

(No Model.)

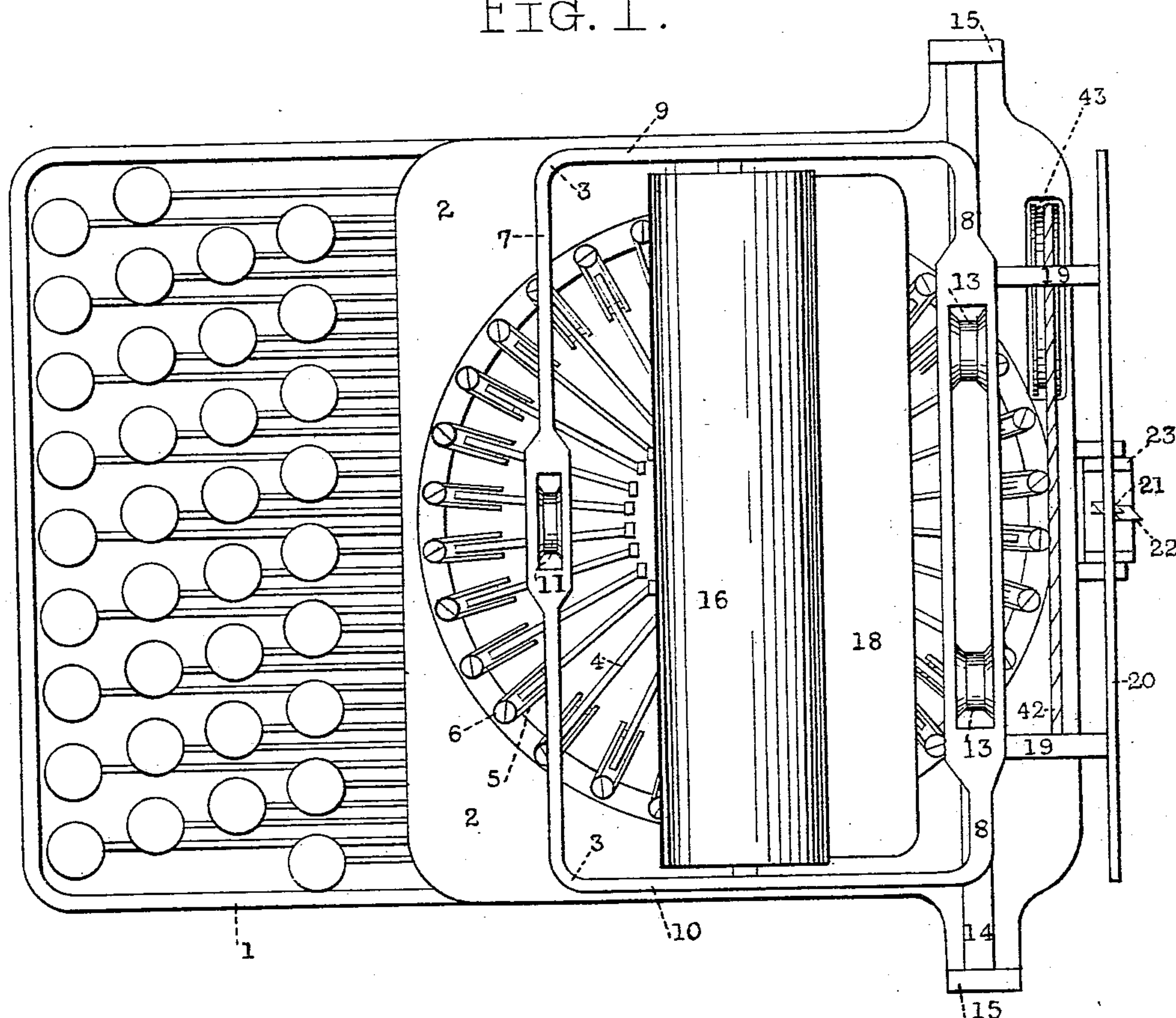
5 Sheets—Sheet 1.

B. C. STICKNEY.
TYPE WRITING MACHINE.

No. 557,711.

Patented Apr. 7, 1896.

FIG. 1.



Witnesses
Nellie J. Hoffman.
Ida C. Macdonald.

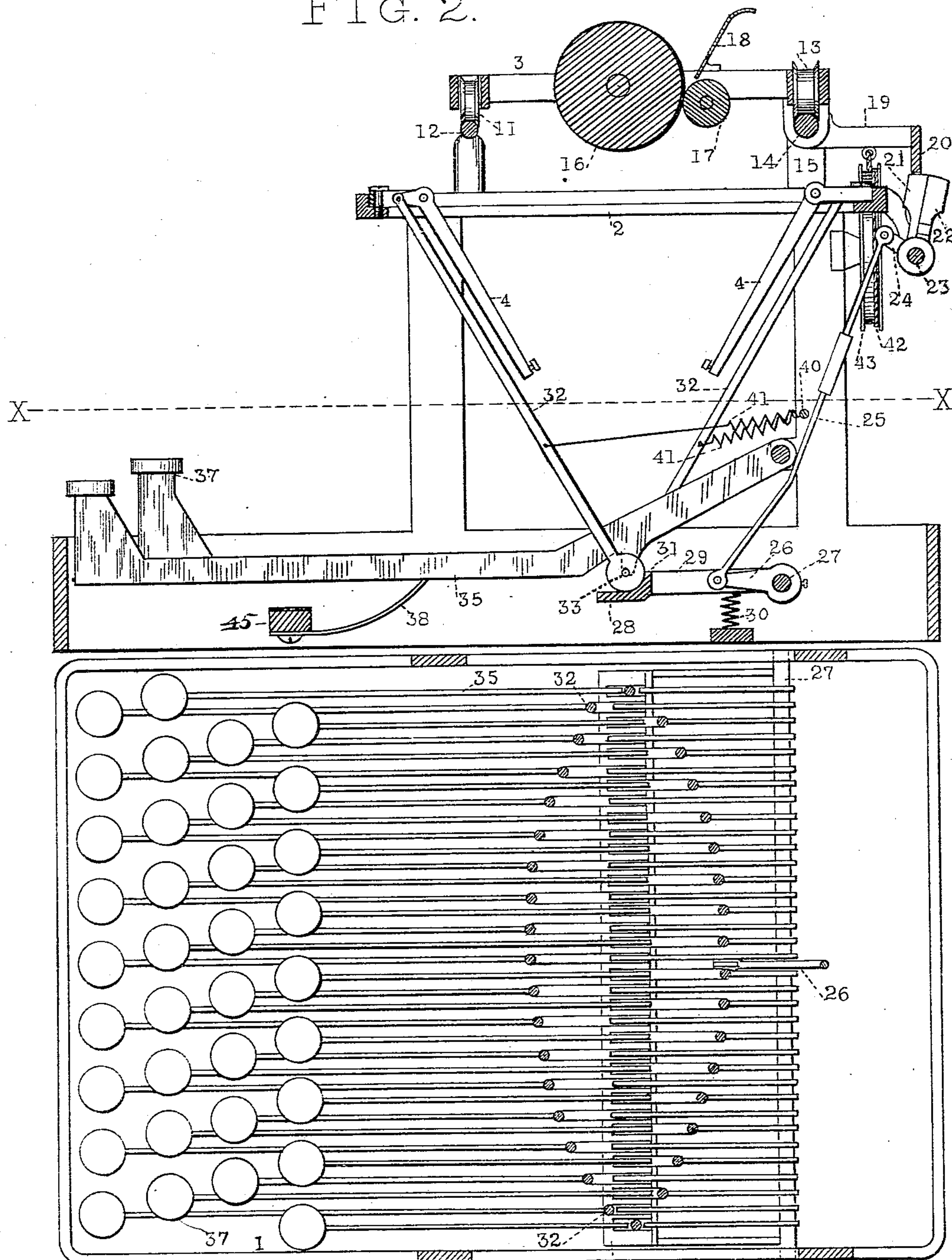
Inventor
Burnham C. Stickney
By his Attorney Jacob Felbel

