

J. J. COOPER.
TYPE WRITING MACHINE.
APPLICATION FILED FEB. 1, 1908.

929,834.

Patented Aug. 3, 1909.

2 SHEETS—SHEET 1.

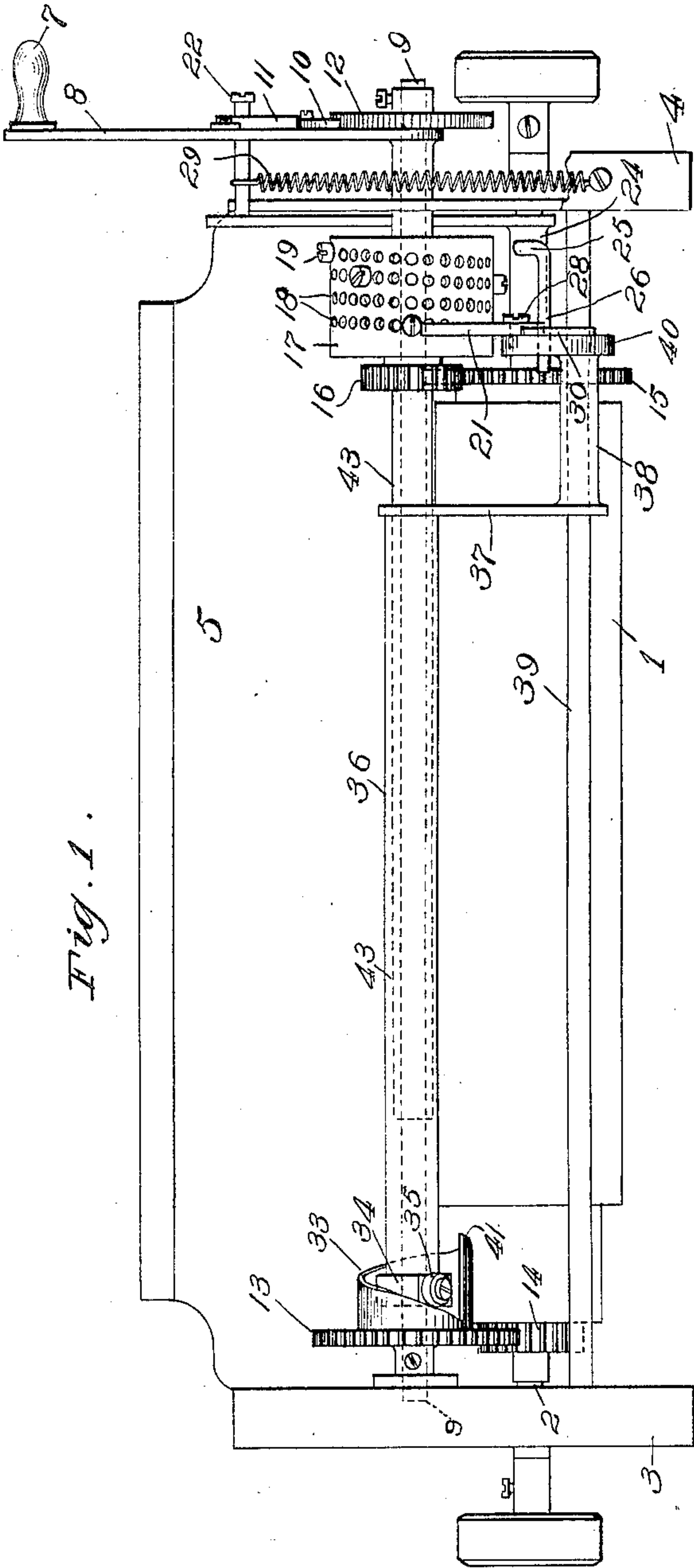


Fig. 1.

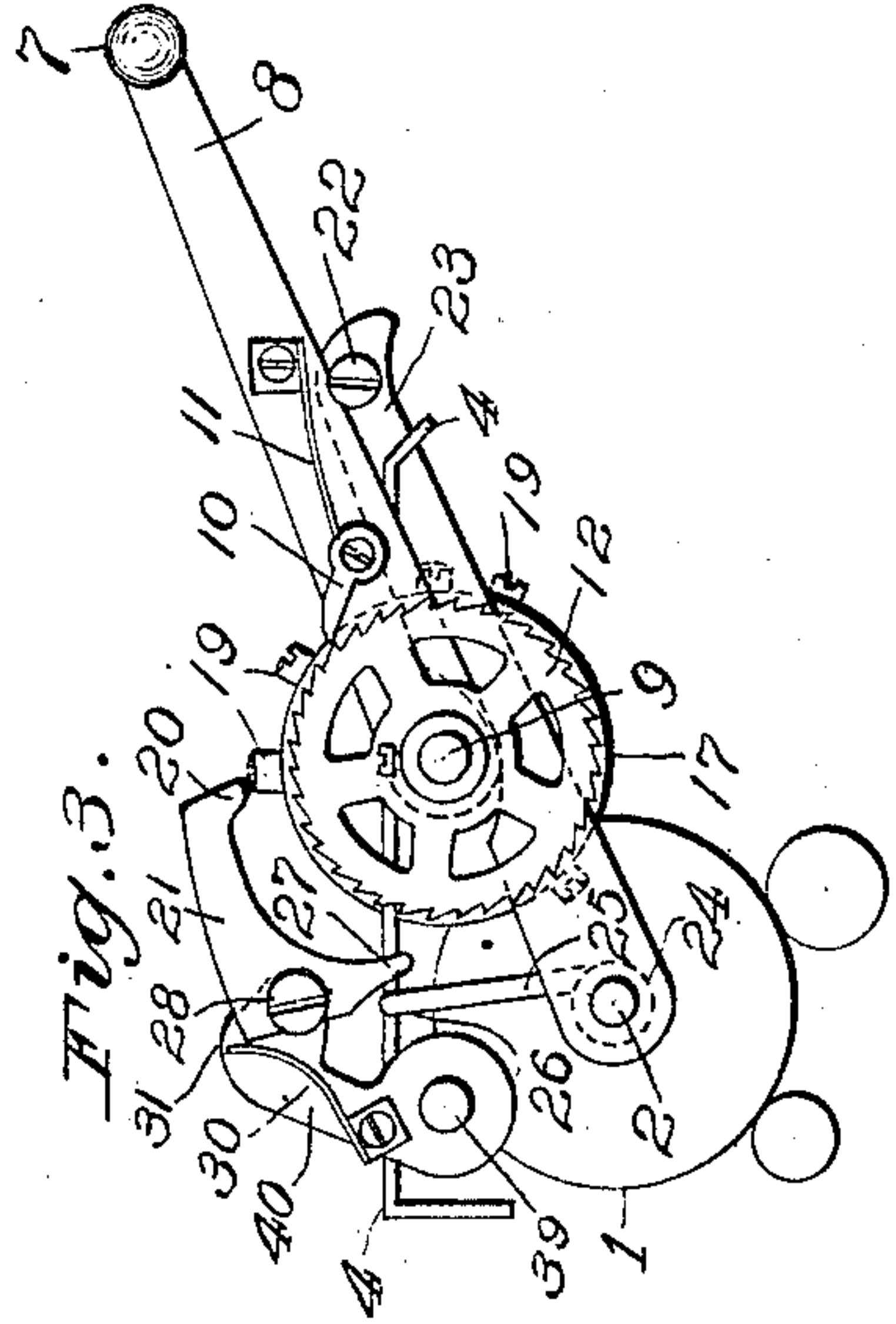


Fig. 3.

