

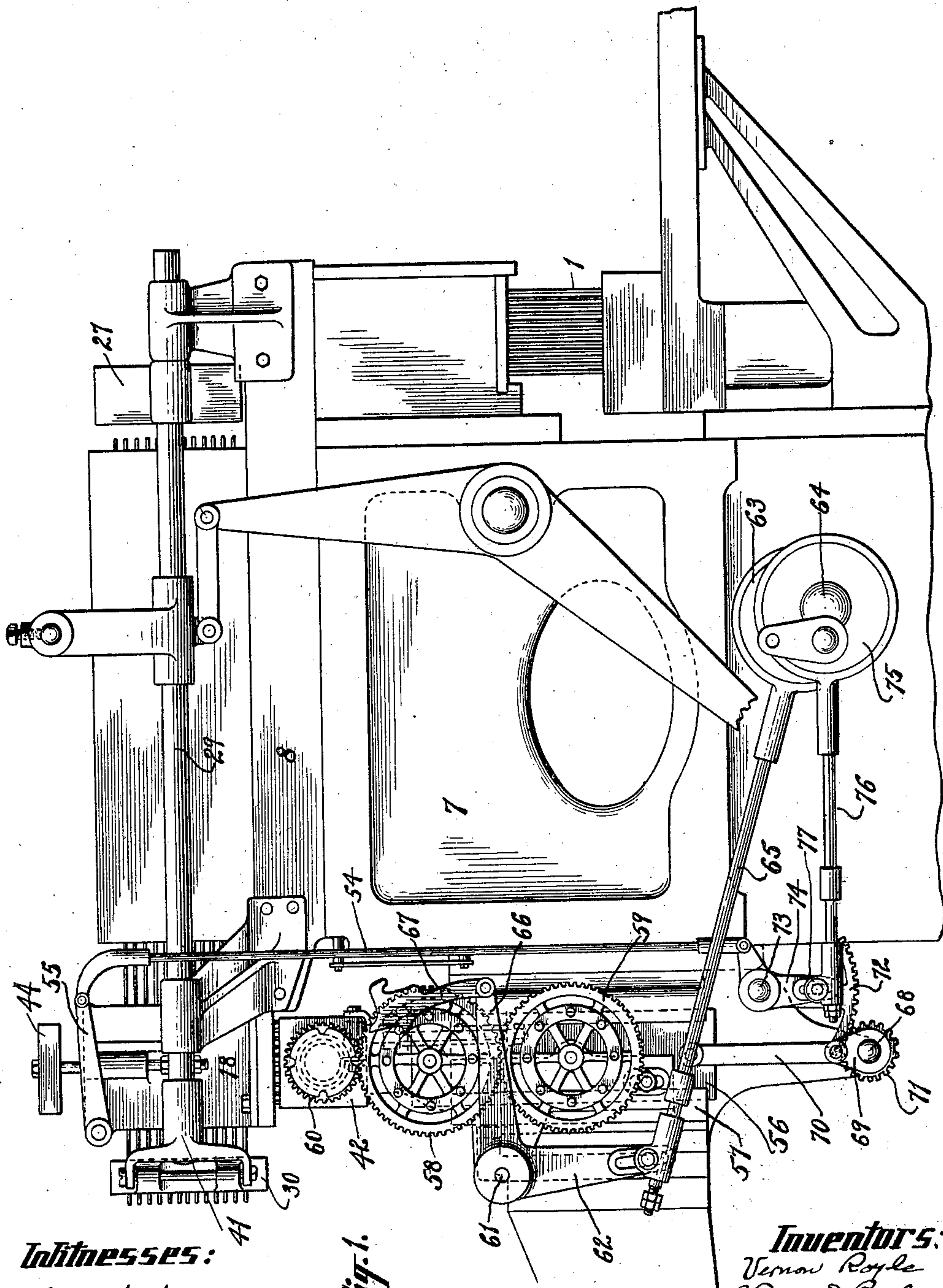
No. 862,019.

PATENTED JULY 30, 1907.

V. & V. E. ROYLE & J. WHITEHEAD.
MECHANISM FOR PUNCHING JACQUARD CARDS.

APPLICATION FILED NOV. 1, 1905.

5 SHEETS—SHEET 1.



Witnesses:

F. J. Hachenberg
Henry O'Brien

Fig. 1.

Inventors:

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Vernon E. Royle
James Whitehead
By Brown & Wood
their Attorneys

