

No. 631,963.

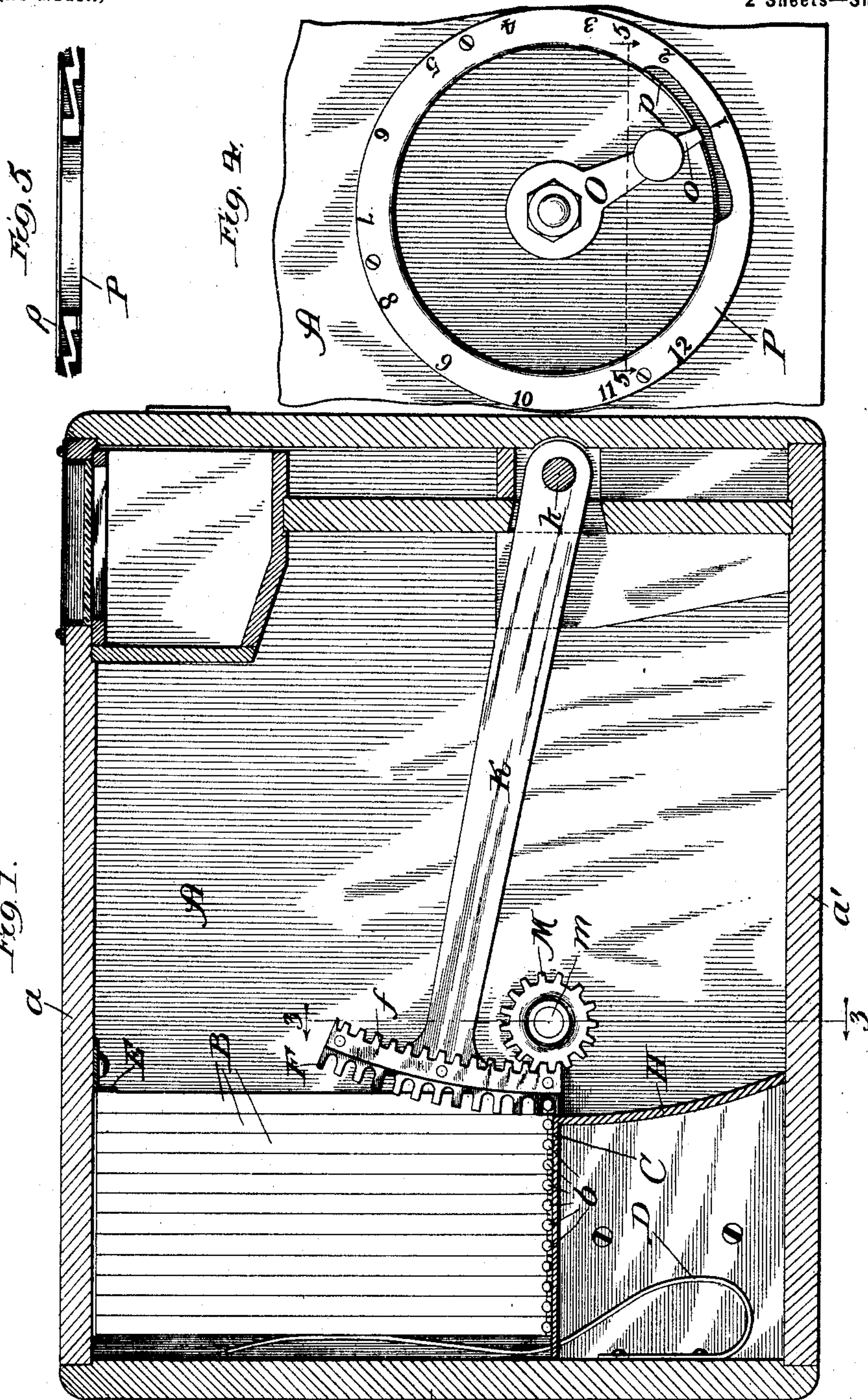
Patented Aug. 29, 1899.

J. A. MOSHER.
MAGAZINE CAMERA.

(Application filed Jan. 28, 1899.)

(No Model.)

