

No. 777,943.

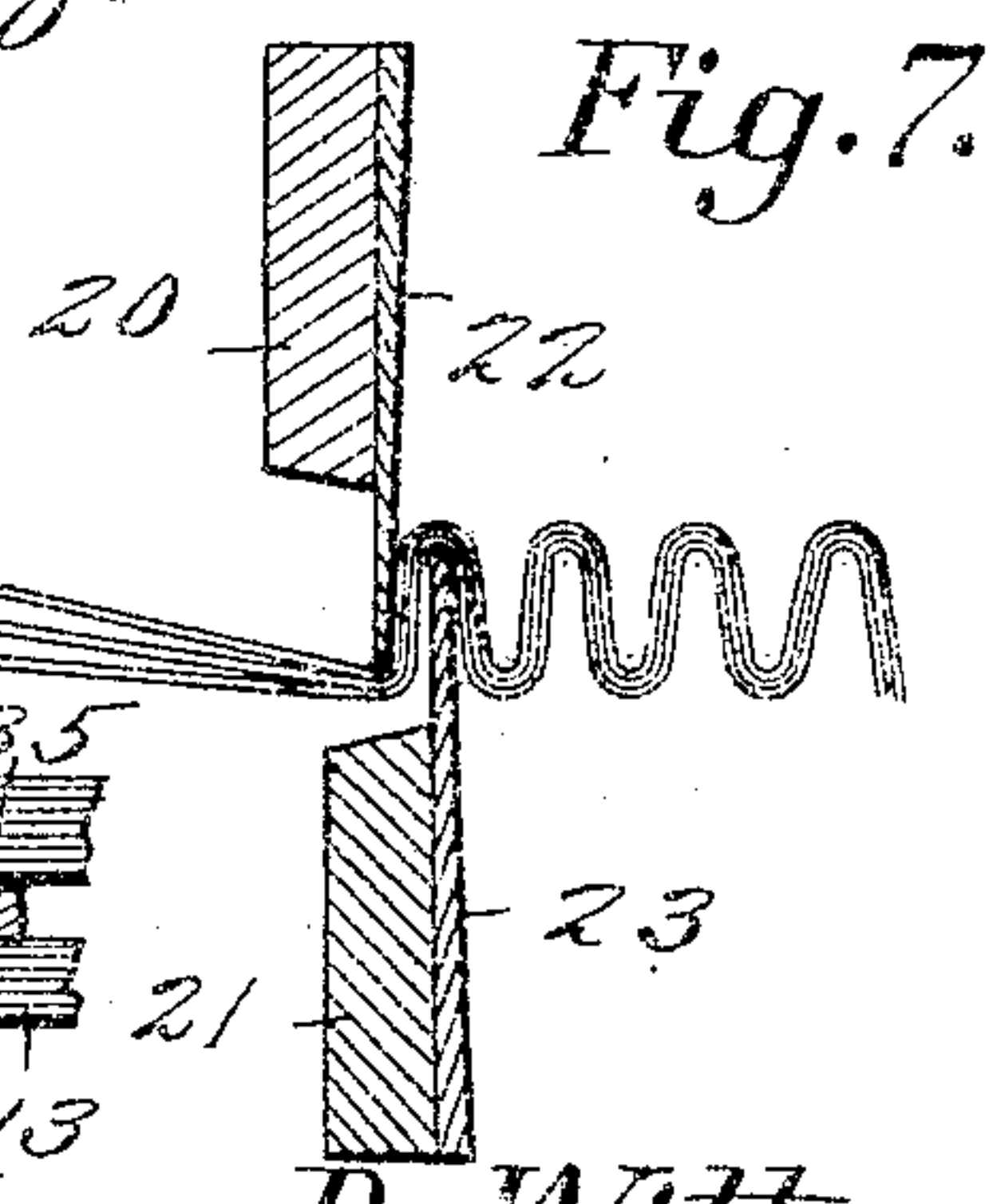
