(No Model.)

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W. A. LORENZ.

TYPE JUSTIFYING APPARATUS.

No. 467,335. Patented Jan. 19, 1892.

Fig. 1

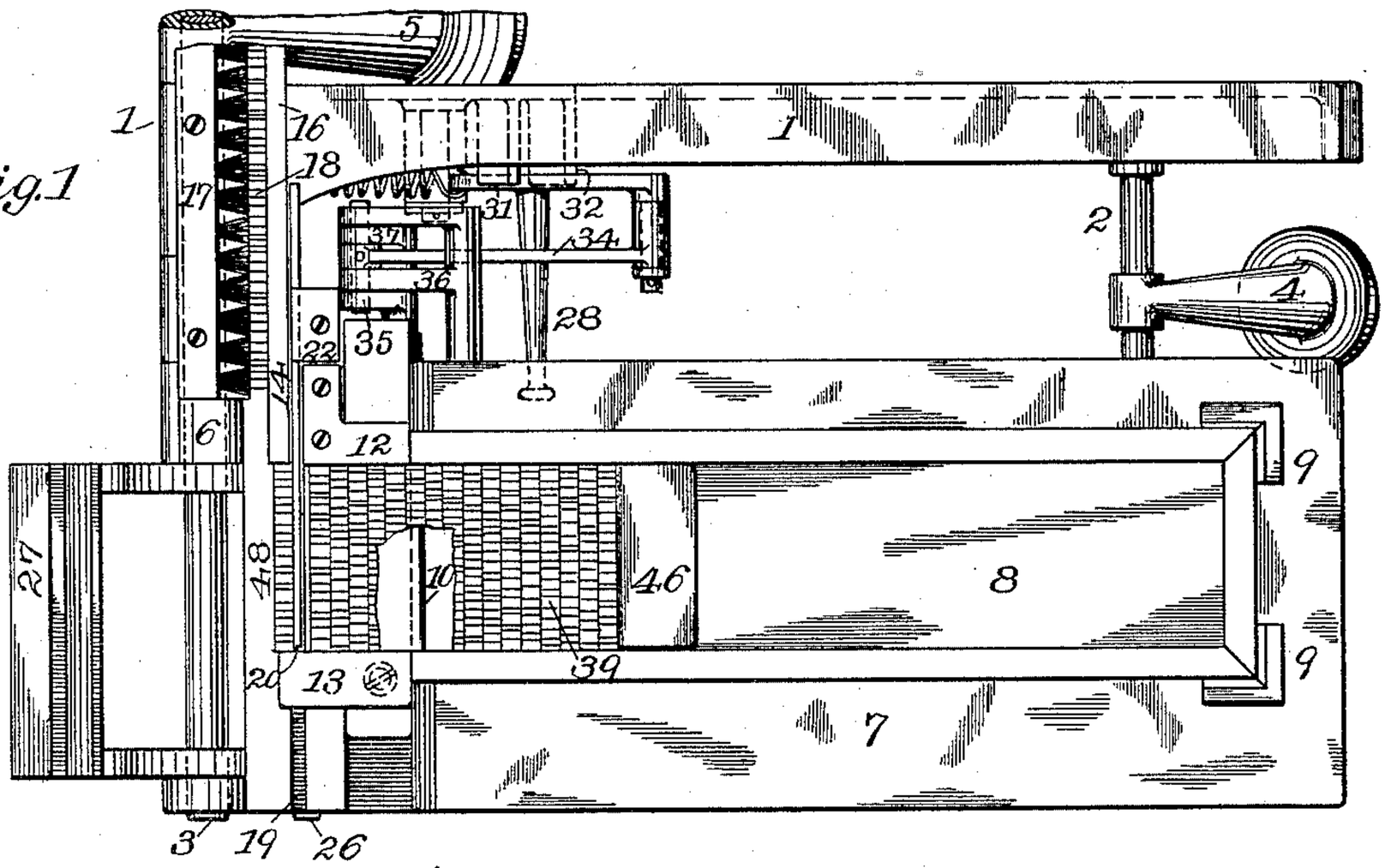

Fig. 2.