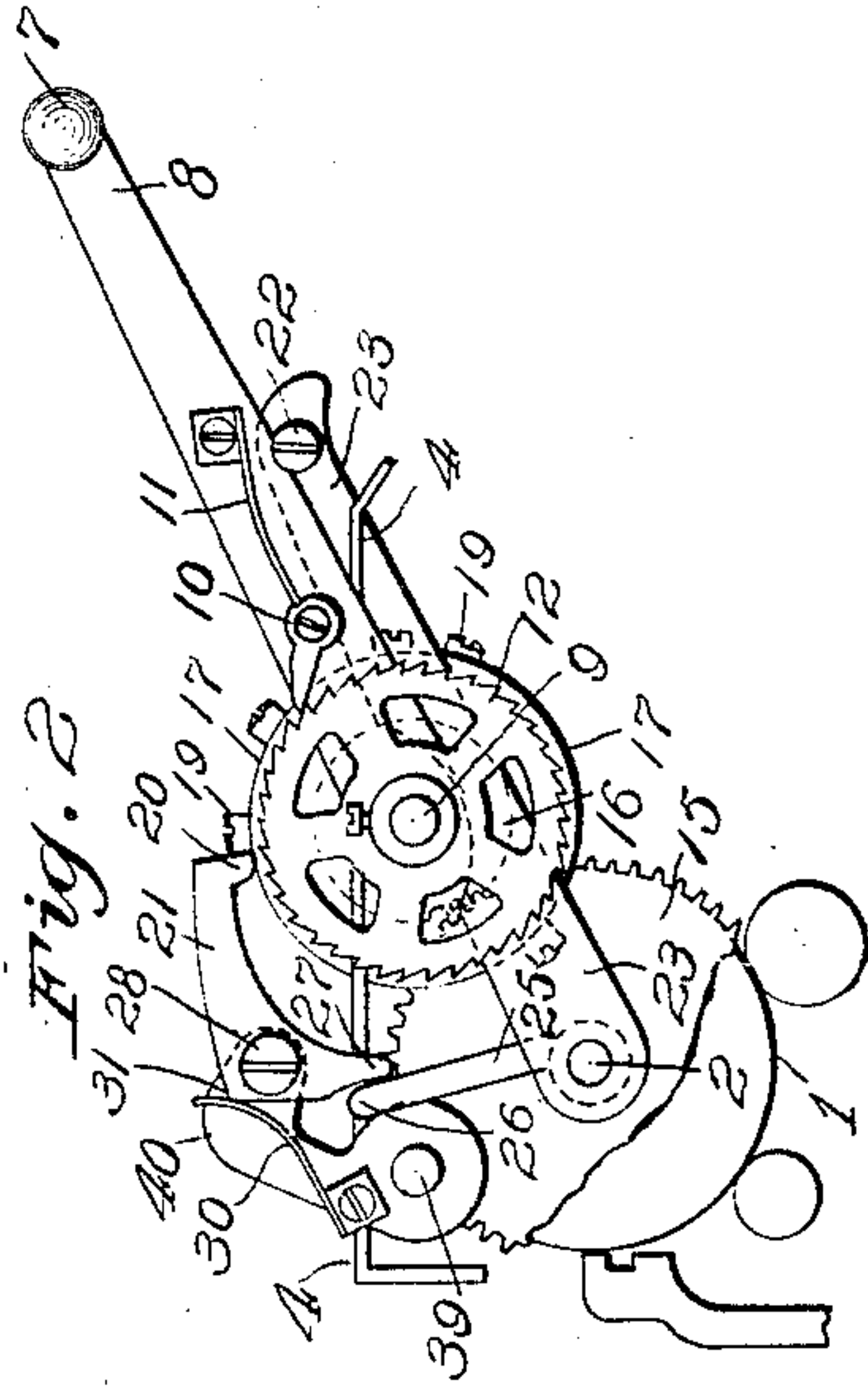


Fig. 2.

