

No 858,760.

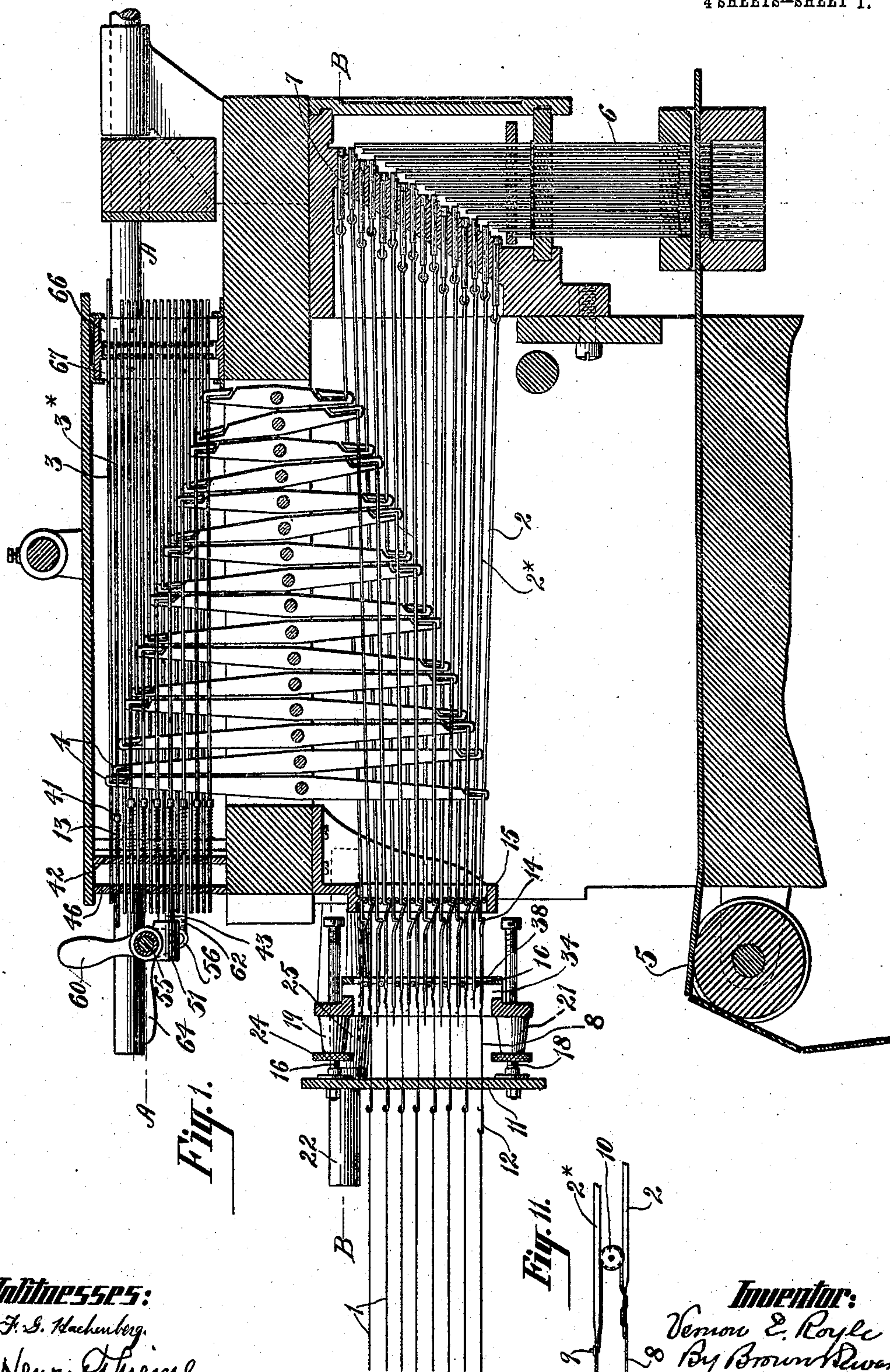
PATENTED JULY 2, 1907.

V. E. ROYLE.

MACHINE FOR REPEATING JACQUARD CARDS.

APPLICATION FILED NOV. 28, 1904.

4 SHEETS—SHEET 1.



Witnesses:

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Inventor:

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No. 858,760.

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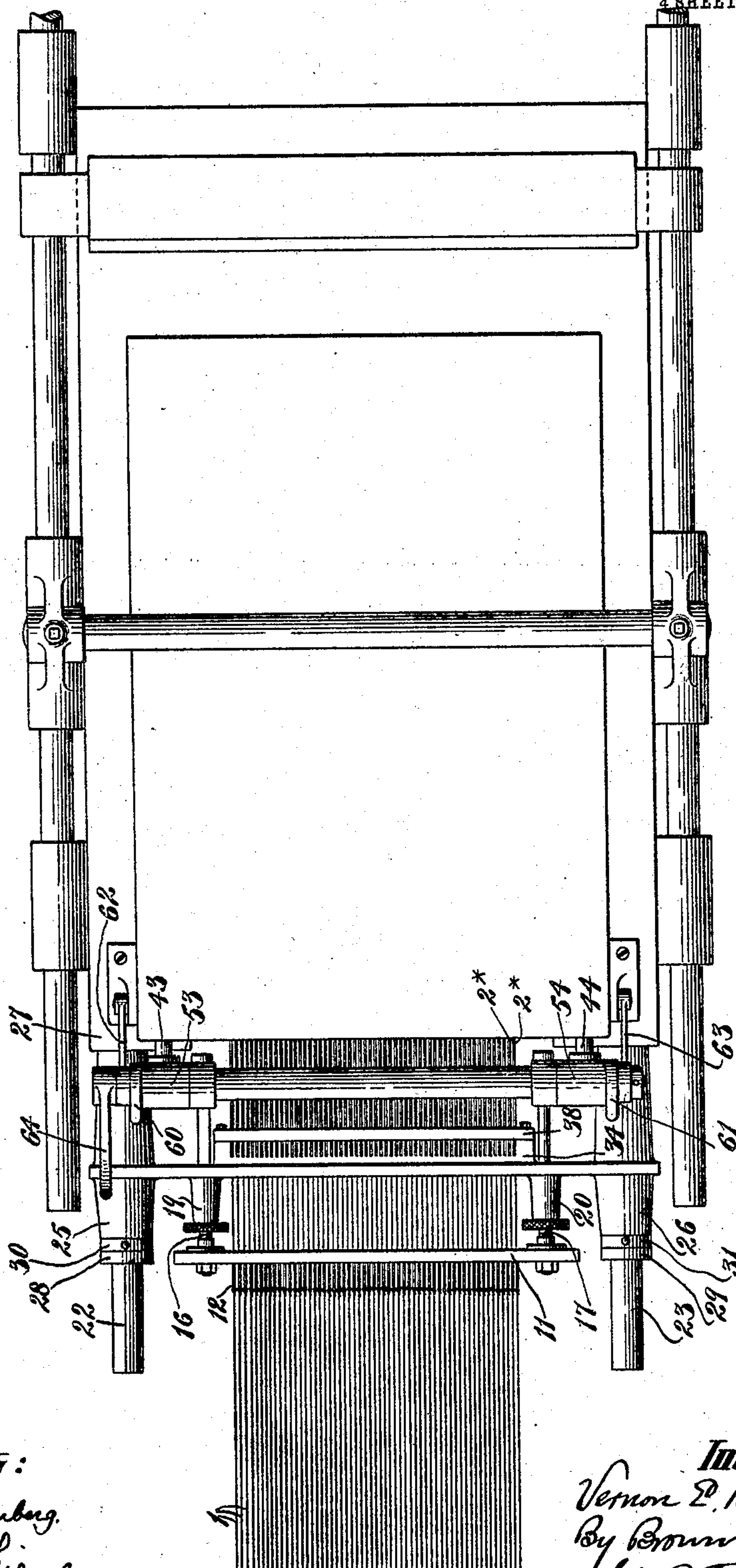
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4 SHEETS—SHEET 2.