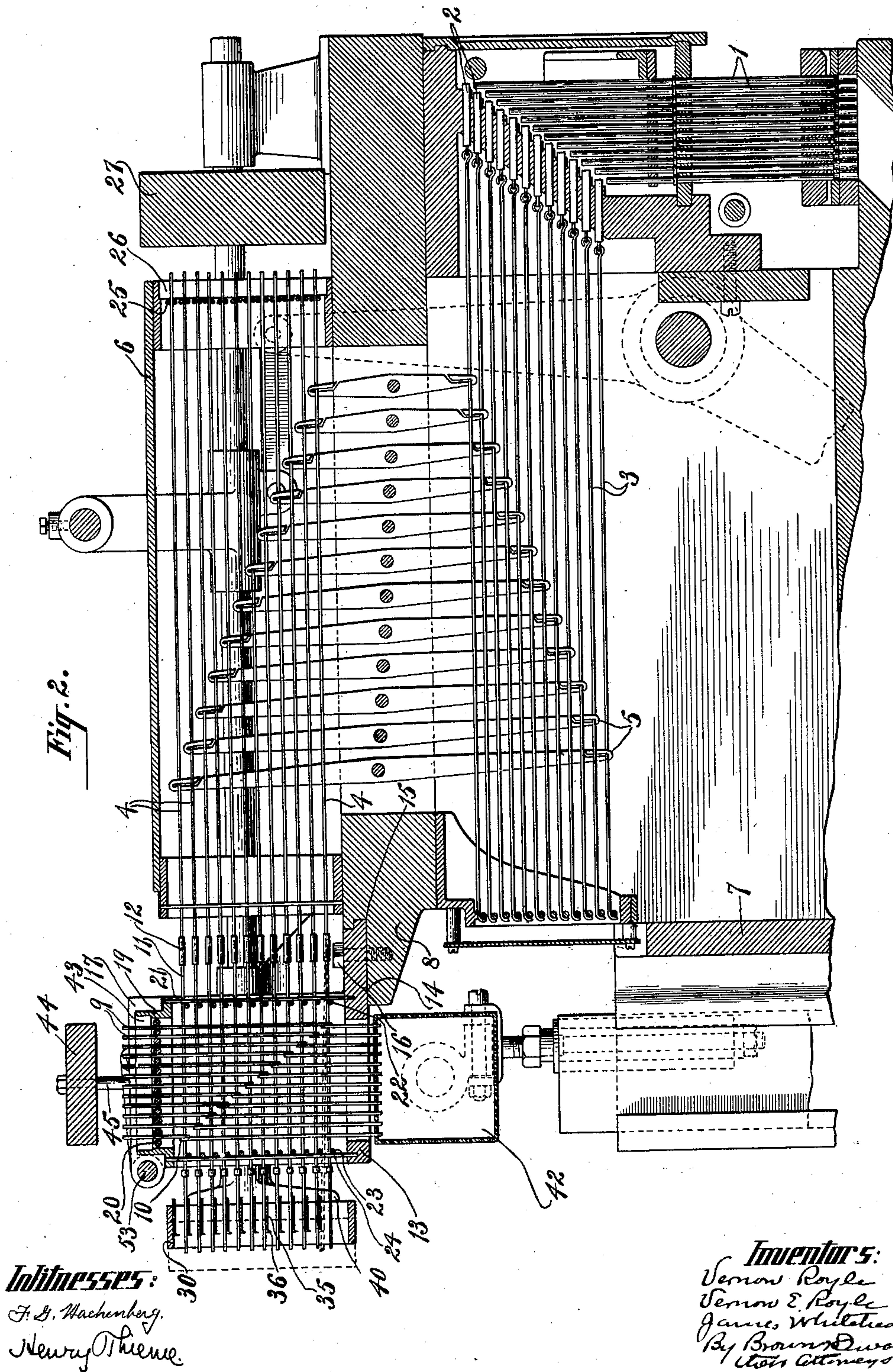
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5 SHEETS—SHEET 2.



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5 SHEETS—SHEET 3.

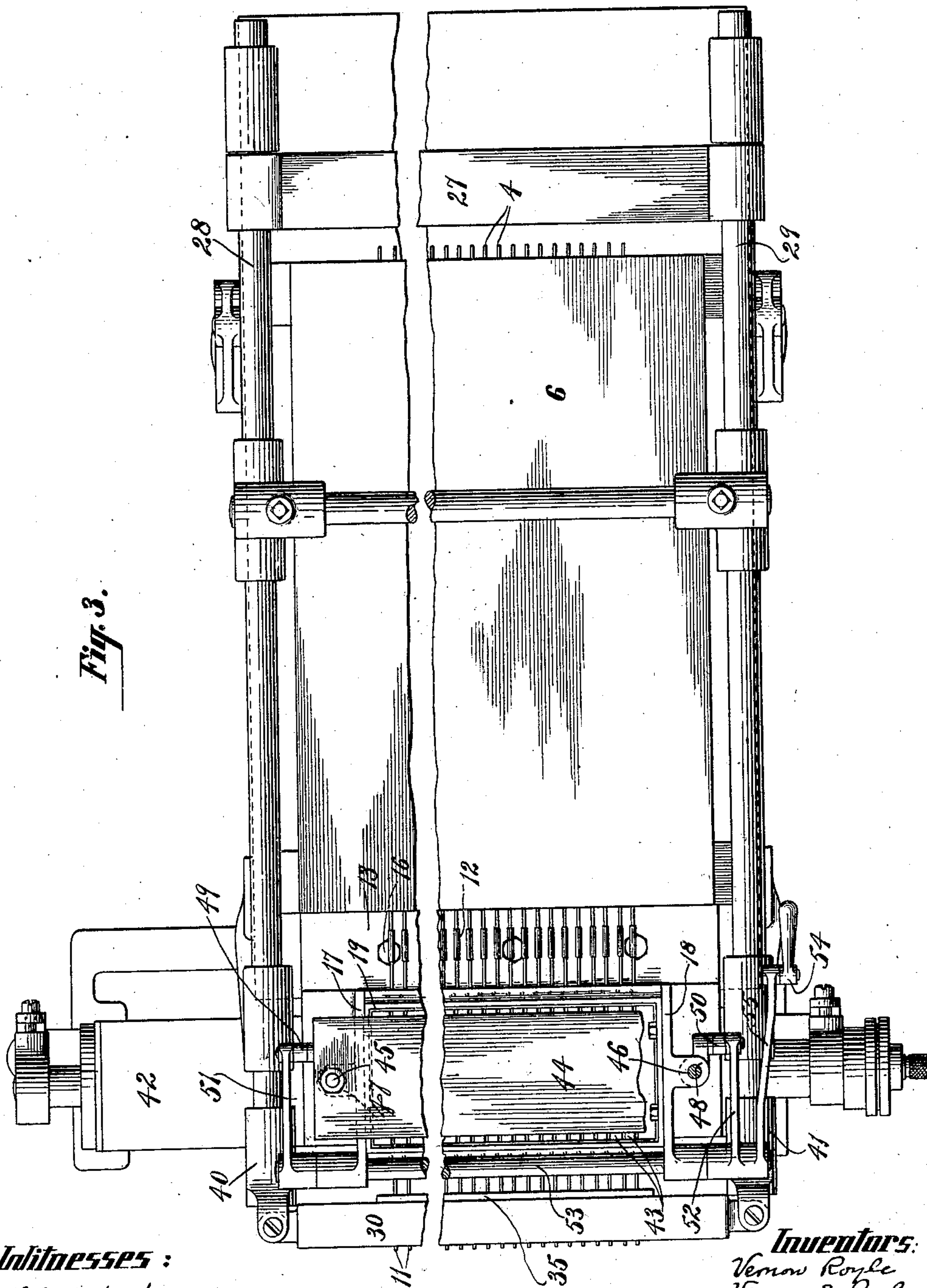


Fig. 3.