Witnesses:
John C. Seifert.
K. Frankfort

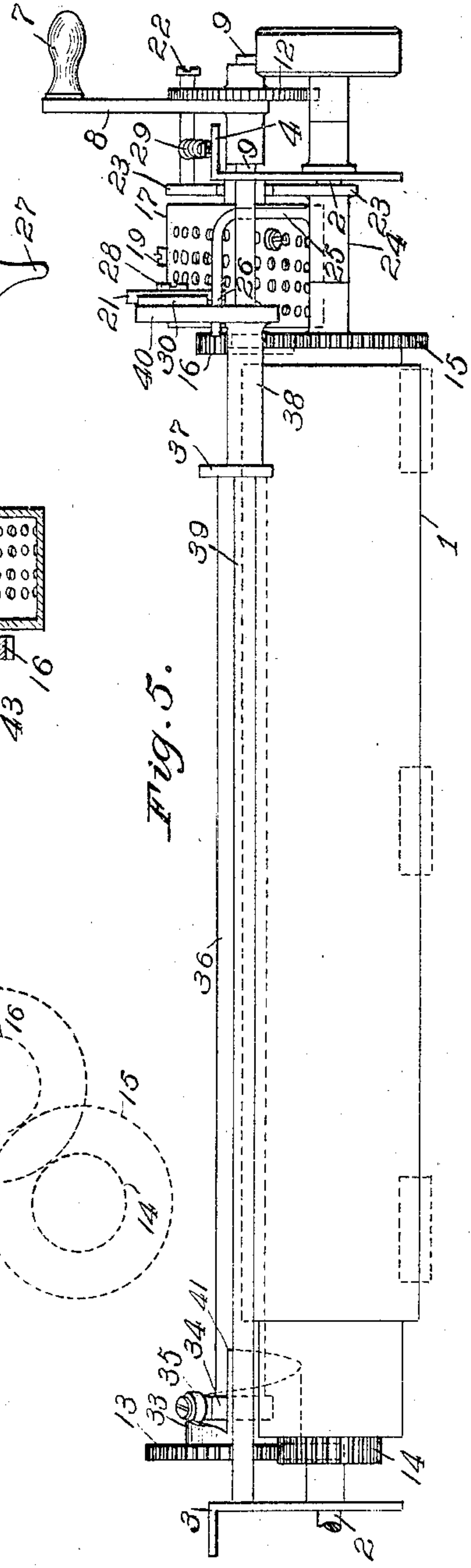
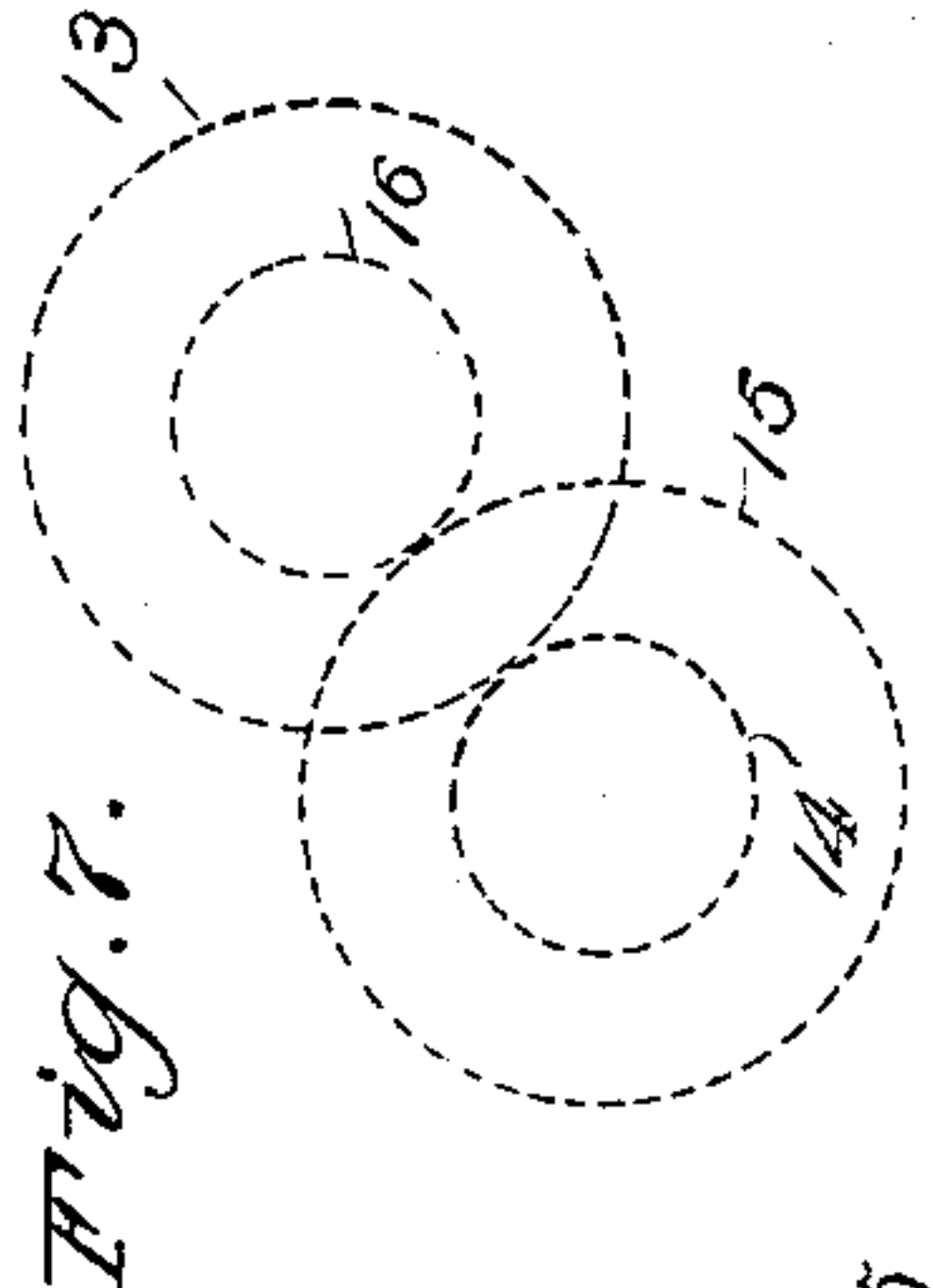
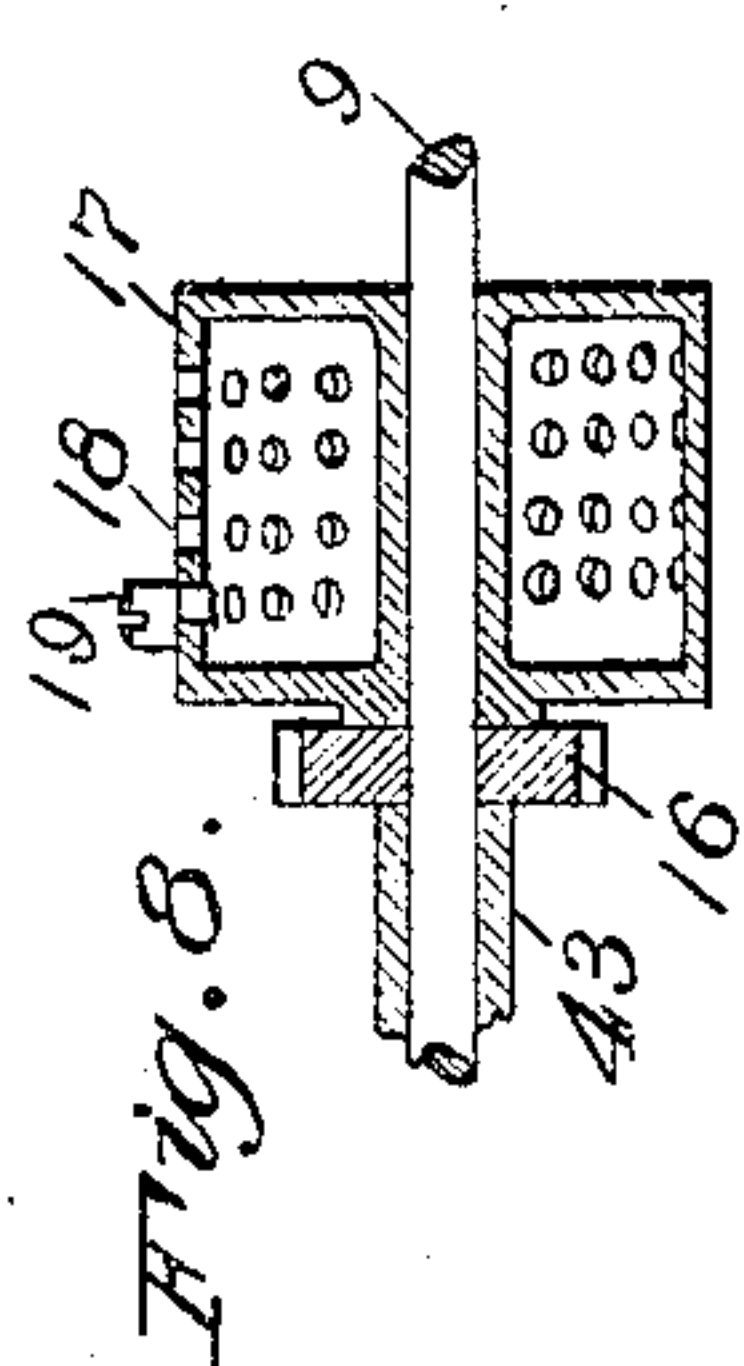