2 Sheets—Sheet 1.



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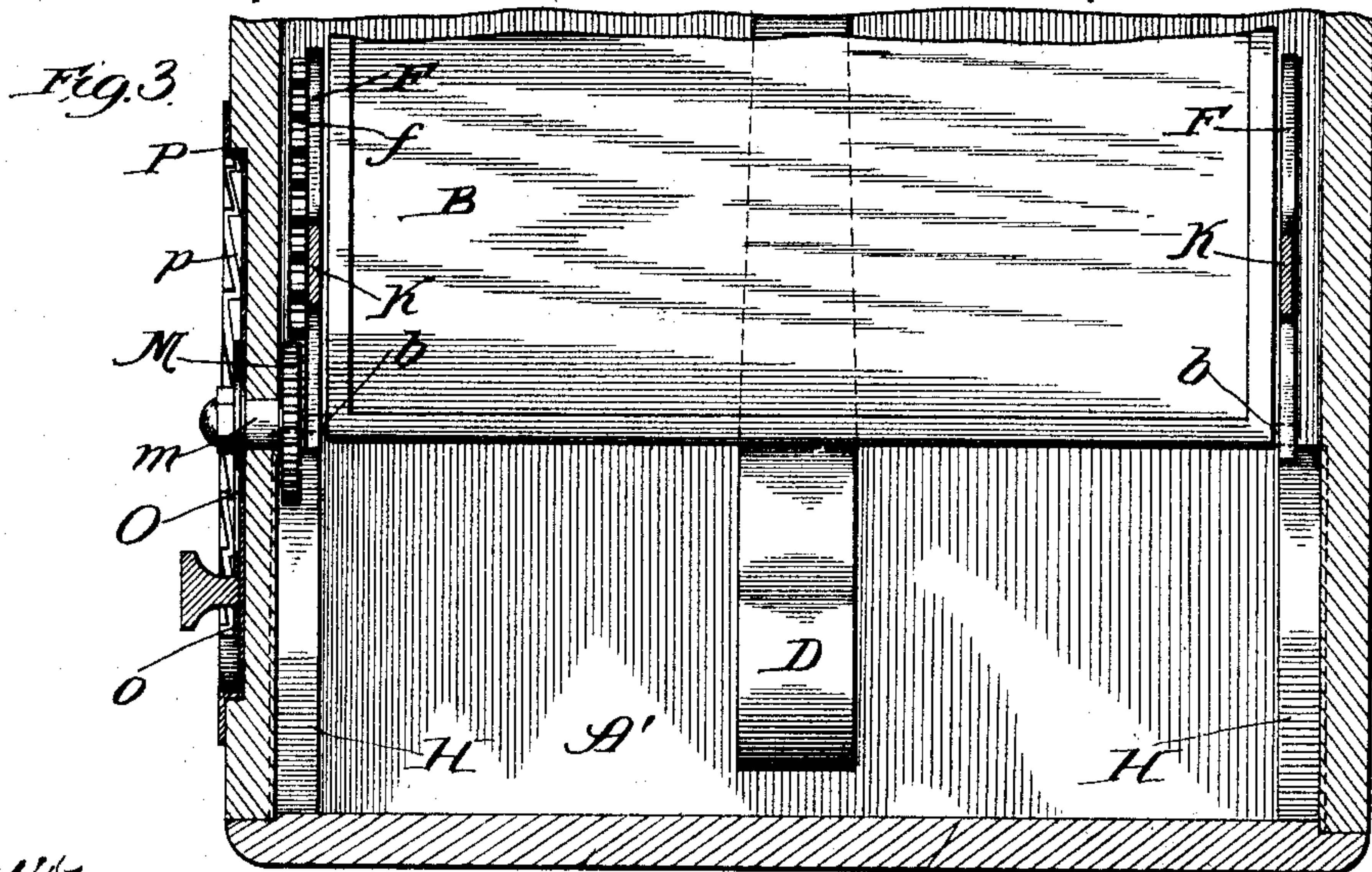
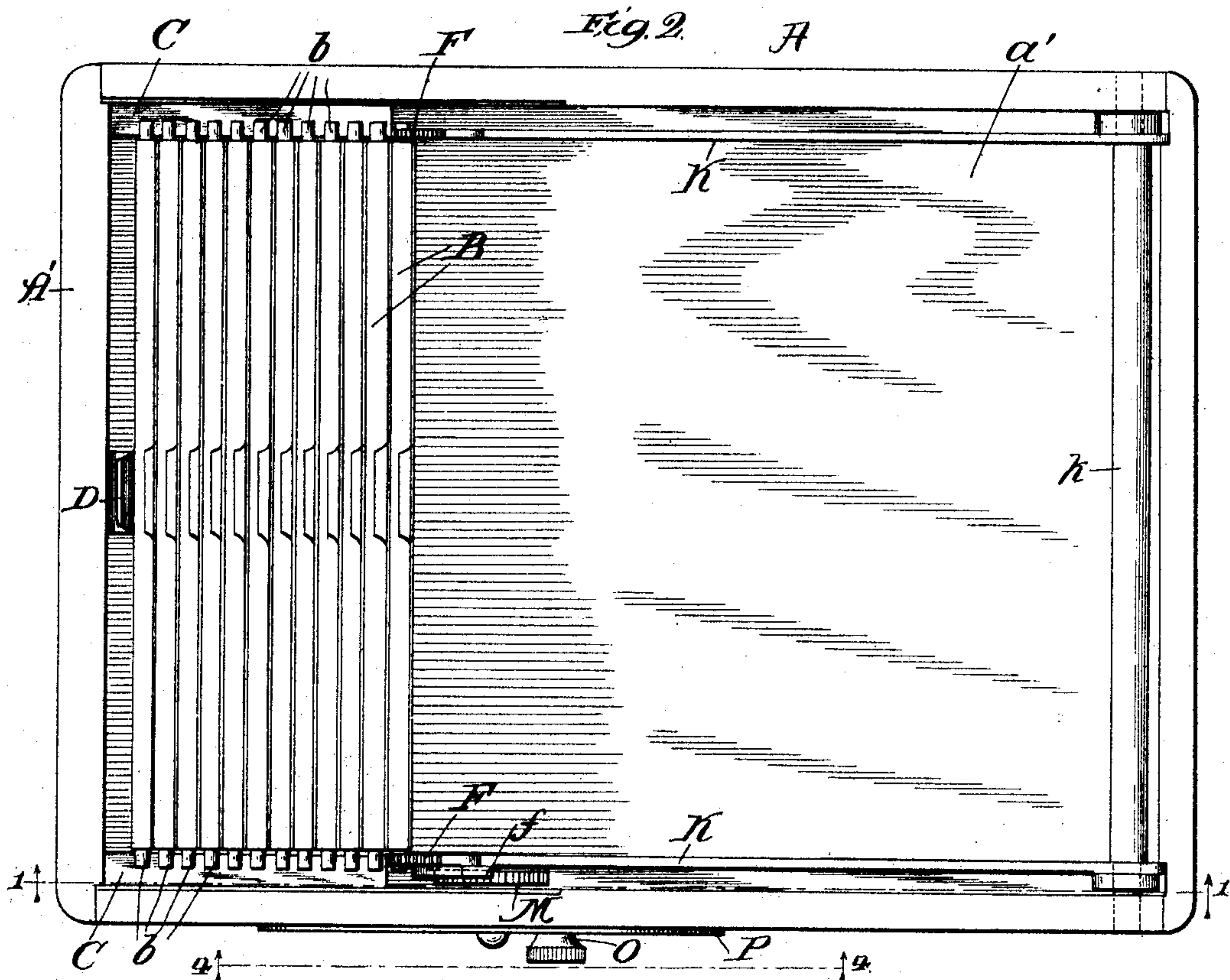
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(No Model.)