Fig. 2.



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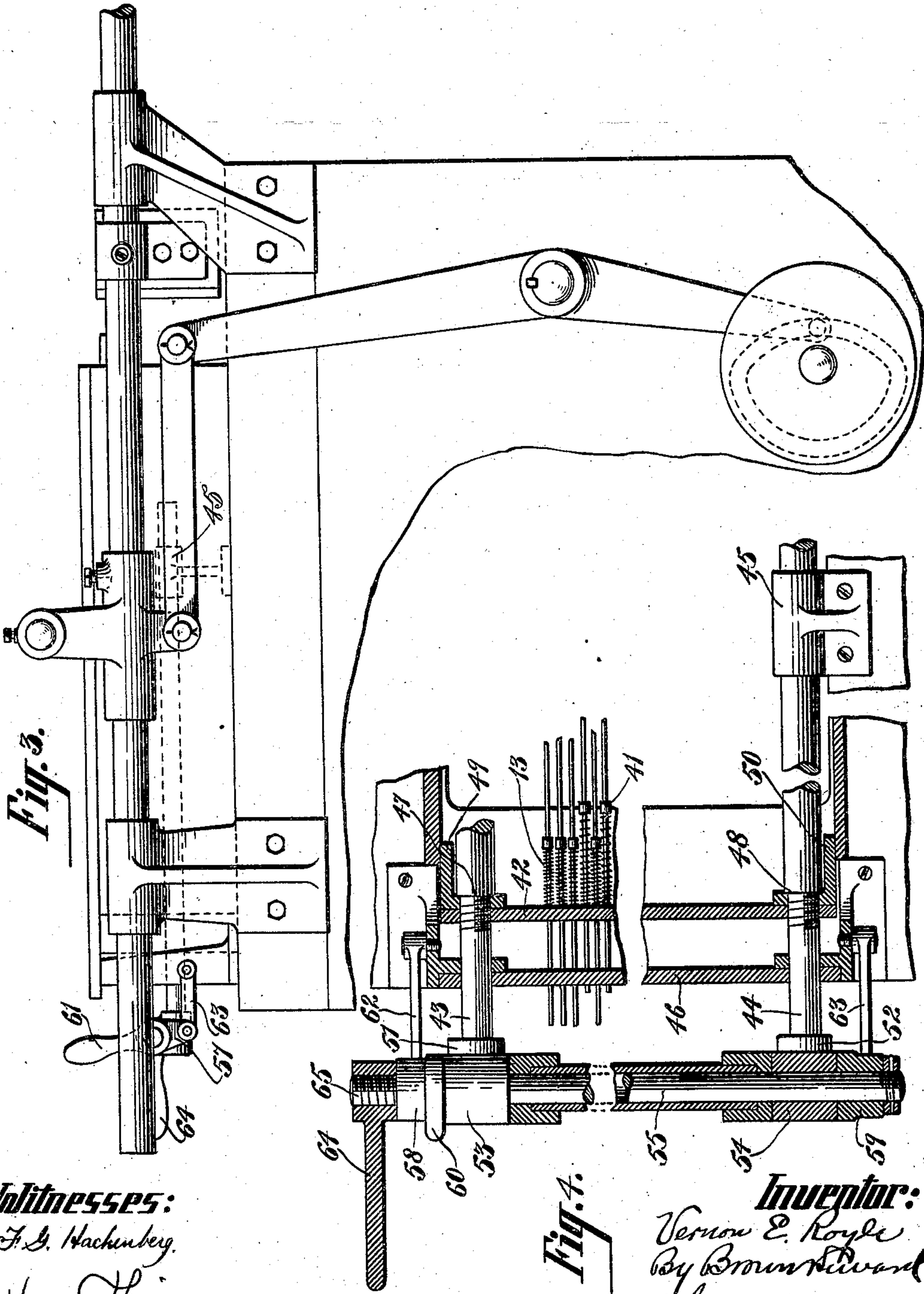
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4 SHEETS—SHEET 3.



Witnesses:

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Fig. 4.

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4 SHEETS—SHEET 4.

