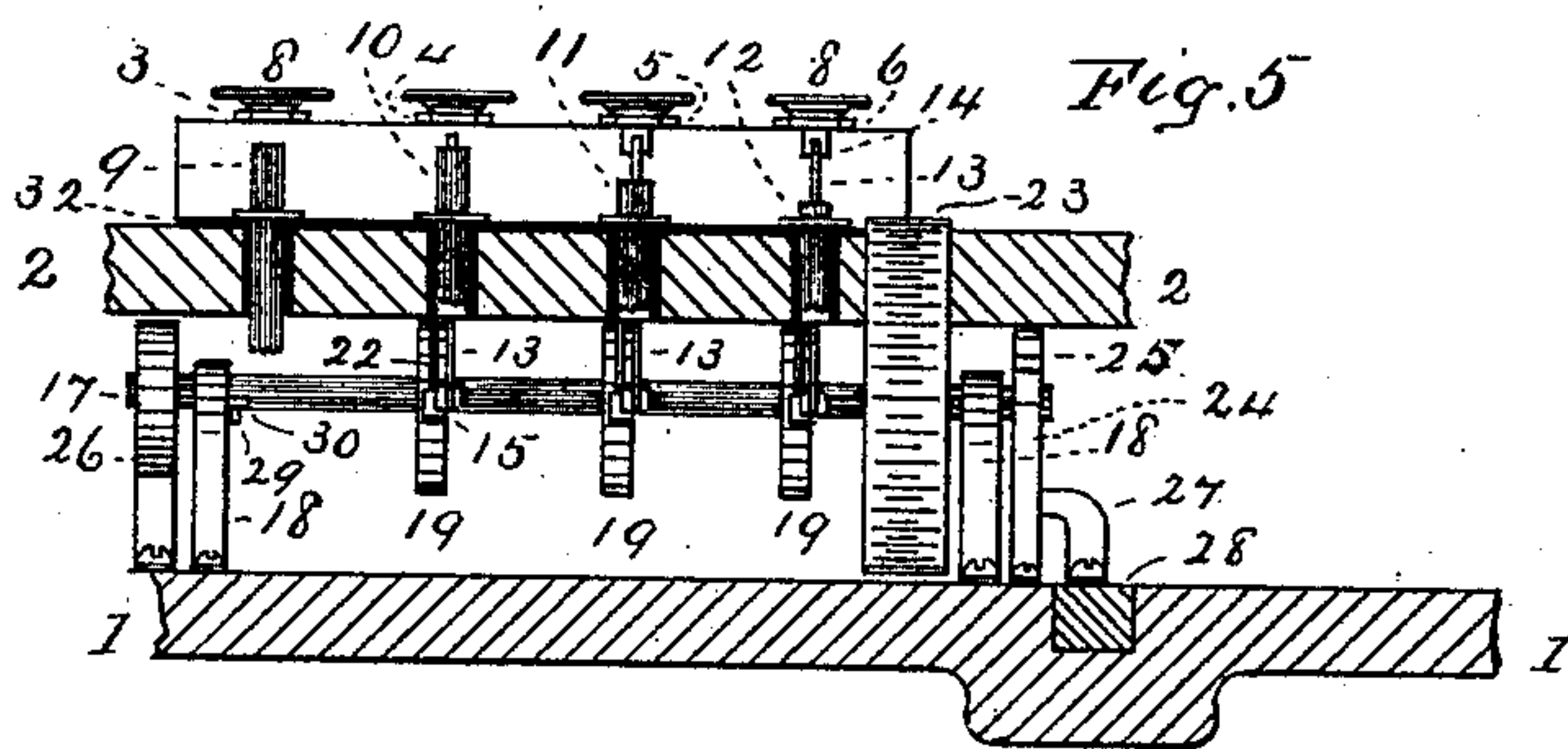