2 Sheets—Sheet 2.



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UNITED STATES PATENT OFFICE.

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MAGAZINE-CAMERA.

SPECIFICATION forming part of Letters Patent No. 631,963, dated August 29, 1899.

Application filed January 28, 1899. Serial No. 703,692. (No model.)

To all whom it may concern:

Be it known that I, JOHN A. MOSHER, a citizen of the United States, and a resident of Chicago, county of Cook, and State of Illinois, have invented certain new and useful Improvements in Magazine-Cameras, of which the following is a specification and which are fully illustrated in the accompanying drawings, which form a part thereof.

10 This invention relates to that type of magazine-cameras in which the supply of plates is stored within one portion of the case or box and the holders are successively transferred to another portion thereof by falling, swinging as they fall through an arc of ninety degrees or thereabouts. The obstacles to the success of this type of cameras are the difficulty of providing for certain action in transferring the holders, in retaining the holders in place after transfer, and in securing ease and simplicity of action and cheapness and simplicity of construction.

25 The object of the present invention is to overcome these difficulties; and it consists in the construction hereinafter described and which is illustrated in the accompanying drawings, in which—

30 Figure 1 is a longitudinal vertical section of the camera on the line 1 1 of Fig. 2. Fig. 2 is a plan of the camera with its top removed. Fig. 3 is a detail section on the line 3 3 of Fig. 1. Fig. 4 is a detail side elevation viewed from the line 4 4 of Fig. 2, and Fig. 5 is a detail on the line 5 5 of Fig. 4.

