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Patented Sept. 2, 1902.

D. W. TOWER.

LATCH.

(Application filed Oct. 11, 1901.)

(No Model.)

2 Sheets—Sheet 1.

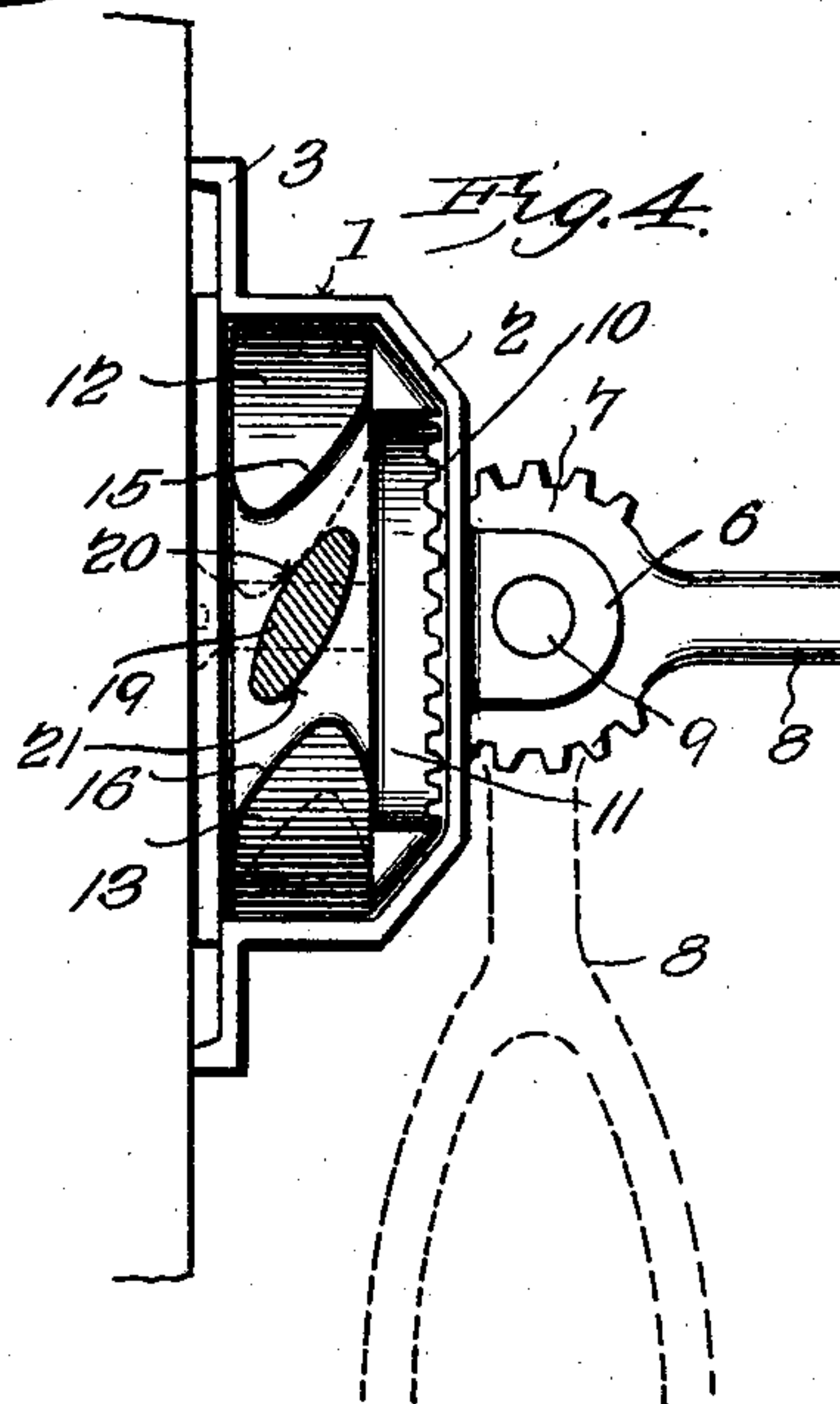
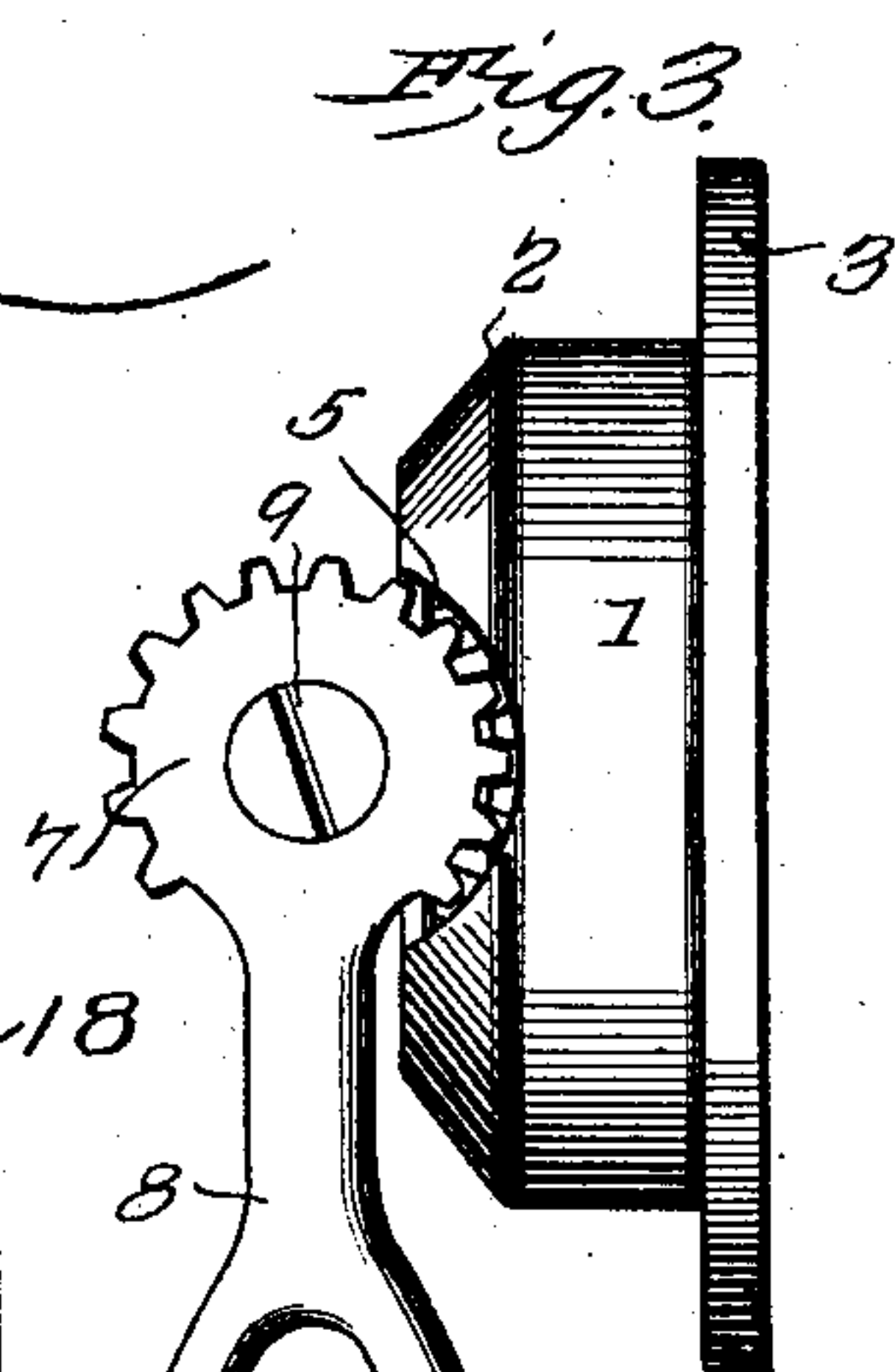
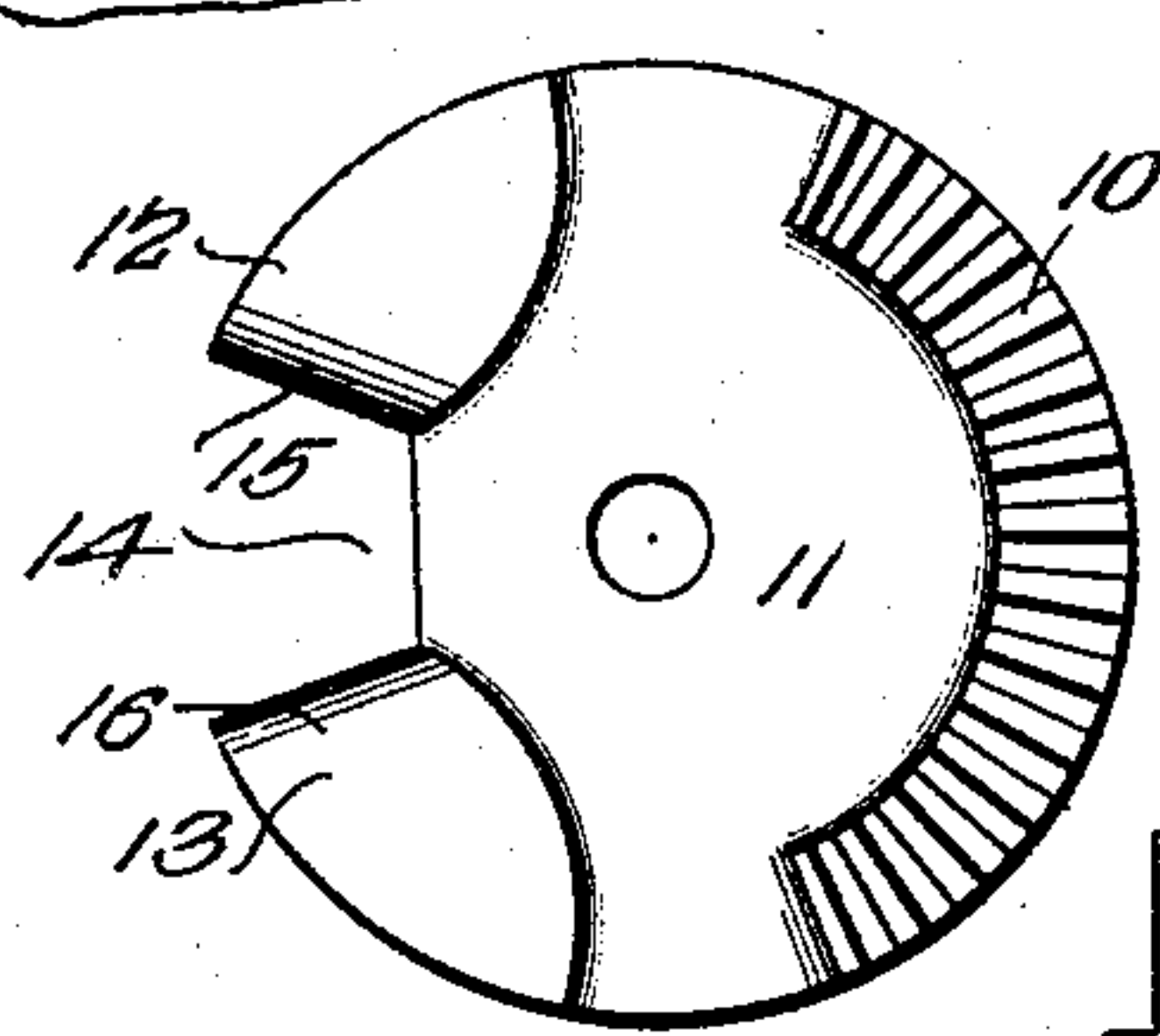