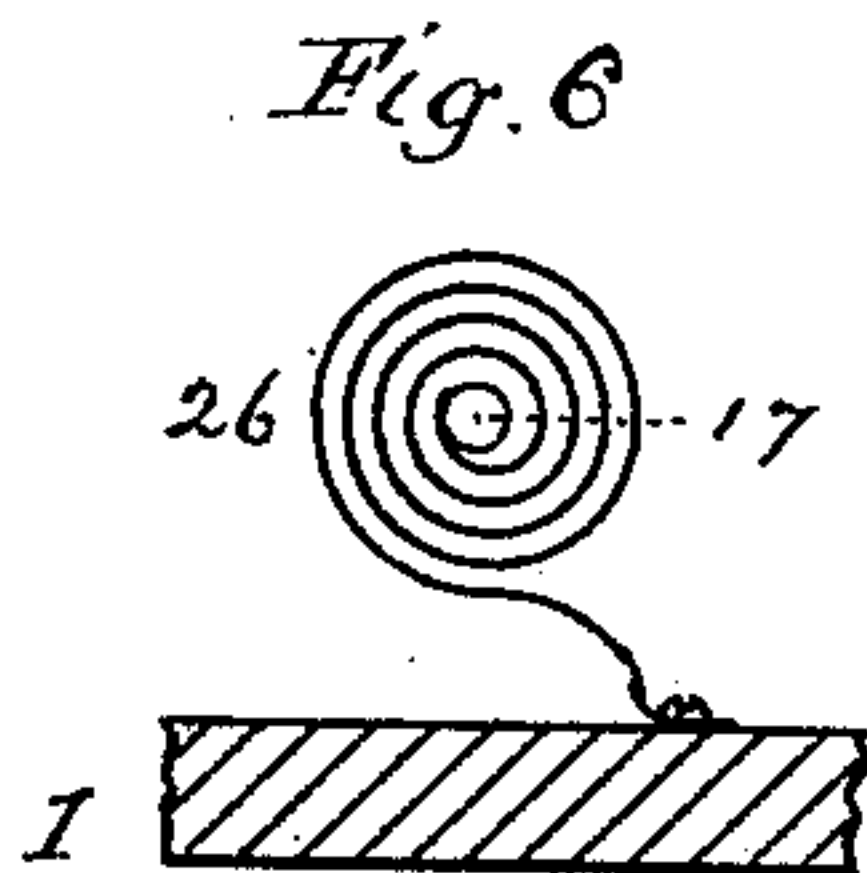