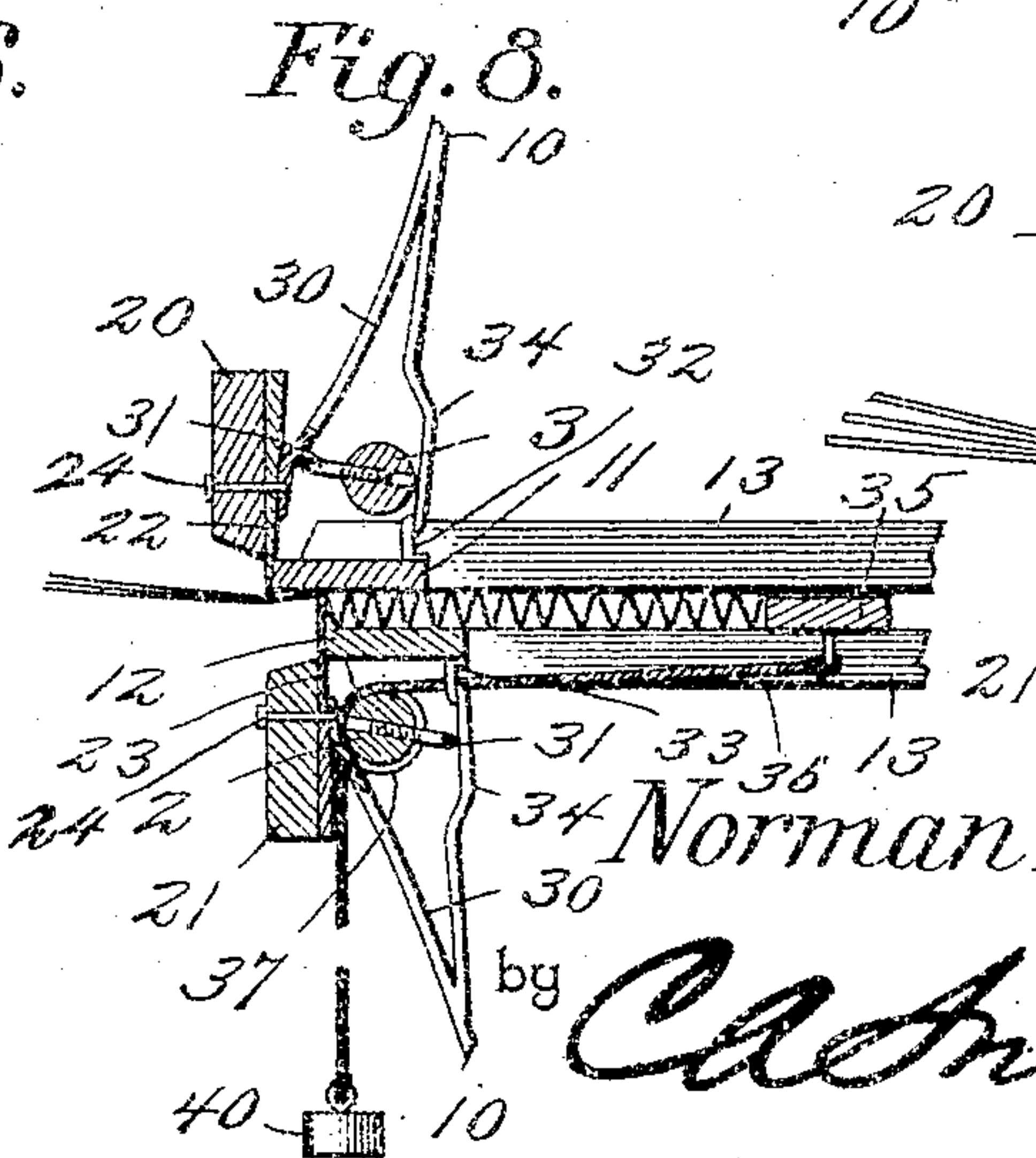
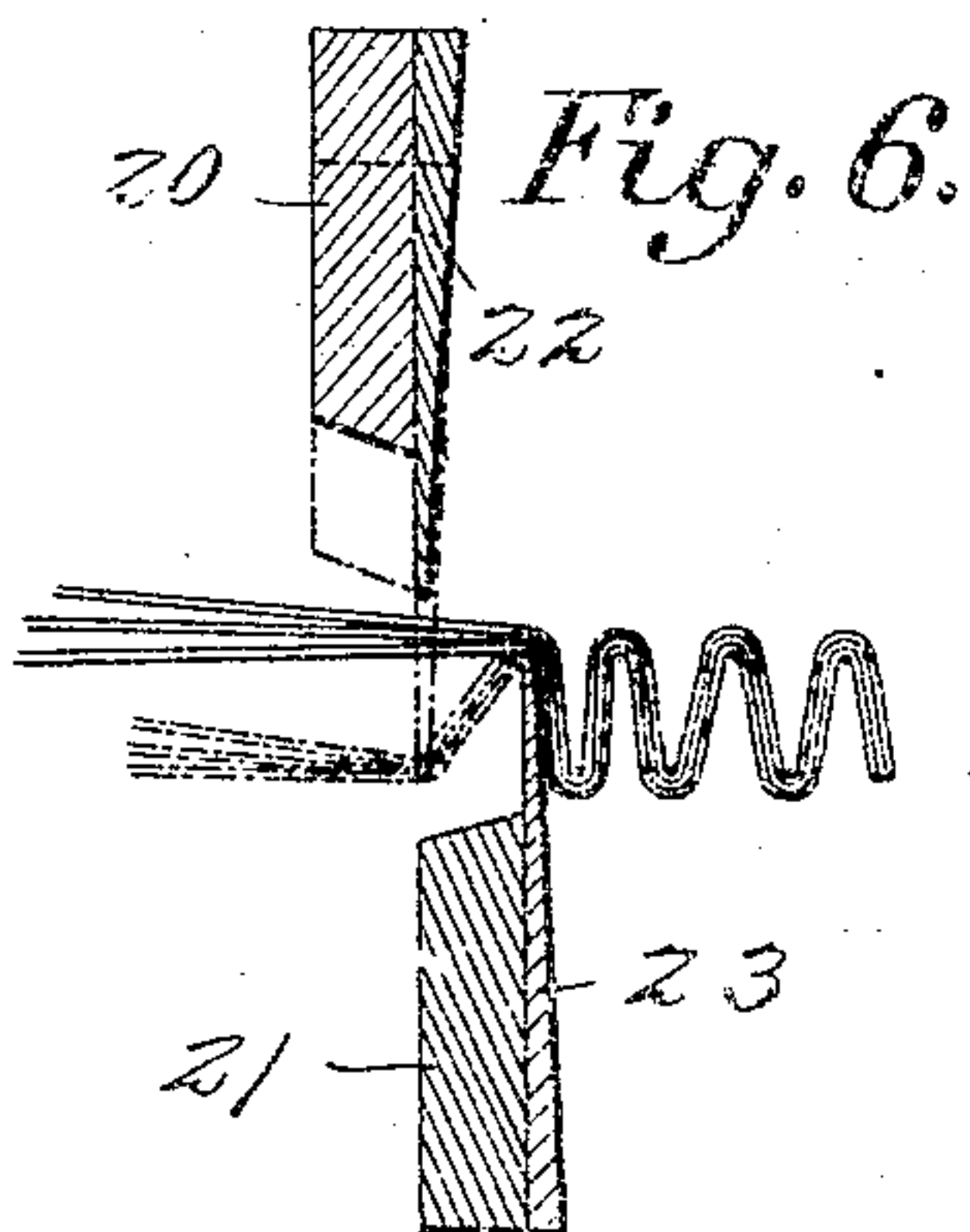
