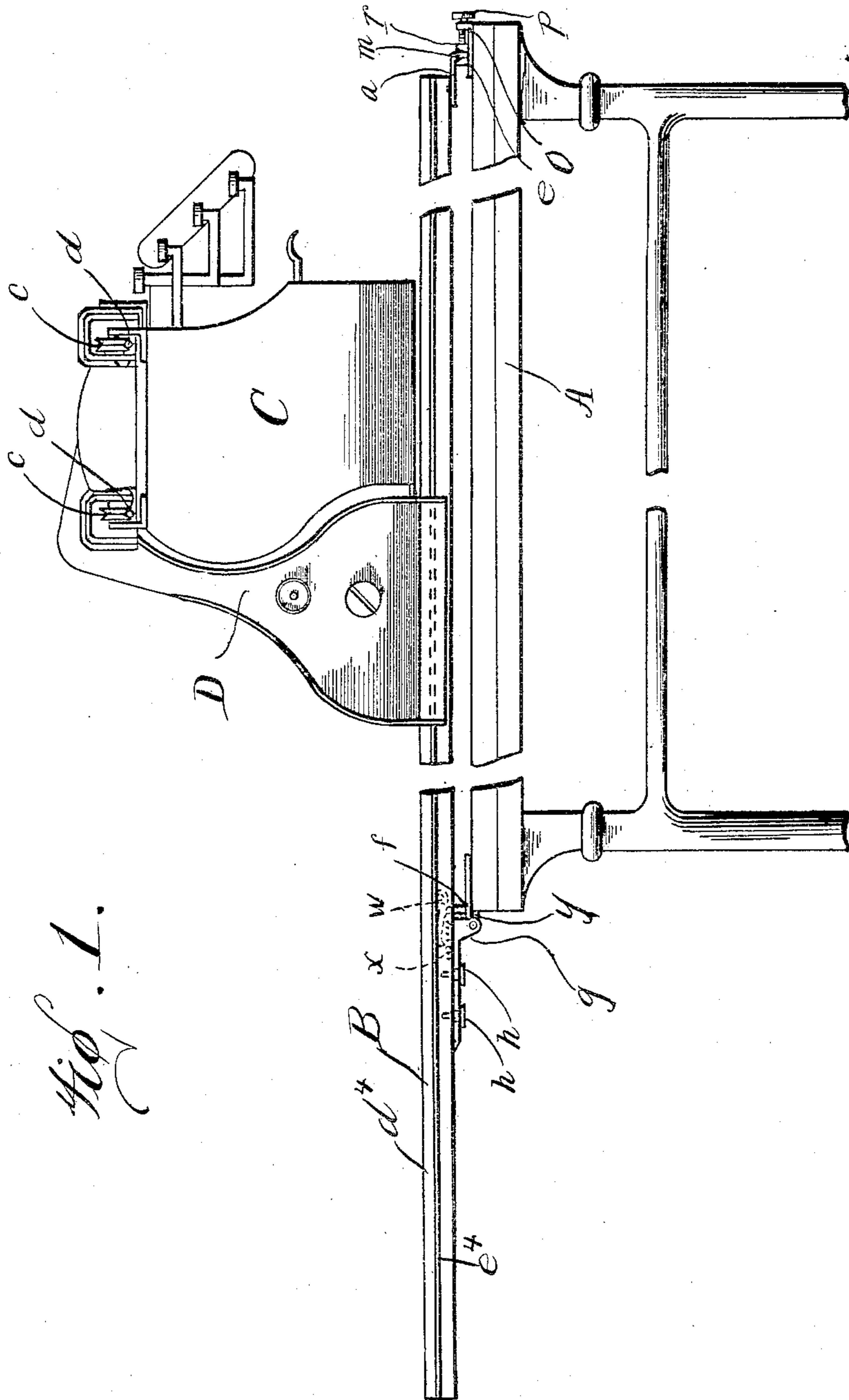


G. W. DONNING.
TYPE WRITER.
APPLICATION FILED FEB. 1, 1906.

929,840.

Patented Aug. 3, 1909.