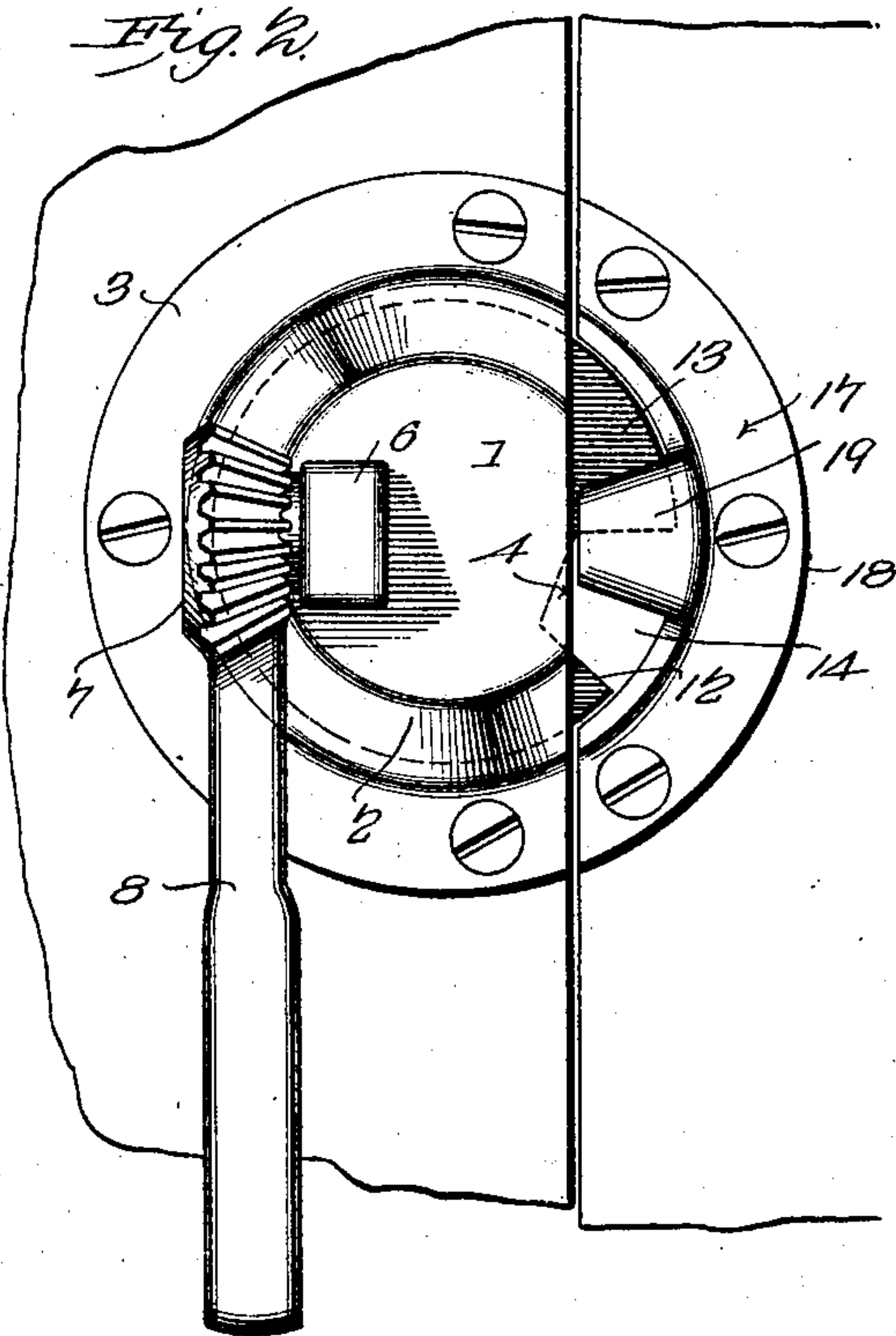
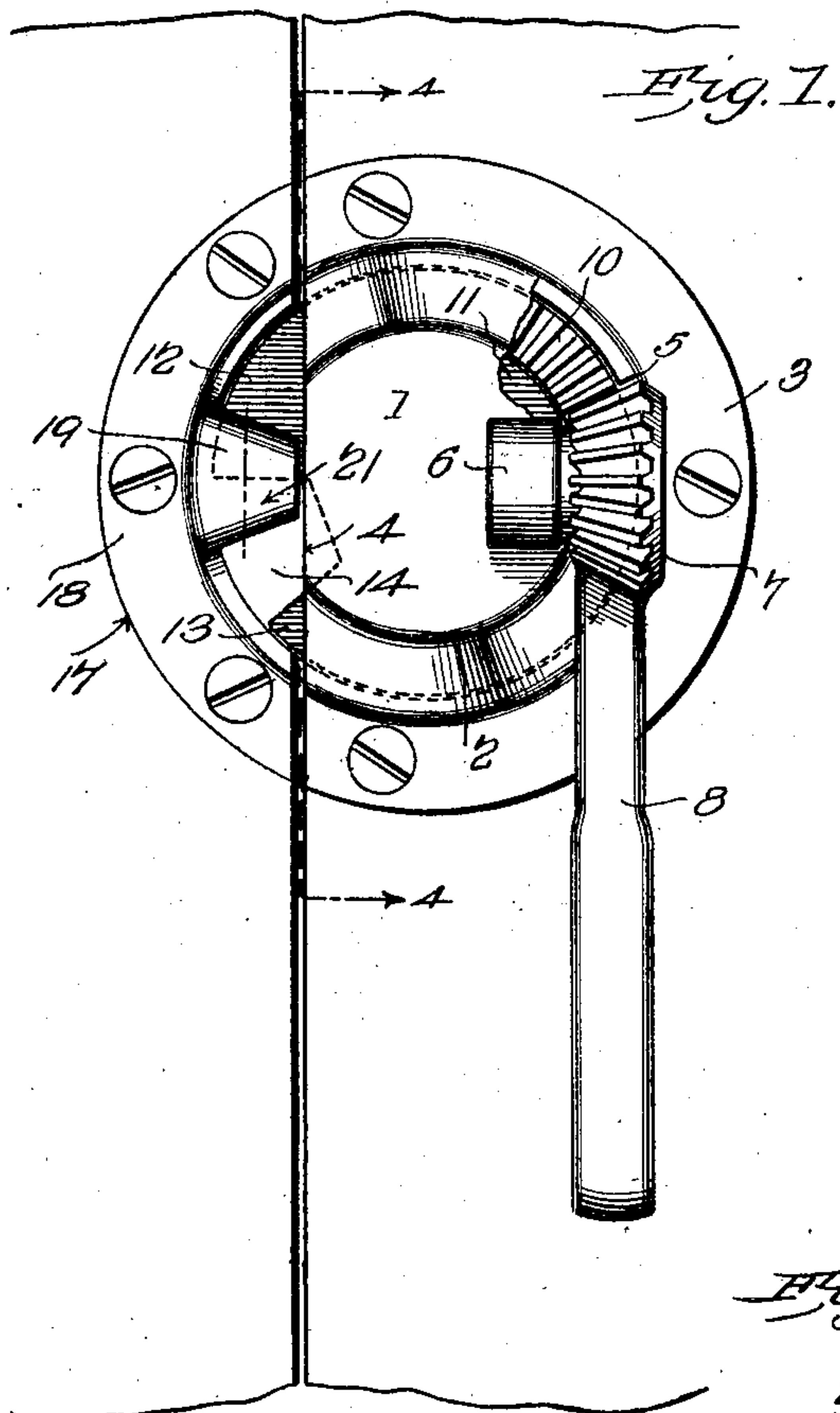


