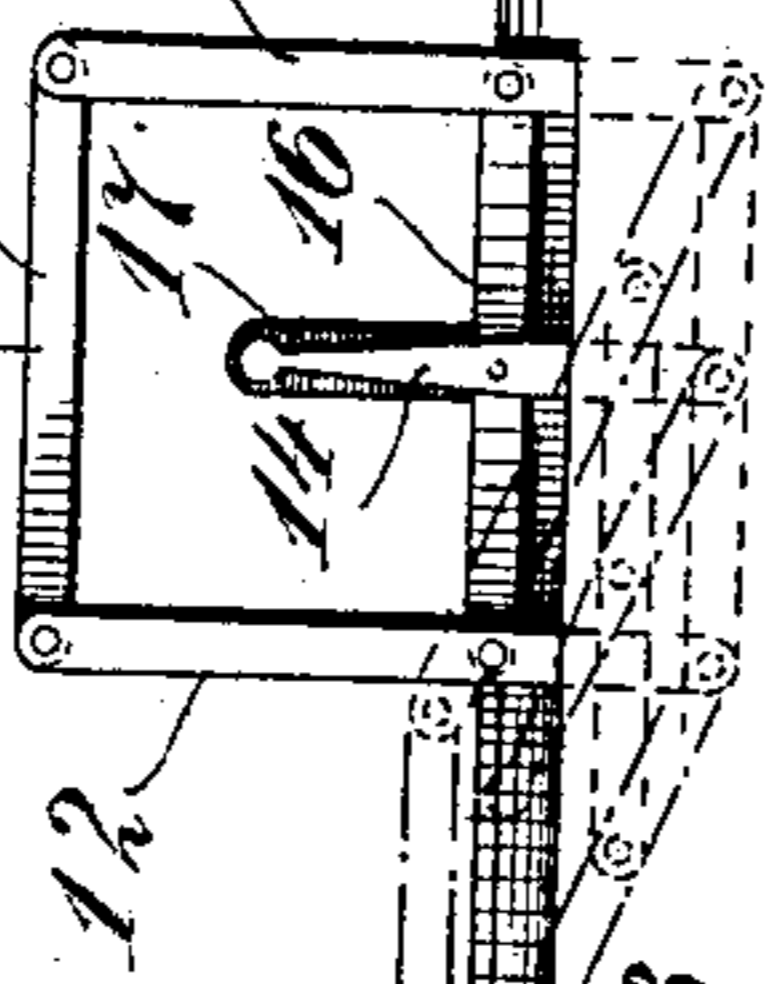
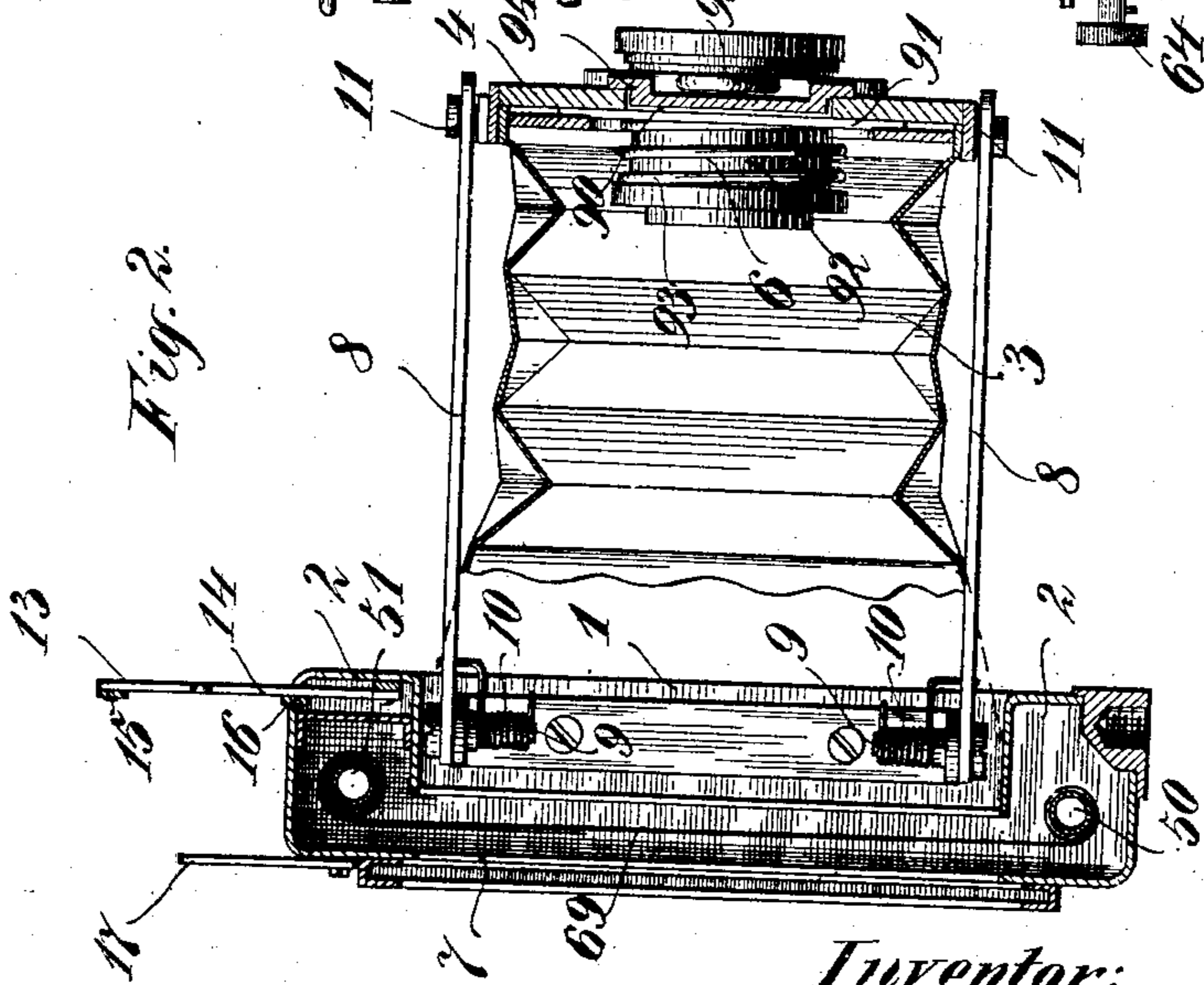


Fig. 2.