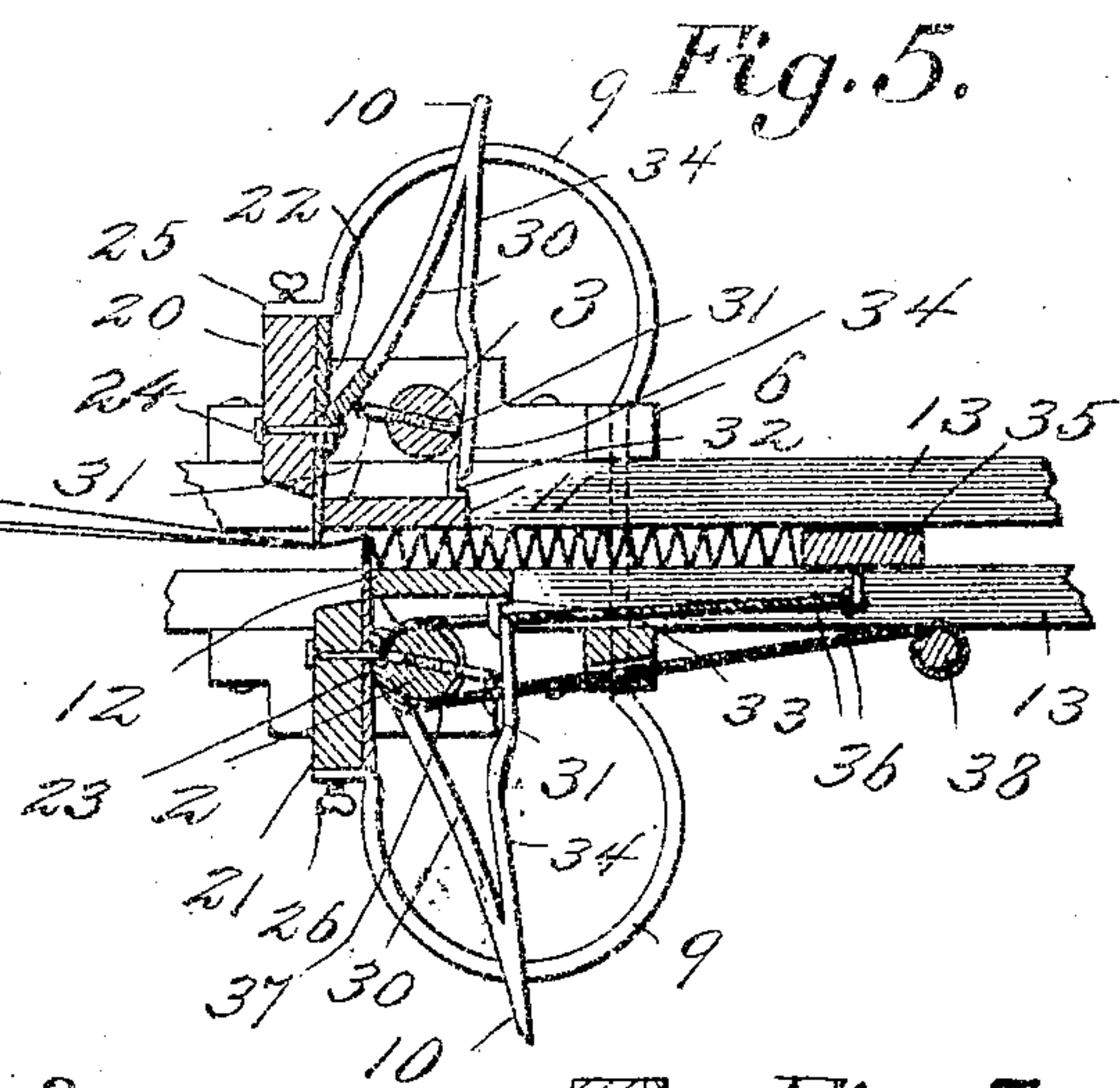
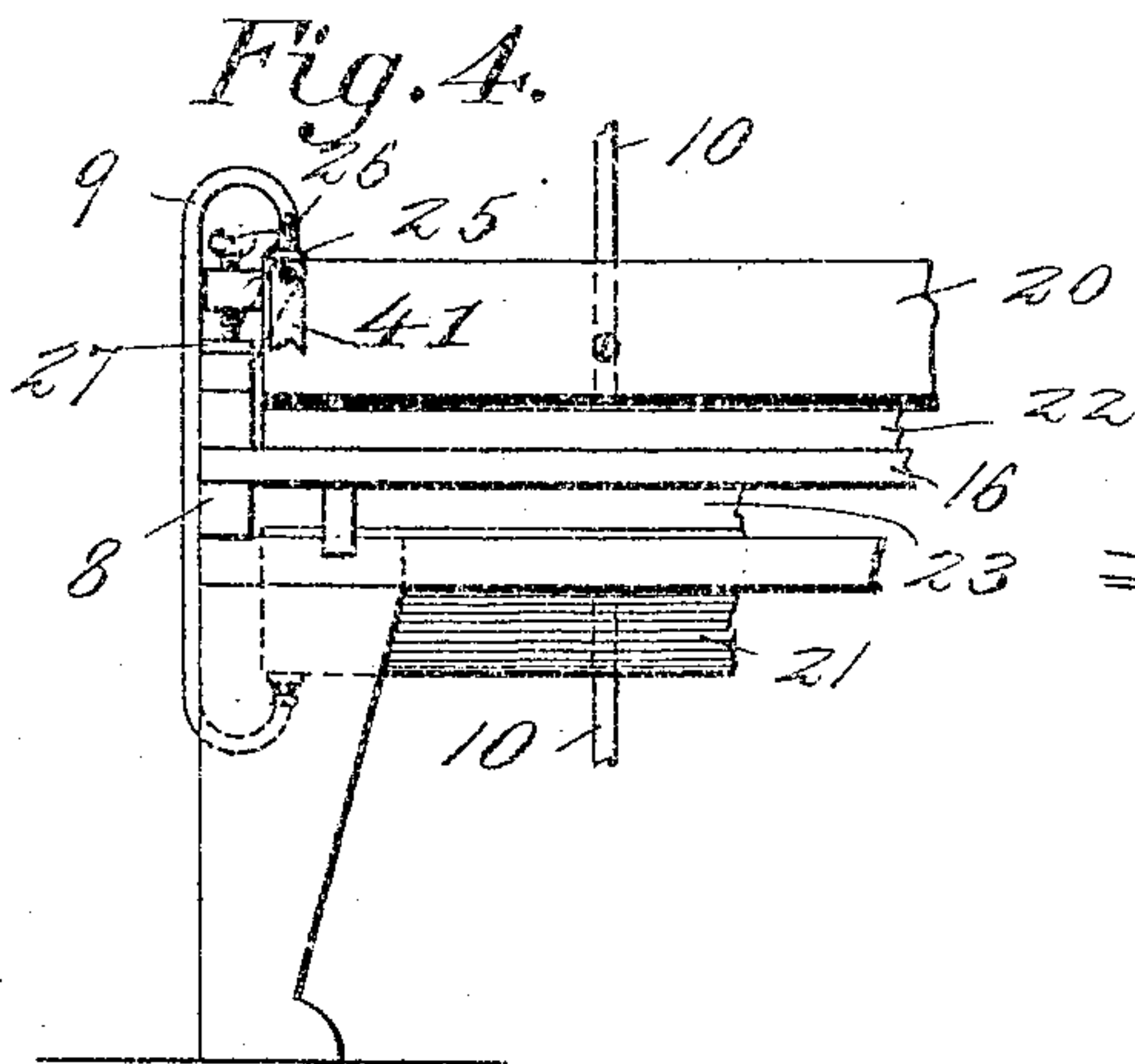