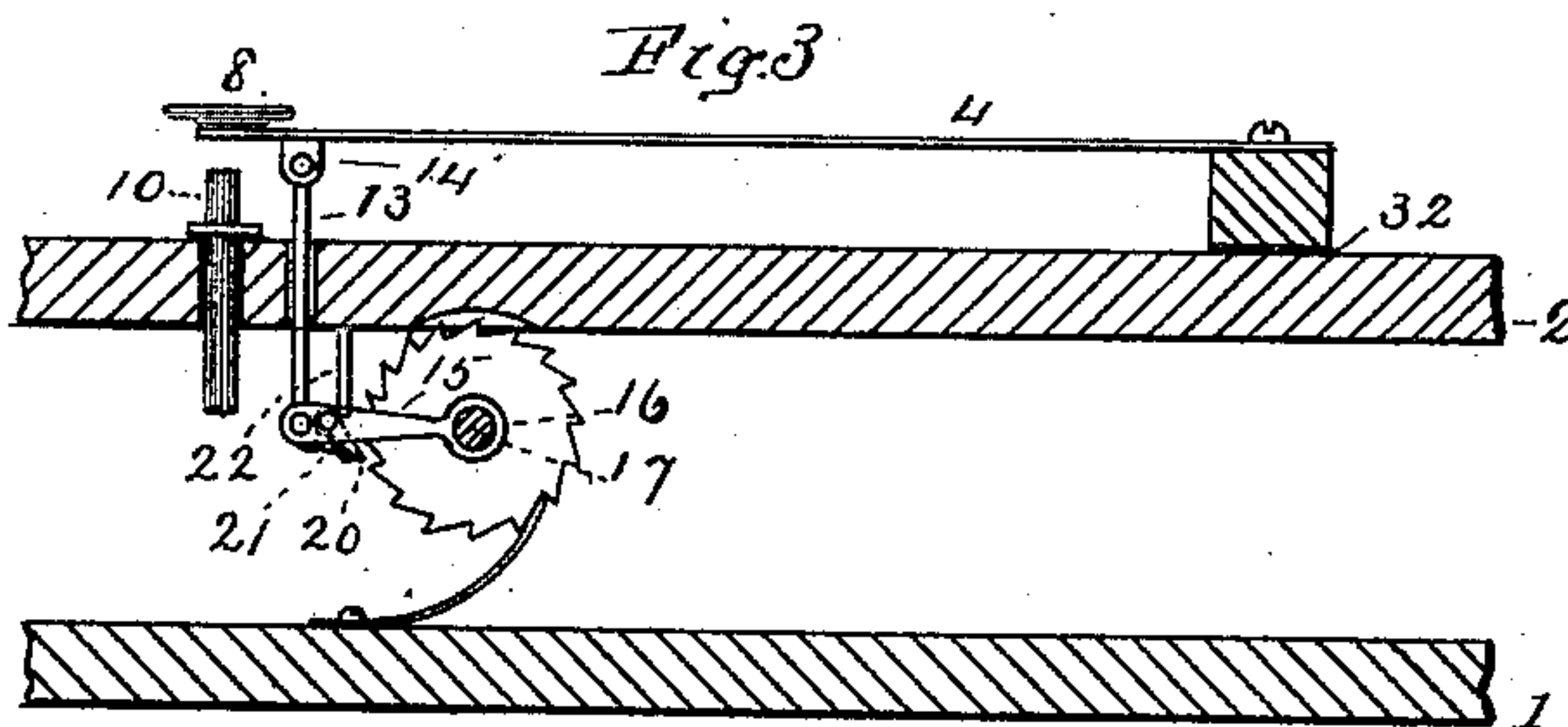
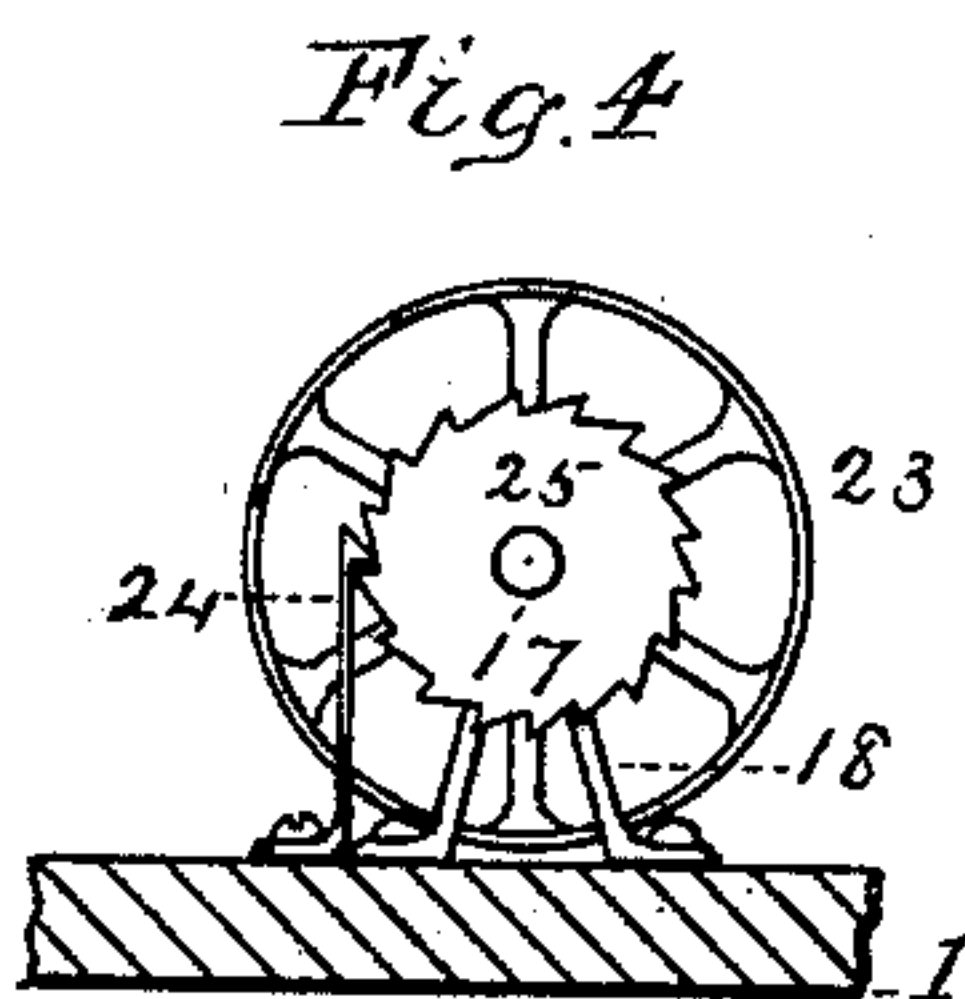