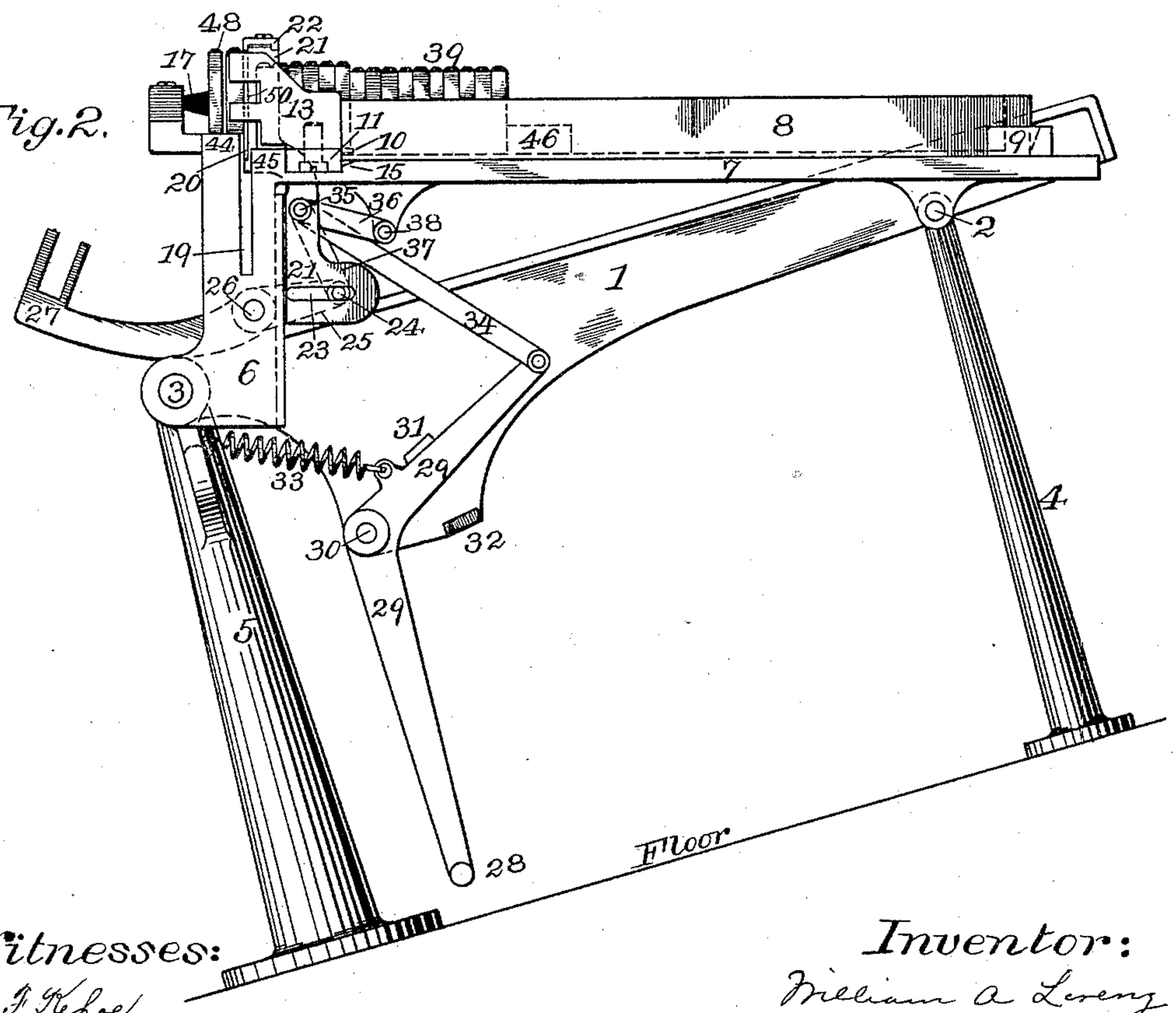

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Fig. 3

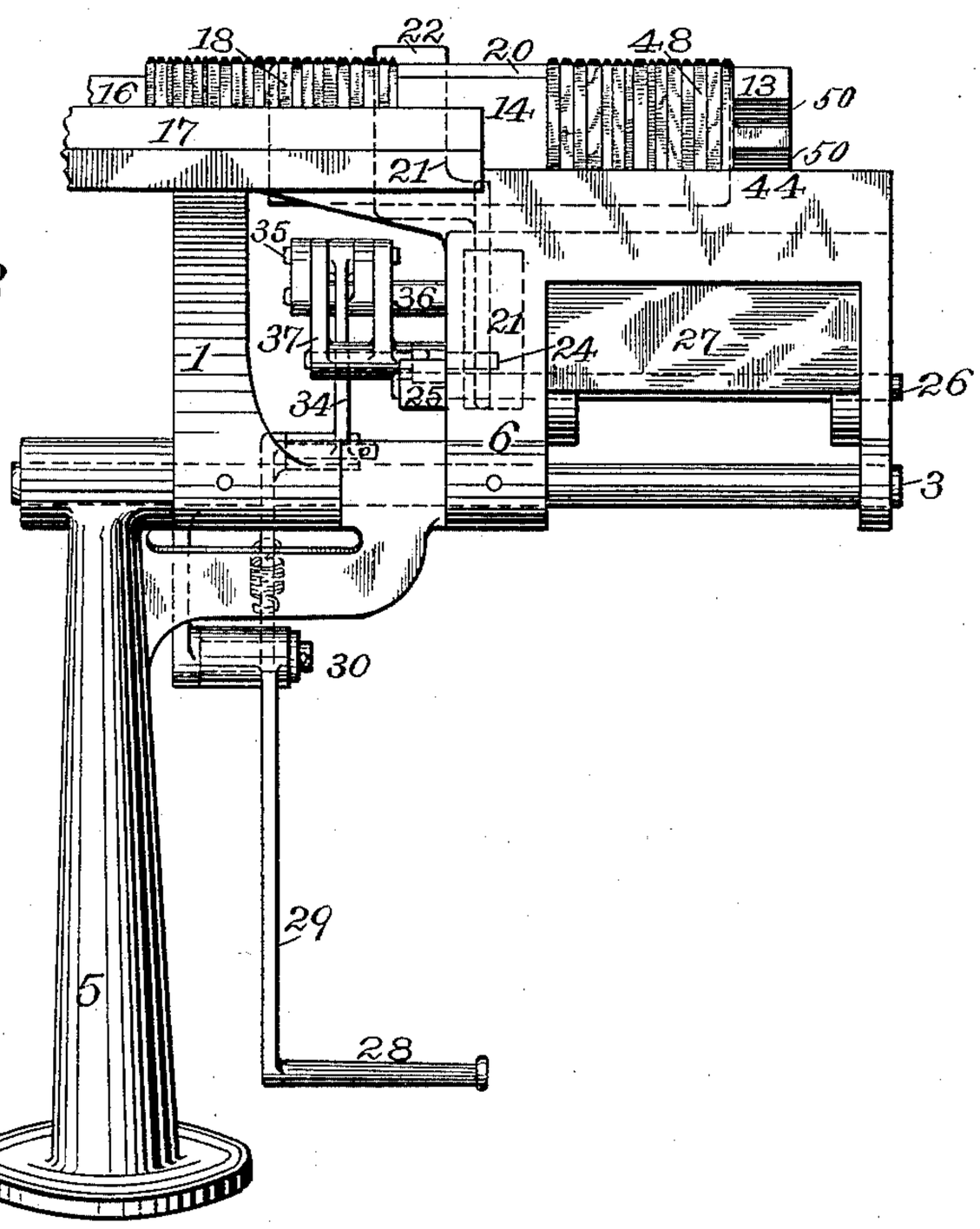


Fig. 4