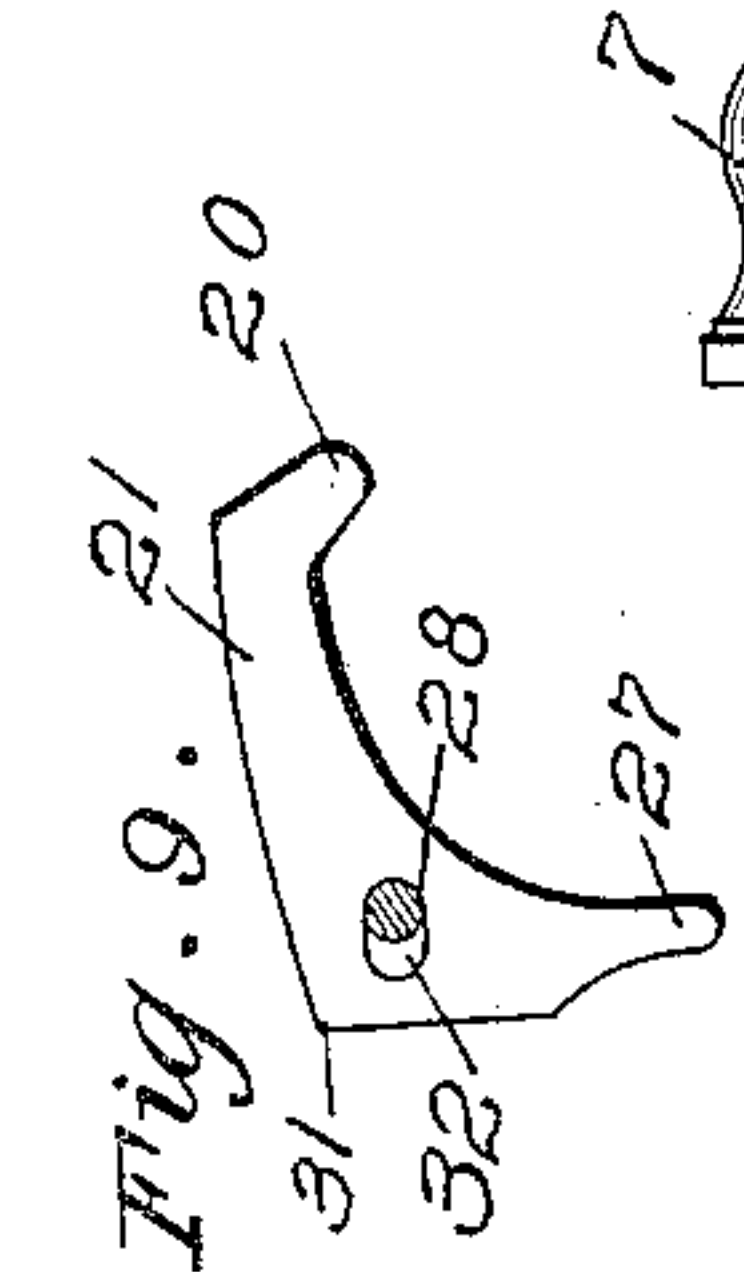
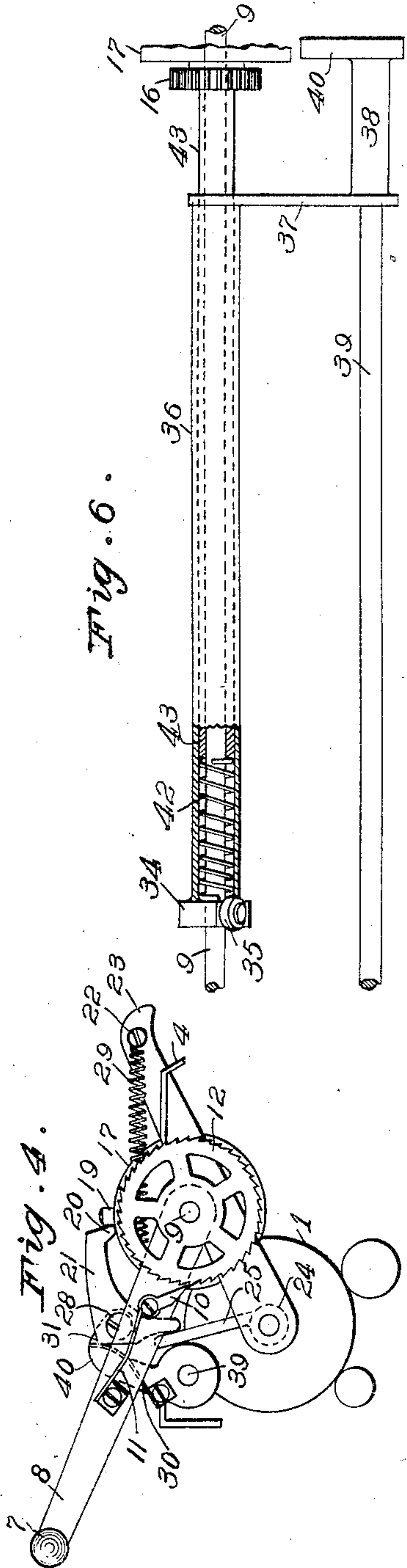
Inventor: J. J. Cooper
By R. B. Stickney
Attorneys.