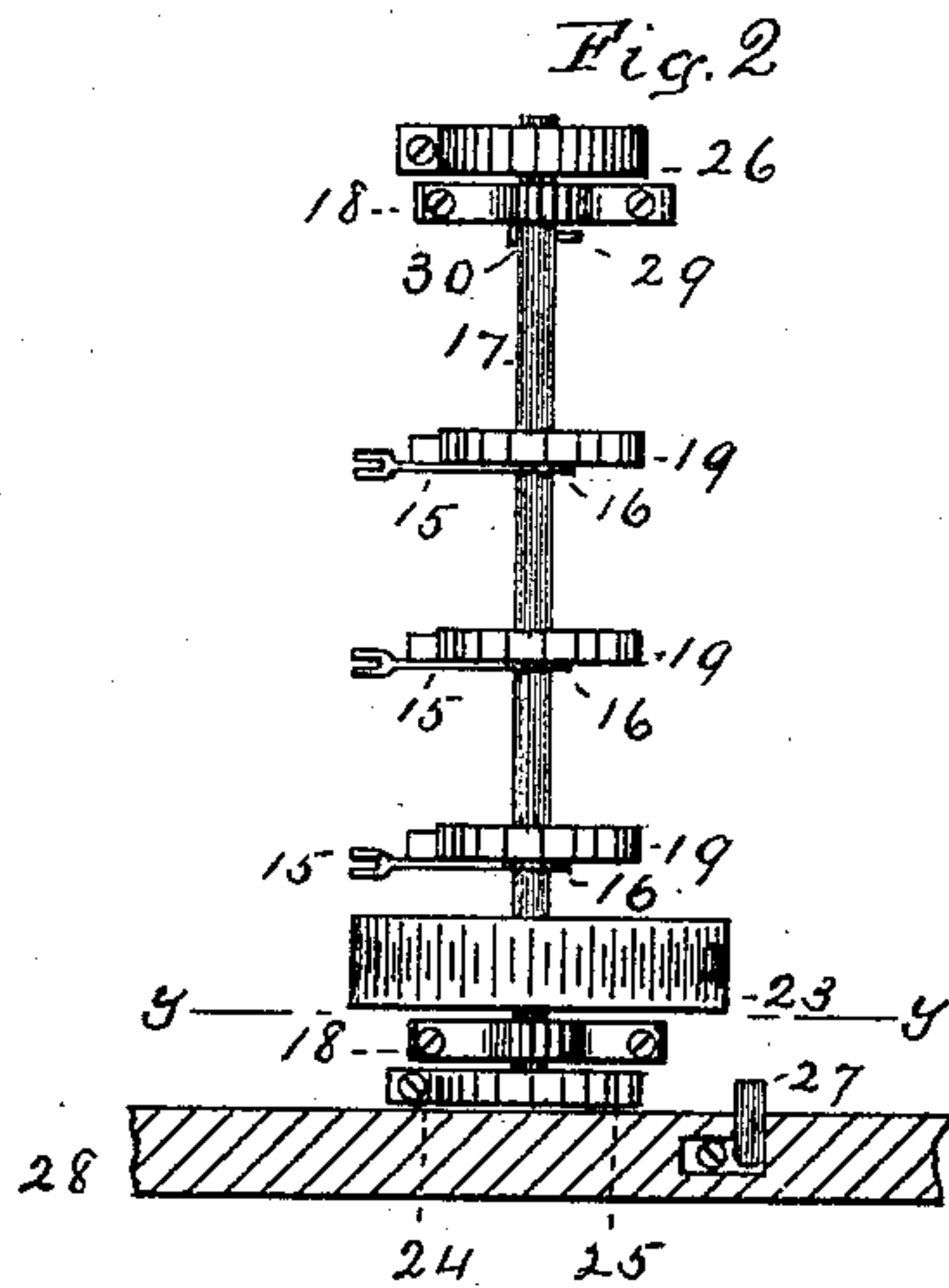