5 Sheets—Sheet 2.

No. 557,711.

Patented Apr. 7, 1896.

FIG. 2.



WITNESSES

Kellie J. Hoffman
Ida C. Macdonald.

Fig. 3.

28 INVENTOR *Beverham C. Stickney*
BY HIS ATTORNEY *Jacob Felbel*

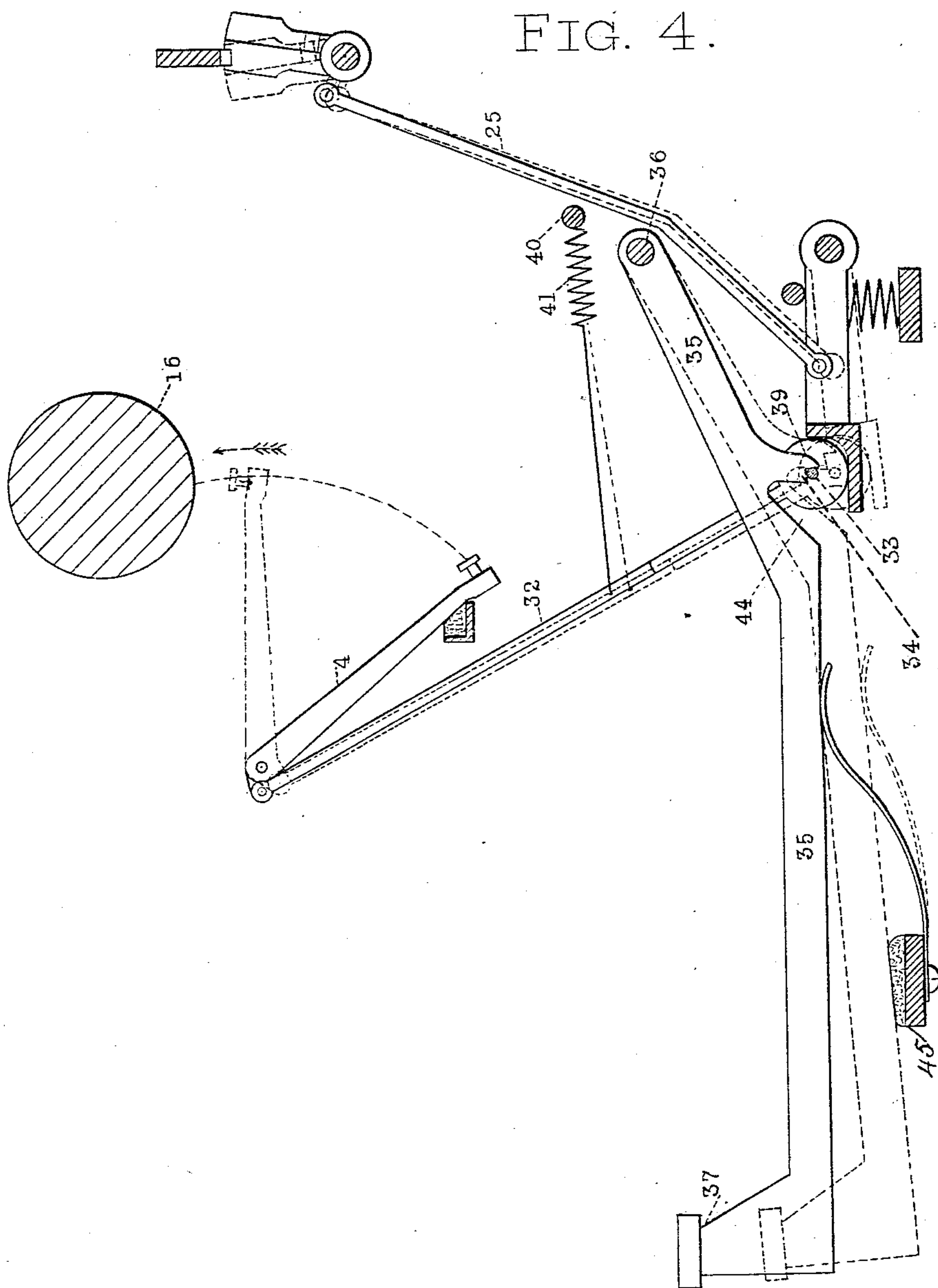
(No Model.)

5 Sheets—Sheet 3.

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FIG. 5.