35 The box A is of the ordinary oblong rectangular form having a top *a*, a bottom *a'*, and a removable back A', to which is attached a follower-spring D. The plate-holders B used with the camera are of the common sheath type made of a piece of sheet metal having three of its edges overturned to form ways for the reception of the plate. Each holder, however, is provided at its lower corners with a pair of trunnions *b*. The depth of the box A is equal to the depth of a holder plus the combined thickness of the number of holders it is desired to adapt the box to carry.

50 The supply of holders is inserted from the back, their open sides being directed forwardly, and the follower-spring D advances

them so that the advance holder is always at the focal plane. A pair of rails C C is secured to the inner surfaces of the side walls of the box A and lead inwardly from its rearward end, these rails being spaced apart from the top of the box a distance equal to the depth of the holders. On these rails the trunnions *b* rest and slide. A simple lug E depends from the top *a* of the box at the focal plane to stop the tops of the holders as they are advanced, and at their bottoms they are stopped by means of a pair of reciprocating notched bars F F, which move in paths transverse to the rails C C, crossing them at their inner ends and in the focal plane. The notches of the bars F F are adapted to receive the trunnions *b*, and in practice corresponding notches of the two bars are brought opposite the ends of the rails C C, and when in that position the trunnions of the advance holder enter them, so that when at the focal plane the holder is carried by the notched bars F F and its upper edge is in contact with the stop E. A rail or flange H H leads downwardly from the inner end of each of the rails C C, and along and substantially in engagement with the forward side faces of the rails the notched edges of the bars F F move.

80 When it is desired to transfer a holder, the bars F F are moved downwardly a sufficient distance to disengage the holder from the stop E. The pressure of the follower-spring D impels the holder forward, but as it is still held at the bottom by the bars F F it swings forward on its trunnions, and its upper edge strikes the bottom of the box. The length of the stop E and the spacing of the notches of the bars F F are the same and substantially equal the thickness of the holders B. The downward movement of the bars F F to disengage a holder from the stop E therefore brings the next pair of their notches in line with the trunnions of the next holder, and the spring D causes its advance to the focal plane. The holders are successively transferred in this manner from the receptacle at the back to that at the bottom of the box. The trunnions remain within the notches of the bars F into which they first enter until the holders are finally removed from the box,

being prevented from disengagement there-with by the rails H H.

The bars F F are preferably segmental in form, though obviously they may be straight, and are carried by a pair of arms K K, fixed upon a rock-shaft k , journaled across the front end of the box A, so that the two bars always move together.

One of the bars F is provided with a rack f , intermeshing with a pinion M, fixed upon a stud-shaft m , which sets through the side wall of the box A, and its outer end carries a crank-arm O, by means of which the operator controls the transferring mechanism. The crank-arm O moves over a dial-plate P, secured to the outer side of the box A. The central portion, over which the crank-arm sweeps, is depressed below the surface of the box, and there is cut in the wall p of the well thus formed a zigzag groove comprising a succession of steps alternately perpendicular and oblique to the general direction of the slot and into which a projecting end o of the crank-arm enters. The oblique steps in the zigzag slot correspond in number with the notches in the bars F, and the length of each measures the distance the crank-arm O must move to cause the transfer of a plate-holder. The crank-arm is by this zigzag slot necessarily caused to move over the dial-plate by a succession of steps, as it is stopped by each perpendicular step and must be raised to the top of the next oblique step. The possibility of accidentally throwing the crank-arm far enough to transfer more than one holder at a time is wholly obviated by this construction. It will be seen that if one-half of the grooved wall p were removed there would remain a common ratchet the teeth of which each have one abrupt and one inclined face. This construction would in a measure serve the desired end, provided the crank-arm were elastic and formed so as to bear against the face of the ratchet. The construction shown, however, is greatly to be preferred, as the oblique steps of the groove force the arm inwardly, so that it necessarily encounters the next perpendicular step whether it be elastic or not. The dial-plate is so disposed that the crank-arm comes to rest at the end of an oblique step in the slot when the next succeeding notches in the bars F are opposite the ends of the rails C C, and opposite these points of rest the dial-plate is marked with suitable figures to indicate the number of the plate with which it corresponds.

While I have shown the device for compelling the movement of the transferring mechanism to be step by step as being exterior to the box and forming a part of the indicating-dial, I do not desire to be limited to this construction, as any which provides a zigzag path for an adjunct of the transferring mechanism comes within the scope of the invention.