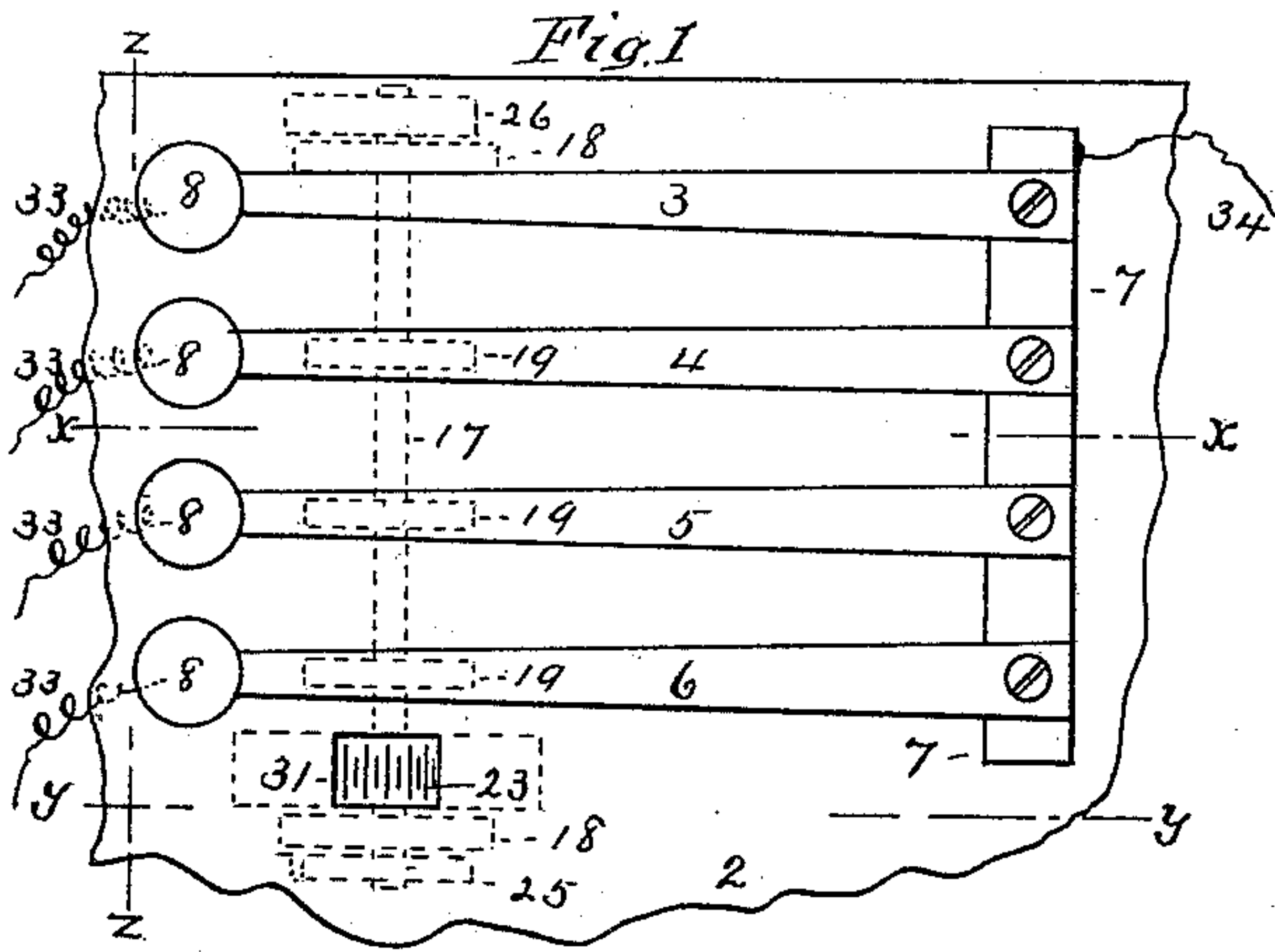