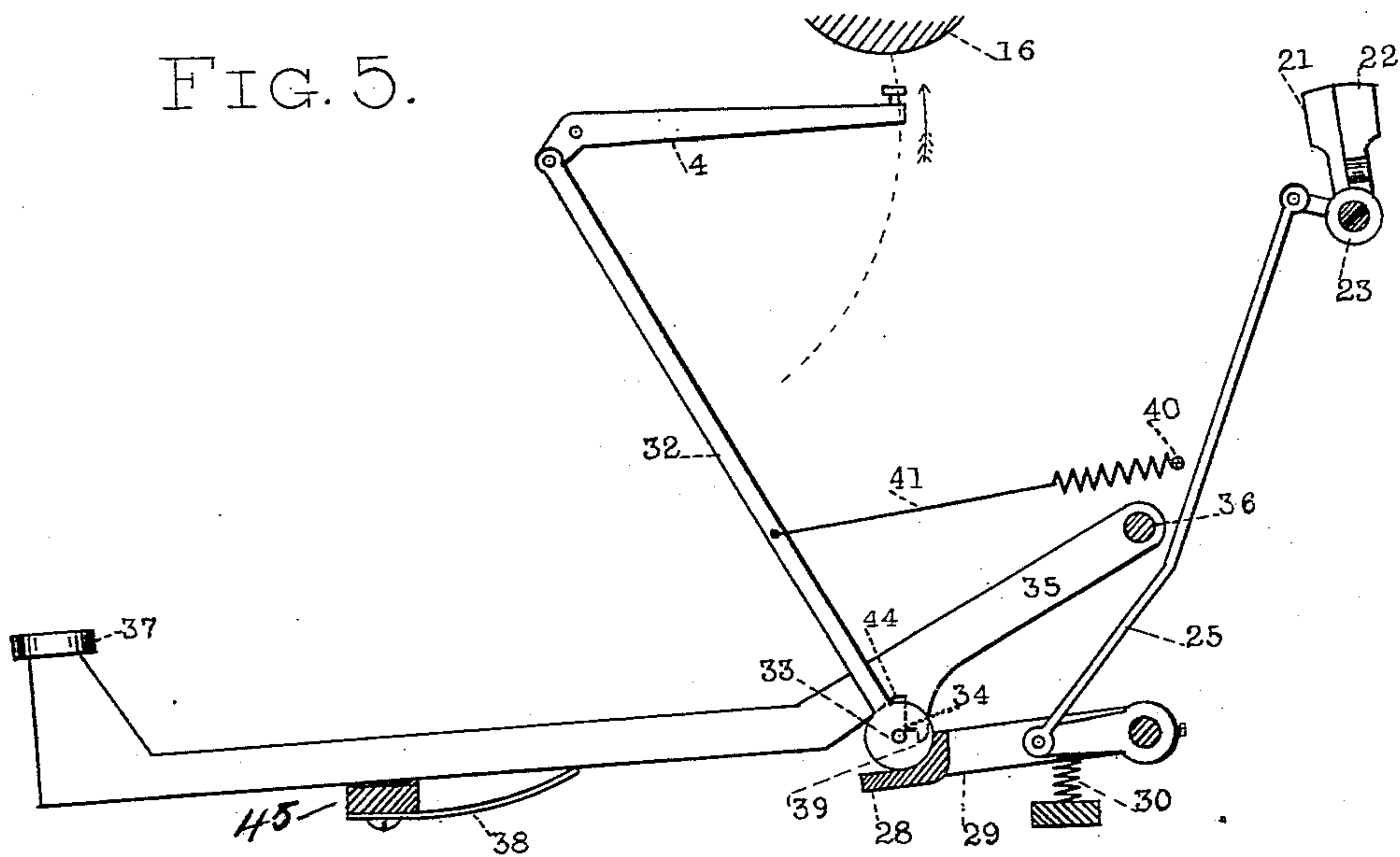
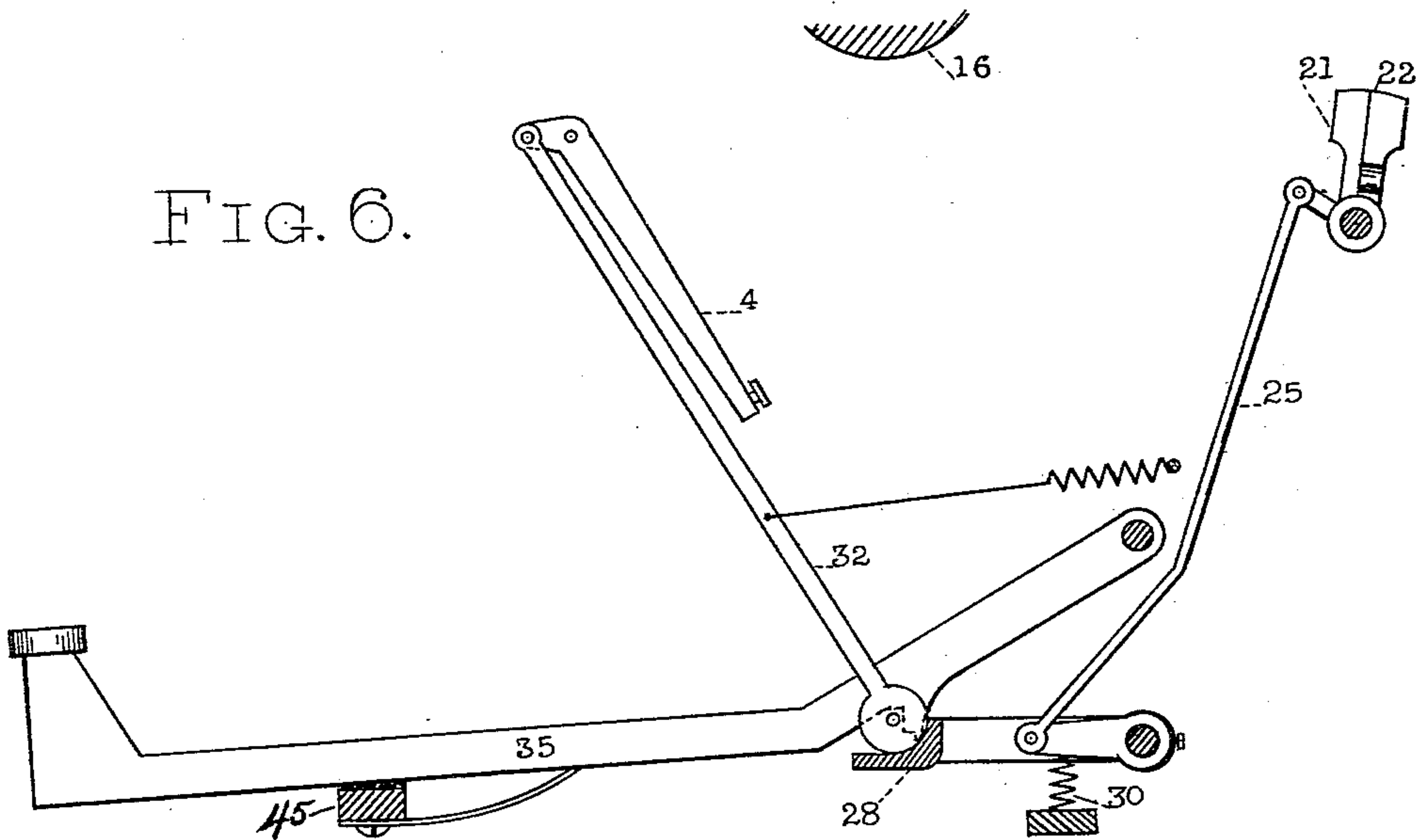