When the camera is to be loaded, the arms

F are in the position shown in Fig. 1. The back A' is removed and the supply of holders is introduced, their trunnions sliding forward on the rails C C until those of the forward holder enter the lower notches of the arms F and the top of the holder is stopped by the lug E. The desired number of holders having been inserted, the back A' is replaced and the instrument is ready for use, the forward plate being at the focal plane. After this plate has been exposed the arm O is moved one step, thereby transferring the exposed plate and its holder to the bottom of the box A and bringing the second plate to the focal plane. After all of the plates have been exposed they are removed from the camera by first turning the arm O back to its starting-point, thereby raising the trunnioned ends of the holders all above the rails C, so that they may be readily grasped and drawn out together. It will be seen that the method shown for mounting the bars F obviates the necessity for locating a shaft across the box so that it is in the way of the hand in removing the holders. The employment of the rails to retain the trunnions permanently within the notches of the bars F prevents the displacement of the holders from the receiving-receptacle after transfer, due to careless handling of the instrument, and these rails and the bars also cooperate to increase the ease with which the holders may be removed from the box.

While I have shown and described a camera in which the plate-holders are transferred from a chamber back of the focal plane to a lower chamber forward of it, I do not desire to be limited to this construction, as the invention relates, broadly, to means for securing the trunnions within the notches of the transferring-bars after they have once entered the same and until removed therefrom by the operator.

I claim as my invention—

1. In a magazine-camera the combination with a box having storage-chambers for plate-holders respectively at its rear end and at its bottom, of a rail C secured to the inner surface of each side of the box at the bottom of the rearward chamber, a pair of reciprocating bars each having a notched edge, such bars being adjacent one to each of the side walls of the box and moving transversely as to the rails C, the notches of the bars crossing the focal plane of the camera, a plate-holder stop at the top of the box and at the focal plane, a pair of rails H secured to the side walls of the box and leading downwardly from the ends of the rails C and closing the notches of the bars, and means for causing the reciprocation of the bars in unison.

2. In a magazine-camera of the kind described the combination with supports for trunnioned plate-holders, reciprocating transferring-bars having notches for successively receiving the trunnions of the holders, means

for reciprocating the bars in unison, and covers for the notches of the bars whereby the holder-trunnions are held therein.

3. In combination a camera-box having an openable rearward end, rails secured to the sides of the box and extending forward from the rear end, a stop at the top of the box and at the focal plane, curved rails leading downward from the forward end of the first-mentioned rails, a rock-shaft journaled across the box forward of the focal plane, a pair of arms fixed to such shaft, a segmental bar fixed upon each arm and having its peripheral face notched, and being so mounted as to sweep such curved rails, and means for causing the oscillation of the rock-shaft.

4. In a magazine-camera, in combination with a case having two storage-chambers, and adapted for the use of trunnioned plate-holders, of a pair of notched plates or bars for engaging at the focal plane of the camera the trunnions of the holders to effect the transfer of the latter from one chamber to the other, one of such plates or bars being provided with a rack-gear, an actuating-shaft journaled in the side of the box and manually controllable from without the same, a pinion carried by such shaft and intermeshing with the rack-gear, a rock-shaft crossing the case remote from the position of the trunnions at the time of transfer, a pair of arms fixed upon the shaft and carrying the notched plates or bars, the parts being so disposed that as the holders swing upon their trunnions they pass between the arms.

5. In a magazine-camera the combination with mechanism for effecting the transfer of plate-holders, of an external crank-arm for actuating the transferring mechanism, a way

or path for the crank-arm, such way or path having a succession of stops, whereby the crank-arm is necessarily moved step by step.

6. In a magazine-camera, the combination with mechanism for effecting the transfer of plate-holders, of an external crank-arm for actuating the transferring mechanism, and a plate, having a zigzag groove with abrupt stop-shoulders which is engaged by the crank-arm.

7. In a magazine-camera, the combination with mechanism for effecting the transfer of plate-holders, of a shaft projecting outwardly and by which the transferring mechanism is actuated, a crank-arm fixed to the outer end of the shaft, a dial-plate having an outstanding rim concentric with the shaft, such rim having a zigzag groove with abrupt stop-shoulders, such groove being engaged by the crank-arm.

8. In a magazine-camera, the combination with a pair of reciprocating notched bars for effecting the transfer of trunnioned plate-holders, an outwardly-projecting shaft for actuating the bars, a crank-arm for controlling the shaft, and a plate having a zigzag groove with abrupt stop-shoulders which is engaged by the crank-arm.

9. In a magazine-camera, the combination with mechanism for effecting the transfer of plate-holders, of an oscillating part moving with such transferring mechanism, and a plate having a zigzag groove with abrupt stop-shoulders which is engaged by such oscillating part.

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