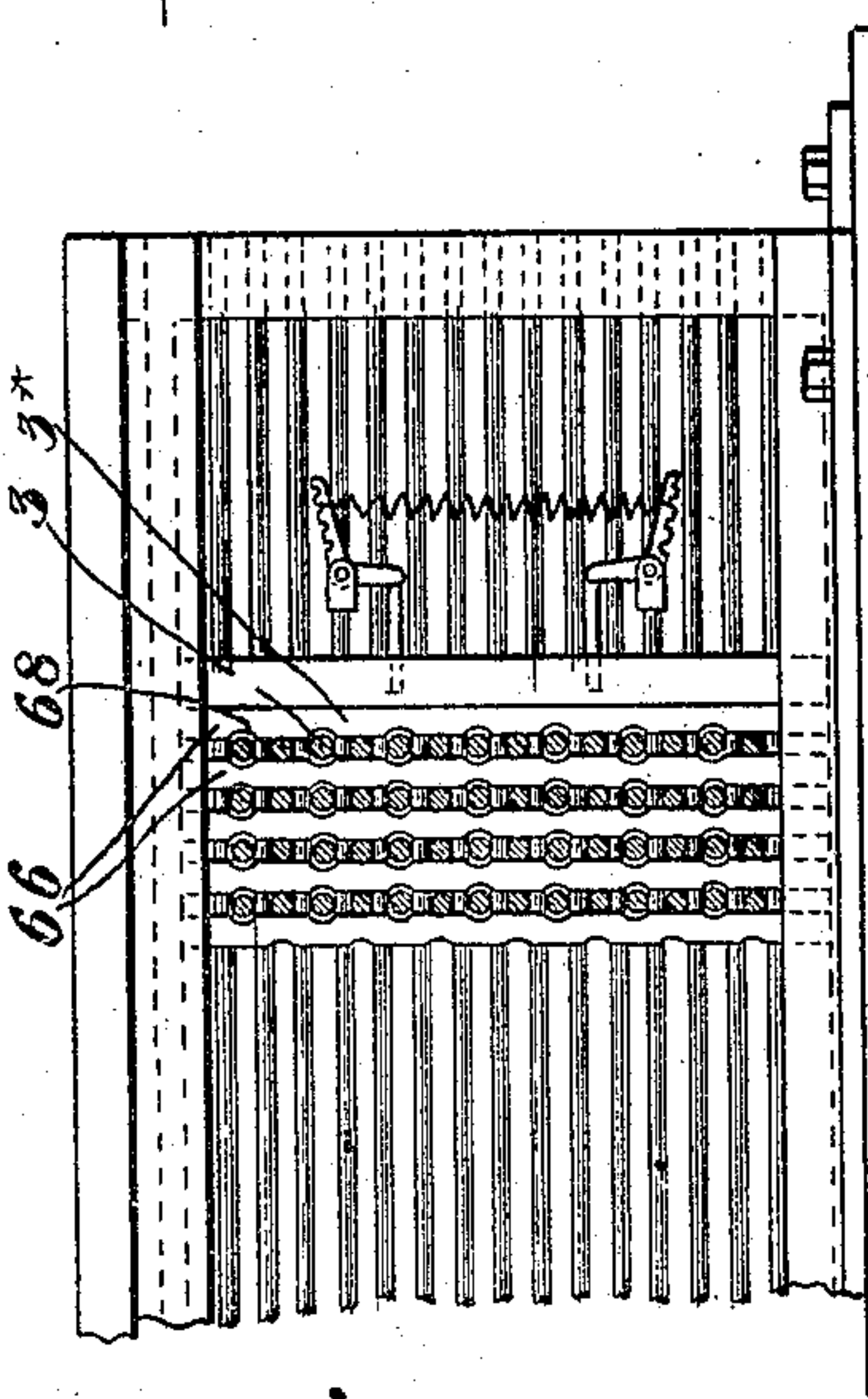
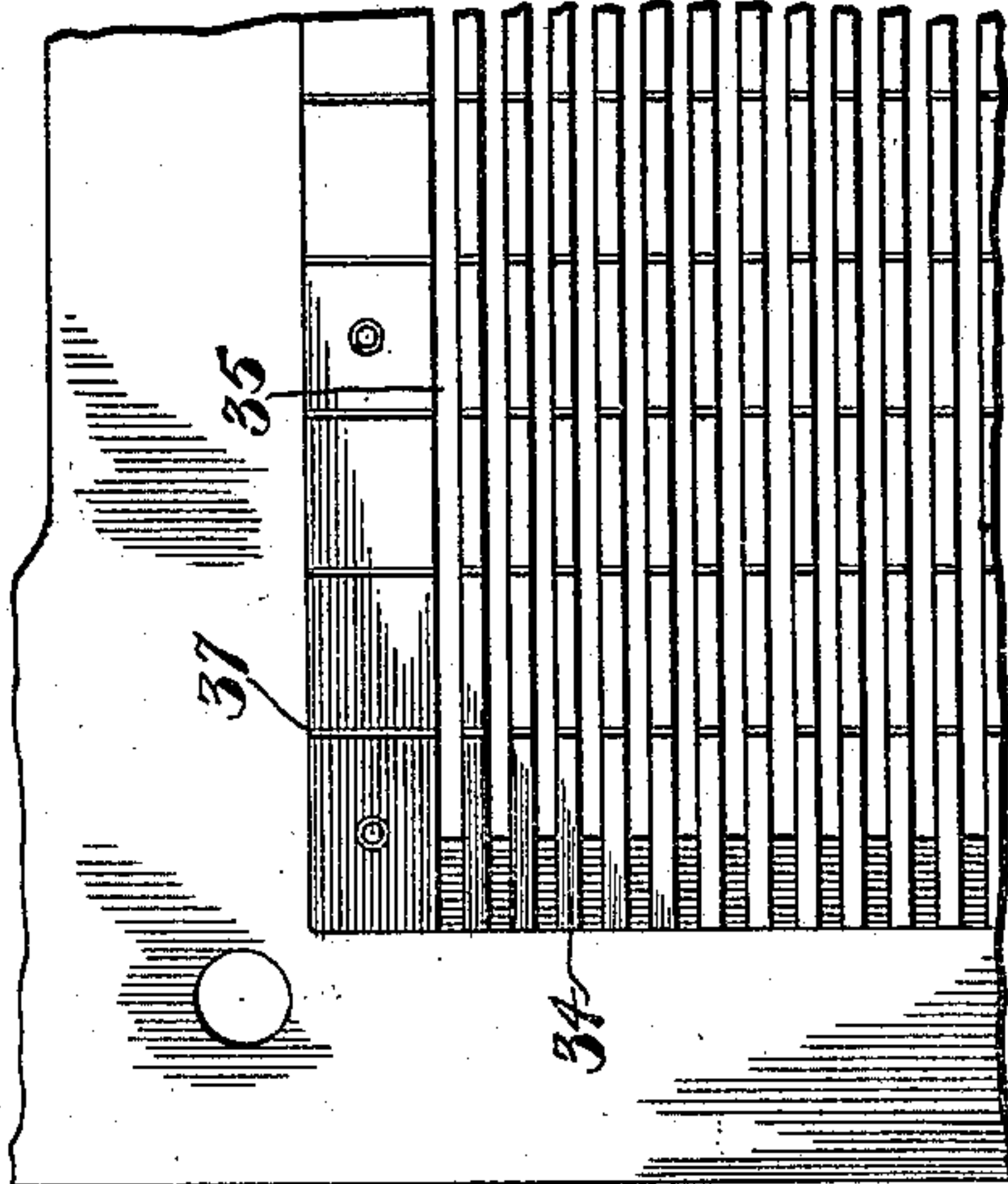