FIG. 6.



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FIG. 7.

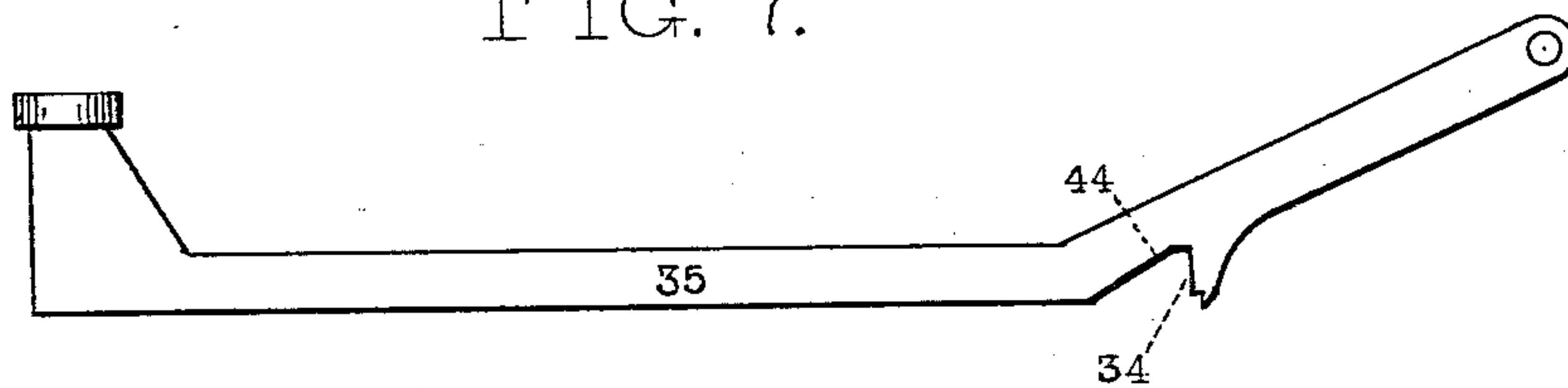


FIG. 8.

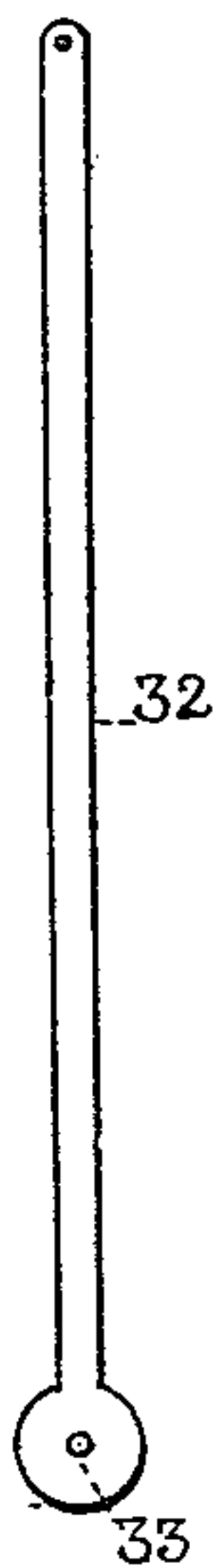
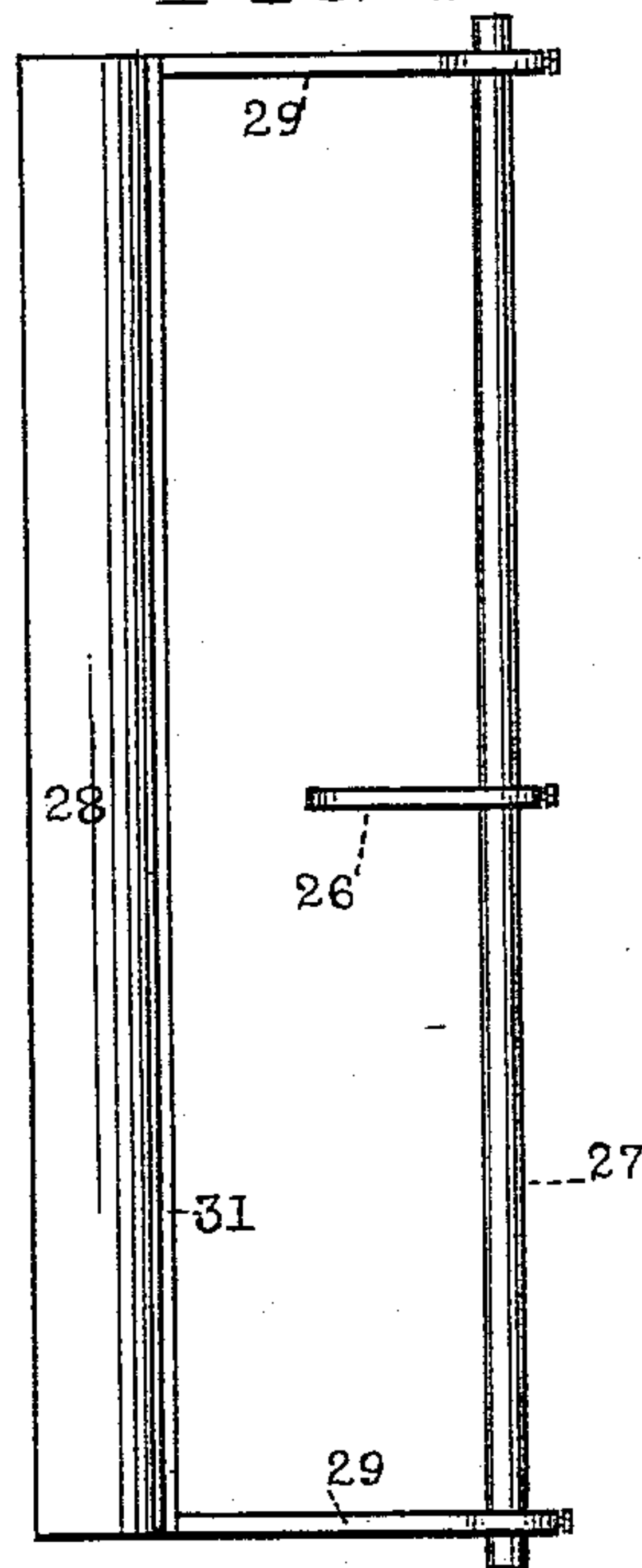