Fig. 5.

Fig. 11.

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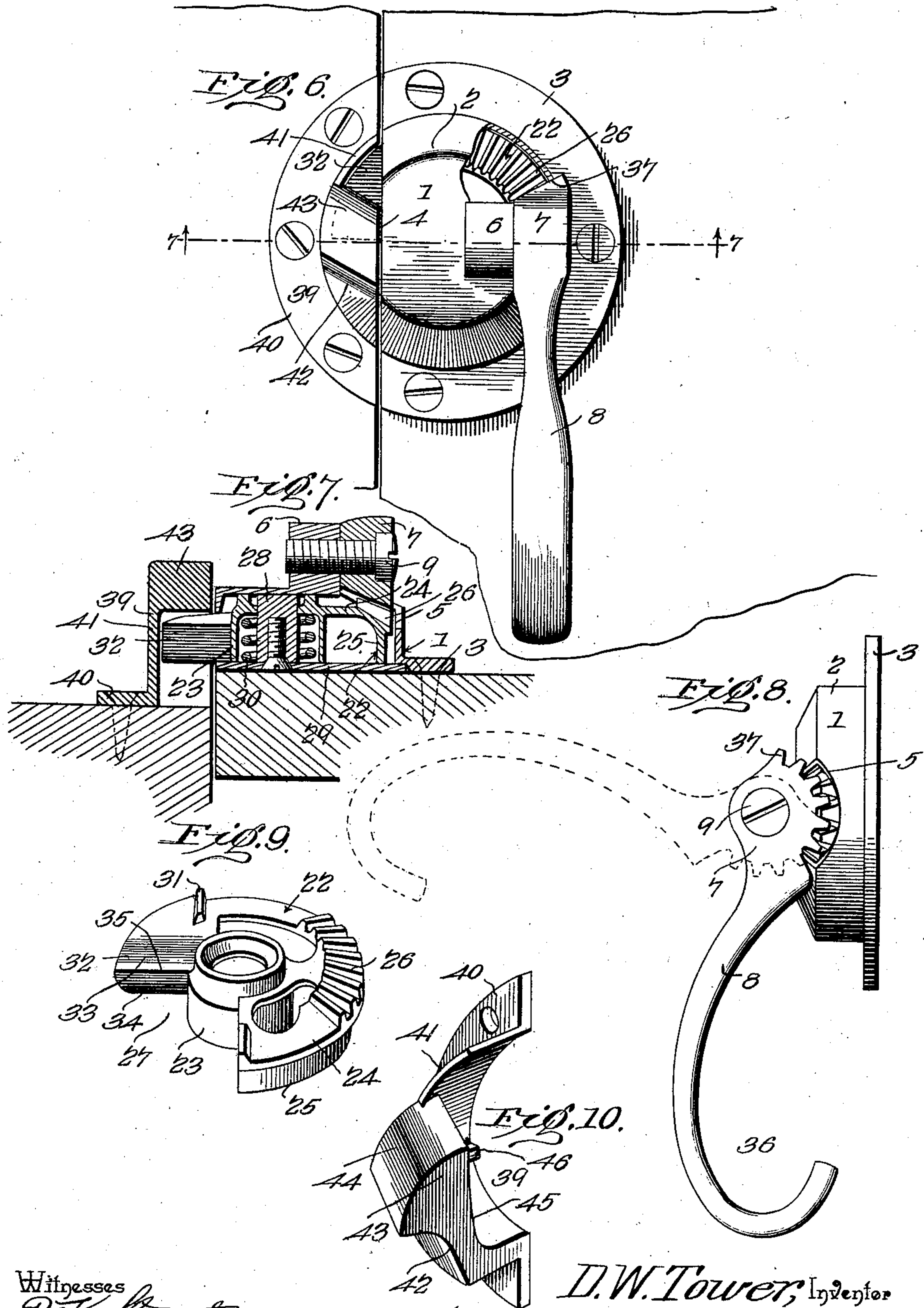
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2 Sheets—Sheet 2.