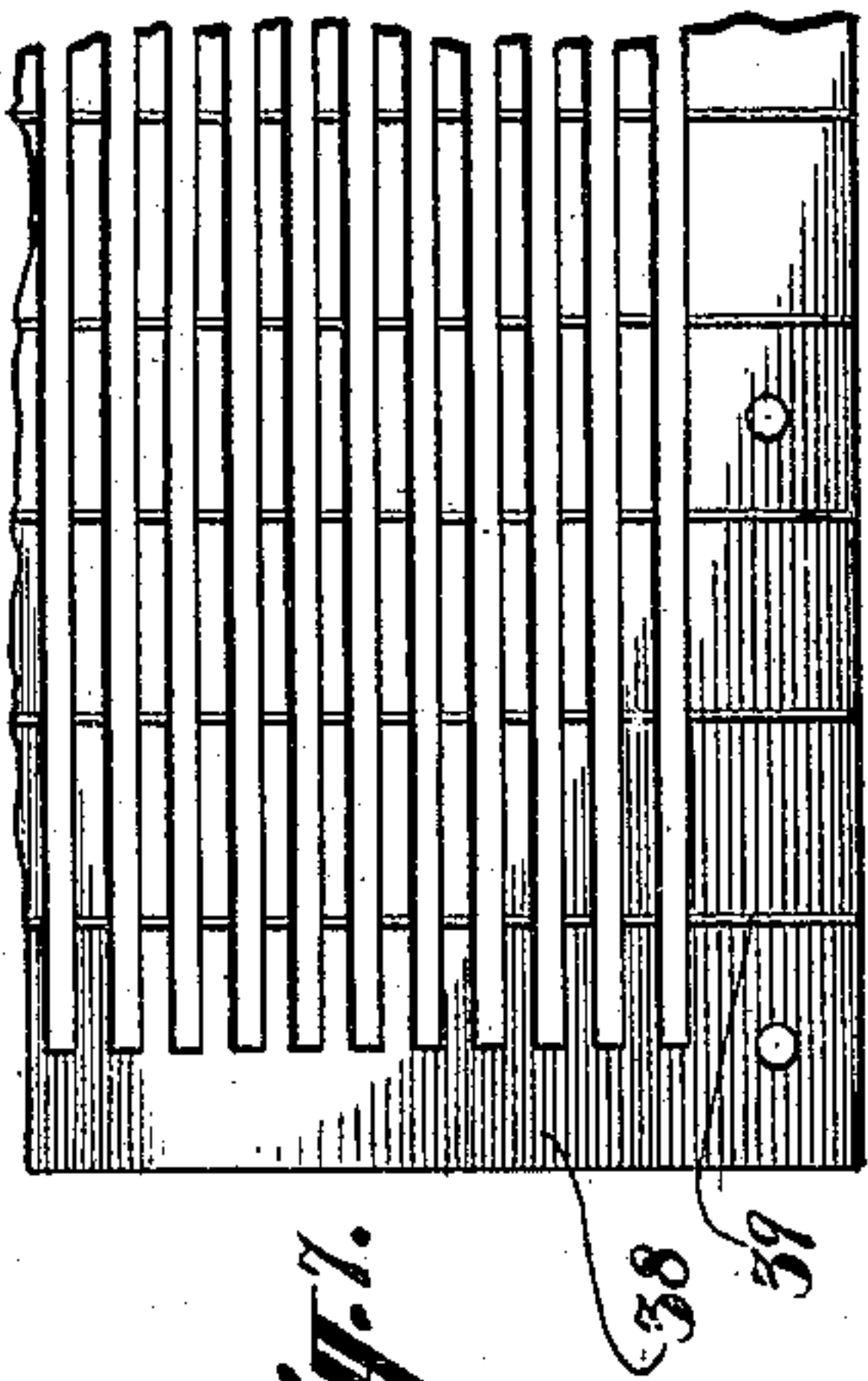
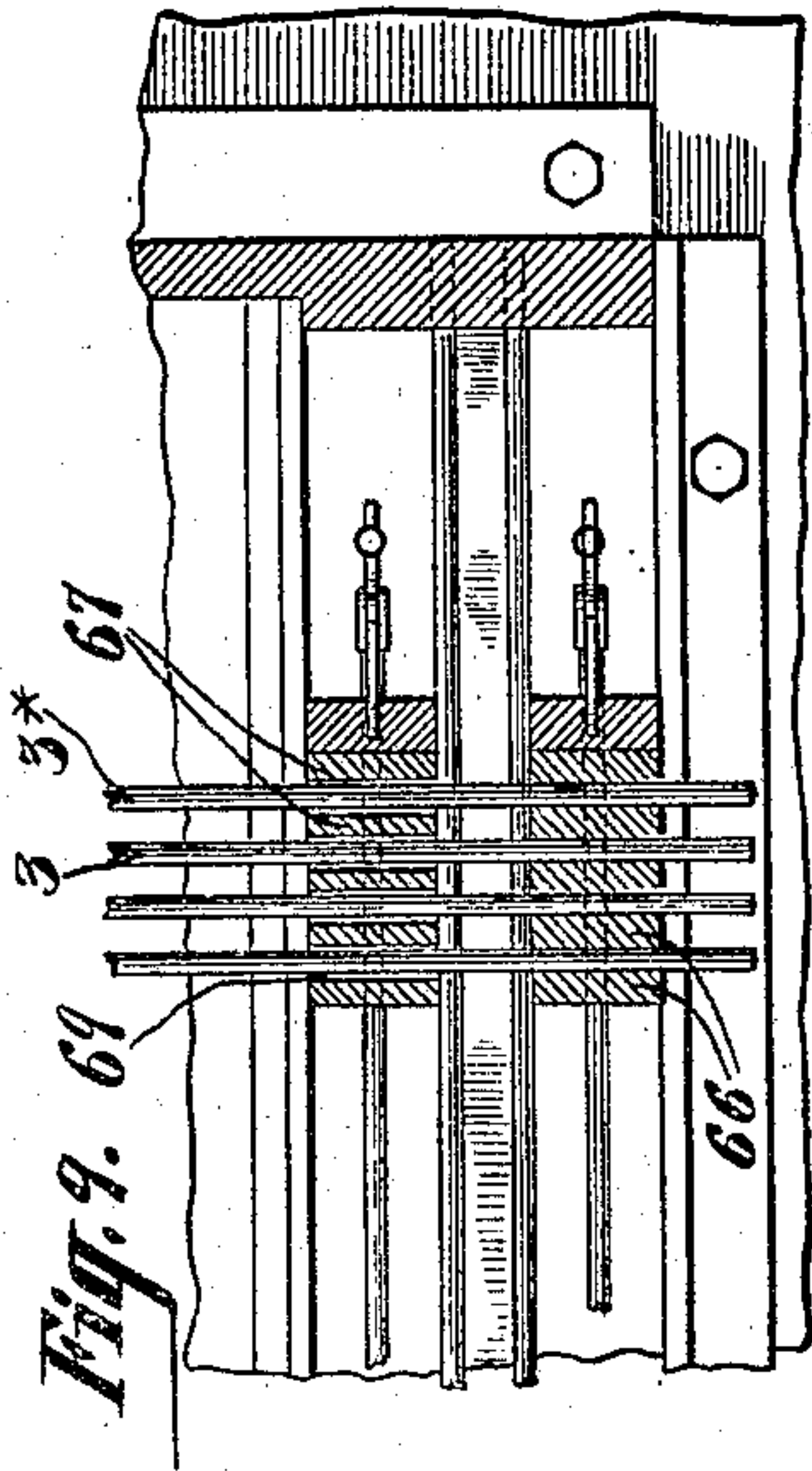