(No Model.)

C. L. REDFIELD.
JUSTIFYING INDEX FOR MATRIX MACHINES.

No. 429,741.

Patented June 10, 1890.



Witnesses

E. M. Schumann
J. T. Chrischilles

Inventor

By his Attorney
Casper L. Redfield
P. H. Gunkel

UNITED STATES PATENT OFFICE.

CASPER L. REDFIELD, OF MINNEAPOLIS, MINNESOTA, ASSIGNOR TO THE
CHICAGO MATRIX MACHINE COMPANY.

JUSTIFYING-INDEX FOR MATRIX-MACHINES.

SPECIFICATION forming part of Letters Patent No. 429,741, dated June 10, 1890.

Application filed May 27, 1889. Serial No. 312,320. (No model.)

To all whom it may concern:

Be it known that I, CASPER L. REDFIELD, a citizen of the United States, residing at Minneapolis, in the county of Hennepin and State of Minnesota, have invented certain new and useful Improvements in Justifying-Indexes for Matrix-Machines, of which the following is a specification.

My invention relates to space-throwing devices connected with the feed mechanism of matrix-making machines, and specifically to recording devices adapted to indicate how much extra space has been thrown between the words to make the lines justify. Its object is to show an operator at any time the percentage or amount of extra space thrown, to enable him to determine how much more space must be thrown to properly justify a line; and the invention, generally stated, consists in attaching to the space-throwing keys of a matrix-making machine devices for recording the total amount of units of space beyond one unit thrown between words where such extra units of space are used to justify lines of printing.

The devices of the improvement, as illustrated in the accompanying drawings, are adapted for use in an electrically-operated machine of the character set forth in an application for patent filed by me on April 25, 1889, Serial No. 309,288; but such devices are designed for use in other matrix-making machines as well.

In said accompanying drawings, Figure 1 is a plan view of the portion of a matrix-machine containing the spacing-levers. Fig. 2 is a plan view of the recording devices, the portion of the devices shown in Fig. 1 and the frame being removed. Fig. 3 is a vertical section on the line $x x$ of Fig. 1. Fig. 4 is an end view of the recording devices on the line $y y$ of Figs. 1 and 2. Fig. 5 is a front view on the line $z z$ of Fig. 1, and Fig. 6 is a side elevation of the spring for retracting the indicating-device shaft.

In said drawings, 1 designates the base and 2 the upper portion of the frame of the machine.

3, 4, 5, and 6 designate the spacing-levers, that have their rear ends attached to a trans-

verse bar 7. These levers are composed of spring-bars, that resume their horizontal position after being depressed. On the forward ends of the levers are buttons 8 for manipulating them. Beneath the buttons and levers are circuit-making pins 9, 10, 11, and 12, that are connected to the feed-escapement devices, (not shown,) by means of which the circuits are made for causing feed movements of variable quantities.

The lever 3 and its pin 9 are for producing single units of space of which no record is made. The other pins 10, 11, and 12 are longer and of varying lengths, so that the distance between their ends and the levers 4, 5, and 6, which respectively operate them, is progressive in degree corresponding with the different measures of feed movement. Thus the shortest extra space corresponding with the unit of feed movement is that between the pin 10 and its lever 4. The next in extent is that between the pin 11 and its lever 5, and so on in the series.

The devices shown are designed to record only the units of space beyond a single unit thrown between words, and the lever in connection with the pin 9 is intended to make the unit-space without producing a record.