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2 SHEETS—SHEET 2.



Witnesses:
John C. Seifert
K. Frankfort.

Inventor:
John J. Cooper
By
Blanchard
Attorney

UNITED STATES PATENT OFFICE.

JOHN JOSEPH COOPER, OF LONDON, ENGLAND, ASSIGNOR TO UNDERWOOD TYPEWRITER COMPANY, OF NEW YORK, N. Y., A CORPORATION OF NEW JERSEY.

TYPE-WRITING MACHINE.

No. 929,834.

Specification of Letters Patent.

Patented Aug. 3, 1909.

Application filed February 1, 1908. Serial No. 413,730.

To all whom it may concern:

Be it known that I, JOHN JOSEPH COOPER, a subject of the King of Great Britain, residing in the city of London, England, have
5 invented certain new and useful Improvements in Type-Writing Machines, of which the following is a specification.

This invention relates to the paper feeding devices or revoluble platens of type-
10 writing machines, and particularly to the means whereby the paper is fed or moved in line-spacing direction.

The invention more particularly deals with machines used for filling in forms or
15 printed blanks, and its principal object is to facilitate writing upon such blanks.

It has been the custom for the operator to insert a blank in the machine, and adjust the same, so that the first line of writing
20 may fall upon the first blank space. Such adjustment is accomplished either by rotating the platen, or by casting off the pressure rolls and adjusting the paper independently around the platen, or by casting off the usual
25 line-space wheel; but in any case, it is necessary for the operator to use the eye in bringing the first ruled or blank line to the printing point. After writing said line, it is often necessary to advance the paper much
30 more than is customary for ordinary line spacing, in order to bring the sheet to position to fill in the next blank, and so on down the page, it being necessary for the operator always to stop and effect the final adjust-
35 ment of each line by the eye, which is a time-consuming operation and a great objection where large numbers of similar blanks are to be filled in.

The main object of my invention, there-
40 fore, is to enable a less laborious method to be used for advancing the sheet from one blank line to another and to provide for simple and quick adjustment of the machine to different kinds of blanks.

In carrying out my invention, I provide
45 for the rotation of the platen with ease and certainty step by step to any predetermined extent, regular or irregular, to accord with the printed forms used. I combine with the
50 usual revoluble platen means for mechanically arresting its rotation at a succession of predetermined intervals of greater or less length as may be desired, suitable means being provided for enabling the device to be

used with various kinds of blanks or forms. 50
I connect to the platen a succession of stops, and arrange a detent to cooperate with the same *seriatim*, whereby, after the leading edge of the sheet or blank is inserted in the
usual manner between the platen and the 60 pressure roll, the platen may be rotated until arrested by the first of said stops, thereby advancing the sheet to the exact position to receive the first line of writing, without the
necessity of adjusting said sheet by the eye. 65 Then the line is written and the platen again advanced until arrested by the next stop, and the second blank is filled in, and so on until the entire sheet is written. Fre-
quently the length of the blank is greater 70 than the circumference of the platen, and I therefore provide for mechanically arresting the platen at a succession of predetermined regular and irregular intervals, as the case
may be, throughout a cycle consisting of a 75 plurality of revolutions of the platen. This is done by arranging the stops in a helix or spiral, and arranging for the detent after completing the helix, to go back to the be-
ginning thereof at the completion of writing 80 the sheet, so as to be in proper position at the beginning of the next sheet. The stops are preferably in the form of pegs or screws independently insertible in any of a helical
series of holes formed upon the periphery of 85 a barrel, the latter being connected to the platen by gearing, which causes the barrel to rotate faster than the platen. The platen is preferably operated by means of a lever or
crank, which by means of a pawl turns a 90 ratchet wheel; the latter being connected by movement-multiplying gearing to the platen, so that a single swing of the lever may effect
a substantial turning movement of the 95 platen. Means are provided to release the detent after each arrest of the platen. Each stop is preferably individually adjustable to effect fine variations in the positioning of
the platen, to enable the writing to fall ac- 100 curately upon the desired line upon the sheet. In order that the detent may follow the heli-
cal series of holes, which may be regarded as a helical rack, said detent is caused to
move lengthwise of the barrel—that is, to 105 traverse the helix at a rate corresponding to the pitch of the helical convolutions. For
this purpose, the detent is mounted to slide on a guide which is parallel to the axis of

the stop barrel, and is connected to a suitable cam. A spring returns the slide and detent after the writing of each sheet.

In the accompanying drawings, Figure 1 is a plan illustrating my improvements applied to the platen of the well known "Underwood" typewriting machine. Fig. 2 is an end elevation of parts seen at Fig. 1. Fig. 3 is an end elevation showing the manner of releasing the platen arresting detent. Fig. 4 shows the platen and sheet as having been advanced, and the platen arrested by the detent and a stop. Fig. 5 is a front elevation. Fig. 6 illustrates the detent-carrying slide and its returning spring. Fig. 7 is a diagram illustrating the movement-multiplying gearing. Fig. 8 is a sectional view of a stop barrel. Fig. 9 is an elevation of a platen-arresting detent.

A platen 1 is mounted by means of an axle 2 in a platen frame comprising ends 3, 4 and a paper shelf 5. The operator pulls forwardly a handle 7 provided upon a crank 8, which is loosely journaled on a shaft 9, the latter extending along the platen and being journaled in the platen frame ends. A pawl 10 pivoted upon said crank or lever 8 is pressed by a spring 11 into engagement with the teeth of a ratchet wheel 12 fixed upon said shaft 9, whereby the crank is enabled to rotate the shaft. A gear 13 fixed upon the other end of the shaft meshes with a pinion 14 fixed upon the platen axle 2, whereby the platen is given preferably two revolutions to a single revolution of the ratchet wheel 12. Also fixed upon the platen axle 2 at the same end of the platen as the crank 8 is a gear 15, meshing with a pinion 16, which is fixed to a barrel 17, both pinion and barrel mounted loosely upon the shaft 9, so as to turn independently thereof. A helical series of holes or perforations 18 extends around the barrel 17, and as many stop pins 19 as may be necessary are inserted in the proper holes to correspond with the blank line on the sheet to be written. Owing to the movement-multiplying gearing 15, 16, the periphery of the barrel 17 travels about twice as fast as that of the platen, and the holes 18 are sufficiently close together, so that the adjustment of the stop pins may correspond approximately with the blanks on almost any kind of a blank form. The stops preferably consist of the heads of screws which are threaded into the holes 18. When the handle 7 is pulled forward as aforesaid, the platen and stop barrel or rack are advanced until the first stop 19 is engaged by the nose 20 of a pawl 21, whereby the barrel and platen are arrested, as at Figs. 2 and 4, in position for the insertion of a sheet of paper into the machine. The leading edge of the sheet is introduced between the platen and the rear pressure roll without releasing the latter. The crank 8