Fig. 8.

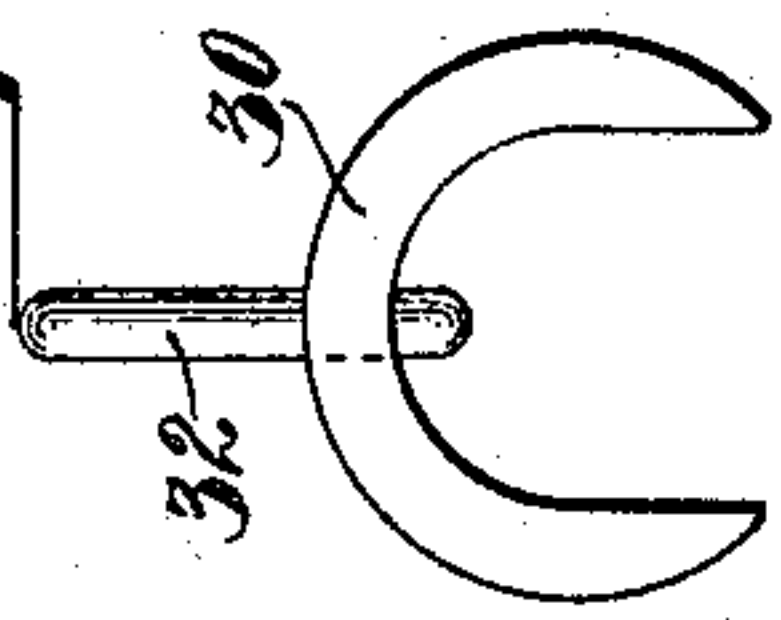


Fig. 10.

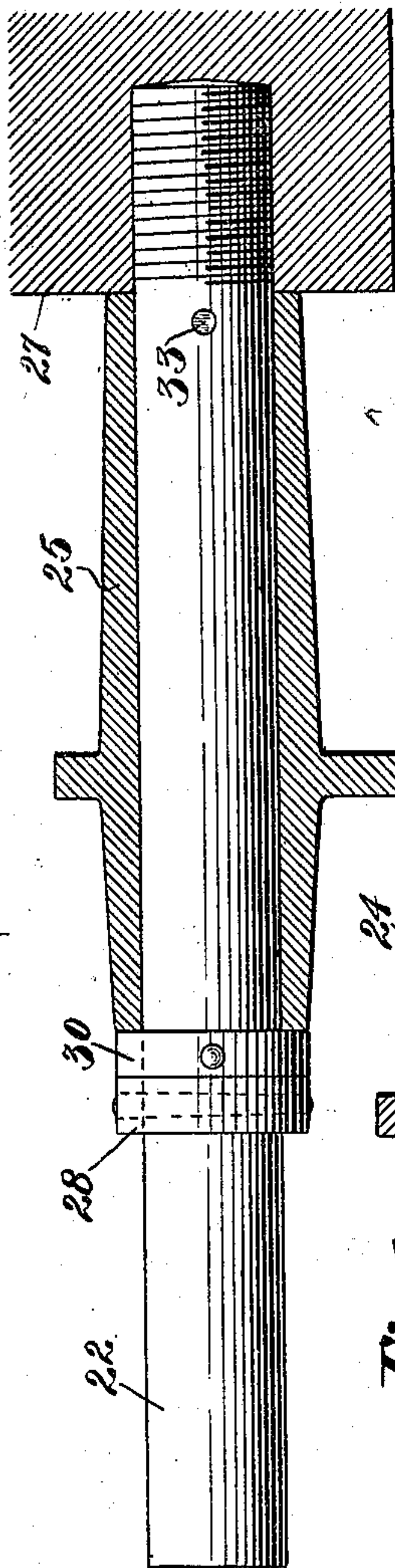


Fig. 5.