5 SHEETS—SHEET 1.



Witnesses
Philip Smith
E. H. Parry

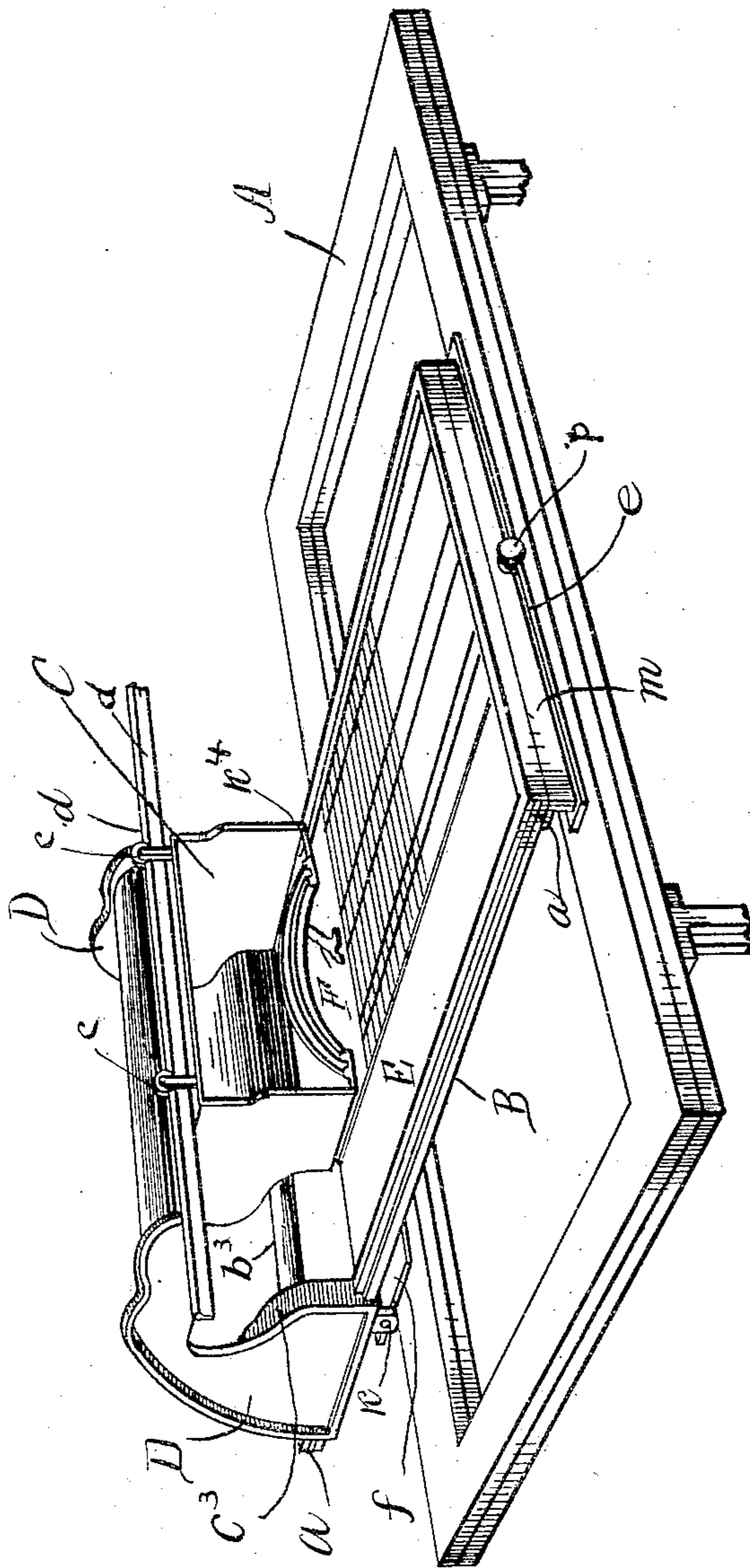
Inventor:
George W. Donning.
By R. S. Dyer,
his Attorney.

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 5 SHEETS—SHEET 2.

Fig. 2.