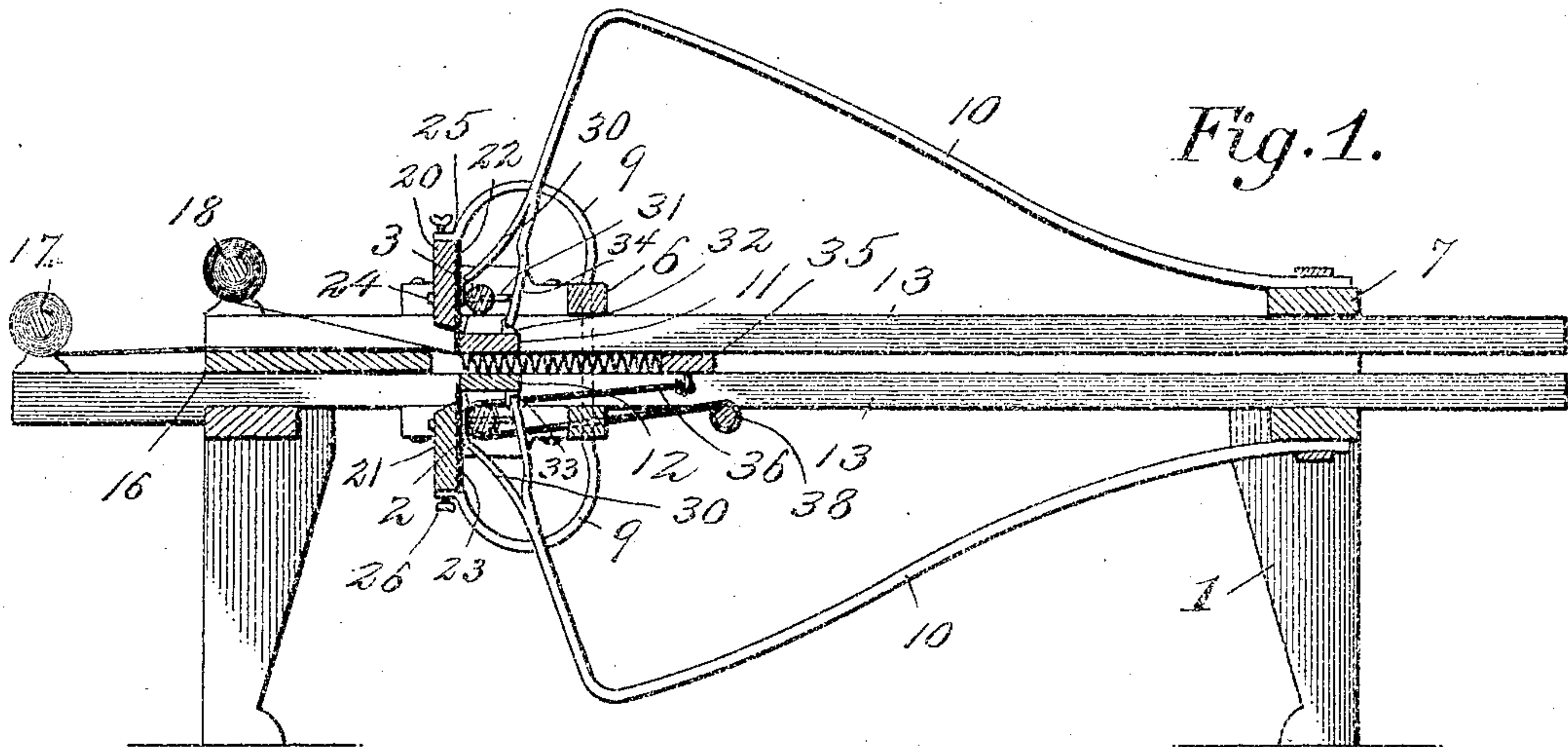
PATENTED DEC. 20, 1904.