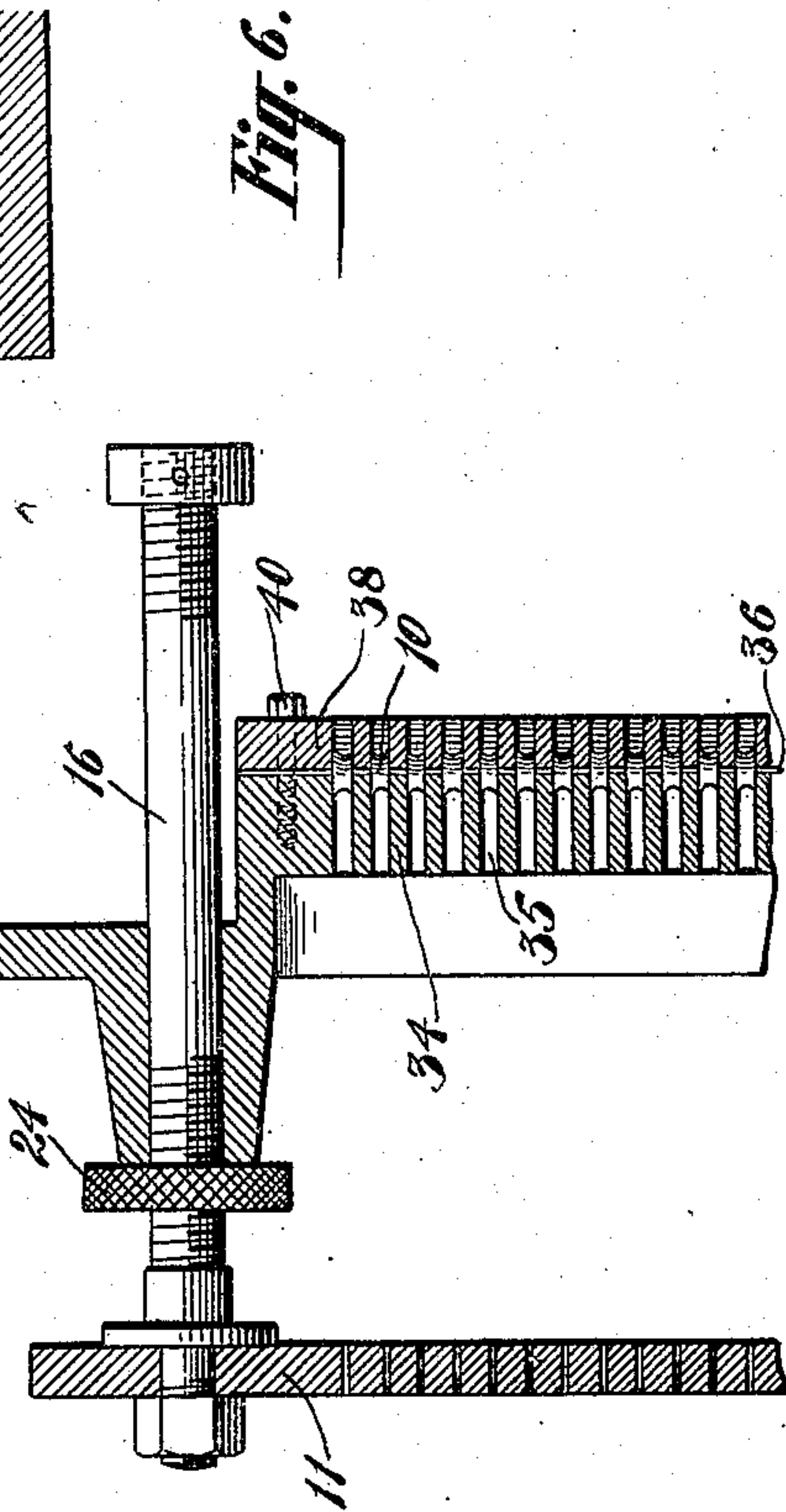


Fig. 6.

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UNITED STATES PATENT OFFICE.

VERNON E. ROYLE, OF PATERSON, NEW JERSEY.

MACHINE FOR REPEATING JACQUARD-CARDS.

No. 858,760.

Specification of Letters Patent.

Patented July 2, 1907.

Application filed November 28, 1904. Serial No. 234,459.

To all whom it may concern:

Be it known that I, VERNON E. ROYLE, a citizen of the United States, and a resident of Paterson, in the county of Passaic and State of New Jersey, have invented a new and useful Machine for Repeating Jacquard-Cards, of which the following is a specification.

This invention relates to machines for repeating jacquard cards, with the object in view of increasing the scope and efficiency of machines of this character and more particularly to provide for putting the selecting needles simultaneously under greater or lesser tension; to provide for causing one line or set of selecting needles to advance simultaneously with the retrograde movement of another line or set; to provide for putting out of action each alternate bank of key wires; to provide for gaining ready access to the needles for threading them and to provide two sets of tension blocks for relieving different sets of needles.

A practical embodiment of my invention is represented in the accompanying drawings, in which

Figure 1 is a view in vertical longitudinal section of so much of the machine as will serve to illustrate the invention, Fig. 2 is a top plan view of the same, Fig. 3 is a partial side elevation of the same, Fig. 4 is a partial horizontal section of the same in the plane of the line A—A of Fig. 1, Fig. 5 is a partial horizontal section of the same on an enlarged scale in the plane of the line B—B of Fig. 1, Fig. 6 is a partial face view of the plate for mounting the pulleys over which the cords connecting the key wires pass, Fig. 7 is a face view of the retaining plate for holding the pulley supporting spindles in position, Fig. 8 is a partial face view on an enlarged scale of the frame for retaining the tension blocks showing the structure of the blocks and their relation to the selecting needles, Fig. 9 is a horizontal section through the same showing the two sets of tension blocks and their reverse structure for engaging the needles, Fig. 10 is a view in detail of the removable spacing collar for throwing the pulleys out of action, and Fig. 11 is a view in detail on an enlarged scale of a pulley showing the two needles in proximity thereto and the manner of connecting them by a cord passing over the pulley.

This invention contemplates the introduction into a machine for repeating jacquard cards, of means for mechanically reproducing a pattern and to this end the cords 1 are assumed to lead to a pattern carrier and manipulator such, for example, as that shown, described and claimed in last Letters Patent No. 740,694, granted on the 6th day of October, 1903, and not shown herein; while the selecting key wires 2, 2*, etc., to which the said cords 1 are attached, as will be hereinafter more particularly described, are also attached to selecting needles 3 by the vibrating levers 4 of well known construction so that the key wires 2 and hence

the keys may be operated by either the cords 1 or the selecting needles 3, 3*, etc., as may be desired, thus materially broadening the scope of the machine.

The chain of cards to be punched to correspond to the pattern is represented by 5 and is given a step by step movement beneath the bank of punches 6 in any well known or approved manner.

The keys for locking the punches are denoted by 7 and are connected to the key wires 2 as usual. The key wires 2 are connected with the operating cords 1 leading to the mechanical pattern manipulator not shown, one directly, and its neighbor indirectly, as follows:—Take, for example, the two lower wires of the bank represented in Fig. 1, viz; the wires indicated by 2, 2*; a cord 8 is connected with the end of the wire 2*, for example, by a knot 9 which will prevent it from drawing through a perforation in the end of the wire and leads thence over a pulley 10, one of a horizontal series of pulleys, back to the end of the wire 2 where it is threaded back and forth, as clearly shown in Fig. 11, through eyes in the end of the wire 2 which serve to clamp it sufficiently to secure it to the end of the wire 2 to prevent it from slipping and thence lead outwardly through a guide and stop plate 11 to the shank of a hook 12 where it is made fast. The opposite end of the hook part of the hook 12 is attached to one of the cords 1.