Witnesses
Philip Ferrell
Adams H. Parry

Inventor
George W. Donning
 by *A. S. Dyrenforth*
 His Attorney.

G. W. DONNING.

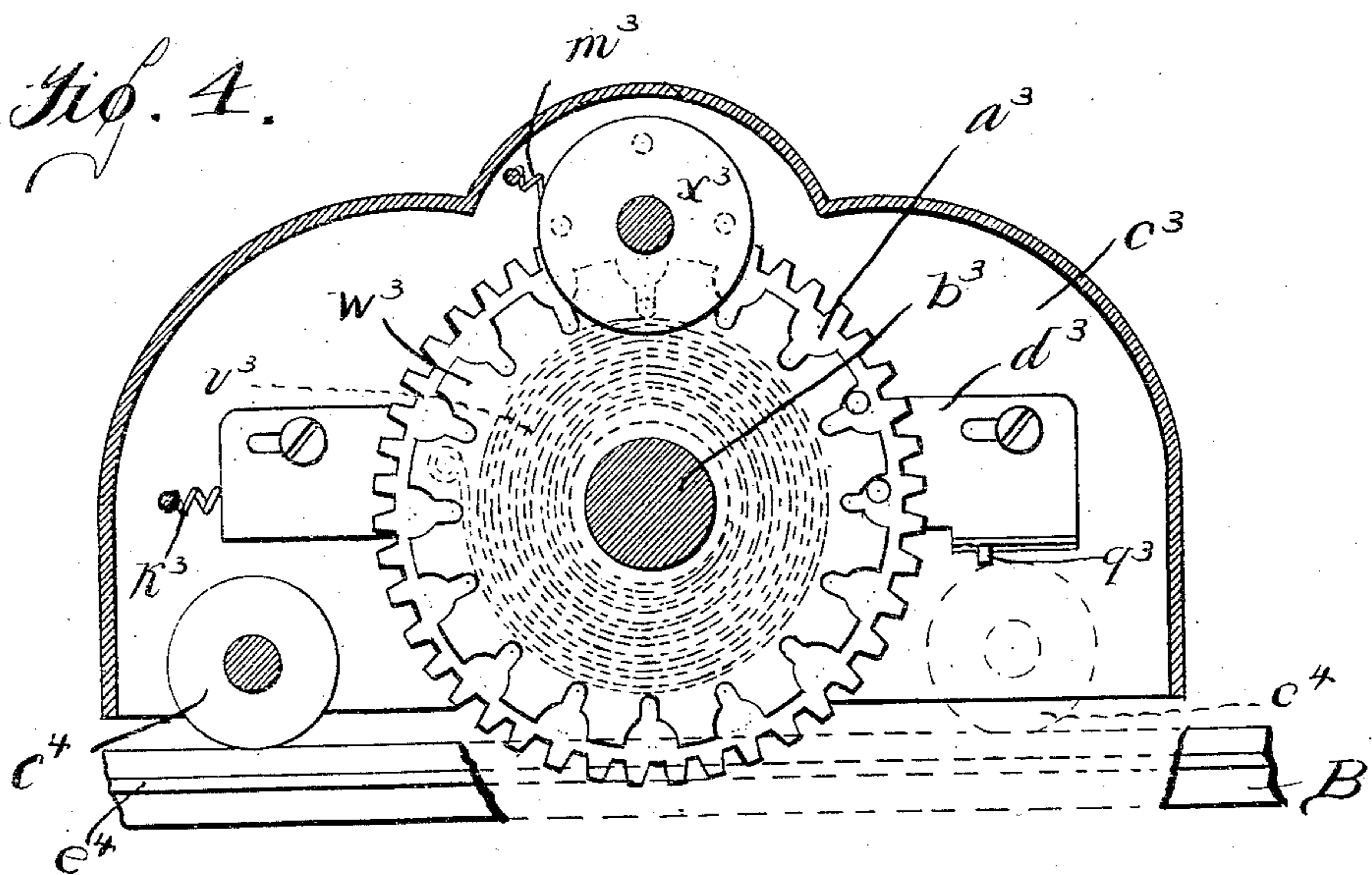
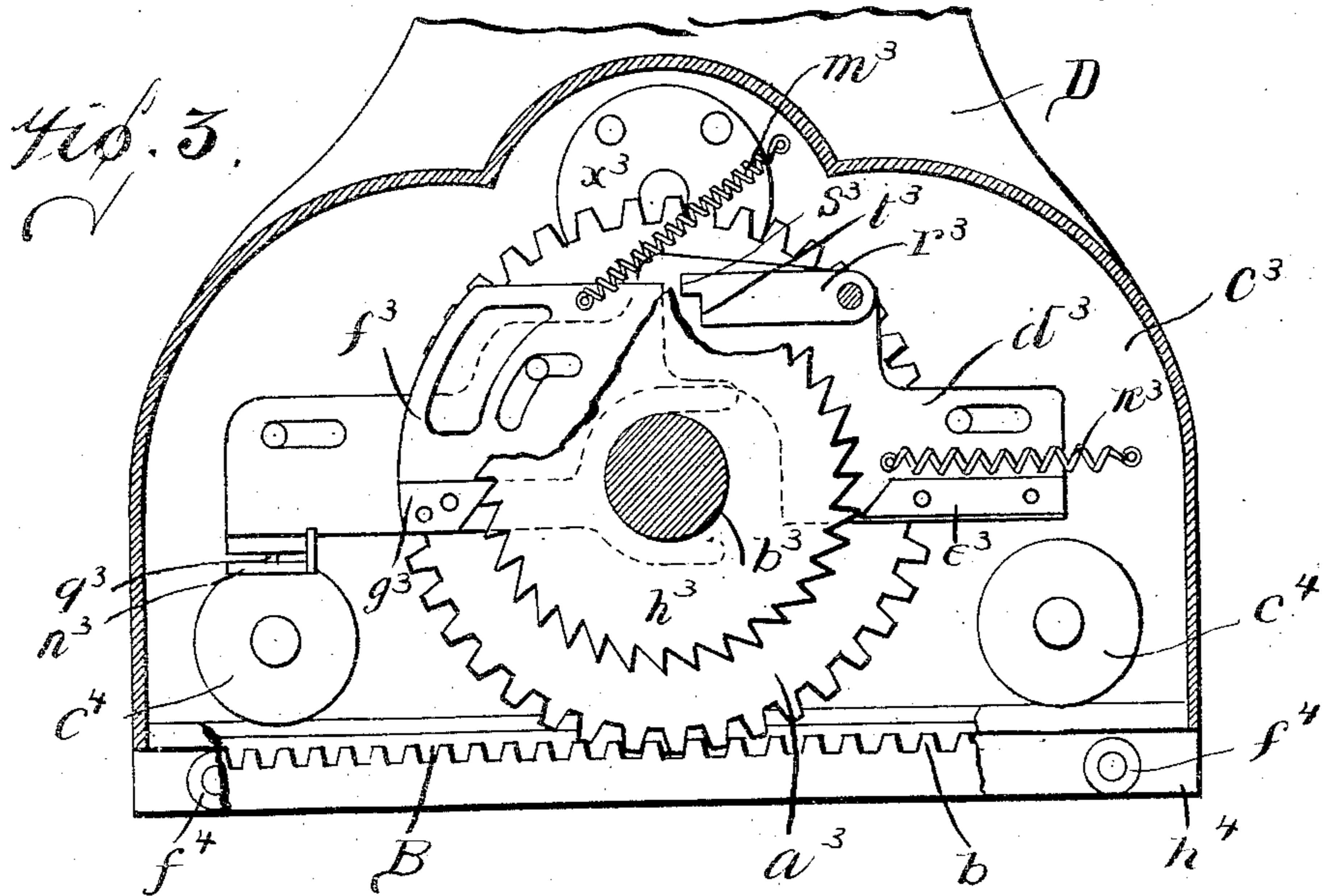
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5 SHEETS—SHEET 3.