The second lever 4 is adapted to produce two units of space and to record but one, the third lever to produce three units of space and to record but two, and the fourth lever 6 to produce four units and record but three. At the under side of each of the levers except that for making contact with the pin 9 is a rod 13, that is pivoted to an ear 14 on the lever, and has its lower end pivoted in the jaws of an arm 15, which has a loose sleeve 16 on a shaft 17. The shaft 17, which is mounted on standards 18, extends transversely between the base and cover of the machine-frame, and on it are ratchet-wheels 19 for turning it. These ratchet-wheels are arranged beneath the levers that produce the second, third, and fourth degrees of movement. They are operated upon the depression of their respective levers by means of pawls 20, pivoted to the arms 15, and thrown into engagement with the ratchet-teeth by springs 21, attached to the arms and bearing on the backs of the

pawls. Their engagement is released upon the rising of the levers by pins 22, fixed at the under side of the casing 2 in position to engage the pawls and force them away from the teeth by the upward movement of the arms carrying the pawls. The extent of rotation of the shaft 17 is measured by the play of each lever between its starting-point and the pin to which it descends. Thus the movement of the first wheel 19 will be the space of one tooth, the second of two teeth, and the third of three teeth. On the shaft 17 is secured a wheel 23, having circumferential graduations or characters to indicate the extent of rotation and so the aggregate amount of feed movement for spacing, and from this indicator-wheel the operator may read the amount of word-spacing that has been thrown in and determine the percentage to introduce between succeeding words. A spring-dog 24 engages a ratchet 25 near the end of the shaft to hold it when it has been turned by the spacing-levers. A spring 26, having one end attached to the shaft 17 and the other to the frame of the machine, winds upon the shaft as the shaft is turned and serves to rotate it backward to its initial position when a line has been completed and the holding-dog 24 is released. The disengagement of the holding-dog is effected by a projection 27 on the feed-rack 28 of the matrix-carriage in position to engage the dog, as shown in Fig. 4, upon the return movement of the matrix-carriage. The reverse movement of the shaft is limited, so as to bring the zero-mark of the index-wheel 23 to the desired point by means of a pin 29 on the shaft, which engages a lug 30 on the standard 18. A peep-hole 31 in the top of the casing 2 enables the record of the index-wheel 23 to be examined. The bar 7 and the pins 9 10, &c., are insulated by an insulating material 32.

Electrical connections are made by wires 33 with the pins 9 10, &c., and with the bar 7 by a wire 34.

Having described my invention, what I claim is—

1. In a matrix-machine, a justifying-index device comprising, essentially, a shaft, an in-

dex, ratchet-wheels, pawls, and spacing-levers, substantially as set forth.

2. The combination, with the spacing-levers for variable-spacing movements in a matrix-machine, of a recording-index operated thereby to show the sum of the spaces thrown by all the levers other than those thrown by the lever for the minimum movements, substantially as set forth.

3. In a matrix-machine, spacing-levers for throwing different amounts of space, a recording device for indicating the aggregate of the spaces thrown, a shaft and ratchet-wheels for operating the recording device, and pawls carried by the spacing-levers to engage the ratchet-wheels, substantially as set forth.

4. In a matrix-machine, the spacing-levers, in combination with pawls, ratchet-wheels, a shaft, an index operated thereby, a holding-dog, and a retracting-spring, substantially as set forth.

5. The combination, with the spring-retracted spacing-levers, of the index-device shaft, the pivoted arms connecting them, the ratchet-wheels, and the pivoted spring-pawls and their releasing-pins, substantially as set forth.

6. The combination, with the spacing-levers, of the index-device shaft, its retracting-spring, the ratchet-wheels, the pawls and their carriers, and the holding-dog and its releasing device, substantially as set forth.

7. In a matrix-machine, the combination, with the operating-keys for producing variable matrix-spacings, of a justifying-index device adapted to register only the sum of the matrix movements which are greater than the minimum spacing movement, substantially as set forth.

8. In a matrix-machine, the combination, with the operating-keys for producing variable matrix-spacings, of a justifying-index adapted to register the sum of the extra spaces thrown to make a line justify, substantially as set forth.

CASPER L. REDFIELD.

Witnesses:

E. M. SCHUMANN,
P. H. GUNCKEL.