N. DE WITTA.  
PLAITING MACHINE.

APPLICATION FILED APR. 8, 1904.

NO MODEL.

2 SHEETS—SHEET 1.



Witnesses  
*E. J. Stewart*  
*Geo. E. Parker*

Norman DeWitta,  
Inventor.  
by *C. A. Snow & Co.*  
Attorneys

No. 777,943.

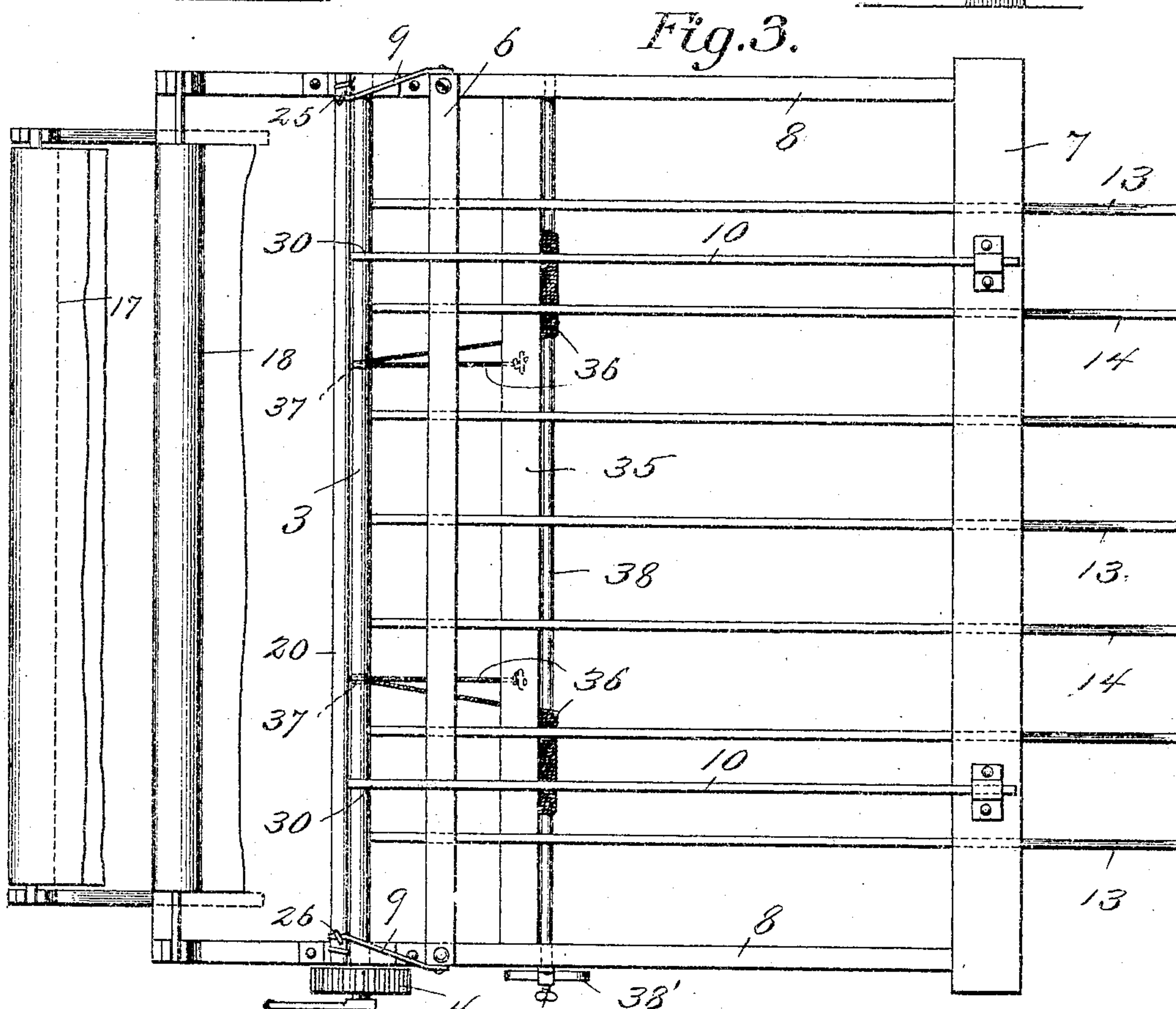
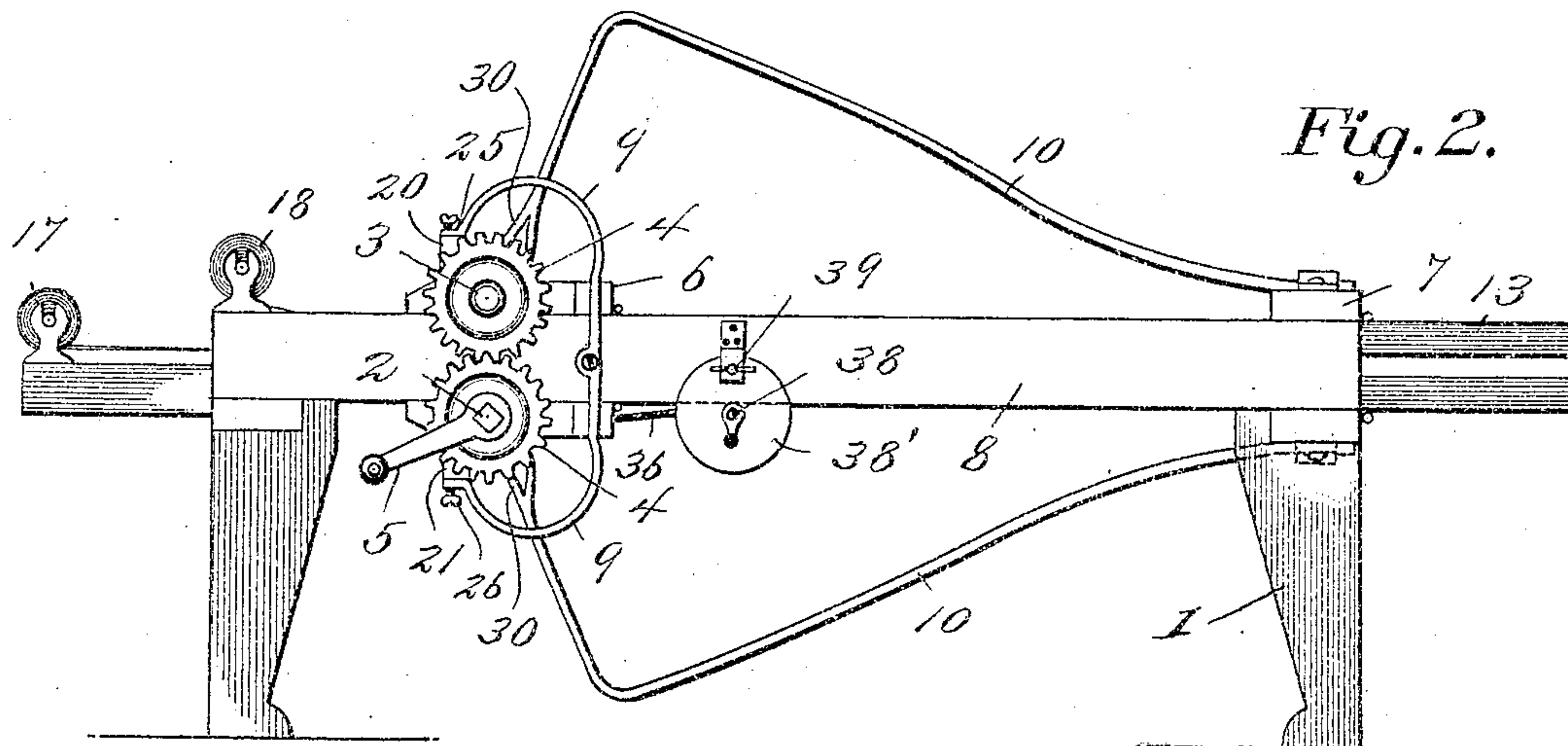
PATENTED DEC. 20, 1904.

N. DE WITTA.  
PLAITING MACHINE.

APPLICATION FILED APR. 8, 1904.

NO MODEL.

2 SHEETS--SHEET 2.



Witnesses

E. H. Stewart  
Brookline

*39 Norman DeWitta*, Inventor.

by

Chas Snow Geo

Attorneys



# UNITED STATES PATENT OFFICE.

NORMAN DE WITTA, OF WATERTOWN, NEW YORK.

## PLAITING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 777,943, dated December 20, 1904.

Application filed April 8, 1904. Serial No. 202,239.

*To all whom it may concern:*

Be it known that I, NORMAN DE WITTA, a citizen of the United States, residing at Watertown, in the county of Jefferson and State of New York, have invented a new and useful Plaiting-Machine, of which the following is a specification.