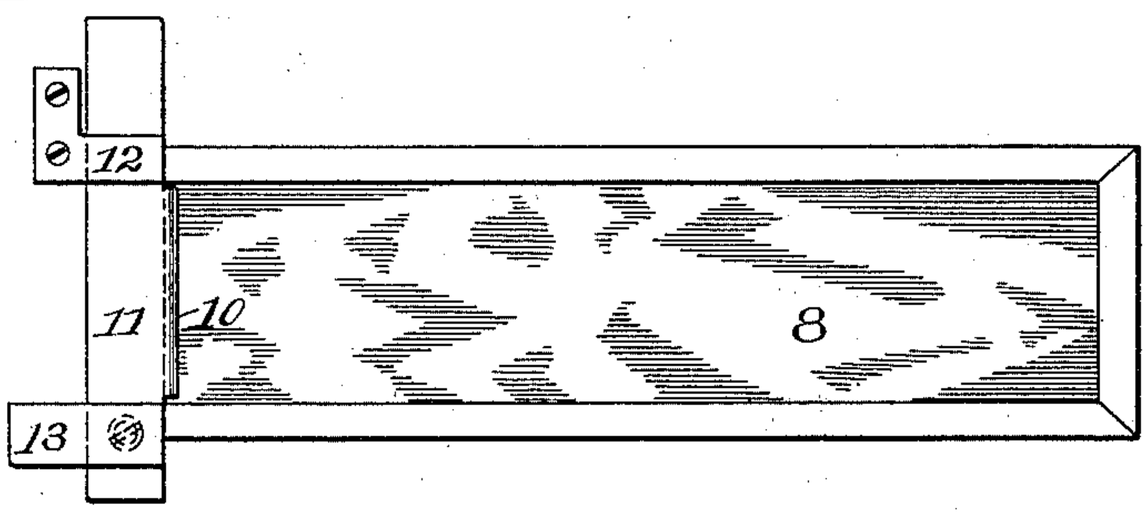
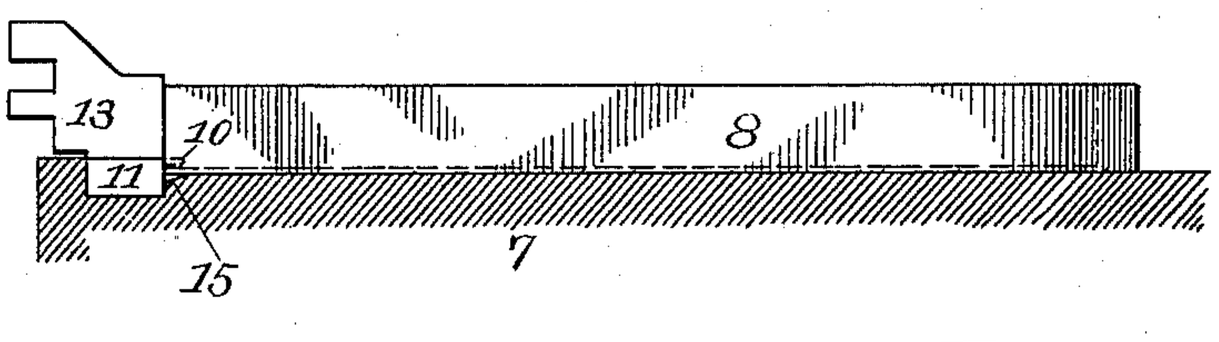


Fig. 5



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TYPE JUSTIFYING APPARATUS.