FIG. 9.



FIG. 10.



Witnesses
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UNITED STATES PATENT OFFICE.

BURNHAM C. STICKNEY, OF BROOKLYN, NEW YORK.

TYPE-WRITING MACHINE.

SPECIFICATION forming part of Letters Patent No. 557,711, dated April 7, 1896.

Application filed July 28, 1892. Serial No. 441,464. (No model.)

To all whom it may concern:

Be it known that I, BURNHAM C. STICKNEY, a citizen of the United States, and a resident of Brooklyn, in the county of Kings and State of New York, have invented certain new and useful Improvements in Type-Writing Machines, of which the following is a specification.

My invention relates more particularly to that class of type-writing machines in which there is employed, in connection with the type mechanism, the paper-carriage, and its escapement or feed mechanism, a tripping means or detaching device arranged at some point between the finger-piece or key and the type, by which both the type and feed mechanisms are released after the initial depression of the finger-piece or key, so that both may return to their normal positions independently and in advance of the finger-piece or key, or while the finger-piece or key is depressed or held down, whereby another finger-piece or key may be actuated without waiting for the removal of the finger first employed and the return of the previously-depressed finger-piece or key.

My invention has for its main objects to improve the carriage and type-actions and provide a machine of better touch and greater speed, capable also of accurate letter-spacing and the performance of speedier work; and to these main ends my invention consists in certain combinations of devices and features of construction and arrangement, all as will be hereinafter more fully described, and particularly pointed out in the appended claims.

In the accompanying drawings, Figure 1 is a plan view of a machine embodying my improvements. Fig. 2 is a central vertical section thereof. Fig. 3 is a horizontal section taken at the line *xx* of Fig. 2, omitting springs 41. Fig. 4 is a sectional or diagrammatic view showing in full and dotted lines the construction, arrangement, and the operation of the various parts comprising the type-movement and carriage-escapement. Fig. 5 is a sectional or diagrammatic view showing the type-bar trip as having been effected and the type as on its way to the platen. Fig. 6 is a similar view showing the trip as having been made and the type as having printed and returned to its normal position. This view also shows

the universal bar as having returned to its normal position while the key-lever is held depressed. Fig. 7 is a side elevation of a key-lever detached, constructed like that shown at Fig. 1. Figs. 8 and 9 are respectively side and edge views of the connecting-rod shown at Fig. 1. Fig. 10 is a plan view of the universal bar shown at Fig. 1.

In the various views the same part will be found designated by the same numeral of reference.

1 designates the framework of the machine, 2 the top plate or type-ring, and 3 the paper-carriage. Around the top plate or type-ring are arranged, in substantially the usual manner, the type-bars 4, which are or may be mounted in hangers 5, secured adjustably upon the top plate or type-ring by set-screws 6.

The paper-carriage is composed, preferably, of a front bar 7, a rear bar 8, and side bars 9 and 10. The front bar is preferably provided with a grooved antifriction-roll 11, which rides upon a supporting track or rail 12, mounted upon posts at the front portion of the top plate. The rear bar of the carriage-frame is preferably provided with two grooved wheels or rollers 13, which ride upon a hinge-and-guide rail 14, mounted in end standards or brackets 15 at the rear side of the top plate. Journaled in the side bars of the carriage-frame is a platen 16 and a pressure or feed roller 17, in conjunction with which may be used the ordinary paper-table 18.

Connected to the paper-carriage and pivoted or hinged to the hinge-and-guide rail 14 is a rack-bar frame 19 provided with a vertically-arranged toothed feed-rack 20, with which coöperate two feed-dogs 21 and 22, mounted upon a trunnion or rocker 23, which is suitably supported in the framework. The dog 21 stands in engagement with the rack in the normal condition of the machine. The dog 22 is a loose, pivoted, or flexible dog and is adapted to be vibrated or moved over into engagement with the feed-rack to permit the letter-spacing of the carriage. The dog 21 is thus the detaining-dog and the dog 22 the feeding-dog of the paper-carriage. To an arm 24 projecting forwardly from the trunnion or rocker is pivotally connected the upper end of a rod or link 25, which at its lower end is pivotally connected to an arm 26 se-

cured to the axis or pivot-rod 27 of the universal bar 28, which is connected at its ends to said axis or pivot-rod by side bars 29. Beneath the arm 26 is arranged a spring 30, which is provided to return the universal bar and its connections to their normal positions after actuation. This spring may, however, be arranged at some other locality. The universal bar extends transversely across the machine and is preferably provided with a flange 31.

To the shorter arm of each type-bar is pivotally attached the upper end of a connecting-rod 32, the lower end of which rests above the horizontal portion of the universal bar. The lower end of each connecting-rod is bifurcated and provided with a cross pin or ledge 33, which is engaged by a projection 34 depending from a lever 35, which preferably rests between the forks at the lower end of the connecting-rod and is pivoted at 36 to the framework. At the forward end of each key-lever is preferably provided a stem or finger-piece 37, and beneath each key-lever is preferably arranged a returning-spring 38. Formed integral with the projection 34 is a lug 39.

Referring now particularly to Figs. 1 to 10, inclusive, it will be observed that the lower ends of all of the connecting-rods are circular in shape or disk-like, and that they are all concentrated or arranged to lie in line transversely and rest above the universal bar.