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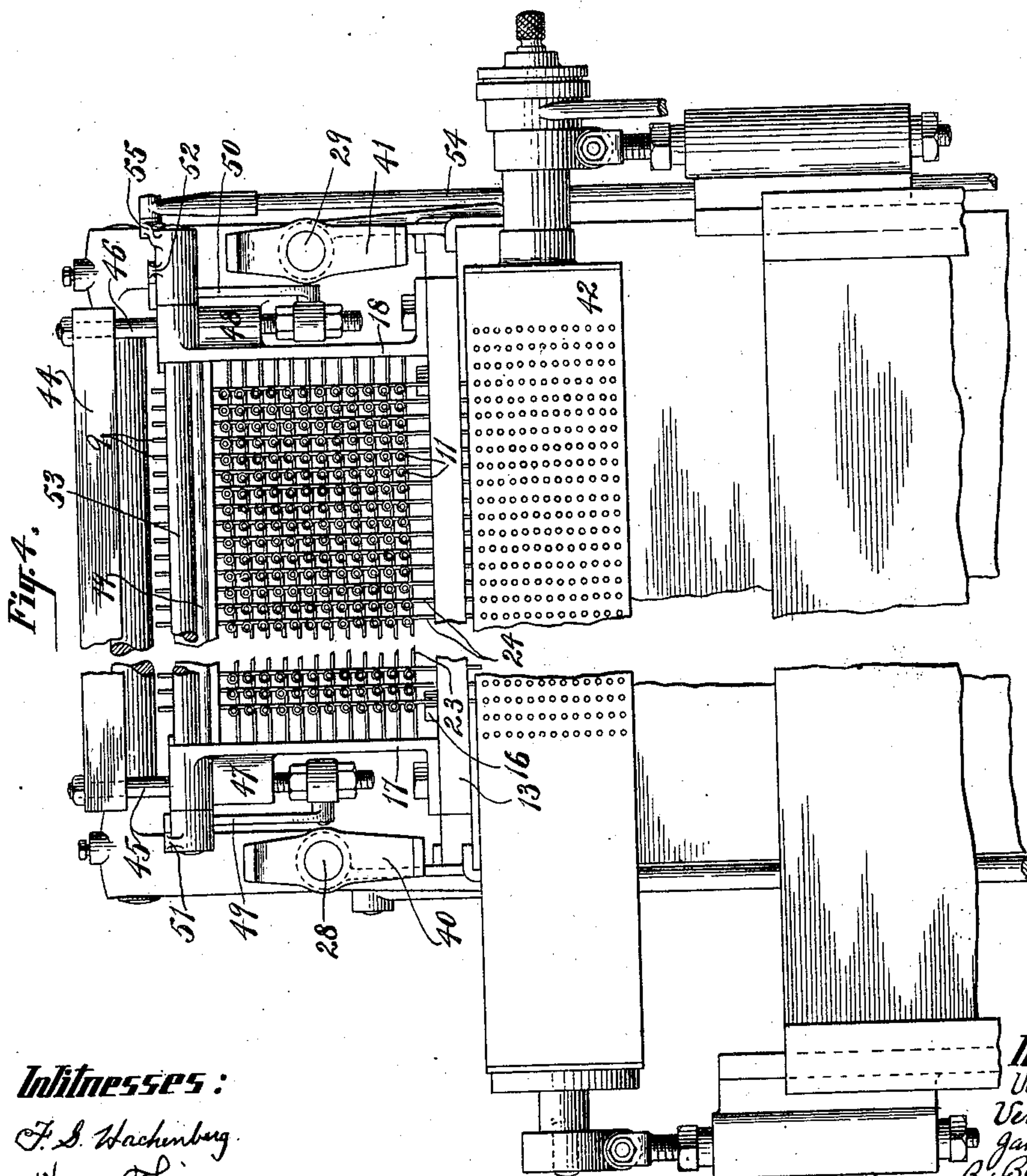
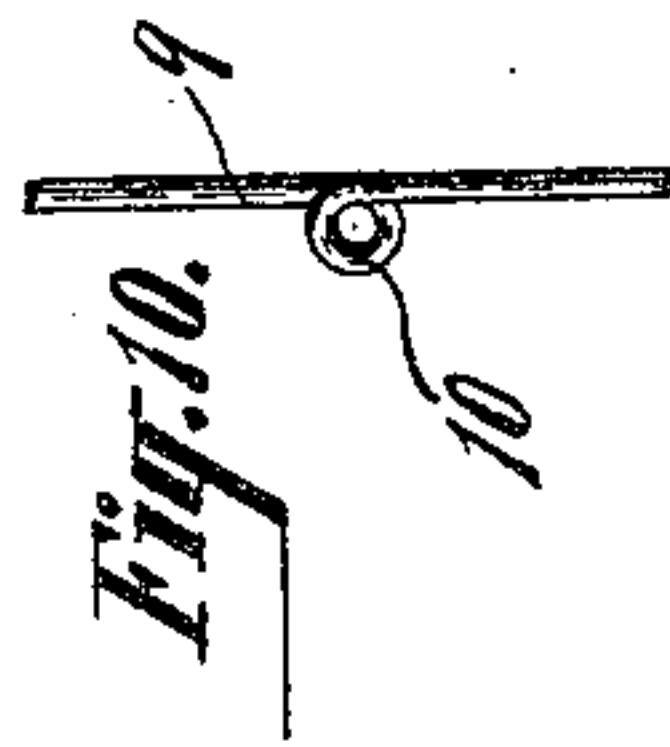