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Fig. 6

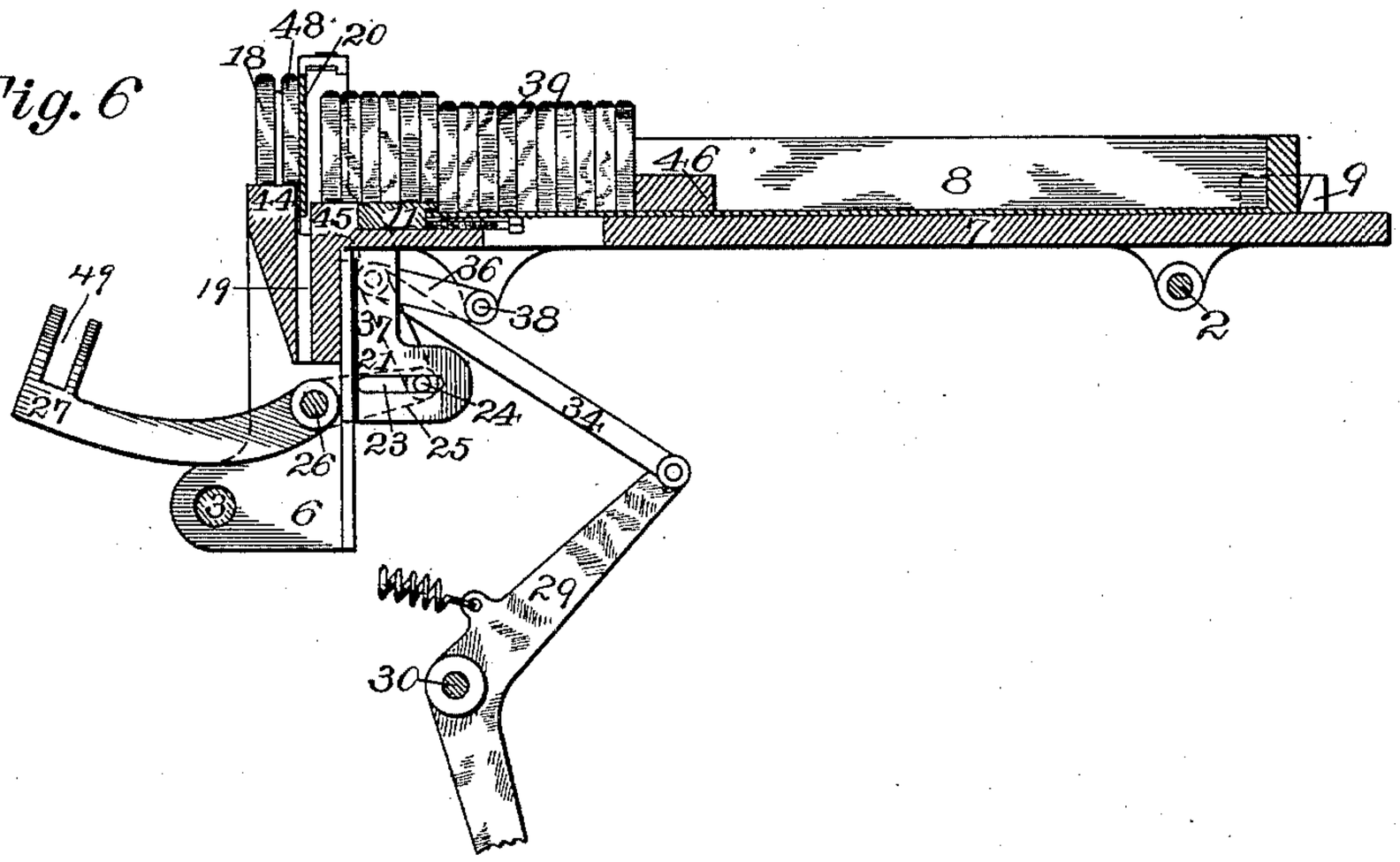

Fig. 7