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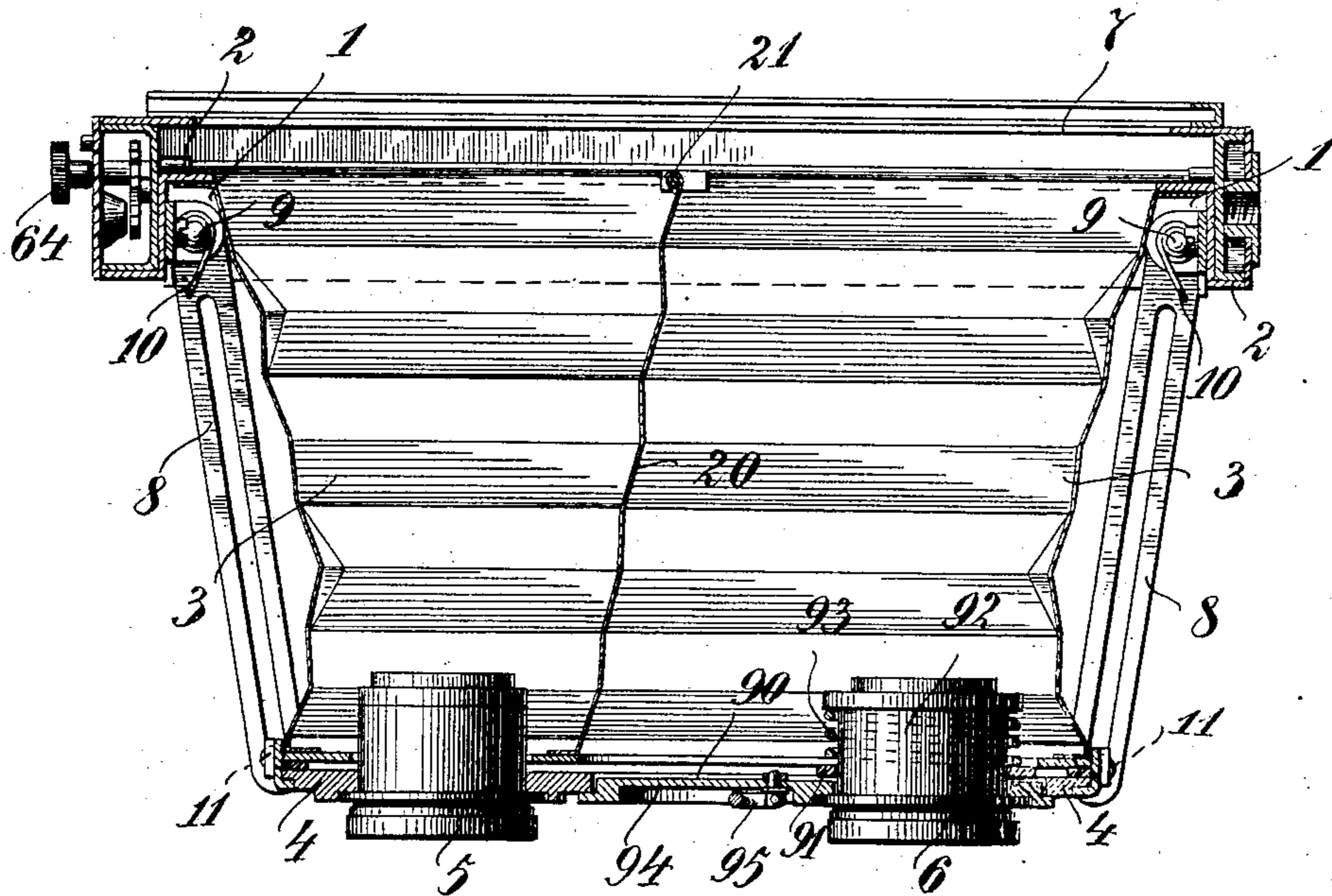


Fig. 4.

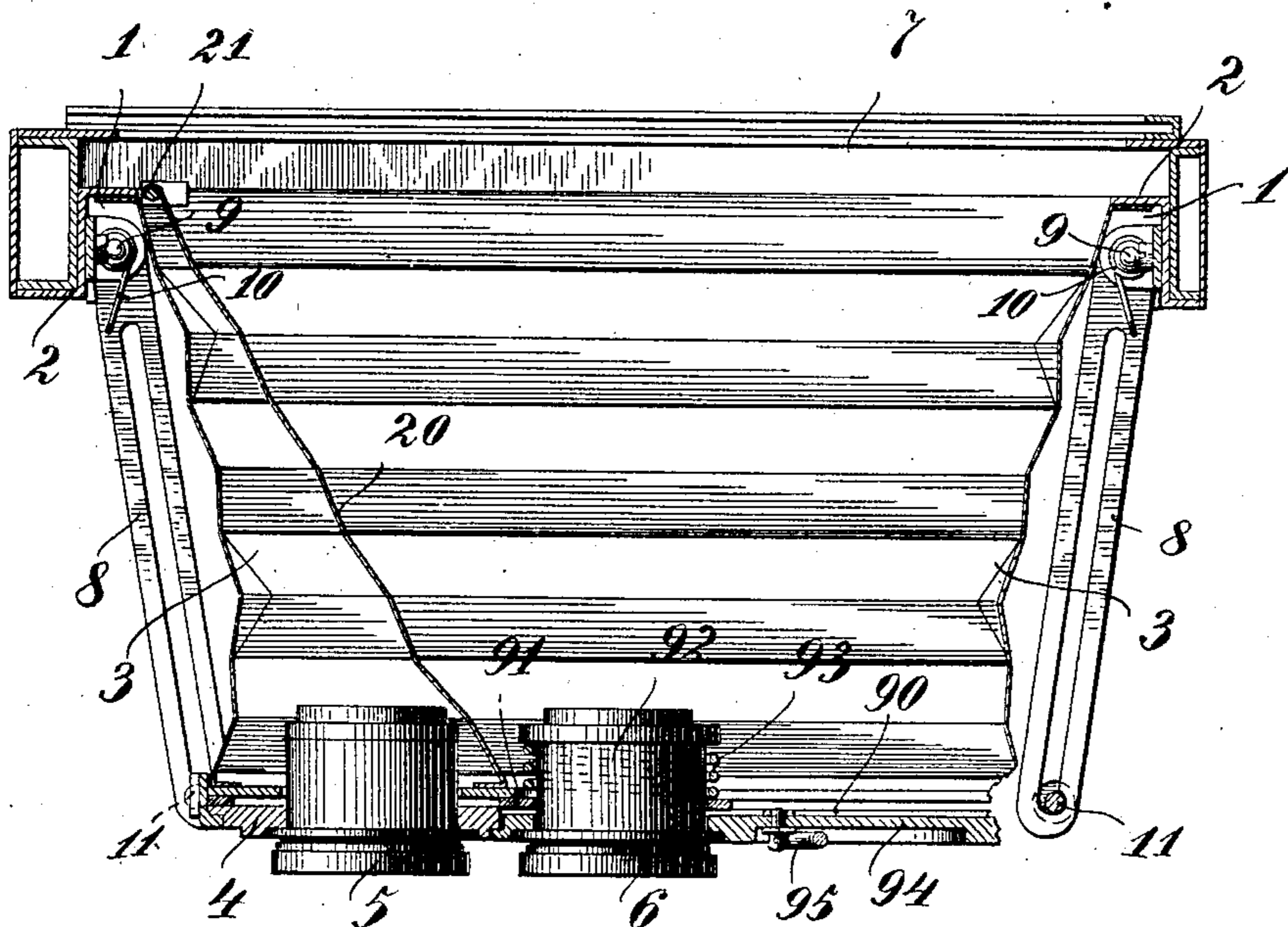


Fig. 5.