Transversely of the machine and above the key-levers is arranged a cross-rod 40, to which are connected the rear ends of a series of springs 41, the front ends of which are attached each to one of the connecting-rods of the type-bars, the arrangement being such that all of the springs operate to pull all of the lower ends of the connecting-rods rearwardly and against the lugs 39 on the key-levers. Thus by means of the springs and the lugs the connecting-rods are all maintained in proper working relation to the universal bar. As will be seen, the springs 41 are of different lengths, according to the rods to which they are connected, and said springs have only sufficient tension to hold the lower ends of the rods in proper working position.

To the paper-carriage is connected one end of a cord or chain or belt 42, the other end of which is connected to a spring driving-drum 43.

At Fig. 2 the parts are shown in their normal positions, and they are also shown in their normal positions in full lines at Fig. 4. In the last-mentioned figure, when the key-lever is depressed to the dotted-line position shown, the connecting-rod of the type-bar is carried down, by reason of the engagement of the projection 34 with the cross pin or piece 33, to the dotted-line position shown at said figure. During the descent of said connecting-rod the type-bar is gradually elevated and the universal bar gradually depressed until they arrive at the dotted-line position shown

at said figure, when the type-bar, connecting-rod, and universal bar are released from the control of the key-lever.

During the descent of the universal bar the link carried thereby operates to oscillate the trunnion or spacing-rocker and move the detaining-dog forward from engagement with the rack and the spacing-dog forward into engagement with the rack. At this time the type has not quite reached the platen or the paper thereon, but strikes the same immediately thereafter, and consequently immediately after the release or trip of the key-lever and the carriage-escapement. Thus the printing is effected while the spacing-dog is in engagement with the rack and after the carriage has been released to feed a new letter-space. In other words, the construction and arrangement of the carriage-escapement devices are such as to produce what is known as the "reverse feed." This kind of feed is extremely useful in connection with a system or series of keys arranged to actuate and release a system or series of type bars or levers without removing the pressure from the keys. By the combination of the reverse-feed carriage-escapement and the type-bar trip the machine is capable of much easier and more rapid manipulation and will do much more perfect work than one having merely a reverse-feed carriage-escapement or one having merely a key-trip.

In using the old or "natural" feed a strong feed-retracting spring 30 for the dog-holder would be necessary in order to have the carriage start soon enough to complete a letter-space distance before the next type strikes the paper, and such a strong spring 30 would much impair the value of the type-bar trip, because the type-bar when released would be so retracted by the back pressure exerted by this strong feed-spring that it would print very faintly, or perhaps not reach the platen at all, which would thus oblige the operator to use a heavier touch on the keys, thus greatly impairing the benefits of the trip; but in using the reverse feed the carriage is released just before the type strikes the platen, which gives it plenty of time to complete its letter-space distance. Thus a light carriage-spring can be used, and the time such light spring occupies in overcoming the inertia of the carriage is sufficient for the type to complete its movement to the platen before the carriage starts. Thus a quick return of the feed-dogs is not necessary to the prompt feeding of the carriage, and moreover the decreased strength of carriage-spring reduces the strength required of the feed-dog's retracting-spring, which will therefore exert no perceptible retarding influence on the tripped type-bar in its motion toward the platen. At the same time by combining the reversed feed with the trip none of the known disadvantages of the reverse feed—such as blurring of the printing, irregular letter-spacing,

and the necessity of the operator acquiring a smart upstroke of the finger—are experienced.

At Fig. 5 the parts are shown in full lines in the positions in which they are shown in dotted lines at Fig. 4, and from this view it will be clearly seen that the key-lever has just released the connecting-rod and that the type-bar is approaching the platen. At the moment the release is effected the type-bar, as has been said, has not completed its stroke, but does so by inertia immediately after release and just before the inertia of the carriage is overcome and it starts to travel a letter-space distance.

The trip or release, it will be observed, is effected during the downward movement of the key-lever and may be timed or arranged to occur at any desired position of the downward stroke of said key-lever. When the key-lever is depressed, it swings or vibrates about its pivot 36 and the projection 34 is carried rearwardly in an arc of a circle. At the same time the universal bar is swung downwardly and rearwardly in the arc of a circle about the pivot-rod 27 as a center of motion by reason of the pressure thereupon of the lower end of the connecting-rod which is being forced down by the key-lever. As the key-lever and the universal bar move in diverging paths and as the lower end of the connecting-rod is confined between the key-lever and the universal bar, it is forced to follow the path of travel or the arc of vibration of the universal bar, which, as will be observed at Fig. 4, is nearly in a straight vertical line. While the lower end of the connecting-rod is moving in this direction the projection 34 is traveling downwardly and rearwardly and leaves or slips off of the cross-pin or ledge on the connecting-rod, as shown at Figs. 4 and 5. When this occurs, and while the finger is yet upon the key-lever holding it down, the type prints by inertia and at once returns to its normal position by the gravity of the type-bar, assisted by the spring 30. During the descent of the type-bar the connecting-rod is lifted and the universal bar and the feed-dogs are returned to their normal positions under the influence of the spring 30. The cross-pin or ledge 33 in ascending passes up into the notch 44 in front of the projection 34. When the key-lever is released, it is returned to its normal position by its spring 38 and the under side of the projection 34 is carried up into a position above and immediately over the cross-pin again. The projection 34 when ascending forces the connecting-rod 32 slightly forward, expanding the spring 41, and when the key-lever reaches its highest position the spring 41 draws the connecting-rod rearwardly again to its normal position, with the cross-pin or ledge beneath the projection 34.

It will be seen, of course, that after the depression of any key-lever and the printing of its corresponding type any other key-lever

may be depressed and its corresponding type caused to print while the first actuated key-lever is still held down.

In the various views there is a soft pad or cushion 45 to receive the key-lever at the end of its downward stroke.

So far as the broader features of my invention are concerned, I do not wish to be limited to any particular construction or arrangement of trip; nor do I wish to be limited to any particular construction or arrangement of the carriage-feeding mechanism, although I have shown herein only one form. The carriage-feeding mechanism being very old and of great variety, I have not thought it necessary to show more than one form.

It will be further understood that numerous other changes in detail, construction, and arrangement may be made without departing from the gist of my several improvements.