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UNITED STATES PATENT OFFICE.

DANIEL W. TOWER, OF GRAND RAPIDS, MICHIGAN.

LATCH.

SPECIFICATION forming part of Letters Patent No. 708,097, dated September 2, 1902.

Application filed October 11, 1901. Serial No. 78,369. (No model.)

To all whom it may concern:

Be it known that I, DANIEL W. TOWER, a citizen of the United States, residing at Grand Rapids, in the county of Kent and State of Michigan, have invented a new and useful Latch for Refrigerator - Doors or other Closures, of which the following is a specification.

This invention relates to latches for refrigerator or other doors and analogous uses; and the purpose of the same is to provide a simple and effective device for overcoming and preventing warping and sagging of doors or other correlative parts adapted to be connected and to produce a tight lock which will resist all tendency toward an accidental disengagement of the parts of the same and always maintain the doors or other closures in positive closed condition and capable of an easy operation to release or fasten the same, one form of the device being adapted to be reversed and applied to either a right or left opening door or the like without reorganizing the elements or components of the latch.

The invention consists in the construction, arrangement, and combination of elements generally and in detail which will be more fully hereinafter described and claimed in the preferred forms, but subject to a wide range of modification in the shape, dimension, proportions, and minor details without departing from the essential features or principle involved.

In the drawings, Figure 1 is an elevation of a portion of a door or the like and an adjacent coacting part, showing one form of the improved latch applied thereto and in locked condition, a part of the casing being broken away, the door opening to the right. Fig. 2 is a similar view of the same latch shown applied to a left-opening door. Fig. 3 is a side elevation of the latch. Fig. 4 is transverse vertical section of the same on the line 4-4, Fig. 1, showing parts in full and dotted line positions. Fig. 5 is a detail plan view of the rotatable bolt forming part of the latch. Fig. 6 is a view similar to Fig. 1, showing a modified form of the latch. Fig. 7 is a transverse vertical section on the line 7-7, Fig. 6. Fig. 8 is a side elevation of the latch shown

by Fig. 6. Fig. 9 is a detail perspective view of the rotatable bolt used in the modified form of the latch. Fig. 10 is a detail perspective view of the striker used in the modified form of the latch. Fig. 11 is a detail view of the striker shown in Figs. 1 and 2, illustrating the construction of the diagonally-arranged keeper.

Similar numerals of reference are employed to indicate corresponding parts in the several views.

The numeral 1 in both forms of the device designates an inclosing casing or shell comprising an outwardly-extending hollow body 2 and a securing rim or flange 3, the form of the casing or shell being that of a segment of a circle, and the body is open at the straight side 4 and provided with a slot 5 at a diametrically opposite point.