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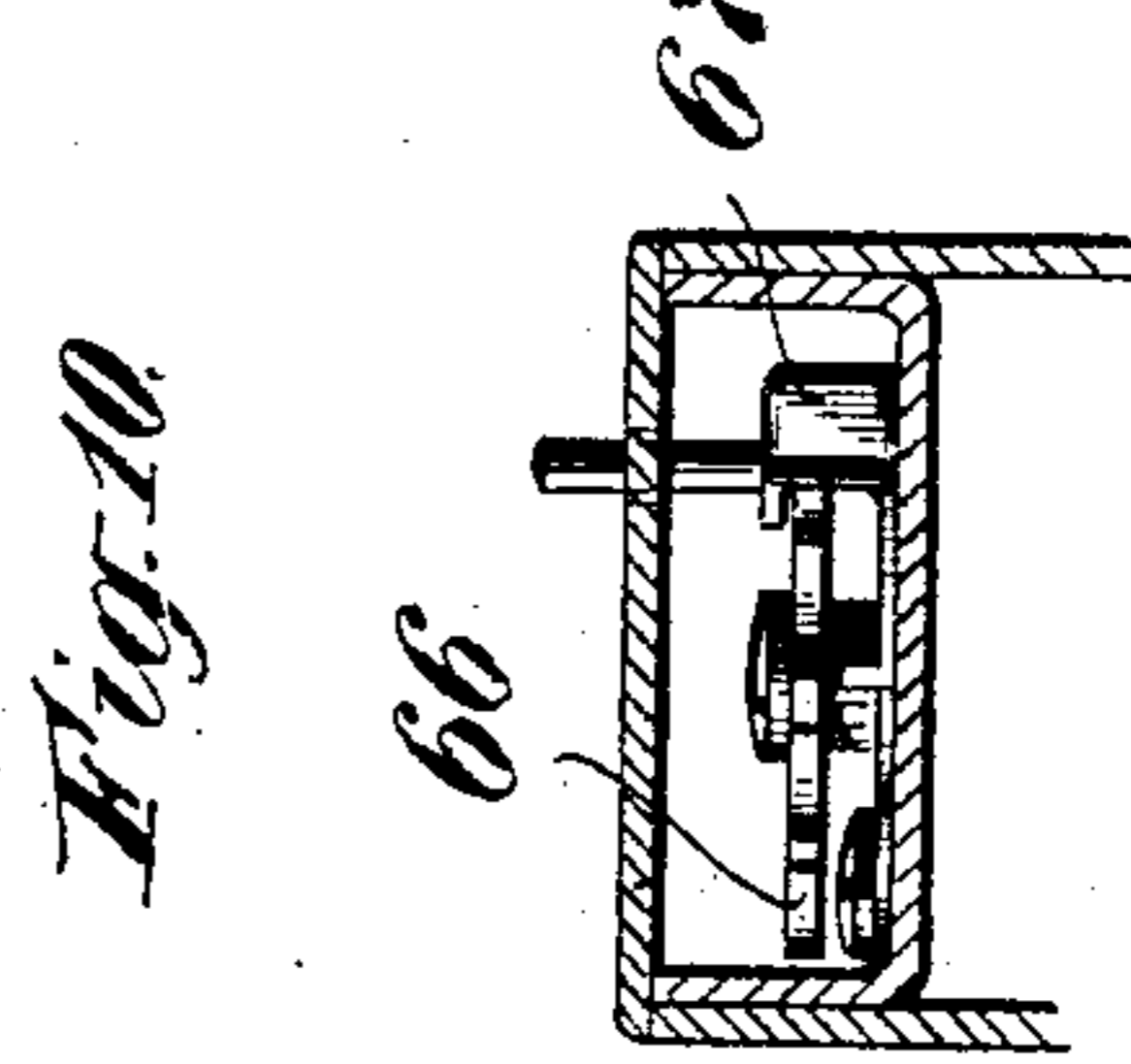
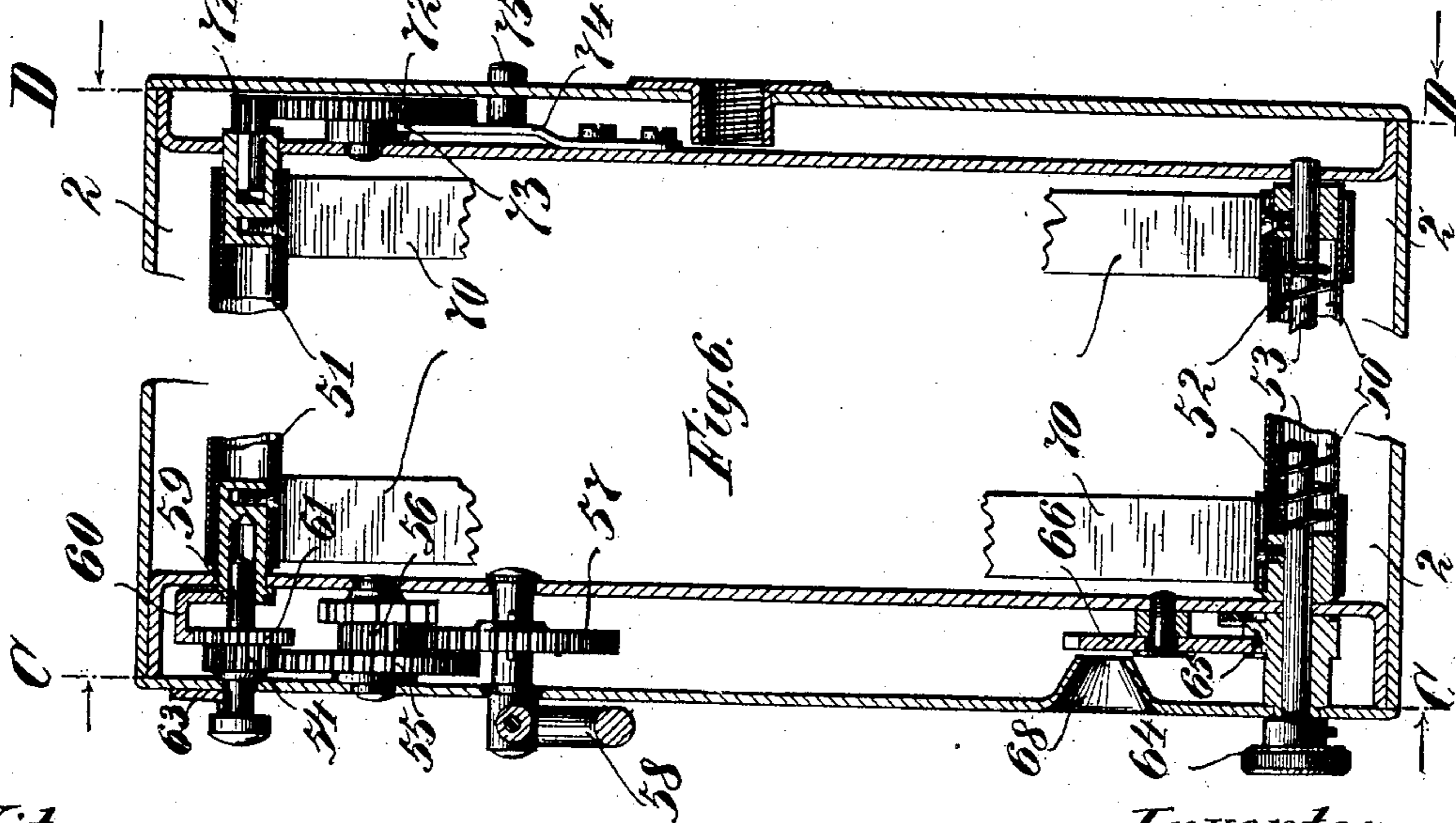
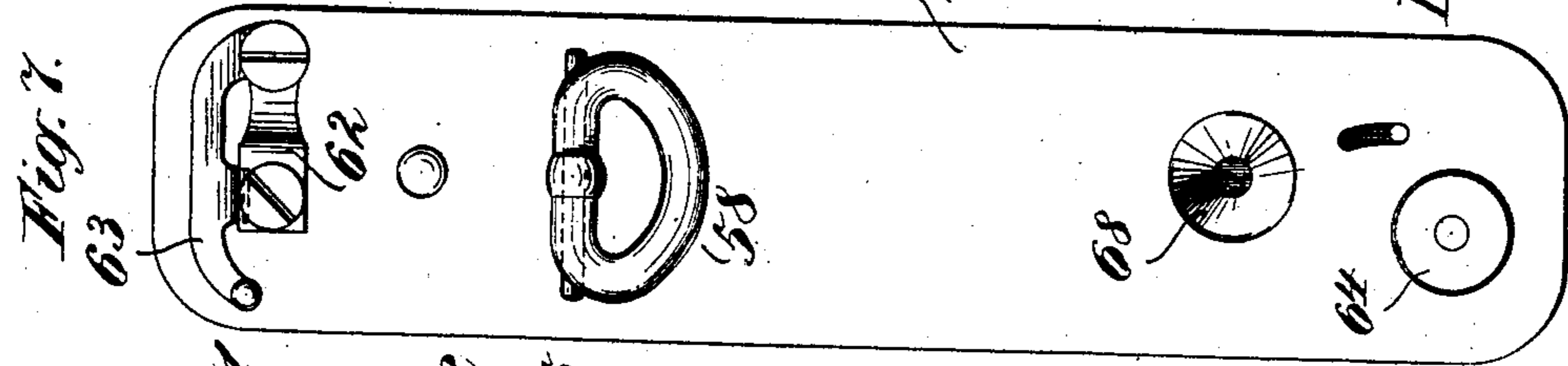