The structure is such that when the cord attached to the hook 12 is pulled outwardly it will draw the wire 2 outwardly and relieve the key at the end of the wire from its locking position over a punch and this action will be communicated by the cord 8 around the pulley 10 to the wire 2* and will cause the wire 2* to move inwardly to place its key in locking position over the punch as clearly indicated in Fig. 1. In like manner each alternate wire 2, 2*, etc., is connected by a cord corresponding to the cord 8 with its neighboring wire so that when drawn outwardly its neighboring wire will be forced inwardly to put the key into locking position. The return movement of the wire 2 into position to lock the punch through the cord 8 and the simultaneous return movement of the neighboring wire 2* is effected by that one of the vibrating levers 4 which has its lower end connected to the wire 2* and its upper end connected to the selecting needle 3*, the latter being actuated by a spring 13 as will hereinafter more particularly appear.

Each of the wires 2, 2*, etc., is provided with a sharp bend 14 producing, in effect, a downwardly projecting nose which, by its engagement with a bar 15, one of a vertical series of bars separating the needles, forms a stop for the wire in a direction to place the key into position to lock the punch and the wire when actuated by the spring 13 will be thrown inwardly or into a locking position until the stop 14 does engage the bar 15.

The guide 11, through which the cords 8 pass to their connection with the cords 1, is supported by four sliding bars, two at the top and two at the bottom, and the upper two being shown in Fig. 2 and denoted by 16, 17, and one of the lower ones being shown in Fig. 1 and denoted by 18, it being understood that there is a bar corresponding to the bar 18 immediately below the bar 17. These bars which support the plate 11 slide the socket pieces 19, 20, 21 and a fourth, corresponding to 21 in its horizontal plane and to 20 in its vertical plane, the said socket pieces forming part of a frame supported and having a sliding movement on ways 22, 23, fixed to and projecting outwardly in a horizontal direction from the main frame of the machine.

The bars 16, 17, etc., have the plate 11 securely fixed to their outer ends and are screw threaded and provided with thumb nuts 24 engaged therewith and pressing against the ends of the sockets 19, 20, etc., to move the plate 11 outwardly to increase the tension upon the cords 8 or by loosening the nuts the plate 11 may be moved inwardly to slacken the tension on the cords 8, and furthermore, when it is desired to renew the cords 8 or to change their fastening to either of the needles with which they connect, as in threading up the machine, the plate 11 may be moved outwardly, the bars 16, etc., sliding in their sockets so as to gain ready access to the ends of the needles for convenience in manipulating the cords 8, it being understood that when the plate is so moved outwardly the cords 8 are free to slide through the plate 11 or entirely disconnected from it.

The frame mounted on the ways 22, 23, and which has formed thereon the socket pieces 19, 20, etc., for supporting the bars which carry the movable plate 11, is mounted by means of sleeves 25, 26, on the ways and has a limited movement thereon between the frame 27 of the machine (see Fig. 5) and collars 28, 29, fixed on the ways 22, 23, respectively, the movement of the said sleeves 25 and 26 being sufficient to simultaneously put tension onto all the cords 8 to make them operative or to slacken them all so as to make them inoperative by simply moving the support for the pulleys around which the cords pass bodily inwardly and outwardly. The holding of the sleeves 25 and 26 in either of these two positions to render the cords 8 operative or inoperative is effected by means of removable collars 30, 31, one of these being shown in detail in Fig. 10, and being left open at their lower ends so as to straddle the way and provided with a pin 32 set in the top of the collar and projecting through the crown of the collar to enter a socket 33 formed in the way. The ways are each provided with one of these sockets 33 in proximity to the main frame 27 and in proximity to the fixed collars 28 and 29 so that the slip spacing collar 30 may be removed from its position at one end of the sleeve and when the sleeves and the frame carried thereby are moved outwardly or inwardly as the case may be the slip collars are inserted into the spaces to hold the sleeves 25, 26, and hence the frame carried thereby in their adjusted positions.

The pulleys 10 hereinabove referred to are arranged in horizontal series, several of these horizontal series being arranged in a vertical plane in the face of a grid 34 forming a part of the frame carried by the sleeves 25, 26. The wires 2, 2*, etc., are arranged in vertical se-

ries in the spaces 5 between the bars of the grid. A horizontal series of pulleys 10 are mounted on a swinging pintle passing continuously along the face of the grid and denoted, in the present instance, by 36.

The pintles 36 conveniently consist of a wire let into half-sockets 37 formed in the faces of the bars of the grid and the several pintles are held in position by a grid face plate 38, the bars of which correspond to the bars in the grid 34 and the face of which is provided with half-sockets 39 corresponding to the half-sockets 37 so that when the face plate 38 is fastened to the face of the grid 34 as, for example, by screws 40, the spindles 36 will be securely locked in position and the pulleys 10 will each be housed between two consecutive bars of the grid and corresponding bars of the face or retaining plate.

Particular attention is invited to Figs. 5, 6 and 7, for a clear illustration of the parts immediately hereinabove described.

The bank of selecting needles 3, 3*, etc., for each alternate needle in a vertical series, in the present instance, the needle denoted by 3*, is provided with retracting springs 13. These springs are shown in the present instance as coiled springs interposed between a collar 41 on the needle, and a tension plate 42 through which the needles pass. The tension plate 42 is a vertical plate provided with perforations which permit the needles to slide freely in it and is made movable longitudinally of the machine to simultaneously increase or decrease the tension upon the springs 13. This adjustment of the plate 42 is effected as follows:—The plate 42 is fastened to rods 43, 44, supported at their rear ends in brackets 45 (see Fig. 4) made fast to the opposite sides of the main frame, one only being shown in Fig. 4, it being assumed that there is a similar bracket 45 on the opposite side of the machine for the rod 43 and at their forward ends the said rods 43, and 44, are supported in the stationary needle plate 46. As a matter of construction, I find it convenient to make the outer portions of the rods 43 and 44 of reduced size and separate from the inner portions to form shoulders at 47, 48, and to provide the inner face of the movable tension plate 42 with angle iron pieces 49, 50, one flange of the angle iron resting flat against the inner end of the face of the plate 42 and the other extending rearwardly from the plate to form extended bearings at the opposite edges of the plate, the outer portions of the rods 43, 44, being screw threaded and tapped into the larger inner portions and the plate 42 and flange lying against it being provided with screw threaded perforations to receive the screw threads on the rods 43, 44, to hold the plate against the shoulders 47, 48. The outer ends of the rods 43, 44, are provided with heads 51, 52, on the top of which are formed sleeves 53, 54, through which a rock shaft 55 extends, the said rock shaft being provided with depending arms 56, 57, fixed thereon by means of socket pieces 58, 59, and provided with upwardly extending operating handles 60, 61.