is swung back (releasing the detent 21 in a manner presently to be explained), and is then swung forwardly to advance the platen until the second stop 19 is arrested by the detent, when it will be found that the sheet is in position to receive the first line of writing. If finer adjustment is required, so as to cause the writing to fall with greater accuracy upon the desired line upon the blank, the heads of the screws or stop pins may be made eccentric as shown in the drawings, so that by turning them, the desired fine adjustment may be secured, each screw being adjustable in this manner independently of the others. In advancing the sheet to the first line of writing, the crank may be swung forwardly, as at Fig. 4. Thereafter the crank may be swung backwardly to the Fig. 3 position and pressed down, engaging and pressing down a pin or screw 22, thereby pressing down an arm or lever 23 from which said pin projects. Said arm is provided with a hub 24 whereby it is loosely mounted upon the platen axle 2 between the end of the platen frame and the gear 15. This arm performs the function of releasing the detent 21, an arm 25 extending up from said hub being bent inwardly to form a bar 26 which swings it backwardly to engage a pendent finger 27 formed on the pawl 21, thereby turning said pawl about its pivot 28 to lift the nose 20 above the stop 19, Fig. 3. A spring 29, Fig. 1, engages the arm 22 to return the same after releasing said detent. A spring 30 presses against a shoulder 31 formed on the detent near its pivot and tends constantly to throw down the nose 20 of the pawl. The latter has a horizontal slot 32, whereby it engages its pin 28, the purpose of the slot being to permit the spring 30 to throw the detent bodily back, Fig. 3, to cause the nose 20 to ride over the top of the pin 19, whereby the detent is mechanically held in a released position ready for the next forward stroke of the crank 8.

To enable the detent to move automatically from left to right to traverse the helix as the barrel 17 revolves, so that the detent may engage all of the stops 19 in succession, I provide upon the gear 13 a snail cam 33 to revolve therewith, whereby an arm 34 is caused to travel from left to right during the revolution of the gear, said arm having an anti-friction roll 35 to run upon said cam, the latter extending almost entirely around the gear shaft 9 and turning at about one quarter the angular speed of the stop barrel or rack 17, the helical series of holes 18 accordingly extending four times around said barrel. The left to right movement of the arm 34 is communicated through a sleeve 36 (sliding upon the shaft 9) and a bar 37 to a sleeve 38 sliding upon a rod 39 and having an arm 40 in which the pivot screw 28 is se-

cured. The throw of the cam is equal to the distance between the first and last stop holes on the barrel 17 considered lengthwise of the barrel, so that the detent 21 upon the arm 40 is caused to traverse the helical series of holes at a speed corresponding to the pitch of the helix, and hence to engage *seriatim* all of the stops 19 wherever disposed upon said helix. The releasing bar 26, it will be seen, extends transversely of the helix or longitudinally of the barrel 17 for a sufficient length to be enabled to engage the detent-finger 27 at all points in the travel of the detent. The guide rod 39 extends parallel with the platen and is fixed in the ends of the platen frame. At the completion of the writing of the sheet, the roll 35 trips or runs off the apex 41 of the cam 33. The spring 42 returns the arm, the frame 36, 37, 38, 40 and the detent 21 to normal positions, whereupon the handle 7 is pulled forward until the detent engages the first stop 19, whereupon a second sheet is inserted between the platen 1 and the pressure roll, and the operation is repeated line by line. The spring 42 is compressed between the hub of the arm 34 (which fits loosely upon the shaft 9) and a short tube 43 placed upon the shaft 9 and abutting against the pinion 16. The tube 36 fits loosely upon said tube 43 to permit sliding of the former.

Variations may be resorted to within the scope of the invention, which may be used in connection with other forms of paper feeding devices or typewriting machines; and portions of my improvements may be used without others.

Having thus described my invention, I claim:

1. In a typewriting machine, the combination with a platen revoluble for line-spacing, of means, including a series of stops, for mechanically arresting its line-by-line rotation at a succession of predetermined irregular intervals, and a rack along which said stops are adjustable.

2. In a typewriting machine, the combination with a platen revoluble for line-spacing, of means for mechanically arresting its rotation line-by-line at a succession of predetermined irregular intervals throughout a cycle consisting of a plurality of revolutions of the platen, and a reciprocatory driver provided with means to turn the platen at one stroke through any of said intervals.

3. In a typewriting machine, the combination with a platen, of a line-spacing mechanism including a driver connected to the platen to move the same in line-space direction, movement-multiplying gearing being provided between the finger piece and the platen, and a succession of stops effective *seriatim* to determine the extent of successive line-spacing movements of the platen.

4. In a typewriting machine, the combina-

tion with a revoluble platen, of a line-by-line spacing mechanism including a finger piece connected to the platen to rotate the same, a succession of stops arranged in a helix or spiral, and means to enable said stops to arrest the platen *seriatim* at successive line-by-line movements thereof.

5. In a typewriting machine, the combination with a revoluble platen, of a line-by-line spacing mechanism including a finger piece connected to the platen to rotate the same, movement-multiplying gearing between the finger piece and the platen, a succession of stops arranged in a helix or spiral, and means to enable said stops to arrest the platen *seriatim* at successive line-by-line movements thereof.

6. In a typewriting machine, the combination with a platen, of a line-by-line spacing mechanism including a finger-piece connected to the platen to move the same in line-space direction, and a succession of stops effective *seriatim* to arrest the finger-piece and platen; releasable means being connected to said finger-piece to enable each stop to be passed after it has arrested the line-spacing mechanism.

7. In a typewriting machine, the combination with a platen, of a line-by-line spacing mechanism including a finger piece connected to the platen to move the same in line space direction, a succession of stops, a releasable member to engage said stops *seriatim* to arrest the platen at predetermined intervals in its movements in line-spacing direction, and means to enable said finger-piece at each stroke thereof to turn the platen until arrested by the nearest of said stops.

8. In a typewriting machine, the combination with a revoluble platen, of a line-spacing mechanism including a succession of stops arranged in a helix or spiral, a releasable stop-engaging member, and means to cause said member to engage the stops *seriatim* to arrest the platen at its consecutive line-by-line spacing movements.

9. In a typewriting machine, the combination with a revoluble platen, of a line spacing mechanism including a finger-piece for rotating the platen, movement multiplying gearing between the finger piece and the platen, a succession of stops arranged in a helix or spiral, a releasable stop-engaging member, and means to cause said member to engage the stops *seriatim* to arrest the platen at predetermined intervals in its movements in line-spacing direction.

10. The combination with a platen revoluble for line-spacing, of a revoluble succession of stops arranged in a helix or spiral, movement-multiplying gearing between the platen and the stops, and means to cooperate with said stops to arrest the platen.