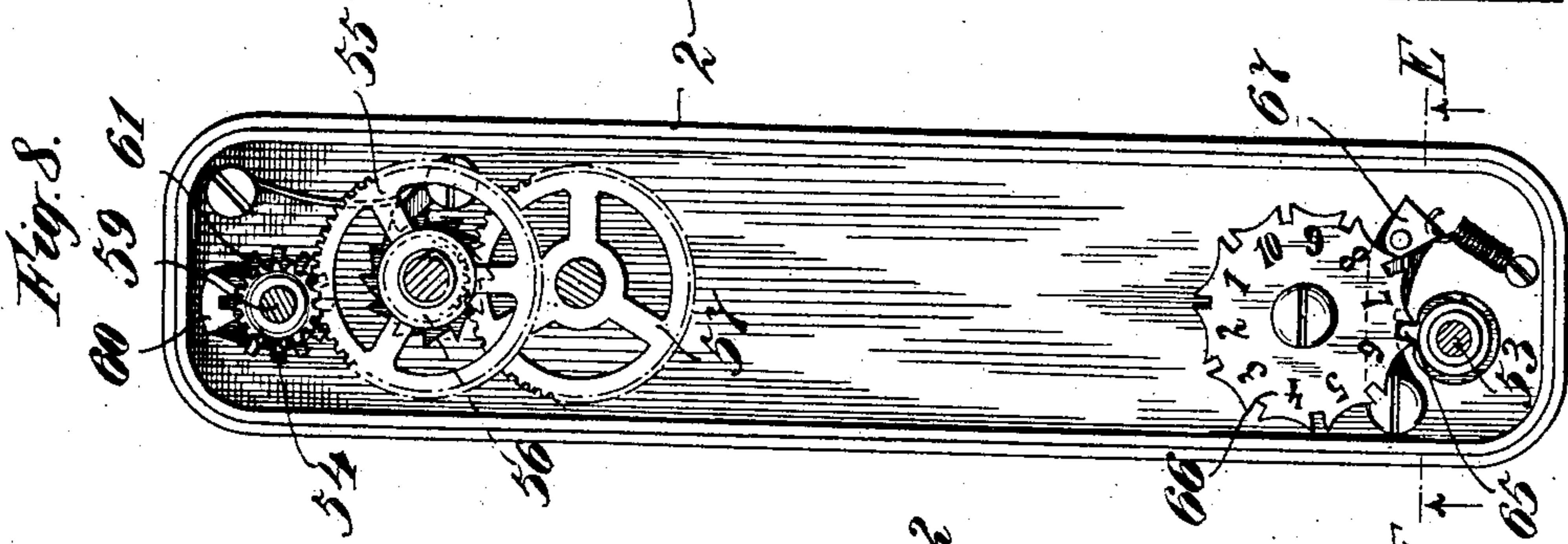
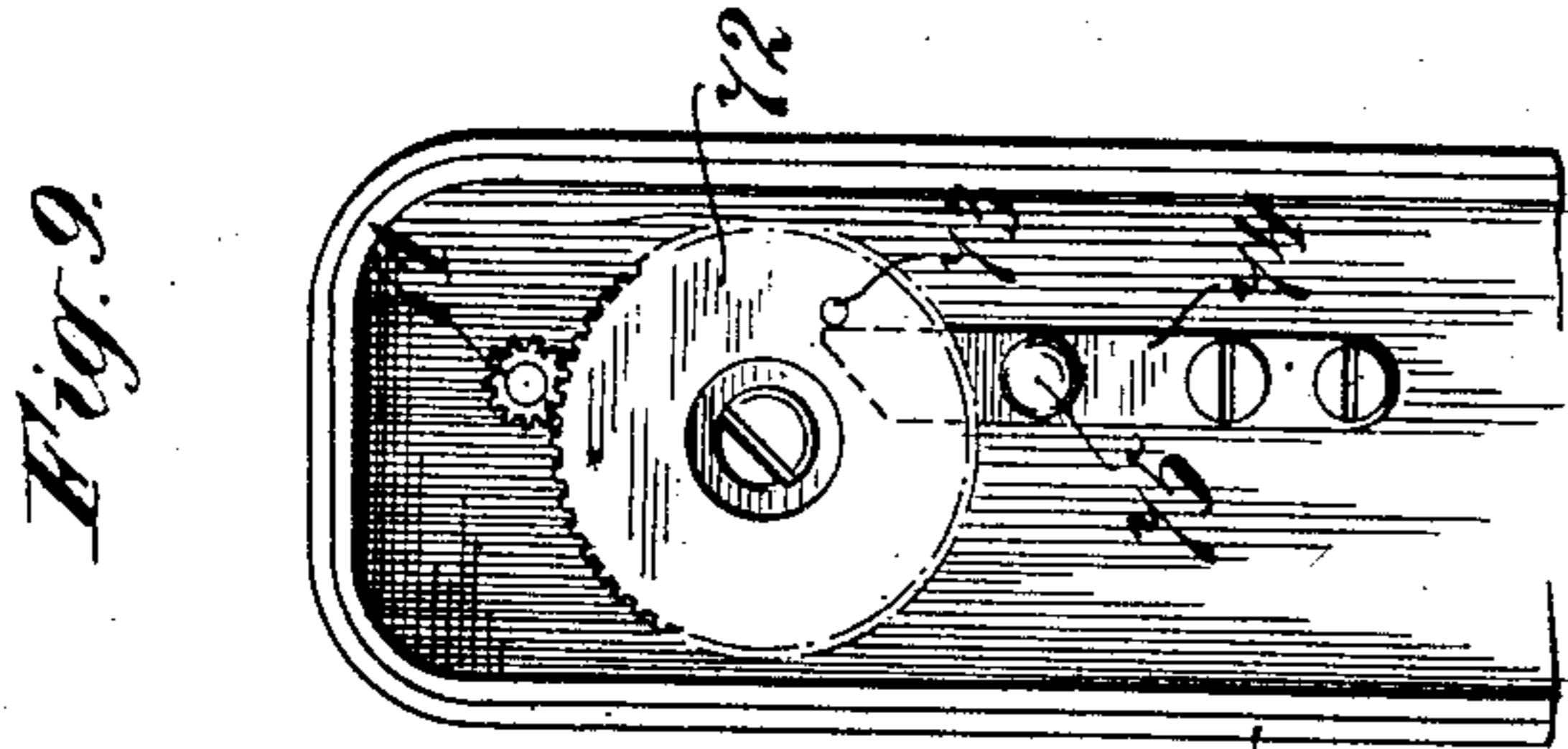
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4 Sheets—Sheet 3.