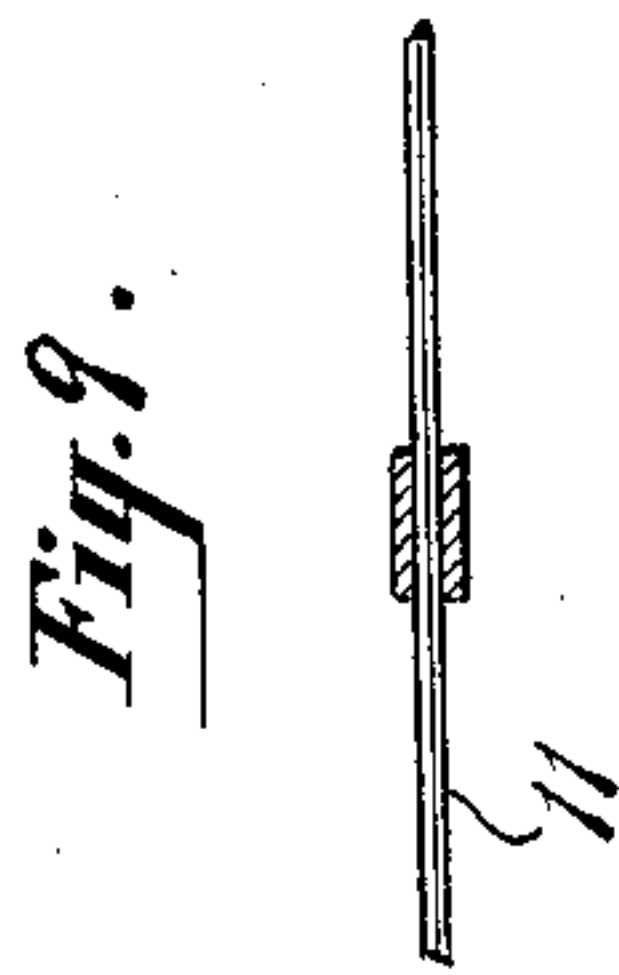
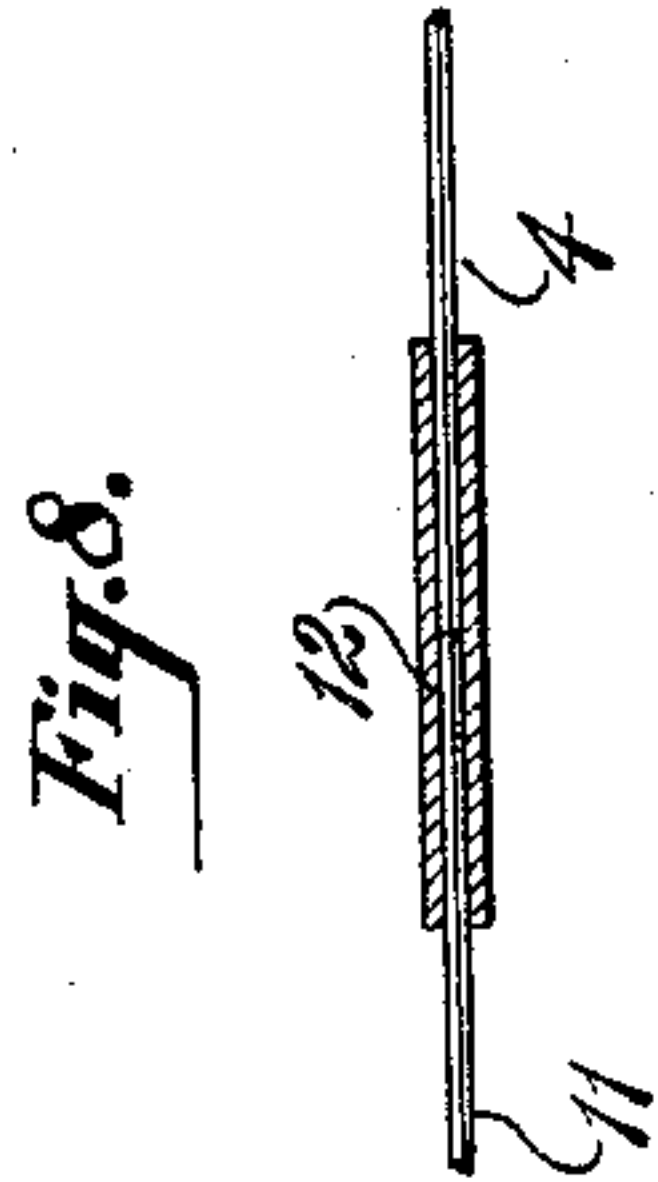
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5 SHEETS—SHEET 4.