This invention relates to improvements in plaiting-machines, and has for its principle object to provide a novel form of machine for accordion-plaiting of skirts and other fabrics in general.

A further object of the invention is to provide a plaiting-machine in which the plaits will be of uniform character as regards the folding and creasing in opposite directions and in which the strain exerted on the cloth will be precisely the same on both sides of the fabric.

A still further object of the invention is to provide a machine in which the depth of the plaits may be varied to any extent and the character of plaiting altered in accordance with the work, so that a piece of fabric may be plaited to form a skirt, the depth of the plait being gradually increased from the waist-line toward the hem.

A still further object of the invention is to provide a machine in which the cloth is protected from contact with the folding devices in order to avoid danger of injury to delicate fabrics, strips of paper or similar material being disposed on opposite sides of the fabric for direct contact with the folding-blades.

A still further object of the invention is to provide a plaiting-machine in which provision is made for holding the plaited article in folded position in such manner as to permit its convenient withdrawal from the machine, while the folds are retained during the subsequent steaming and pressing operations.

With these and other objects in view, as will more fully hereinafter appear, the invention consists in the novel construction and arrangement of parts hereinafter described, illustrated in the accompanying drawings, and particularly pointed out in the appended claims, it being understood that various changes in the form, proportions, size, and minor details of the structure may be made without de-

parting from the spirit or sacrificing any of the advantages of the invention.

In the accompanying drawings, Figure 1 is a longitudinal sectional elevation of a plaiting-machine constructed in accordance with the invention. Fig. 2 is a side elevation of the same. Fig. 3 is a plan view of the machine. Fig. 4 is a front elevation of one side of the machine. Fig. 5 is a longitudinal sectional elevation of a portion of the folding mechanism, drawn to a somewhat enlarged scale. Figs. 6 and 7 are views in the nature of diagrams, showing the folding operation. Fig. 8 is a view corresponding to Fig. 5, illustrating the novel construction of the mechanism for holding the fabric in its folded condition.

Similar numerals of reference are employed to indicate corresponding parts throughout the several figures of the drawings.

The various operating parts of the machine are supported on a suitable frame 1, having standards so arranged as to place the folding-knives at a convenient distance above the floor. In this frame are bearings for the support of the shafts 2 and 3, which are connected by intermeshing spur-gears 4, and the lower shaft 2 is provided with an operating-crank 5 when the machine is to be operated by hand. Extending transversely across the machine are two sets of rigid bars 6 and 7, that are spaced from each other by means of main longitudinal bars 8 of the frame. The forward set of bars 6 serve to support a pair of springs 9, and to the rear bars 7 are secured elongated springs 10, the two sets of springs serving as carriers for the folding devices.

The fabric as it is fed is forced between a pair of spaced bars 11 and 12, to each of which is secured a number of parallel bars 13, that are guided by the frame, and these bars move with the transverse bars 11 and 12 as the latter are alternately moved to and fro during the plaiting operation. The sets of bars 13 form, in effect, a chamber into which the folded fabric is gradually fed, and a portion of the walls of this chamber is formed by a plurality of bars 14, arranged in upper and lower series and spaced at intervals with respect to the bar 13. The front ends of the bars 14 are connected loosely to the trans-



verse bars 6 and are adjustable thereon in a direction transversely of the machine in order to accommodate fabrics of different width.

The bars 14 are movable from the machine independent of the bars 13, so that when a piece of fabric has been completely plaited it may be removed, together with the bars 14, and subjected to any further necessary treatment, while the fresh bars may be placed in position and the machine operated without loss of time.

At the front of the machine is a bed or table 16, and at suitable points on the frame are brackets for the reception of rollers 17 and 18, which may be removed from the machine for rewinding, the roller 17 receiving a fabric to be folded together with a strip of paper or other protecting material, while the roller 18 receives a strip of material for the protection of the opposite sides of the fabric. All of the strips of material may be wound on a single roller, or a separate roller may be employed for each of the strips, or the protecting-strips may be omitted without departing from the invention.

To the opposite ends of the springs 9 are secured transverse blade-carrying bars 20 and 21, and to these bars are secured blades 22 and 23, respectively, the blades being held in position by bolts 24, that extend through suitable slots in order to permit adjustment of the blades with respect to their carrying-bars. The two carriers 20 and 21 are provided at opposite ends with projecting lugs 25, having openings for the passage of stop-screws 26, that are adapted to engage with plates 27, secured to the frame of the machine, and by properly adjusting the movement of the carriers and blades toward each other the vertical direction may be altered to any desired extent in order to alter the depth of the plaits, and this may be advantageously used in the plaiting of skirts where the depth of plait at one edge of the fabric is greater than at the opposite edge.

The carriers are secured to the forward arms 30 of the springs 10, and these springs are acted upon by pins 31, projecting radially from the shafts 2 and 3, the pins projecting in opposite directions from the respective shafts, so that they will operate alternately on the pins, and said pins are provided with threaded portions adapted to openings in the shaft and having heads at their outer ends constructed for engagement by a suitable tool, so that the extent of projection may be varied in accordance with the movement to be imparted to the blades and their carriers.

To the transverse bars 11 and 12 are secured lugs 32 and 33, respectively, these being engaged at times by arms 34, carried by the springs 10, and when so engaged the bars are moved outward or in the direction of the carrying-rollers 17 and 18 and are afterward

returned to initial position by the stress of the springs.