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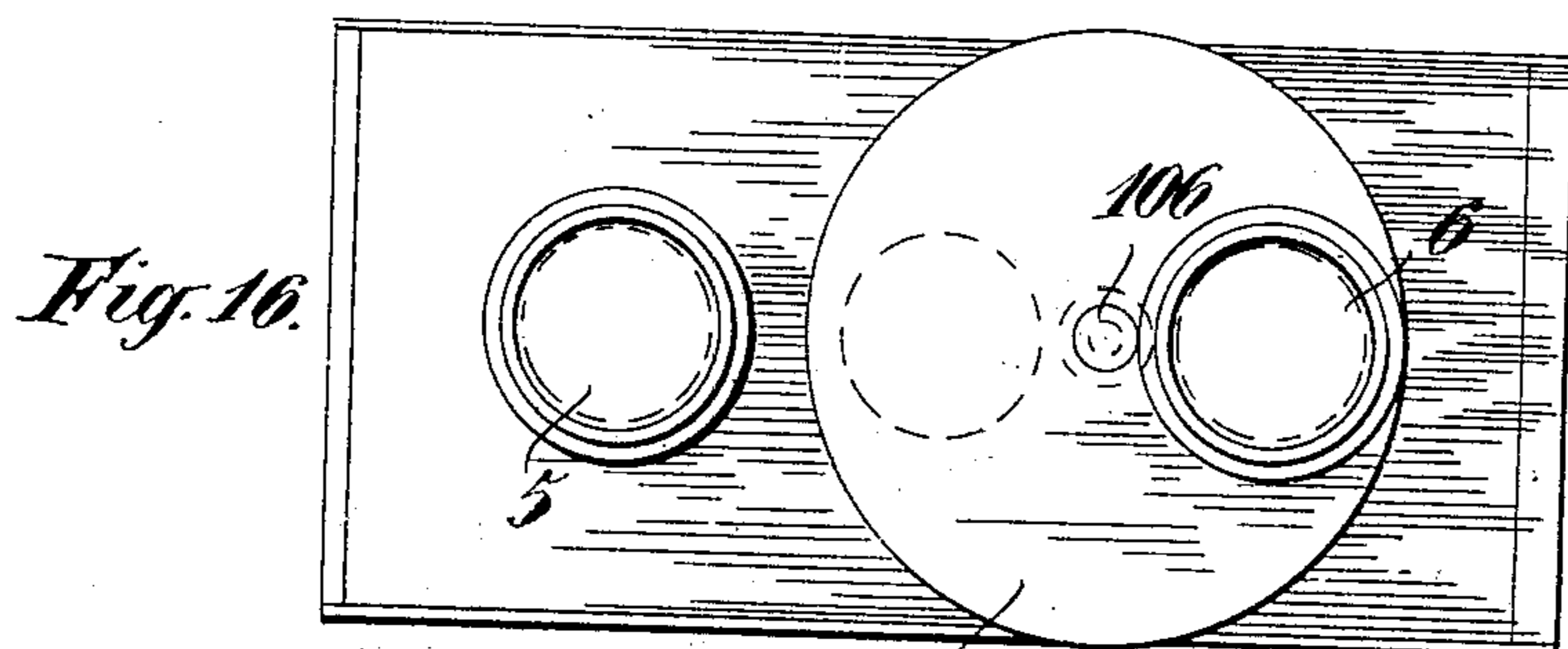
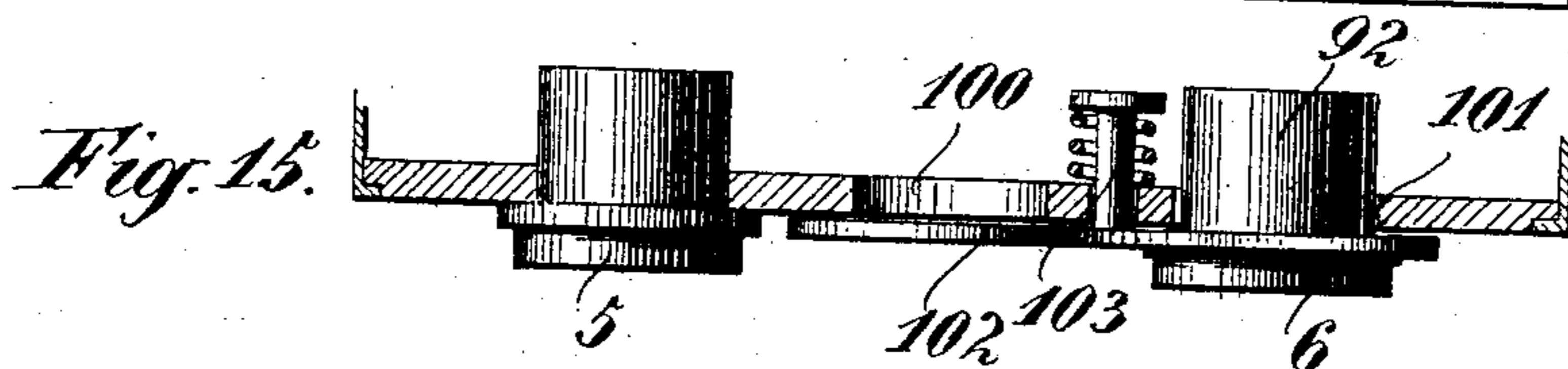
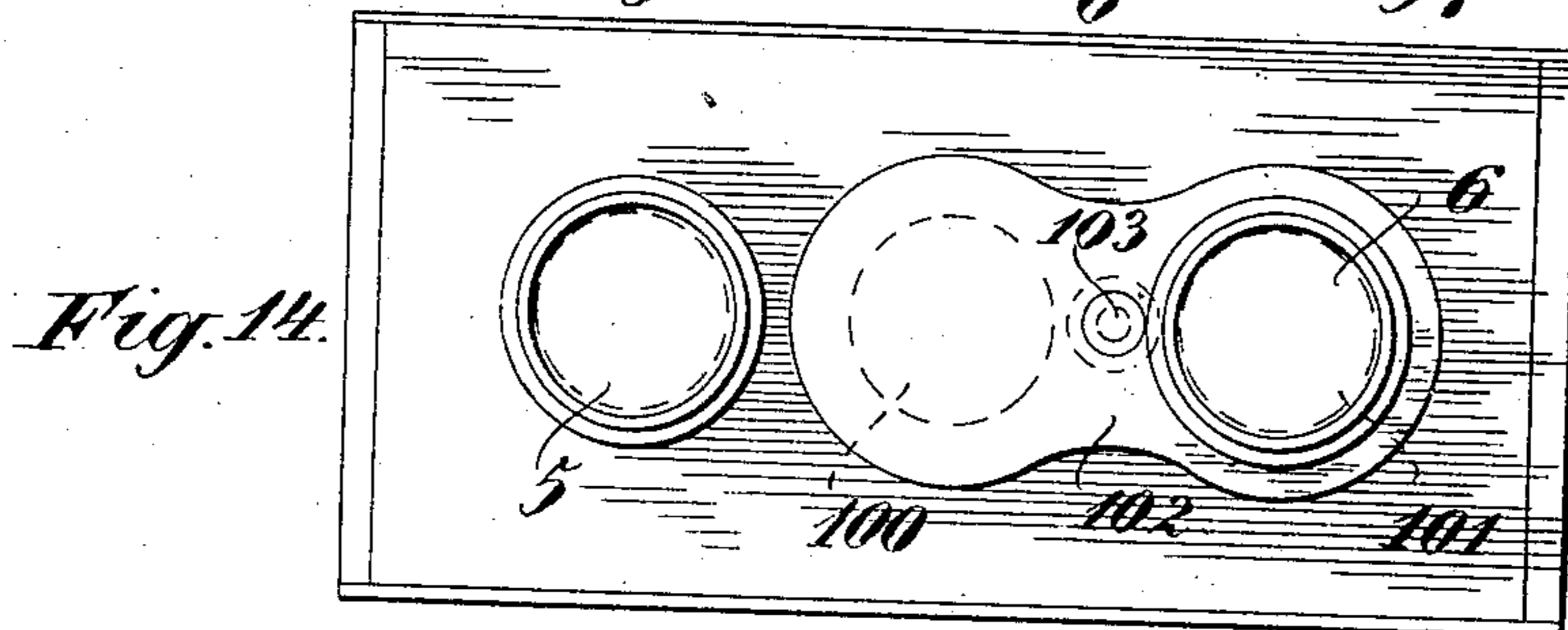