11. The combination with a platen revo-

- luble for line-spacing, of a finger piece for rotating the platen, movement-multiplying gearing between the finger piece and the platen, a revoluble succession of stops arranged in a helix or spiral, movement-multiplying gearing between the platen and the stops, and means to cooperate with said stops to arrest the platen.
12. In a typewriting machine, the combination with a revoluble platen, of a line-spacing mechanism including a ratchet wheel, a lever and pawl to operate the same, movement-multiplying gearing between the ratchet wheel and the platen, and a succession of stops.
13. In a typewriting machine, the combination with a revoluble platen, of a line-spacing mechanism including a ratchet wheel, a lever and pawl to operate the same, movement-multiplying gearing between the ratchet wheel and the platen, a succession of stops arranged in a helix or spiral, and means to cooperate with said stops *seriatim* to arrest the platen.
14. In a typewriting machine, the combination with a revoluble platen, of a line-spacing mechanism including a ratchet wheel, a lever and pawl to operate the same, movement-multiplying gearing between the ratchet wheel and the platen, a succession of stops arranged in a helix or spiral, movement-multiplying gearing between the platen and the stops, and means to cooperate with said stops *seriatim* to arrest the platen.
15. In a typewriting machine, the combination with a platen, of a succession of devices independently adjustable in line-spacing direction, a rack along which said devices are adjustable, and means cooperative with said adjustable devices to determine the successive arresting points of the platen movement at consecutive line-spacing operations.
16. In a typewriting machine, the combination with a platen revolving for line-spacing, of a rack connected thereto to revolve therewith and extending in a general circular direction, a succession of devices independently adjustable upon said rack, and means to cooperate with said adjustable devices to determine successive arresting points of the platen in its rotation.
17. In a typewriting machine, the combination with a platen revolving for line spacing, of a helical or spiral rack connected to the platen to revolve therewith, a series of stop members independently adjustable along said rack, and means to cooperate with said stop members to determine successive arresting points of the platen in its revolution.
18. In a typewriting machine, the combination with a platen, of a cylinder connected thereto and provided with a spiral series of perforations, stops constructed to fit in any of said perforations, and means to cooperate with said stops to determine mechanically the line spacing movements of the platen.
19. In a typewriting machine, the combination with a revoluble platen and sheet feeding means cooperating therewith, of means to arrest the platen at the proper point for the sheet to be introduced between the platen and the sheet feeding means, and a succession of platen-arresting devices connected to the platen to determine the movement of the sheet to the first and succeeding writing positions thereof.
20. The combination with a platen, of a succession of stops to determine the line-spacing movements of the platen, a finger-piece to operate the platen, a member to cooperate with said stops to arrest the platen at consecutive line-spacing movements thereof, and means for enabling said finger-piece to release said cooperating member after the arrest of the platen.
21. In a typewriting machine, the combination with a platen, of a ratchet wheel connected thereto, a lever, a pawl to operate the ratchet wheel, a succession of stops, a member to engage said stops in succession to arrest the platen at consecutive line-spacing movements thereof, and means operable by said lever to release said stop-engaging member.
22. In a typewriting machine, the combination with a platen, of a ratchet wheel connected thereto, a lever, a pawl to operate the ratchet wheel, a succession of stops, a member to engage said stops in succession to arrest the platen at consecutive line-spacing movements thereof, and means operable by said lever at the completion of the return stroke thereof to release said stop-engaging member.
23. In a typewriting machine, the combination with a revoluble platen, of a line-by-line spacing mechanism therefor, including a reciprocatory driver, a succession of independently adjustable stops, and means to enable said driver at each stroke to turn the platen until arrested by the nearest of said stops.
24. In a typewriting machine, the combination with a revoluble platen, of a rotary member connected thereto and provided with a series of holes extending in a general circular direction, and a succession of stops insertible into said holes to be held thereby in position to correspond with the blanks on the page to be written; a detent being mounted to engage the stops in succession to arrest the platen.
25. In a typewriting machine, the combination with a revoluble platen, of a rotary member connected thereto and provided with a series of holes extending in a general circular direction, and a succession of stops

insertible into said holes to be held thereby in positions to correspond with the blanks on the page to be written; means being provided to release the detent after each arrest

5 of the platen.

26. In a typewriting machine, the combination with a revoluble platen, of a rotary member connected to the platen and provided with a helical or spiral winding series of

10 holes, stops independently insertible in said holes to be retained thereby, and a detent being mounted to engage the stops in succession to arrest the platen.

27. In a typewriting machine, the combination with a revoluble platen, of a rotary member connected thereto and provided with a series of holes extending in a general circular direction, and a succession of stops insertible into said holes to be held thereby

20 in positions to correspond with the blanks on the page to be written; a detent being mounted to engage the stops in succession to arrest the platen; each of said stops being in the form of a pin projecting from its

25 hole or seat and having an eccentric head or flange, so that by rotating the stop in its seat a fine adjustment is obtained for the purpose of arresting the platen and the sheet thereon in exact position to receive the next

30 line of writing.

28. In a typewriting machine, the combination with a revoluble platen, of a rack connected thereto and having means to hold a succession of stops, means to cooperate

35 with the stops to arrest the line-spacing movements of the platen, and means being provided for effecting fine individual adjustments of the stops.

29. In a typewriting machine, the combination with a revoluble platen, of a line-spacing mechanism including a succession of stops arranged in a helix or spiral, a releasable stop-engaging member, means to

40 cause said member to engage the stops *seriatim* to arrest the platen at predetermined intervals in its movements in line-spacing direction, and means for causing the stop-engaging member after cooperating with all of said stops to begin again with the

50 first stop in the series.

30. In a typewriting machine, the combination with a revoluble platen, of a line-spacing mechanism including a succession of stops arranged in a helix, a detent to engage said stops, and means to give the detent a lateral movement to correspond with the pitch of the helix.

31. In a typewriting machine, the combination with a revoluble platen, of a line-spacing mechanism including a succession of stops arranged in a helix, a detent to engage said stops, means to give the detent a lateral movement to correspond with the pitch of the helix, and means to return the

detent to normal position after moving the 65 width of the helix.

32. In a typewriting machine, the combination with a revoluble platen, of a succession of stops arranged in a helix and connected to the platen, a detent, means connected to the platen to move the detent laterally to correspond with the pitch of the helix, and means to cause the detent to return to normal position after moving the

70 width of the helix.

33. In a typewriting machine, the combination with a revoluble platen, of a succession of stops arranged in a helix and connected to the platen, a revoluble cam also connected to the platen, a detent mounted to engage the stops in succession, and means engaging said cam to move said detent laterally to correspond to the pitch of the helix.

34. In a typewriting machine, the combination with a revoluble platen, of a succession of stops arranged in a helix and connected to the platen, a revoluble cam also connected to the platen, a detent mounted to engage the stops in succession, and means engaging said cam to move said detent laterally to correspond to the pitch of the helix; a spring being provided to return the detent to normal position after reversing said helix.