On the body 2 adjacent to the slot 5 is an ear or boss 6 to serve as a means for securing the head 7 of an operating handle or lever 8, which has a pivot-screw or analogous device 9 passed therethrough and secured in the said ear or boss. In the reversible form of the latch shown by Figs. 1, 2, 3, 4, and 5, the head 7 is in the form of a bevel-pinion which partially projects through the slot 5 to mesh with a toothed segment 10 of a rotatable bolt 11, pivotally mounted within and mainly inclosed by the body 2, the pivot for the said bolt 11 being passed through the center thereof, as indicated by Figs. 4 and 5. The handle 8 of the reversible form of the device is in the form of a loop, as clearly shown by Fig. 3, so that it will be convenient for operation when thrown over in reversed position; but it will be understood that the shape of the said handle may be varied at will without in the least affecting the successful operation of this form of the latch. The rotatable bolt 11 at points opposite the toothed segment has a pair of heads 12 and 13, which are reversely positioned and separated by an intervening slot or space 14, the outer face of the head 12 having an inwardly-curved bevel 15 and the rear face of the head 13 having an outwardly-curved bevel 16, as clearly shown by Fig. 4.

The striker 17 comprises a securing-flange 18 and a diagonally-arranged keeper 19, having opposite convex engaging faces 20 and

preferably of elongated elliptical form in cross-section, though other forms may be adopted having the faces 20 and 21, as set forth. This diagonally-arranged keeper 19, which is set at an angle, as clearly shown in Figs. 4 and 11, presents inner and outer inclined faces and extends inwardly from the center of the striker in diametrical alinement with the center or pivot of the bolt 11 when the two parts of the latch are applied in operative relation, as clearly shown by Figs. 1 and 2, and when this form of the latch is applied to a right-opening door or the like a downward movement of the handle 8 will cause the bolt 11 to rotate to the left through the medium of the bevel-pinion head, forming a part of said handle, and cause the head 12, with the outer beveled face 15, to move under the keeper 19 and to engage the convex face 20 of the latter. An upward movement of the handle to a horizontal position, as clearly indicated by Fig. 4, will cause the head 12 to become disengaged from the keeper 19, and the door carrying the bolt 11 or other device with which the latch is used will then be in released condition, so that the one part may be opened in relation to the other.

When the reversible form of the latch is applied in connection with a left-opening door or the like, the parts are arranged as shown by Fig. 2 and the handle 8 and head 7 are completely overturned, so that when the handle is pressed downwardly it will cause the bolt 11 to become locked in relation to the keeper 19. In this reversed position of the latch the head 13 of the bolt 11 when the latter is rotated to a locking position will have its beveled face 16 brought into contact with the convex face 21 of the keeper, and when the handle 8 is raised said head 13 will be released from the keeper and permit the door or other device to be opened. It will be observed that no reorganization whatever will be required in changing the latch from the position shown by Fig. 1 to that illustrated by Fig. 2, and in view of the capability of reversing the latch in the manner set forth a considerable saving in the cost of manufacture, as well as material convenience in applying the improved latch, will result.

The form of the latch shown by Figs. 6, 7, 8, 9, and 10 is substantially similar to that heretofore set forth in the general or essential features, with the difference that this form of the latch is adapted to be applied in one position only, and to arrange it for use in both right and left opening doors or the like independent structures with the elements reversed will be required. This modified form of the latch comprises a rotatable bolt 22, having a central hub 23, a circular rim 24, provided with a flange 25, and a toothed segment 26, the rim 24 and flange 25 extending partially around the hub 23 to leave a segmental space 27. A post 28, secured to a bottom closing-plate 29, extends upwardly through the hub 23, and surrounding the said post and lying