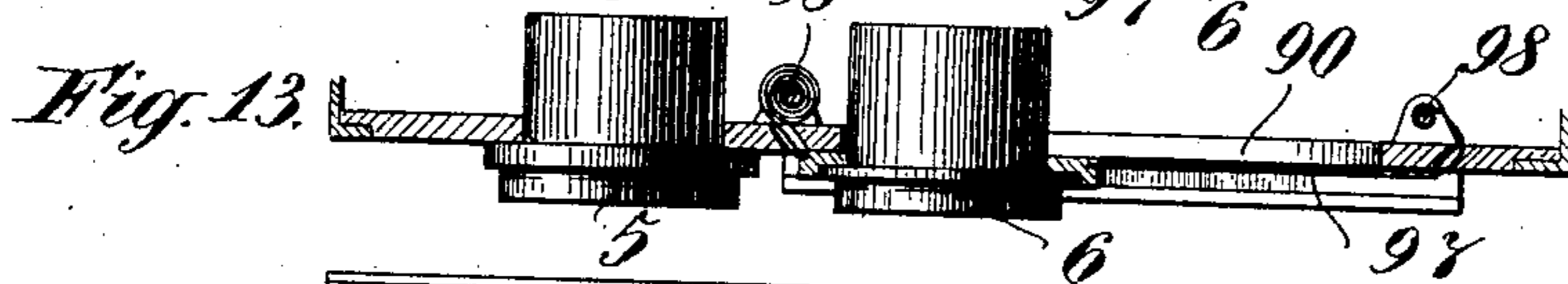
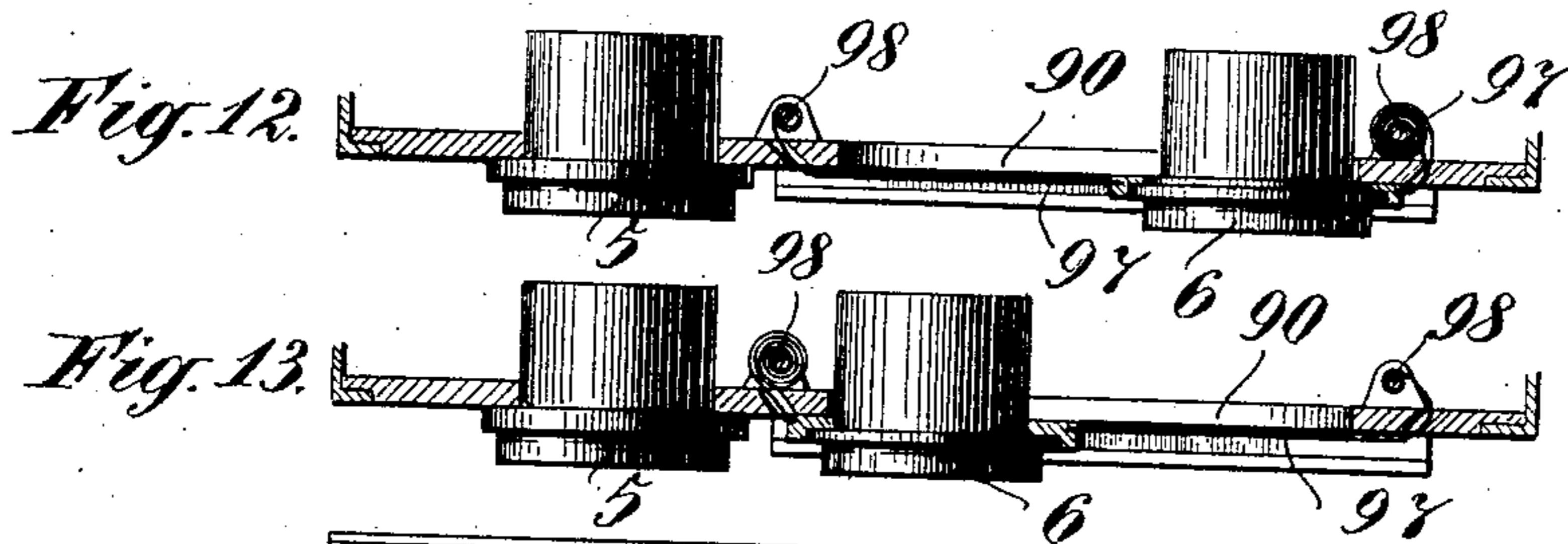
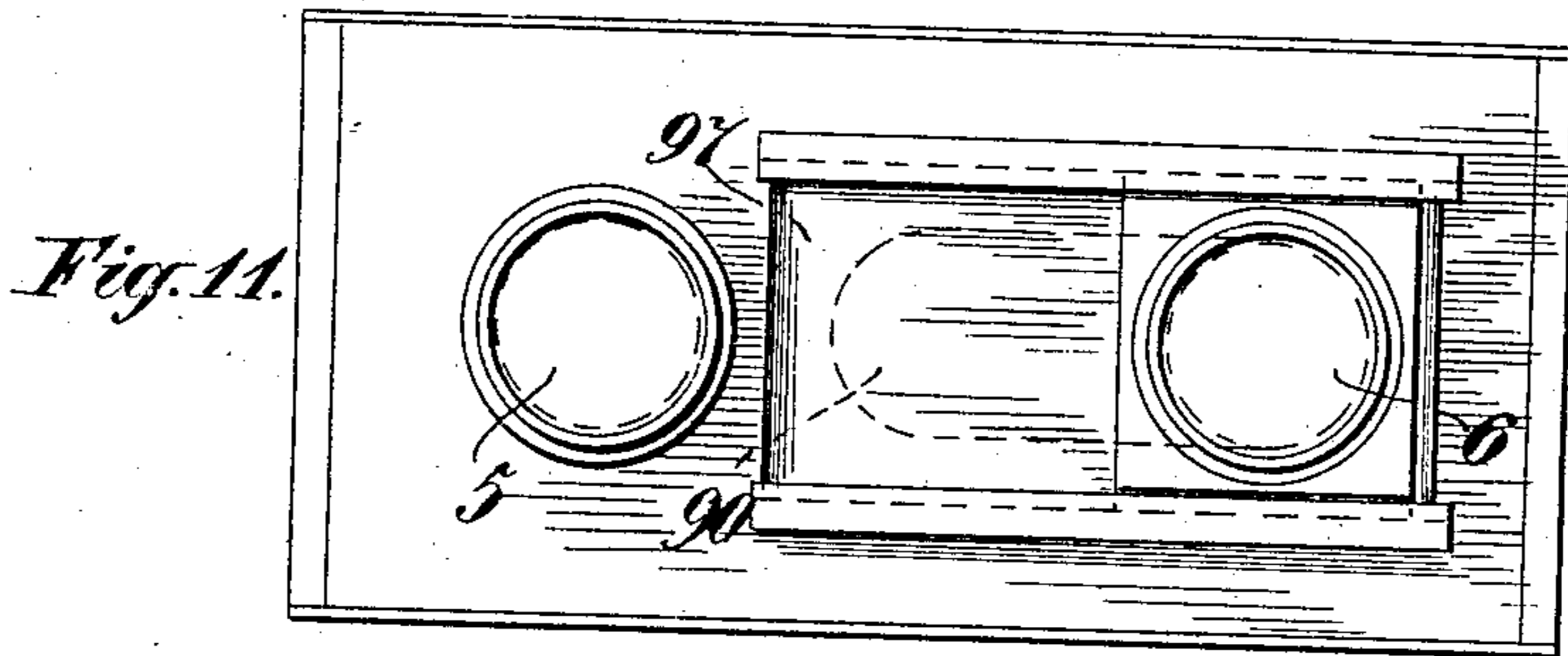
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4 Sheets—Sheet 4.