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5 SHEETS—SHEET 5.

Fig. 6.

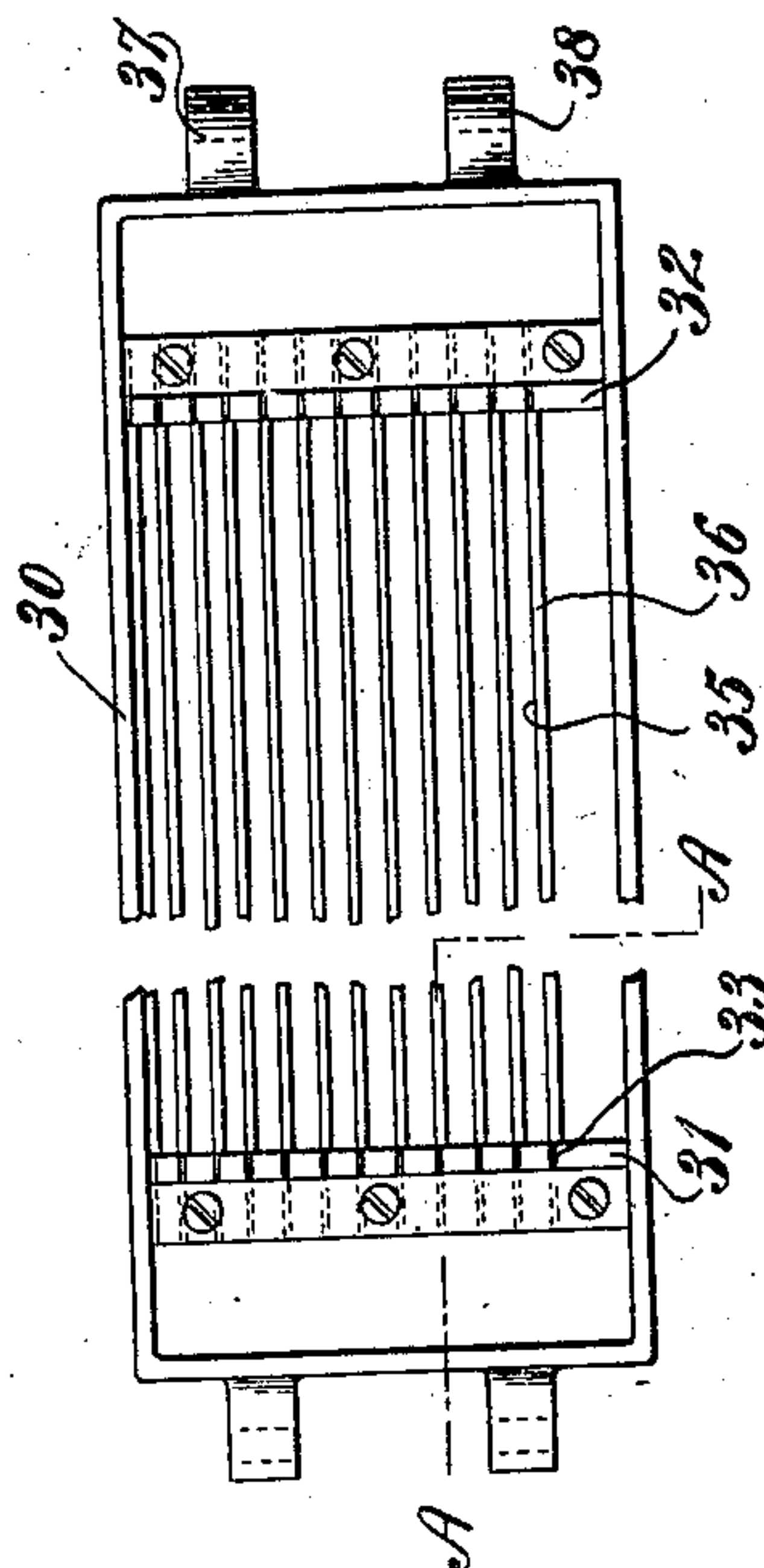


Fig. 7.