The arms 56, 57, are connected by links 62, 63, respectively with the stationary frame of the machine so that when the handles 60, 61, are pulled outwardly their arms 56, 57, will fulcrum on the links 62, 63, and the rods 43, 44, together with the plate 42, will be drawn outwardly thereby reducing the tension on the springs 13. On the other hand the inner throw of the handles

60, 61 will carry the rods 43, 44, inwardly and with them the plate 42 compressing the springs 13 on the needles and hence increasing their tension.

Whatever adjustment may be made by rocking the shaft 55 and hence the arms connected thereto, the parts may be locked in such adjustment by turning the tail nut 64 on the threaded end of the shaft 65 and hence drawing the parts into snug frictional contact.

I further provide for placing either the needles 3 or the spring actuated needles 3*, the one or the other, under increased tension sufficient to prevent them from operating under the spring tension or sufficient to hold the former in the positions which they shall be adjusted or the latter against spring tension or permitting them to work under spring tension by employing two sets of tension blocks, as follows: One of these sets of tension blocks is denoted by 66 (see Fig. 1) and the other by 67. These are shown in detail on a larger scale in Figs. 8 and 9. The particular means for pressing them toward the needles to exert tension upon the needles forms no part of this present invention and is shown described and claimed in Letters Patent No. 556775, dated March 24, 1896. My present invention, however, contemplates the use of two sets of tension blocks instead of one set and the recessing of the individual blocks of the sets in such a manner that when one set, for instance, the set 66 is forced into engagement with the needles, each of the needles 3 will have tension applied thereto while the needles 3* will be free to slide because of the recesses 68 in the series of blocks 66 which lie opposite the needles 3* but, when the tension is applied to the series of blocks 67 (see Fig. 9), the bars 3* will be placed under frictional tension while the bars 3, the series or bank of blocks 66 being released, will be free to slide because of the recesses 69 in the sides of the blocks constituting the series 67 coming opposite the bars 3.

The arrangement of tension blocks in two series, one series applying to one set of needles and the other to another set of needles enables me to place each alternate needle under tension and leave the others free to reciprocate or to place the others under tension and leave the former free to reciprocate as the working of the particular pattern may demand.

In actual practice, in the event the needles 3, 3*, etc., are to be used to operate the punch keys as in the ordinary repeater, the springs 13 may have their tension materially reduced by the outward movement of the plate 42 and the corresponding tension to make them operate with the same freedom as the needles 3 may be applied by manipulating the series of tension blocks 66 and 67 while the pulley carrying plate or grid 34 is bodily moved outward to slacken the cords 8 so as to cause the wires 2, 2*, to move under the action of the vibrating levers 4 wholly independent of the mechanical pattern manipulating mechanism. On the other hand, if it is desired to use the machine with the pattern manipulating mechanism, the selecting needles 3, 3*, etc., may be permitted free movement and the actuating springs of the needles 3* may be utilized to return the wires 2 which may be actuated by the cords 1.

What I claim is:—

1. In a machine for punching jacquard cards, key wires connected in couples by flexible connections, pulleys engaged with the flexible connections and means for moving the pulleys bodily along the machine to place the connecting cords into and out of operative adjustment. 65
2. In a machine for punching jacquard cards, key wires connected in couples by flexible connections, pulleys engaging the flexible connections and an adjustable plate for increasing or diminishing the tension upon the several flexible connections at one and the same time. 70
3. In a machine for punching jacquard cards, key wires connected in couples by flexible connections, pulleys engaging the flexible connections, pintles each common to a series of pulleys, a grid between the bars on which the pulleys are located and means for locking the pintles to the face of the grid. 75
4. In a machine for punching jacquard cards, key wires connected in couples by flexible connections, pulleys engaging the flexible connections, the said pulleys being arranged in series, pintles each common to a series of pulleys, a grid, a face or retaining plate and means for securing the face or retaining plate to the grid to house the pulleys between the bars of the grid and retain the pintles in position. 80
5. In a machine for punching jacquard cards, the combination with the key wires, of cords connecting the wires in couples, pulleys arranged to engage the cords, a plate through which the cords pass, means for moving the plate toward and away from the ends of the wires and means for moving the said plate and pulleys bodily toward and away from the ends of the wires. 85
6. In a machine for punching jacquard cards, the combination with key wires, and selecting needles connected with the key wires, of springs for operating the selecting needles and means for increasing or diminishing the tension of the several springs at one and the same time. 90
7. In a machine for punching jacquard cards, the combination with key wires and selecting needles connected therewith, of springs for operating the selecting needles, a plate against which the springs bear, means for adjusting the plate bodily and hence the tension of the springs and means for locking the plate in its adjusted position. 95
8. In a machine for punching jacquard cards, the combination with key wires and selecting needles connected therewith, of springs for actuating the selecting needles, a plate forming a bearing for the springs, sliding rods carrying the plate, a rock shaft supported on the ends of the sliding rods, the said rock shaft being provided with arms, links connecting the said arms with the frame of the machine and means for locking the shaft in its rocked adjustment. 100
9. In a machine for punching jacquard cards, the combination with key wires, selecting needles connected therewith and springs for actuating certain of the selecting needles, of a plurality of series of tension blocks, the said series of tension blocks being arranged the one series to exert tension upon certain of the needles and relieve other of the needles and another series being arranged to exert tension upon those which were relieved by the former set and relieve those upon which tension was placed by the former set. 105
10. In a machine for punching jacquard cards, the combination with key wires and selecting needles connected with the key wires, of a plurality of series of tension blocks, one series being arranged to act upon certain of the needles and another series being arranged to act upon others of the needles. 110

In testimony, that I claim the foregoing as my invention, I have signed my name in presence of two witnesses, this 11th day of November 1904.

VERNON E. ROYLE.

Witnesses:

FREDK. HAYNES,
C. S. SUNDGREN.