within the hub is a helical spring 30, which operates to keep the parts in tight relation and to compensate for wear. The spring 30 also serves to hold the bolt 22 up in such position that the toothed segment 26 may be always positively engaged through the slot 5 in the casing or shell. The bolt 22 at opposite points is provided with upstanding bearing-lugs 31, which engage the top or outer portion of the shell or casing to reduce the friction and at the same time maintain the close contacting relation of the outer and inner portions of the bolt with the casing or shell, which is desirable in order to avoid looseness of the parts. The rear edge of the flange 25 of the rim 24 moves over and in contact with the closing-plate 29, and at one terminal of the said flange and rim is a head 32, having an upper elongated inwardly-curved bevel 33 and a rear outwardly-trending more abrupt curved bevel 34, the bevels 32 and 34 intersecting at a terminal edge 35, extending diametrically of the bolt 22. The handle or lever 8 in this instance has a semilooped grip 36, as shown by Fig. 8, and the head 7 is formed with a toothed segment 37, which meshes with the segment 26 of the bolt 22. The striker 39 in this instance includes a ring 40 for securing purposes, similar to the rim 17, heretofore described, and an outwardly-projecting flange 41, having its lower portion closed over by a web 42, merging into a keeper 43, having an outer inwardly-curved beveled face 44 and a rear substantially straight striking-face 45, the flange 41 being formed with a stop-rib 46, extending the full width thereof and shown in part by Fig. 10. The striker is secured in such manner that the head 32 will move thereunder, and the beveled face 33 thereof contacts with the striking-face 45, said head being limited in its movement by contacting with the rib 46. It will be understood that the handle or lever 8 in this instance, as before indicated, is pivotally attached to the ear or boss 6 on the body 2 of the casing adjacent to the slot 5, and when the handle or lever is raised it will retract the head 32 from the keeper 43 and permit the door or like device to be opened. If the head 32 of the bolt 22 be projected from the casing or shell when the door or like device carrying the same is closed, the under or rear bevel 34 of the said head will contact with the bevel 44 of the striker 43 and cause the said head to be forced past the striker and assume a normal position for locking. The position of the handle or lever 8 and the segment 37 of the head 7 when raised to retract or release the bolt 22 and cause the head of the latter to move out of lapping relation with the keeper 43 of the striker is clearly shown by dotted lines in Fig. 8, and in either form of the device shown the handle or lever may be employed to pull the door open or to push it shut.

The parts of both forms of the latch will be made by casting or otherwise in the most eco-

nomical manner, and such metals will be used as are best adapted for the purpose, and it is also proposed to nickel-plate or otherwise ornament said parts. The parts of the improved latch in its two forms may be quickly applied in operative position, and in the use of the latch the door or the like will be tightly locked when closed and will be caused to be preserved in its normal condition without liability of warping or sagging. By varying the dimensions of the two forms of the latch application thereof can be made with advantage to boxes, window-sashes, and other correlative devices it is desired to connect or lock.

Having thus described the invention, what is claimed as new is—

1. In a latch, the combination of a casing, a rotatable bolt mounted therein having a locking-head and a toothed segment, an operating-handle with a toothed head engaging the said segment, the toothed head of the handle being at an angle to the bolt, and a striker having a keeper for engagement by the bolt-head.

2. In a latch, the combination of a casing, a rotatable bolt having a locking-head and a toothed segment, an operating device disposed at an angle to the bolt and having a toothed head to engage said segment, and a striker having a keeper for engagement by said bolt-head.

3. In a latch, the combination of supporting means, a rotatable bolt having a locking-head and toothed segment, an operating device for the bolt movable in a plane at right angles to the latter and having a toothed head to engage said segment, and a striker for engagement by said bolt-head.

4. In a latch, a rotatable bolt, a striker to engage a portion of the bolt, and means movable in planes at right angles to the movement of the bolt for operating the latter.

5. In a latch, the combination with a keeper, of a rotatable bolt having a portion to engage said keeper and provided with a toothed segment, and a vertically-movable operating means having a toothed head to engage said

segment, the bolt being movable in a plane at an angle to that of said operating means. 50

6. In a latch, the combination with a striker, of a rotatable bolt having means to engage said striker movable concentrically therewith, and an operating device for the said bolt movable in a plane at an angle to the latter. 55

7. In a latch, the combination of a striker having a reversible keeper, a rotatable bolt having two heads spaced apart and arranged to engage opposite portions of the keeper, and reversible means movable in planes at right angles to the movement of the bolt for operating the latter, substantially as described. 60

8. In a latch, the combination of a striker having a diagonally-arranged keeper and adapted to be reversed, a rotatable bolt provided with a pair of heads spaced apart to engage opposite portions of the keeper, and reversible means movable in planes at right angles to the movement of the bolt for operating the latter, substantially as described. 70

9. In a latch, the combination of a striker having a diagonally-disposed keeper, a rotatable bolt provided with reversely-tapered heads spaced apart and arranged to engage the opposite faces of the diagonally-disposed keeper, the latter being adapted to be reversed to enable either of the said heads to extend behind it, and reversible means for operating the bolt, substantially as described. 80

10. In a latch, the combination of a striker having opposite engaging faces, a rotatable bolt with a pair of contiguous heads to individually engage the faces of the said keeper and also having a toothed segment, and an operating-handle revolubly and reversibly mounted in relation to the bolt and having a head in the form of a bevel-pinion to engage the said segment. 85

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses. 90

DANIEL W. TOWER.

Witnesses:

H. EMORY PEASE,
GEORGE F. SINCLAIR.