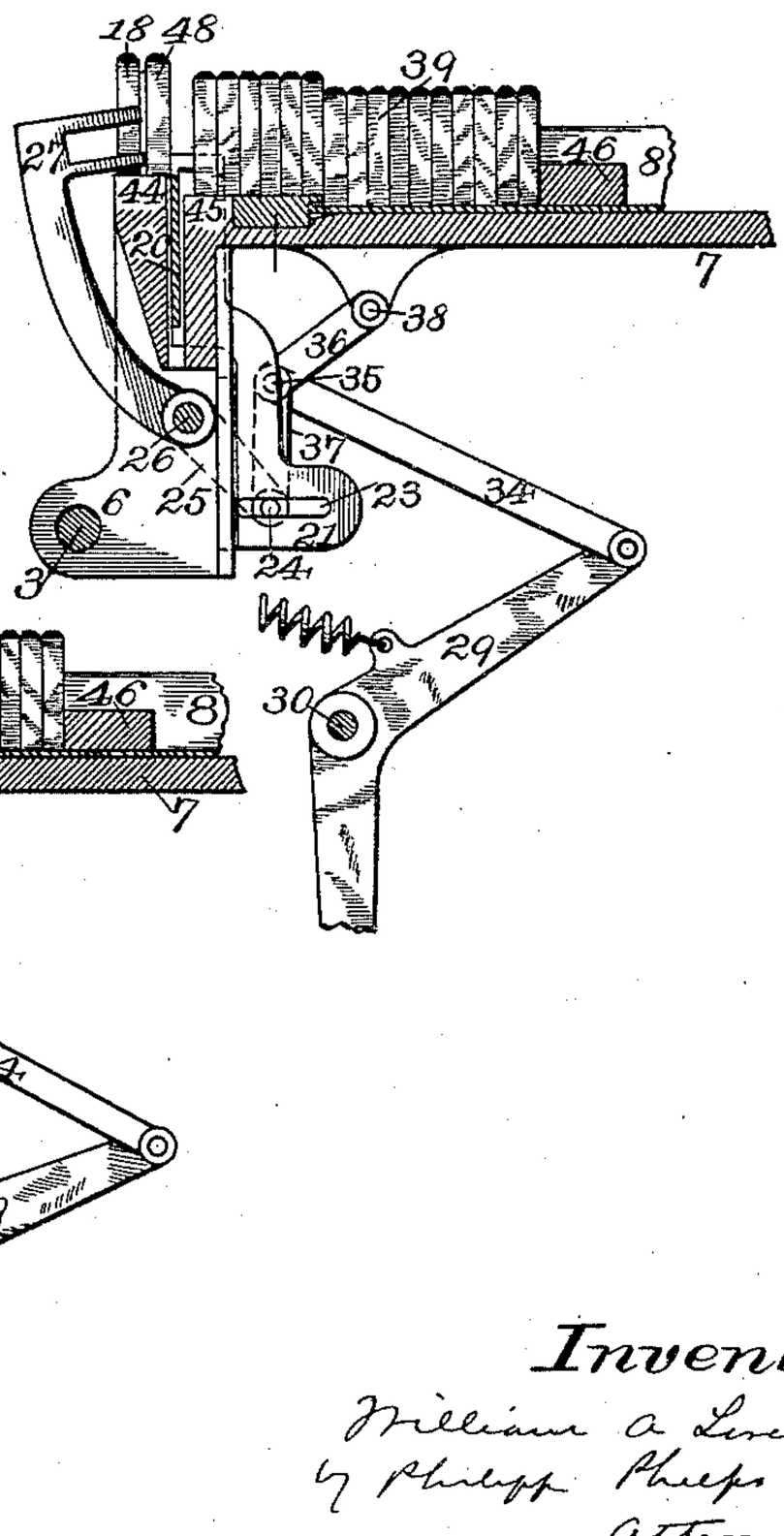

Fig. 8

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W. A. LORENZ.

TYPE JUSTIFYING APPARATUS.