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UNITED STATES PATENT OFFICE.

CARL PAUL GOERZ, OF FRIEDENAU, NEAR BERLIN, GERMANY.

FOLDING STEREOSCOPIC CAMERA.

SPECIFICATION forming part of Letters Patent No. 709,480, dated September 23, 1902.

Application filed May 1, 1901. Serial No. 58,317. (No model.)

To all whom it may concern:

Be it known that I, CARL PAUL GOERZ, a citizen of the Kingdom of Prussia, and a resident of Friedenau, near Berlin, Germany, (whose post-office address is Rheinstrasse 45/46,) have invented certain new and useful Improvements in Folding Stereoscopic Cameras, of which the following is a specification.

The object of the present invention is a folding stereoscopic camera which may be easily changed into one for taking wide-angle pictures.

In the accompanying drawings said camera is clearly shown in its outer form as well as in its inner disposition.

Figure 1 is a front view of same; Fig. 2, a vertical section through same on line A A of Fig. 1. Fig. 3 is a top view of the same when folded. Figs. 4 and 5 are horizontal sections through the camera, showing the position of the partition-wall in either of the possible cases. Fig. 6 shows a cross-section through the camera on line B B of Fig. 3 on enlarged scale, the middle part broken away. Fig. 7 is a side view of the folded camera from the right side of Fig. 4. Figs. 8 and 9 are vertical sections on lines C C and D D, respectively, of Fig. 4. Fig. 10 is a longitudinal section on line C C of Fig. 8. Figs. 11 to 16 show modified means for bringing one of the objectives of the stereoscopic camera into the central line of same when the camera is to be used for taking single wide-angle photographs.

The opening 1 in the recessed front wall of the body 2 of the camera, which is made out of a piece of especially-profiled tubing, is fastened to one end of the folding bellows 3. The other end of said bellows is closed by a board 4, bearing the objective lenses 5 and 6. One of these is fixed. The other one, 6, may be shifted from its position shown in Fig. 1 to the central line of the objective board. The rear side of the body 2 is also open and forms a frame 7, which is provided with means for fastening a ground-glass pane for focusing purposes or a dark slide of any suitable construction. In the corners of the recessed part of the body are hinged slotted arms 8. On

their pivots 9 are arranged coiled springs 10, one end of which bears against the body 2 of the camera and the other end of which is fastened to the arms 8. These springs consequently tend to draw the arms 8 into their folded position. The objective board has arranged in its four corners pins 11, which engage into the slots of said arms 8. These slots are bent at the outer ends of the arms 8 a little outward, so that the pins 11 when entering said curved part of the slots are firmly held, whereas the arms 8 are pulled back to their folded position by the springs 10 as soon as the pins 11 are left in a position before entering the curved part of the slots in the arms 8.

On top of the body 2 of the camera there is arranged a pointing device, the arrangement of which is as follows: To the front side of the body 2 of the camera are pivoted three arms 12, 13, and 14, the middle one of which is shorter than the other ones and the end of which is formed like the aim of a rifle. Two horizontal bars 15 and 16 are hinged to the outer arms 12 and 13. The latter of them is besides also pivotally connected to the middle arm 13. The whole forms a parallel motion. A stop may be provided for limiting the motion of the parallelogram in the highest point.

On the rear side of the body 2 is arranged a folding arm 17, the end of which forms a sight, which, in combination with the already-mentioned arm 13 bearing an aim, forms the device for pointing the camera to a certain object when used as a hand-camera. It is of course necessary that the line indicated by the sight and the aim be exactly parallel to the optical axis of the objective lenses.