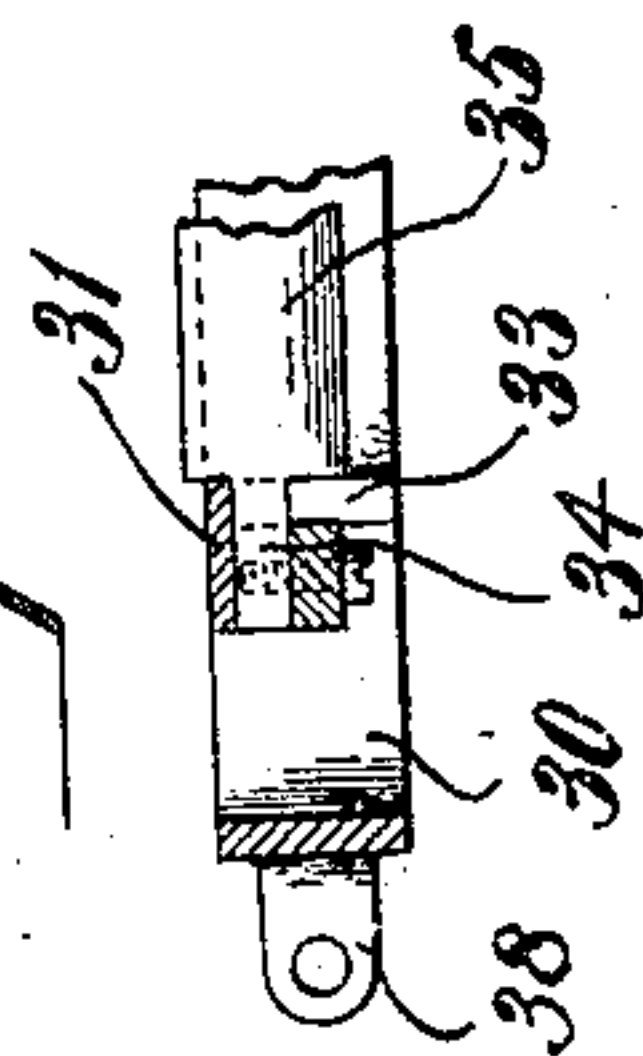
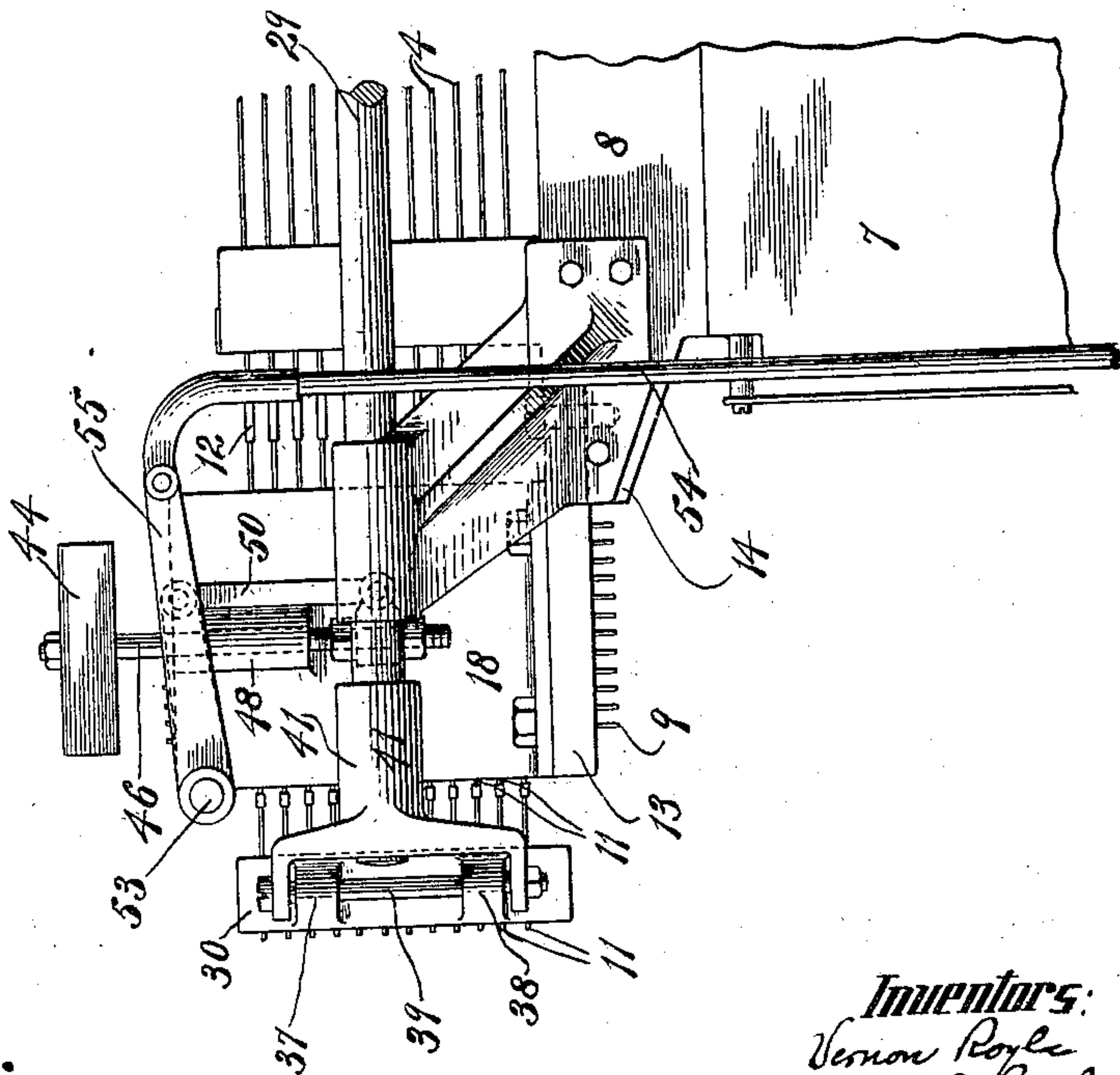


Fig. 5.



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Inventors:

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UNITED STATES PATENT OFFICE.

VERNON ROYLE AND VERNON E. ROYLE, OF PATERSON, NEW JERSEY, AND JAMES WHITEHEAD, OF PHILADELPHIA, PENNSYLVANIA; SAID WHITEHEAD ASSIGNOR TO JOHN ROYLE & SONS, OF PATERSON, NEW JERSEY, A CORPORATION OF NEW JERSEY.

MECHANISM FOR PUNCHING JACQUARD-CARDS.

No. 862,019.

Specification of Letters Patent.

Patented July 30, 1907.

Application filed November 1, 1905. Serial No. 285,367.

To all whom it may concern:

Be it known that we, VERNON ROYLE and VERNON E. ROYLE, citizens of the United States, and residents of Paterson, in the county of Passaic and State of New Jersey, and JAMES WHITEHEAD, a citizen of the United States, and a resident of Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented a new and useful Mechanism for Punching Jacquard-Cards, of which the following is a specification.

10 Our invention relates to mechanism for punching jacquard cards, and more particularly to the means for controlling the selecting needles which operate the punch locking and releasing dogs.

The object is to provide for interchanging a gang of 15 auxiliary selecting needles which operate on the main set of selecting needles and for the reversal of the pattern in a simple and effective manner, and with these ends in view our invention consists in certain features of construction and combinations of parts as will be 20 hereinafter described and pointed out in the claims.

In the accompanying drawings, Figure 1 is a view in side elevation of so much of a jacquard card punching machine as will suffice to show our invention, Fig. 2 is an enlarged view in longitudinal vertical section, the 25 mechanism for reciprocating the auxiliary needle roller being omitted, Fig. 3 is a top plan view of the same, Fig. 4 is an end elevation with the operating grid removed, Fig. 5 is a partial side elevation, Fig. 6 is a view in elevation in detail of the reversible grid, Fig. 30 7 is a partial horizontal section of the grid in the plane of the line A—A of Fig. 6, Fig. 8 is an enlarged view in detail showing the connection of the two sections of a main selecting needle, Fig. 9 is an enlarged view in detail showing the stop collar on a main selecting needle, and Fig. 10 is an enlarged view in detail showing the eye in one of the auxiliary selecting needles for receiving a main selecting needle.