Between the sets of bars 13 and 14 is placed a transverse bar 35, to which are connected the ends of cords 36, which are led around guiding-pulleys 37 near the front of the machine and thence back from winding-shaft 38, mounted transversely in the frame and provided at one end with a disk 38', against which presses an adjusting-screw 39, offering greater or less resistance to the turning movement of the disk, and thus increasing the force necessary to move the bar 35. A simpler form of resistance may be employed in the form of a weight or weights 40, attached to the ends of the cords or chain 36.

In the operation of the device the bar 35 is introduced between the two transverse bars 11 and 12 and the fabric is started in between the bars. For convenience the uppermost blade-carrier 20 is provided near each end with a turn-button 41 of the character shown in Fig. 4. This turn-button is in the form of a flat bar pivoted at its upper end to the bar 20 and its lower end being provided with a V-shape notch. The button is disposed near the end of the blade-carrier, and when said blade is elevated the buttons may be turned outward by hand until they assume the position shown by dotted lines in Fig. 4, so that the lower end of each button will rest on the top of one of the stop-plates 27. This will hold the blade-carrier elevated against the stress of the springs 9 and 10, and the blade will be locked in its raised position while the cloth is being introduced. This being accomplished, the machine is started, and, with the parts in the position shown in Fig. 5, the pins or cams 31 of the upper shaft 3 are moving the blade 22 forward and upward, while the lower blade 23 is holding the previously-folded plait in position, the upper edge of the blade pressing the fabric against the under surface of the transverse bar 11 and the latter sliding thereover, but the friction being insufficient to draw the fabric away from the blade 23. At the completion of the forward movement of the blade 22 the cam or pin 31 in traveling over the inclined portion 30 of the spring 10 will permit the blade to descend against the upper surface of the fabric or against the sheet of paper used as a protecting-strip and effect the downward fold of the fabric in the direction opposite to that previously accomplished by the lower blade 23. The spring 10 then carries the whole gradually to the rear, pressing the cloth tightly against the outer face of the blade 23. Immediately following this the pin or cam 31 of the lower shaft will have become active and the blade 23 will be moved outward and downward, while the blade 22 remains in position to hold the folded fabric. The blade 23 operates in a manner similar to the blade



22, but engaging the lower surface of the fabric or protecting-sheet will form a fold in the opposite direction. After the plaiting operation has been accomplished a second bar is introduced between the two bars 11 and 12 and pressed with any desired force in the direction of the bar 35, so as to firmly confine the fabric in position, after which the several bars 14 and the two bars between them may be removed and serve in the meantime as carriers for the fabric and hold the same properly folded in readiness for the subsequent steaming and pressing operations.

It will be observed that inasmuch as the blades engage the opposite faces of the cloth very tightly the stretch of the fabric is limited and the folding or plaiting will be more uniform and perfect than where only one face of the fabric is engaged, and where very delicate fabrics are being operated upon the protecting-strips of paper or similar material may be used, or the paper strips may be used in connection with any fabric and fold with it in order to preserve the plaiting and protect the fabric from exposure.

Having thus described the invention, what is claimed is—

1. In a plaiting-machine, folding-blades movable respectively in opposite directions and coacting with each other to form plaits, springs for moving the blades in the direction of the work, and means for moving the blades outward against the stress of said springs.

2. In a plaiting-machine, yieldably-mounted spring-pressed blades, movable, respectively, in opposite directions and coacting with each other to form the folds, springs tending to move the blades in the direction of the work, and means for moving said blades away from the work against the stress of the springs.

3. In a plaiting-machine, folding-blades, springs tending to move the blades in the direction of the work to accomplish the folding operation, springs tending to move said blades to effect compression of the folded material, and means for moving the blades against the stress of the springs.

4. In a folding-machine, a pair of alter-

nately-operable folders for engagement respectively with the opposite sides of the fabric, adjustable screws disposed at the ends of each folder, and stop-plates for engagement with the screws.

5. In a plaiting-machine, a pair of alternately-operable folding-blades, carriers for said blades, springs for supporting said carriers, auxiliary springs also serving as supports, and cams for engaging the auxiliary springs.

6. In a plaiting-machine, a pair of alternately-operable blades, springs for supporting the same, cam-shafts for engaging the springs and operating the folders, and a receiver for the folded fabric, said receiver including a pair of transversely-disposed bars that are movable with their respective folders.

7. In a plaiting-machine, folding-blades, carriers for supporting the same, blade-carrying springs, a receiver for the folded fabric, said receiver including a pair of transverse bars, lugs projecting from said bars, and spring connections for engaging the lugs to cause movement of the bars with their respective folding-blades.

8. In a folding-machine, a receiver comprising a pair of spaced members, and means for alternately operating the same during the folding operation.

9. In a plaiting-machine, a receiver including a pair of members spaced to form a receiving-chamber, folding-blades movable with said members, and means for operating the members alternately.

10. In a plaiting-machine, a plurality of spaced bars forming a receiver, folding means, a presser-bar against which the fabric is forced, an arbor or shaft, a flexible chain or cord for attaching the shaft to the bars, a disk carried by the shaft, and adjustable friction devices for engaging the disk.

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

NORMAN DE WITTA.

Witnesses:

JAMES A. DULMY,  
J. E. GRAY.