In order to hide the folded frame of the pointer from the view, the same is preferably arranged in a recess of suitable form and dimensions of the body 2.

As will be readily seen from Figs. 4 and 5, the partition-wall 20, separating the picture produced by one of the objectives from that produced by the other one, is not, as usually, arranged in the middle line of the camera. Only its rear end is fastened in the middle of the frame, into which the sensitized sur-

face is inserted. The front side, which is fastened to the objective board, has its point of attachment nearer to the fast objective lens. It will be readily seen from Fig. 4 that this manner of fastening does in no way disturb the regular producing of the pictures on the sensitized surface. The rear end 21 of said separating-wall is not rigidly fastened to the frame, but may be shifted to one side and fastened there, as will be seen from Fig. 5. If at the same time the movable objective lens 6 is shifted to the middle of the objective board, the whole sensitized surface may be exposed to the rays passing through said lens. The movable partition-wall, which is made of light-proof material, protects at the same time the sensitized surface from the rays passing through the fixed objective.

The shutter employed with the present invention is formed by a curtain having a slot over its breadth, which curtain moves in front of the sensitized plate. The mechanism of this shutter has some novel features, which are clearly shown in Figs. 6 to 11 of the accompanying drawings.

In the upper and lower parts of the body 2 are arranged two hollow axes 50 and 51, the lower one, 50, of which is connected to one end of a coiled spring 52, arranged in its interior. The other end of the same is fastened to an axle 53, passed in the line of the axis through said tube 50. The other hollow axle 51 may be turned by means of a train of toothed wheels 54 55 56 57, the ratio of which is so chosen that the angular velocity of the axis 51 is considerably greater than that of the axis of the toothed wheel 57, which may be rotated by means of a handle 58. The pinion 54 is not directly connected to the axis 51. Its central pin 59 is only inserted in an axial bore of the former. The coupling of the pinion with the axis 51 is done by means of a take-about 60, which engages a ratchet-wheel 61, arranged at the side of pinion 54 and forming one solid piece with the same. A spring 62, arranged on the outside of the body 2, holds the take-about 60 engaged with the ratchet-wheel 61. As soon as the pin 59 is pressed toward the interior the catches of the take-about release the ratchet-wheel and the connection between the axis 51 and the train of toothed wheels is interrupted.

63 is a lever which when pressed down impedes the lateral displacement of pin 59.

The central axis 53 of the lower hollow axis 50 passes to the outside of the body 2 and bears there a milled head 64, by means of which the tension of the spring 52 may be altered. On axle 53 there is fastened one cog 65, which engages a ratchet-wheel 66, provided with a click 67. On the side of the wheel 66 there are inscribed numbers which, when passing under a window 68 in the body, allow to recognize the grade of tension of the spring 52.

The slotted curtain 69 is fastened to the

lower axis 51. To the corners of its free side are fastened narrow bands 70, the ends of which are fastened to the lower hollow axis 50.

The end of the hollow wheel 51 opposite to the train of toothed wheels used for setting the shutter bears a pinion 71, which engages a toothed wheel 72. On the surface of the latter there is a nose 73. The end of a flat spring 74, which may be pressed down by a knob 75, ordinarily enters into the path of the nose 73, thereby stopping the motion of the shutter in setting same. If for the purpose of focusing with the ground-glass pane the shutter is to completely uncover the sensitized surface, the stop must be set free by pressing down the spring 74 by means of the knob 75.

If the stereoscopic camera is to be used as an ordinary camera, one of the objectives must be brought from its lateral position to the center of the objective board. In the drawings are represented different means for that purpose.

In Figs. 1, 4, and 5 the objective board has at one side an oblong opening 90, extending from the eccentric position to the central one of the objective lens. On the rear side of said opening there slides in proper guides a bridge 91, into an aperture of which the lens-tube 92 of the objective is inserted. A coiled spring 93^m is passed around the latter and bears with one end against said bridge 91 and with the other against a collar of the lens-tube. 94 is a plate which exactly fits into the opening 90 of the objective board and which is either solidly connected to the objective tube or for which the latter forms the pivot. It is easily understood that by means of the ring 95 the plate 94 may be withdrawn from the opening 90. Then the bridge 91, with the objective tube, may be shifted from one end of the opening 90 to the other. The plate 94 is then turned for one hundred and eighty degrees and when left to itself is pressed by the spring 93 again into the opening 90, thereby closing the same and fixing the objective lens in its position. Figs. 11 to 13 show another method for obtaining the same purpose. The objective board has also the oblong opening 90, in which the lens-tube may be shifted from one side to the other. The latter is fixed to the middle of a flexible band 97 of light-proof material—for example, thin metal—the edges of which slide in guides arranged on both long sides of the opening 90. The ends of said band are preferably fastened to spring-actuated axles 98, by means of which they are rolled up and which hold the band always stretched.

In the modification shown in Figs. 14 and 15 there are only two circular openings 100 and 101 in the objective board into which the objective tube 92 may be inserted. Said tube is fastened to an oblong preferably 8-shaped plate 102, moving around a pivot 103, inserted into the objective board. A coiled spring

slung around the same presses the plate 102 against the objective board. It is clear without any further explanation in which manner the changing of the objective from one position to the other is done.

In Fig. 16 is shown another modification, where the oblong plate 102 is replaced by a circular disk 105, bearing the objective tube. By turning the former around its central pivot 106 the objective tube may be either brought in front of the lateral or central opening of the objective board, whereas the other one is closed at the same time by the full part of said disk.

What I claim is—

1. A folding stereoscopic camera, comprising a body made out of a piece of especially-profiled tubing, having bellows parted by a movable partition in two attached thereto, the other end of which is closed by the objective board; pins in the corners of said objective board engaging slots and spring-pressed arms hinged to said body of the camera; a shutter for covering and uncovering the sensitized surface moving in front of same and having means for operating it; and means for shifting one of the objectives from its lateral position to the central one; substantially as shown and described.

2. In a folding camera of the kind hereinbefore described a partition-wall for separating the cones of rays produced by the two objectives, said partition formed by a flexible strip of light-proof material provided at its edges with narrow bands, said strip being

fixed to the objective board and with the other end movably fastened to the body of the camera; substantially as shown and described.

3. In a folding stereoscopic camera of the kind hereinbefore described an objective board, having an oblong opening; two objectives carried by said board, one fixed and the other movable, one of the objective tubes movably arranged in said opening and means of suitable dimensions for closing said opening; substantially as shown and described.

4. In a folding stereoscopic camera of the kind hereinbefore described an objective board, an objective tube sliding in the same, a light-proof band fixed to said objective tube and guidings for the edges of the same; substantially as shown and described.

5. In a folding stereoscopic camera of the kind hereinbefore described an objective board, having a fixed and a movable objective and a central and a lateral opening for the movable objective tube; on front of said objective board being arranged movable means bearing the tube of the movable objective arranged in such a way that said tube may be brought to coincide with either of the openings; substantially as shown and described.

In testimony whereof I affix my signature in presence of two witnesses.

CARL PAUL GOERZ.

Witnesses:

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