I do not claim herein, *per se*, either the trip, broadly, or the reverse feed, broadly; but I do seek to cover, broadly, the combination of a trip whereby a type-bar is released before printing and before removing the pressure of the finger from its actuating-key, and a feed mechanism for the paper-carriage constructed and arranged to release the paper-carriage before the type strikes the paper. I also seek to cover the same combination in connection with means for releasing the feed mechanism from the finger-key simultaneously with the releasement of the type-bar, or, in other words, before the type-bar completes its printing movement, so that the said mechanism may first travel with the type-bar until the printing occurs independently of the actuating-key and then return to normal position in advance of and independently of the actuating-key. I also seek to cover the feature of detachably connecting the type-bar connecting-rod to the key-lever in a manner such that they may become automatically separated upon the depression of the key-lever. I also seek to cover the feature of having the connecting-rods operate directly the universal bar of the carriage-feed mechanism, and I also seek to cover various other features of construction and arrangements of parts, as hereinbefore shown and described, and now to be more particularly set forth in the claims.

I do not claim, broadly, in this application a construction whereby the type-bar is released from the finger-key when the type is in the vicinity of the platen and just before the printing takes place, because the novel subject-matter relating to this feature is the subject-matter covered by my application filed February 26, 1896, Serial No. 580,845.

What I claim as new, and desire to secure by Letters Patent, is—

1. In a type-writing machine, the combination of a power-driven paper-carriage having a platen, a reverse-feed mechanism therefor, a type-bar mechanism, and a trip, the whole being constructed and arranged so that the carriage is released for letter-spacing previ-

ous to the impact of the type, and so that the type-bar is tripped when near the end of the printing stroke and just before the type touches the paper.

2. In a type-writing machine, the combination of a power-driven paper-carriage having a platen, a reverse-feed mechanism therefor, a type-bar mechanism, and a trip, the whole being constructed and arranged so that the carriage is released for letter-spacing previous to the impact of the type, and the feed mechanism and type-bar mechanism are disconnected from the actuating finger-key during the downward movement of the latter and just before the type strikes the paper on the platen, whereby the type-bar may continue to print by inertia and after leaving its impression return with the feed mechanism to normal position in advance of the actuating finger-key.

3. In a type-writing machine, the combination with a power-driven paper-carriage having a platen, of a type-bar mechanism, a trip which releases the type-bar when the latter is near the end of its printing stroke and just before the type touches the paper, and a carriage-feed mechanism connected thereto and constructed and arranged to release the carriage for letter-spacing at the initial movement of said carriage feed mechanism.

4. In a type-writing machine, the combination of a type-bar, a connecting-rod, and a key-lever having a separable connection with said rod and arranged to automatically release the same and its connected type-bar during the downward stroke of the key-lever and to automatically engage the same on its upward stroke after the type-bar has returned to its normal position.

5. In a type-writing machine, the combination of a power-driven paper-carriage having a platen, a feed mechanism, a type-bar, a connecting-rod, and a key-lever, the said key-lever and connecting-rod having a separable engagement, and the said connecting-rod being arranged and connected to actuate the feed mechanism, and the said feed mechanism being arranged and connected to be tripped or released with the type-bar, so that the feed mechanism and the type-bar may both return to their normal positions independently and in advance of the said key-lever.

6. In a type-writing machine, the combination of a power-driven paper-carriage having a platen, a feed mechanism, a type-bar, a connecting-rod, and a key-lever, the said key-lever and connecting-rod having a separable engagement, and the said connecting-rod being arranged and connected to actuate the feed mechanism so that the latter and the type-bar may return together independently and in advance of the key-lever.

7. In a type-writing machine, the combination of a power-driven paper-carriage having a platen, a feed mechanism, a type-bar, a connecting-rod connected at one end to the type-bar to actuate it, and also connected to the

feed mechanism to actuate it, and a key-lever detachably connected to said connecting-rod.

8. In a type-writing machine, the combination of a power-driven paper-carriage having a platen, a feed mechanism, a type-bar, a connecting-rod connected to said type-bar to actuate it and contacting at its lower end with the universal bar of the feed mechanism, and a key-lever detachably connected to said connecting-rod.

9. In a type-writing machine, the combination of a power-driven paper-carriage having a platen, a feed mechanism, a type-bar, a connecting-rod connected to said type-bar to actuate it and adapted to actuate said feed mechanism and having a cross-pin or ledge, and a key-lever having a projection adapted to engage said cross-pin or ledge, and adapted to be removed therefrom upon the depression of said key-lever.

10. In a type-writing machine, the combination with a power-driven paper-carriage having a platen, a feed mechanism, a type-bar, a connecting-rod adapted to actuate said feed mechanism and having a cross-pin or ledge, a key-lever having a projection adapted to engage said cross-pin or ledge, a lug adjacent to said projection, and a spring for holding the connecting-rod normally against said lug.

11. In a type-writing machine, the combination of a power-driven paper-carriage having a platen, a feed mechanism, a type-bar, a connecting-rod, the lower end of which contacts with the universal bar of the feed mechanism, a cross-pin or ledge on said connecting-rod, a key-lever passing through a slot or fork in said connecting-rod and having a projection to coact with said cross-pin or ledge and also a lug, and a spring for maintaining the said connecting-rod in operative relation to the universal bar and the key-lever.

12. In a type-writing machine, the combination of a power-driven paper-carriage having a platen, a feed mechanism, a universal bar, a type-bar, a connecting-rod, and a key-lever detachably connected to said connecting-rod and pivoted eccentrically of the universal bar, whereby when the key-lever is depressed the lower end of the connecting-rod is caused to follow the path of the universal bar, in order that the eccentrically-pivoted key-lever may part company with the said connecting-rod.

13. In a type-writing machine, the combination of a power-driven paper-carriage having a platen, a feed mechanism, a pivoted, flanged universal bar, a type-bar, a connecting-rod, and a key-lever detachably connected to said connecting-rod and pivoted eccentrically of the universal bar, whereby when the key-lever is depressed the lower end of the connecting-rod is caused to follow the arc of vibration of the universal bar, in order that the eccentrically-pivoted key-lever may part company with the said connecting-rod.

14. In a type-writing machine, the combination of a power-driven paper-carriage having a platen, a feed mechanism including a piv-

oted, flanged universal bar, a connecting-rod having a cross-pin or ledge and a spring, and a key-lever having a projection, a lug, and a notch or cut-away.