The gang of punches is denoted by 1, their locking and releasing dogs by 2, the vibrating arms which connect the dog operating wires 3 with the main selecting 40 needles 4 are denoted by 5, the box for containing the main selecting needles by 6, the bed frame by 7 and the bed plate to which the vibrating arms 5 are pivoted is denoted by 8. These parts may be of well known 45 or approved form and may be operated as usual except as hereinafter described in their relation to the gang of auxiliary selecting needles to which our present invention is more particularly directed.

At one end of the gang of main selecting needles, in 50 the present instance at that end which we term the rear, we locate a gang of auxiliary selecting needles, arranged to reciprocate vertically. These auxiliary se-

lecting needles are denoted by 9 and each is provided with an eye 10 which embraces an extension 11 of a main selecting needle 4. The extension 11 is removably secured to the body of the main selecting needle 55 by means of a sleeve 12, made fast on the end of the body 4 and adapted to receive the end of the extension 11 with a close sliding fit.

The gang of auxiliary selecting needles 9 is supported 60 in a box consisting of a bottom plate 13, resting throughout a portion of its width, on the bottom of a recess 14 at the rear end of the plate 8, the edge of the plate 13 being entered in an undercut recess 15 in the vertical wall of the recess 14 and the said bottom plate 13 is 65 removably secured in position by means of screws 16 extending through it into the plate 8.

To the plate 13 two end plates 17 and 18 are secured and between the upper portions of these end plates a skeleton frame 19 is fastened, its top consisting of a series 70 of wires 20 extending longitudinally of the frame for spacing the auxiliary selecting needles. A series of vertical wires 21 connect the front side of the frame 19 with the bottom plate 13, to guide the extensions 11 of the main selecting needles against horizontal displacement 75 and a set of horizontal wires 22 connect the front edges of the end plates 17, 18, to guide the extensions 11 against vertical displacement. In like manner the rear edges of the end plates 17, 18, are connected by a set of horizontal wires 23 and vertical wires 24 connect 80 the rear side of the frame 19 with the bottom plate 13, to form guides for the extensions 11 on the main selecting needles.

Each vertical needle 9 is engaged with an extension 11 by means of the eye 10 so that a vertical movement 85 of a needle 9 will carry with it an extension 11, the main selecting needles and their extensions being free to rise and fall with the vertical needles, the only point where they are held being at or near their front ends where they pass between the horizontal wires 25 and are 90 gripped by the friction blocks 26 as is usual.

A bumper 27 carried by the longitudinally reciprocating rods 28 and 29 at their forward portions, serves to return the main selecting needles to their normal positions with punches 1 all locked while a grid carried 95 by the said rods 28 and 29 at their opposite ends serves to slide such main needles as are lifted by the vertical or auxiliary needles 9 in a direction to unlock the punches.

The needle operating grid referred to, consists of an 100 oblong frame 30, having its upper and lower sides connected by uprights 31 and 32 made L-shape in cross section as shown in Fig. 6, with their rear branches or legs provided with series of slots 33. The slots 33 re-

ceive the reduced ends 34 of a series of flat bars 35 having their rear edges projected to form shoulders or hooks 36 for engaging the ends of the extensions 11 of the main selecting needles. The opposite ends of the frame 30 are each provided with a pair of perforated ears 37, 38, for the reception of pintles 39 which serve to removably secure the grid to the bifurcated supporting pieces 40, 41, on the ends of the rods 28, 29. The grid 30, etc., is so arranged that the extensions 11 rest normally on the backs or non-shouldered sides of the bars 35 in position to be raised by the needles 9 into position, (see dotted line, Fig. 2) where the shoulder or hook 36 will engage their ends on the forward movement of the grid and thereby operate the punch locking dogs. The grid is also made with a view of reversing it, placing it up side down, with the hooks or shoulders 36 extending upwardly and when so employed those extensions 11 which are lifted by the needles 9 will be removed from engagement by the said shoulders 36 and hence the exact reverse of the pattern will be punched with no other change in parts except the simple reversal of the grid.

The auxiliary needles 9 are operated by the pattern card carried by the roller 42 as is usual, the roller 42 being for this purpose located below the gang of needles 9 and moved toward and away from their ends as the successive pattern cards are fed into position. The needles 9 are gripped by a series of tension blocks 43, resting on the bars 20, and acting on the needles in a manner quite similar to that in which the tension blocks 26 act upon the main selecting needles 4, and the said needles 9 are returned by a bumper 44 supported by rods 45, 46, which reciprocate in sockets 47, 48, on the end plates 17, 18. The rods 45, 46, are connected by links 49, 50, with arms 51, 52, on a rock shaft 53, the latter being rocked at suitable intervals by means of an operating rod 54 connected with an arm 55 on the shaft. The roller 42 carrying the pattern card for operating the auxiliary needles is suitably supported in rotary adjustment on a vertically reciprocating slide 56 mounted in ways 57 fixed to the machine frame. The slide 56 carries spur wheels 58, 59, intermeshing with each other, the wheel 58 also intermeshing with a pinion 60 on the roller shaft.