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Fig. 9

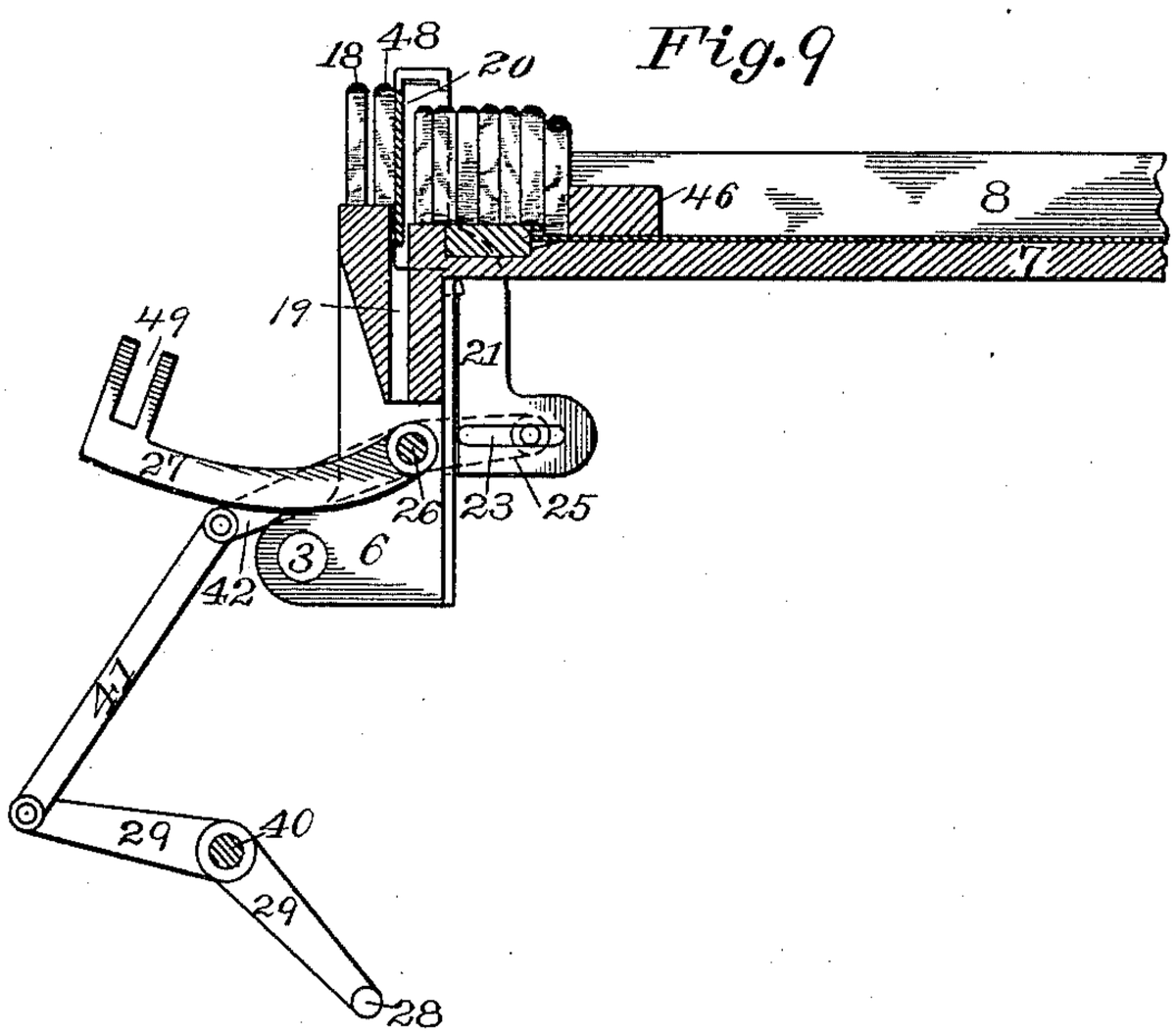
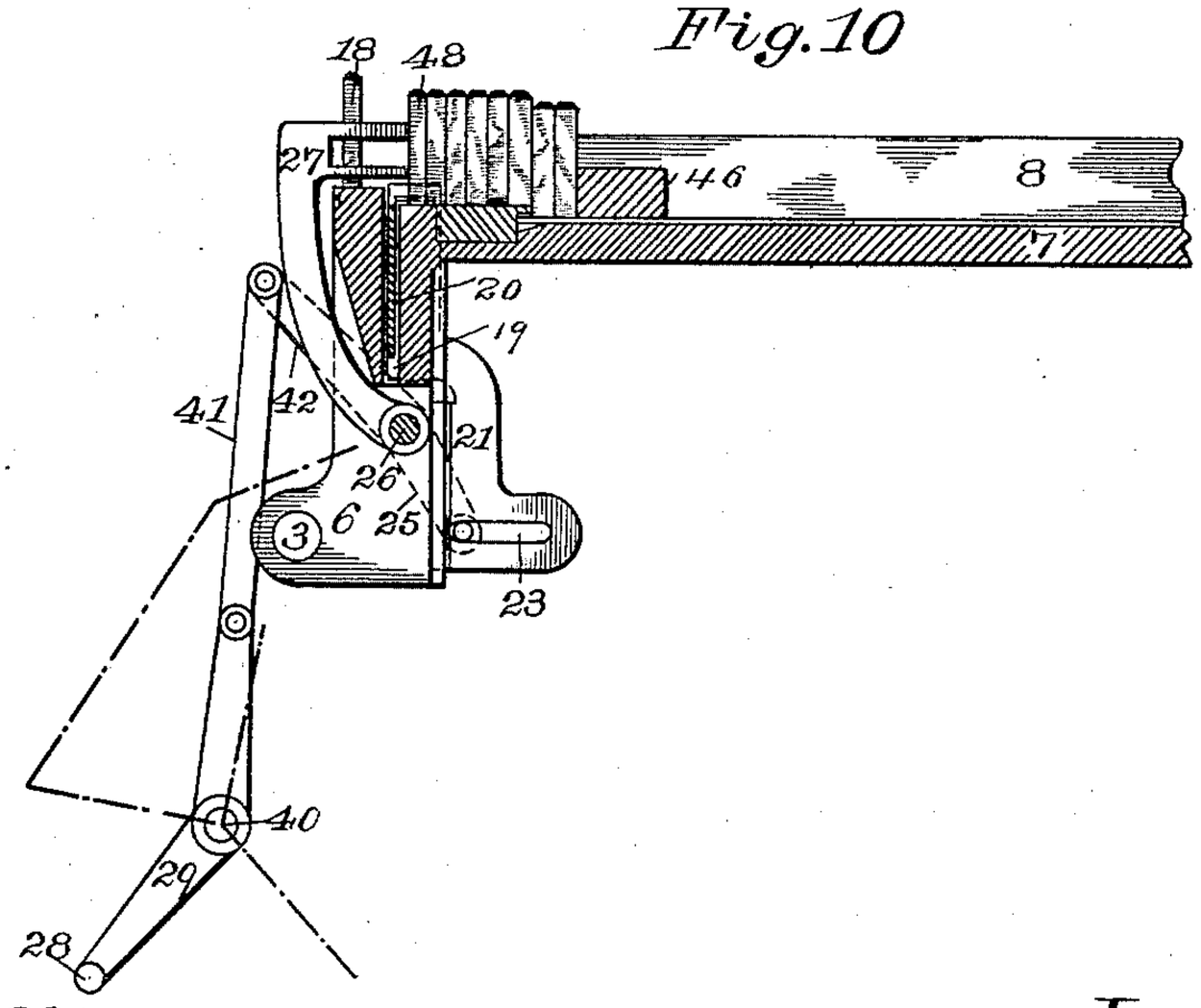


Fig. 10



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UNITED STATES PATENT OFFICE.