5 15. In a type-writing machine, the combination of a platen, a type-bar, a connecting-rod connected at one end to the type-bar and having at its lower end a cross-pin or ledge, a spring, and a key-lever having a projection and a lug.

10 16. In a type-writing machine, the combination of a platen, a type-bar, a connecting-rod connected at one end to the type-bar and having at its lower end a cross-pin or ledge, a spring, and a key-lever having a projection, a lug, and a notch or cut-away.

15 17. In a type-writing machine, the combination of a power-driven paper-carriage having a platen and a feed-rack, a detaining-dog and a feeding-dog, the former being normally in engagement with the rack, a rocker or trunnion, a link, a pivoted spring-actuated universal bar, a type-bar, a connecting-rod connected at its upper end to the type-bar to actuate it and contacting at its lower end with said universal bar, a key-lever, and a trip for releasing the type-bar and the carriage and permitting the return of the type-bar and universal bar and their connections independently and in advance of the finger-key.

20 18. In a type-writing machine, the combination of a power-driven paper-carriage having a platen, a feed-rack, a detaining-dog and a spacing-dog, the former being in normal engagement with the said rack, a trunnion or rocker, a link, a pivoted spring-actuated flanged universal bar, a type-bar, a connecting-rod adapted to actuate said universal bar and having a cross-pin or ledge, a key-lever having a projection, a lug, and a notch or cut-away, and a spring for holding said cross-pin or ledge normally in contact with said lug.

25 19. In a type-writing machine, the combination of a paper-carriage, having a platen, a feed mechanism therefor, including a transversely-arranged universal bar, a series of type-bars adapted to strike at a common center, and a series of connecting-rods connected at their upper ends to said type-bars to actuate the same and inclined inwardly so that their lower ends terminate in line transversely and coincident with the said universal bar so as to actuate the same.

30 20. In a type-writing machine, the combination of a paper-carriage, a feed mechanism therefor, a transversely-arranged universal bar, a series of type-bars adapted to strike at a common center, a series of connecting-rods connected at their upper ends to said type-bars to actuate the same and inclined inwardly so that their lower ends terminate in line transversely and coincident with said universal bar so as to actuate the same, and a series of key-levers connected to said connecting-rods.

35 21. In a type-writing machine, the combination of a paper-carriage, a feed mechanism

therefor, a transversely-arranged universal bar, a series of type-bars adapted to strike at a common center, a series of connecting-rods connected at their upper ends to said type-bars to actuate the same and inclined inwardly so that their lower ends terminate in line transversely and coincident with said universal bar so as to actuate the same, a series of key-levers, and a series of trips located between the finger-keys and the type-bars.

22. In a type-writing machine, the combination of a paper-carriage, a feed mechanism including a transverse universal bar, a series of type-bars, a series of inclined connecting-rods connected at their upper ends to said type-bars to actuate the same and arranged in line at their lower ends to contact with said universal bar, and a series of key-levers detachably connected to said connecting-rods at their lower ends.

23. In a type-writing machine, the combination of a paper-carriage, a feed mechanism including a transverse universal bar, a series of type-bars, a series of inclined connecting-rods arranged in line at their lower ends to contact with said universal bar, a series of key-levers detachably connected to said connecting-rods, and a series of springs for maintaining the lower ends of said connecting-rods in operative relation to the key-levers and the universal bar.

24. In a type-writing machine, the combination of a paper-carriage, a feed mechanism including a transverse universal bar, a series of type-bars, a series of inclined connecting-rods terminating in line at their lower ends and provided each with a cross-pin or ledge, a series of key-levers provided each with a projection, a lug and a notch or cut-away, and a series of springs for pulling the lower ends of said connecting-rods against the said lugs on the key-levers.

25. In a type-writing machine, the combination of a paper-carriage, a type-bar, a connecting-rod, and a key-lever detachably connected to said connecting-rod at a point between its pivot and finger-key and in a manner such that when the key-lever is depressed the type-bar and the connecting-rod are released from the key-lever before the type strikes, whereby the type may continue to the paper by inertia, and after printing return with its connecting-rod to normal position before the releasement of the downward pressure upon the key-lever.

26. In a type-writing machine, the combination with a paper-carriage and its feeding mechanism and the type-bar of means for moving the latter toward the platen and for actuating the feeding mechanism and releasing the type-bar and the feeding mechanism from the finger-key before releasing the key, said releasing means consisting essentially of a driving member and a driven member, one connected to the type-bar and to the feeding mechanism, and the other connected to the finger-key, the driving and driven members

moving together on the downstroke of the key, and the driving member forcing the driven member out of its way, until by continued movement or pressure of the driving member they finally part company.

27. In a type-writing machine, the combination of a type-bar, a lever, a pivotally-mounted trip extending from one to the other, and a spring attached at one end to the connecting-rod and at its other end to a fixed portion of the machine for forcing the trip to reconnect the lever with the type-bar after the tripping action and after the finger-key has been relieved from pressure.

28. In a type-writing machine, the combination of a type-bar, a key-lever, and a tripping connecting-rod extending from one to the other, and a universal bar contacting with said tripping connecting-rod and adapted to be actuated thereby and released therewith.

29. The combination of a paper-carriage, a carriage-feeding mechanism including a universal bar, a type-bar, and a key-actuated lever separably connected to both the type-bar and the universal bar.

30. In a type-writing machine, a power-driven paper-carriage having a platen, a spacing mechanism comprising a rack and a dog and normally holding said carriage against advance movement, and a finger-key con-

nected to said spacing mechanism and during its printing stroke actuating said spacing mechanism to release the carriage for its letter-spacing movement, said finger-key being also arranged to impel a type-bar and cause it to impress a type upon the paper or platen after said releasement of the carriage; in combination with a stop for said key and a trip arranged between said key and said type-bar in such a manner that the type-bar is positively driven by the key until the type has almost reached the platen, whereupon the said trip operates to disconnect the key and the type-bar, so that the type-bar completes its stroke by inertia and strikes the paper after said disconnection, and so that by reason of said disconnecting action of the trip the involuntary pressure exerted by the operator at the end of the finger stroke is shifted away from the type-bar and onto the stop and rendered ineffectual to maintain the type in contact with the moving platen.

Signed at New York city, in the county of New York and State of New York, this 22d day of July, A. D. 1892.

BURNHAM C. STICKNEY.

Witnesses:

IDA C. MACDONALD,
JACOB FELBEL.