35. In a typewriting machine, the combination with a revoluble platen, of a helical series of stops connected thereto, a slide mounted on a guide extending along the platen, a cam connected to the platen to operate said slide, and a detent upon said slide to engage the stops in succession.

36. In a typewriting machine, the combination with a revoluble platen, of a helical series of stops connected thereto, a slide mounted on a guide extending along the platen, a cam connected to the platen to operate said slide, and a detent upon said slide to engage the stops in succession; said cam having a snail form, and a spring being provided to return the slide to normal position after the slide is operated by the cam.

37. In a typewriting machine, the combination with a revoluble platen, of a revoluble barrel having seats in helical arrangement thereon for a succession of stops, movement-multiplying gearing between the platen and said barrel, a detent to engage said stops in succession, and a cam to cause the detent to traverse the helix.

38. In a typewriting machine, the combination with a revoluble platen, of a ratchet wheel, a lever, a pawl to operate the ratchet wheel, a cam rigidly connected to the ratchet wheel, movement-multiplying gearing between the ratchet wheel and the platen, a revoluble barrel carrying a helical series of stops, movement-multiplying gearing between the platen and the barrel, a detent to

engage the stops in succession, and means for enabling the cam to move the detent across the helix at a speed corresponding to the movement of the helix, and means to

5 return the detent to normal position.

39. In a typewriting machine, the combination with a platen, of a line-spacing mechanism therefor, including a succession of stops, a line-spacing lever, a detent to engage

10 the stops in succession to arrest the platen at consecutive line-spacing movements thereof, and means for enabling the lever to release the detent after each arrest of the platen.

40. In a typewriting machine, the combination with a revoluble platen, of a line spacing mechanism therefor, including a barrel connected to the platen, a helical series of stops upon the barrel, a detent to engage the stops, a ratchet wheel connected

20 to the platen, a lever and pawl to turn the ratchet wheel, a bar to release the detent after each arrest of the platen, means for enabling the lever to operate the bar, and means for causing the detent to traverse the

25 helix.

41. In a typewriting machine, the combination with a revoluble platen, of a ratchet wheel, a lever, a pawl to operate the ratchet wheel, a cam rigidly connected to the ratchet

30 wheel, movement-multiplying gearing between the ratchet wheel and the platen, a revoluble barrel carrying a helical series of stops, movement-multiplying gearing between the platen and the barrel, a detent to

35 engage the stops in succession, means for enabling the cam to move the detent across the helix at a speed corresponding to the movement of the helix, means to return the detent to normal position, and a bar extending

40 along the helix barrel to engage said detent to release the same, and means for enabling the lever to operate said bar after each arrest of the platen.

42. In a typewriting machine, the combination with a platen, of a line-spacing mechanism including a series of stops, a detent to engage said stops in succession, means to release the detent, and a spring to cause the detent to overshoot each stop when released.

50 43. In a typewriting machine, the combination with a platen, of a line-spacing mechanism including a series of stops, a detent to engage said stops in succession, means to release the detent, and a spring to cause the detent to overshoot each stop when released; said spring constructed also to press the detent into engagement with the stop.

60 44. In a typewriting machine, the combination with a platen frame, of a revoluble platen, a ratchet wheel, a shaft mounted upon the platen frame and carrying said ratchet wheel, a lever mounted upon said shaft and having a pawl to operate said ratchet wheel, a gear on said shaft, a pinion

65 on the platen casing and meshing with said

gear, a gear on the platen casing, a barrel loosely mounted on said shaft and having a pinion in mesh with the last-mentioned gear, said barrel having a helical succession of holes or perforations extending several times

70 around the same, stops insertible in said holes, a slide mounted for movement along the platen, a detent pivoted upon said slide to engage said stops, a snail cam upon the first-mentioned shaft to move said slide

75 around the platen at a speed corresponding to the pitch of the helix, a lever pivoted upon the platen frame and engageable by the first-mentioned lever upon its return to normal position, a bar upon said lever and extending

80 along said barrel to engage said detent to release the same, and a spring for returning said slide at the completion of the operation of said cam.

45. In a typewriting machine, the combination with a platen, of a line-by-line spacing mechanism for said platen including a succession of line-by-line spacing stops connected to said platen to rotate therewith, a reciprocatory driver for the platen, means

90 operated by said driver to engage said stops for arresting the platen line-by-line, and means connected to the driver to operate automatically for releasing said engaging means from the line-spacing stop after each

95 line-spacing operation.

46. In a typewriting machine, the combination with a platen and a series of line-spacing stops, of a platen driver, a device to engage said stops in succession to determine

100 the limits of the line-by-line movements of the platen effected by said driver, and means to set said stop-engaging device back to position to reengage the first stop in the series.

47. In a typewriting machine, the combination with a platen and a series of line-spacing stops positively connected to the platen to move therewith, of a platen driver, a device to engage said stops in succession to determine the limits of the line-by-line

110 movements of the platen effected by said driver, and means to set said stop-engaging device back to position to reengage the first stop in the series.

48. In a typewriting machine, the combination with a platen and a series of line-spacing stops, of a platen driver, a device to engage said stops in succession to determine the limits of the line-by-line movements of the platen effected by said driver, a spring, and a trip rendered effective by the movement of said driver, to permit said spring to set back said stop-engaging device to position to reengage the first stop in the series.

49. In a typewriting machine, the combination with a revoluble platen, of a reciprocatory driver for said platen, a series of stops, a detent to engage said stops in succession to determine the limits of the line-by-line movements of said platen effected by

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said driver, means for automatically releasing said detent after each arrest of the platen effected thereby, a spring tending to set said detent back to a position to engage
5 the first stop in the series, and a trip connected to the platen to move therewith to permit said spring to act.

50. In a typewriting machine, the combination with a revoluble platen, of a ratchet
10 wheel connected thereto, a lever having a pawl to drive the ratchet wheel, and platen, a series of stops connected to the platen, a detent to engage said stops in succession to determine the limits of the line-by-line
15 movements of the platen effected by said lever and pawl, automatic means being provided to release the detent from the stops to permit further advances of the platen, a

spring, and a trip rendered effective by the movement of the lever to permit said spring
20 to set the detent back to a position to reengage the first stop in the series.

51. In a typewriting machine, the combination with a revoluble platen, of a line-by-line spacing mechanism therefor, including
25 a reciprocatory driver, a succession of independently adjustable stops, means to enable said driver at each stroke to turn the platen until arrested by the nearest of said stops, and means to enable the driver and platen
30 at each stroke to pass the stop by which they were arrested.

JOHN JOSEPH COOPER.

Witnesses:

T. L. RAND,
H. D. JAMESON.