WILLIAM A. LORENZ, OF HARTFORD, CONNECTICUT, ASSIGNOR TO THE THORNE TYPE SETTING MACHINE COMPANY, OF JERSEY CITY, NEW JERSEY.

TYPE-JUSTIFYING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 467,335, dated January 19, 1892.

Application filed October 30, 1890. Serial No. 369,772. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM A. LORENZ, a citizen of the United States, residing at Hartford, county of Hartford, and State of Connecticut, have invented certain new and useful Improvements in Type-Justifying Apparatus, fully described and represented in the following specification and the accompanying drawings, forming a part of the same.

This invention relates to type-justifying apparatus of the class adapted especially to be used in connection with those type-setting machines from which the matter is received in the form of a continuous line, which line is afterward divided by hand into short lines of suitable length for a column or page and then justified and added to a column upon a printer's galley. A type-setting machine of the class referred to is shown and described in United States Letters Patent Nos. 232,157, 283,934, 372,186, and 372,187. A justifying apparatus designed especially for use with this machine is shown in United States Letters Patent Nos. 387,546 and 388,088; and the present invention includes improvements upon the justifying apparatus of these patents, which improvements, however, are of general application in justifying apparatus.

My invention includes, also, various constructions, some of which are of application in type-setting apparatus other than the class of justifying apparatus above described, all of which constructions will be particularly described in the following specification, and pointed out in the claims.

For a full understanding of my invention a detailed description of apparatus embodying the same will now be given, reference being had to the accompanying drawings, forming a part of this specification, in which—

Figure 1 is a plan view of a justifying apparatus embodying my invention. Fig. 2 is a side elevation of the same. Fig. 3 is a front elevation. Figs. 4 and 5 are a plan and side view, respectively, of the top galley and gage slide and blocks. Figs. 6, 7, and 8 are longitudinal vertical sections of a portion of the apparatus, showing the same in three positions. Figs. 9 and 10 are similar sections showing a modification of the operating mechanism in two positions.

Referring now to said drawings, the frame-work 1 is supported by cross-bars 2 3, mounted upon two columns 4 5, the cross-bars 2 3, supporting, also, a head 6, which rises above the frame-work 1 at the front end of the machine and extends rearward in the form of a table 7 over the post 4. Upon the table 7 is supported in an inclined position a galley 8, the lower end of which is held by angle-pieces 9 and its upper end by a lip 10, formed on the rear side of the adjustable gage-slide 11, with its lip extending into and over the bottom of the galley, as shown clearly in Figs. 4 and 5. The table is beveled out beneath the lip to form a recess 15, so that the lower end of the galley may be raised between the angle-pieces 9, and the galley removed without elevating the gage slide and lip. Thus the galley is held firmly from sliding movement in either direction and from rising while it may be readily removed or placed in position. One side of the galley 8 matches a fixed block 12 and the other side an adjustable gage-block 13, secured to the gage-slide 11 and adjustable with the gage-slide transversely of the machine to suit the type-measure required. The type-measure is regulated by the block 13 and the fixed end 14 of the typeway 16, a brush 17 being placed beside the way 16 to hold the advancing line of type 18, as usual in this class of machines. Between the typeway end 14 and the block 12 is a narrow slot 19, extending entirely across the head 6, in which slot is placed the rule 20, against which the type is held during justification. This rule has a downward and upward movement, being carried by a slide 21 and held therein by a cap 22. The slide 21 moves vertically in a way in the head 6 and is provided at its lower end with a cross-slot 23, entered by a pin 24 on an arm 25, secured to the shaft 26, mounted to oscillate in the head 6. The shaft 26 carries a column-packer 27, provided with a groove 49, which enters recess 50 in the block 13 when the packer is swung into the position shown in Figs. 7 and 8. The shaft 26 is rocked to operate the packer 27 and rule 20 by a toggle-joint arragement of levers connected, preferably, to a treadle 28 upon a lever 29, oscillating upon a stud 30 in the frame-work 1. The lever 29 moves between stops 31 and 32 on the frame 1, and is

held in a position of rest against the upper stop by the spring 23, in which position the packer 27 is withdrawn and the rule 20 raised to its highest position, as shown in Fig. 6. To the upper arm of the lever 29 is connected a rod 34, carrying a pin 35, working in two arms 36 and 37, forming a toggle-joint, the upper arm 36 being pivoted at 38 to the frame 1 and the lower arm 37 pivoted on the stud 24, which is carried by the arm 25, as before explained.

While the toggle-joint construction shown in Figs. 1 to 8 is the preferred form it is evident that this may be modified in many ways while retaining the toggle-joint feature. Thus in the construction shown in Figs. 9 and 10, the lever 29 is mounted on a stud 40 in front of the head 6 and connected by a connecting-rod 41 to the arm 42, forming an extension of the arm 25, previously described. It is obvious that this construction is substantially the equivalent of that previously described, and its operation substantially identical therewith.

The upper part of the head 6, on which the type is supported, is preferably made of different heights, as shown, that part 44 in front of the rule 20 being in the same horizontal plane with the floor of the typeway supporting the line 18, and that part 45 behind the rule 20 being lower than the part 44. By this construction the last line of type justified stands upon a lower level than the type being justified, allowing the latter to be more conveniently manipulated. Moreover, when the rule 20 drops to its lowest limit below the part 44, as in Fig. 8, the top of the rule will still be higher than the part 45, thus presenting no hole for the accumulation of dirt.