A bell crank lever pivoted at 61 has one arm 62 connected with an eccentric 63 on the main drive shaft 64 by means of a rod 65, and the other arm 66 of the bell crank lever carries a pawl 67 which may be thrown into engagement with either the spur wheel 58 or 59 to rotate the roller 42 in one direction or another, as the bell crank lever is rocked. This particular feature of rotating the roller in either of two opposite directions by the spur wheels and pawl is already well known in the art, this present invention being directed to the means for reciprocating the slide 56 as follows:—A rock shaft 68, journaled in a suitable support below the ways 57, is provided with a crank arm 69 connected with the slide by a pitman 70. The rock shaft also has fixed to rock therewith a pinion 71 which is engaged by a toothed sector 72, fixed to rock with a shaft 73 on which the bell crank lever 74 is carried for imparting motion to the rod 54 hereinabove referred to. The bell crank lever 74 has its depending arm connected with an eccentric 75 on the drive shaft by a rod 76. The said depending arm of the bell crank lever is provided with an elongated slot 77 for connecting the rod to the arm

at different distances from the axis of the lever and hence providing for varying the throw of the toothed sector 72 and the stroke of the slide 56.

The box containing the auxiliary selecting needles and extensions of the main selecting needles may be readily removed together with the said auxiliary needles and extensions and the grid 30, etc., may be removed and replaced by another.

By preparing different gangs of auxiliary needles and substituting one for another, and using the operating grid either in its normal or reversed position with each gang, a great variety of designs may be punched from a single chain of pattern cards.

What we claim is:—

1. The combination with a gang of main selecting needles and punches under their control, of a pattern card roller, a gang of auxiliary selecting needles removably engaged as a gang with the main selecting needles and under the control of the pattern card and means for operating the main selecting needles.
2. The combination with a gang of main selecting needles and punches under their control, of a needle box containing auxiliary selecting needles engaged with the main selecting needles, the said needle box being removably secured in position, means for supporting a pattern card in position to operate upon the auxiliary selecting needles and means for operating the main selecting needles.
3. The combination with a gang of main selecting needles provided with removable extensions and punches under the control of the main selecting needles, of a needle operating device in position to engage the said extensions, a gang of auxiliary selecting needles engaged as a gang with said extensions and means for supporting a pattern card in position to engage the auxiliary selecting needles.
4. The combination with a gang of main selecting needles arranged to reciprocate horizontally and punches under their control, of a removable gang of auxiliary selecting needles engaged with the main selecting needles and arranged to reciprocate vertically, means for placing the auxiliary selecting needles under the control of a pattern card and means for operating the main selecting needles.
5. The combination with two gangs of selecting needles arranged at an angle to each other, one gang being removably supported with its members engaged with the members of the other gang and punches under the control of the selecting needles, of means for placing one gang under the control of a pattern card and means for operating the other gang.
6. The combination with a gang of main selecting needles gripped at one end and free to move laterally at their opposite ends, of a removable gang of auxiliary selecting needles arranged to move the free ends of the main selecting needles laterally, an operating device arranged to move the main selecting needles endwise and means for sustaining a pattern card in position to operate on the auxiliary selecting needles.
7. The combination with the main selecting needles and the auxiliary selecting needles arranged to move the main selecting needles laterally, of a reversible grid for operating the main selecting needles and means for bringing a pattern card into engagement with the auxiliary selecting needles.
8. The combination with a horizontal gang of selecting needles and a vertical gang of selecting needles removably engaged as a gang therewith, of means for advancing the horizontal selecting needles, means for raising the vertical selecting needles, a horizontally reciprocating bumper for returning the horizontal needles and a vertically reciprocating bumper for returning the vertical needles.
9. The combination with a gang of main selecting needles provided with removable extensions, of a needle box provided with a gang of auxiliary selecting needles engaged with the said extensions, said needle box being removably secured in position, a removable grid for engaging the

said extensions to operate the main selecting needles and means for bringing a pattern card into position to operate the auxiliary selecting needles.

10. The combination with a gang of main selecting
5 needles, of a removable needle box provided with auxiliary selecting needles secured in operative relation to the gang of main selecting needles, the said needle box being provided with wire guides at its front and back, removable
10 extensions on the main selecting needles extending through said front and back, means for operating the main selecting needles and means for operating the auxiliary selecting needles.

11. The combination with a gang of main selecting
15 needles, of a removable needle box provided with a gang of auxiliary selecting needles, means for frictionally gripping the auxiliary needles at their upper ends, the auxiliary selecting needles being connected with the main selecting needles to move the main selecting needles laterally, means for placing the auxiliary needles under the control
20 of a pattern card and means for operating the main selecting needles longitudinally.

12. The combination with a gang of main selecting
25 needles and a removable gang of auxiliary selecting needles engaged therewith and operating in a direction transverse thereto, of a grid comprising a series of hooked or shouldered bars in position to engage the main selecting needles and operate them and means for supporting a pattern card in position to operate the auxiliary selecting needles to

throw the main selecting needles into or out of engagement with the shouldered or hooked bars on the grid.

13. The combination with a gang of selecting needles, a roller for carrying a pattern card in position to operate the needles and a slide for supporting the roller, of vibrating gear connected with the slide and with a source
35 of power, for operating the slide and means for varying the stroke of the vibrating gear.

14. The combination with a gang of selecting needles, a roller for carrying a pattern card in position to operate the needles and a slide for supporting the roller, of a
40 rock shaft, a pinion thereon, a crank thereon, a connection between the crank and slide, a toothed sector arranged to intermesh with the pinion and mounted to swing and means for operating the toothed sector.

In testimony, that we claim the foregoing as our invention, we have signed our names in presence of two witnesses, this 29th day of September, 1905.

VERNON ROYLE.
VERNON E. ROYLE.
JAMES WHITEHEAD.

Witnesses as to Vernon Royle and Vernon E. Royle:

GEO. RUSSELL,
ELIAS BROWN KING.

Witnesses as to James Whitehead:

SARA T. HALL,
EDWARD H. BUCKLEY.