The operation of the apparatus is as follows: The type-measure having been adjusted by setting the block 13 to the required distance from the typeway end 14 and clamping the slide 11 by a screw or other suitable means, the galley 8 is then inserted under the lip 10 and directed into position against the angle-pieces 9. As the line of type 18 is advanced along the typeway 16 by the operation of the type-setting machine, it will pass onto the part 44 of the head 6 and in front of the rule 20, which is now in its highest position, as shown in Fig. 6. When the line of type is advanced sufficiently for the measure required, the justifier in front of the galley will cut off and move rearward against the rule 20 a sufficient length 48 to form one line of matter for the column or page, and then will effect the proper justification of the line by removing and inserting spaces in the usual manner, the line 48 during the process of justification resting upon the part 44 and against the rule 20, the line of type last justified and added to the column being on the lower level 45. When the line has been properly justified and is ready to be added to the column 39, the treadle 28 will be moved forward, which movement, by means of the toggle-joint and connections, will cause the slide 21 and rule 20 to descend, and also cause the packer 27 to move up into engagement with the line 48. In this position, as shown in Fig. 7, the rule 20 will be even with or a little below the level 44 of the head, and the line 48 will then, by further movement of the treadle, be pushed beyond the rule and added to the column 39, as shown in Fig. 8, the column 39 being supported by a friction-block 46, as usual. As the line 48 passes off the level 44, it will drop upon the lower level 45 and thus stand below the next line to be justified, as previously explained. A justified line having been added to the column, the pressure will be taken off the treadle 28, and the spring 33 will at once restore the parts to their original position, as shown in Fig. 6. After this the operator will cut off and move forward another line, justify it, and insert it into the galley in the same manner; and so the operation will be repeated until the column or page is completed. The filled galley will then be removed and an empty galley placed upon the table in its stead.

In the position shown in Fig. 8, the packer 27 is at the limit of its rearward movement, and the knuckle-joint 36 37 is on the dead-center. A slight amount of motion is allowed the treadle beyond this point, by which the toggle-joint may be drawn beyond the dead-center, thus causing the packer 27 to move back from the type a little. The object of this further movement of the treadle is to avoid the failure of adding the line to the column on account of the full movement not being given to the treadle. By this construction a line will be added to the column although the operator fails to move the treadle to the full extent.

It is evident that by the use of the toggle-joint for operating the packer to move the line into the galley the first part of the movement of the packer is rapid and that during the latter part of the movement, as the packer comes into contact with and operates upon the type, the movement is slow and the power largely multiplied, so that the type is gradually carried forward instead of being moved suddenly, as with previous constructions in which speed has been attained, and the columns in the galley are easily pushed ahead even after the galley is nearly full. Moreover, all the movements of the machine are produced by lever connections, thus providing a very simple and efficient construction, little liable to get out of order, and one in which all the parts can be readily reached when necessary.

While I have shown and described a treadle as preferable for operating the packer and rule, it will be understood that any other suitable means for operating the toggle-joint may be employed.

While all my improvements have been de-

scribed in connection with justifying apparatus for use with type-setting machines of the class described, and these improvements have been especially designed for this purpose, it will be understood that these improvements are applicable also in other classes of machines in which type are set and then transferred to a galley.

I believe I am the first to provide a galley held in position in the manner described and claimed, and this I desire to cover independently of the class of machine in which the galley is employed.

What I claim is—

1. The combination, with a column-packer, of a toggle-joint-lever mechanism for operating said packer, substantially as described.

2. The combination, with a column-packer and a justifying-rule, of a toggle-joint-lever mechanism for operating said packer and rule, substantially as described.

3. The combination, with a vibrating column-packer and reciprocating justifying-rule, of a toggle-joint-lever mechanism for operating said packer and rule, substantially as described.

4. The combination, with a column-packer, of an operating-lever and toggle-joint connections between said lever and packer, the operating-lever having a movement sufficient to carry the toggle-joint past its dead-center, substantially as described.

5. The combination, with the table 7, of the galley 8 and lip 10, extending over the base of the galley at the open end for holding the galley in place, substantially as described.

6. The combination, with the table 7, of the galley 8 and lip 10, extending over the base of the galley at the open end for holding the galley in place, the table being formed with the recess 15 beneath the lip, substantially as described.

7. The combination, with the table 7, of the galley 8 and gage-slide 11, having the lip 10 extending over the base of the galley at the open end for holding the galley in place, substantially as described.

8. The combination, with the table 7, of the galley 8, the typeway 14, and gage-slide 11, carrying gage-block 13 and having the lip 10 extending over the base of the galley at the open end for holding the galley in place, substantially as described.

9. The combination, with the table 7, of the galley 8, lugs 9, between which one end of the galley is held, the typeway 14, and gage-slide 11, carrying gage-block 13 and having the lip 10 extending over the base of the galley at the open end, the table being provided with a recess 15 beneath the lip, substantially as described.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

WILLIAM A. LORENZ.

Witnesses:

ALBERT H. WALKER,

CHAS. W. LORENZ.