Witnesses
Philip Terrell
E. H. Parmer

Inventor:
George W. Donning
 by *A. S. Dyreforth*
 his attorney.

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5 SHEETS—SHEET 4.

Fig. 5.

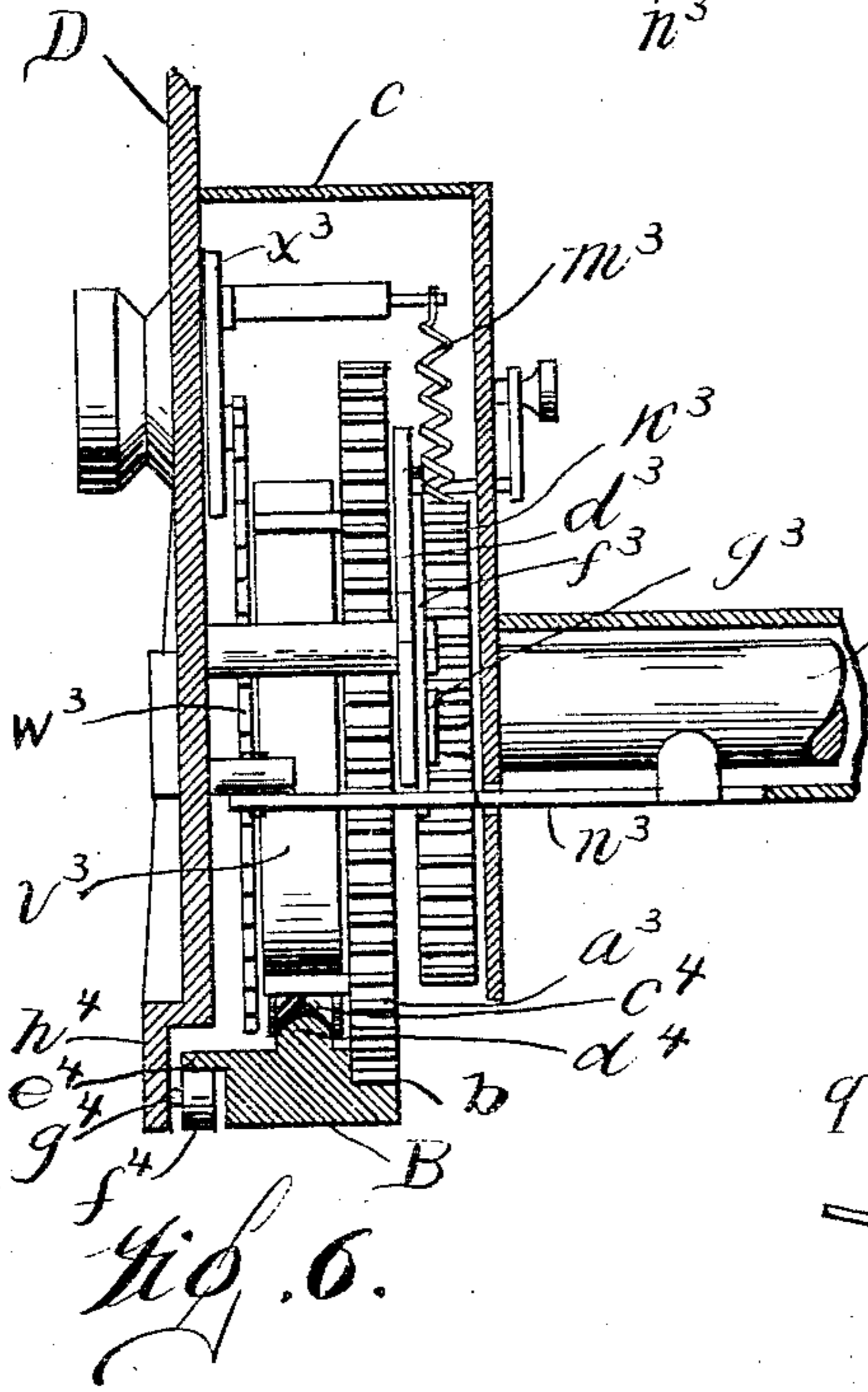
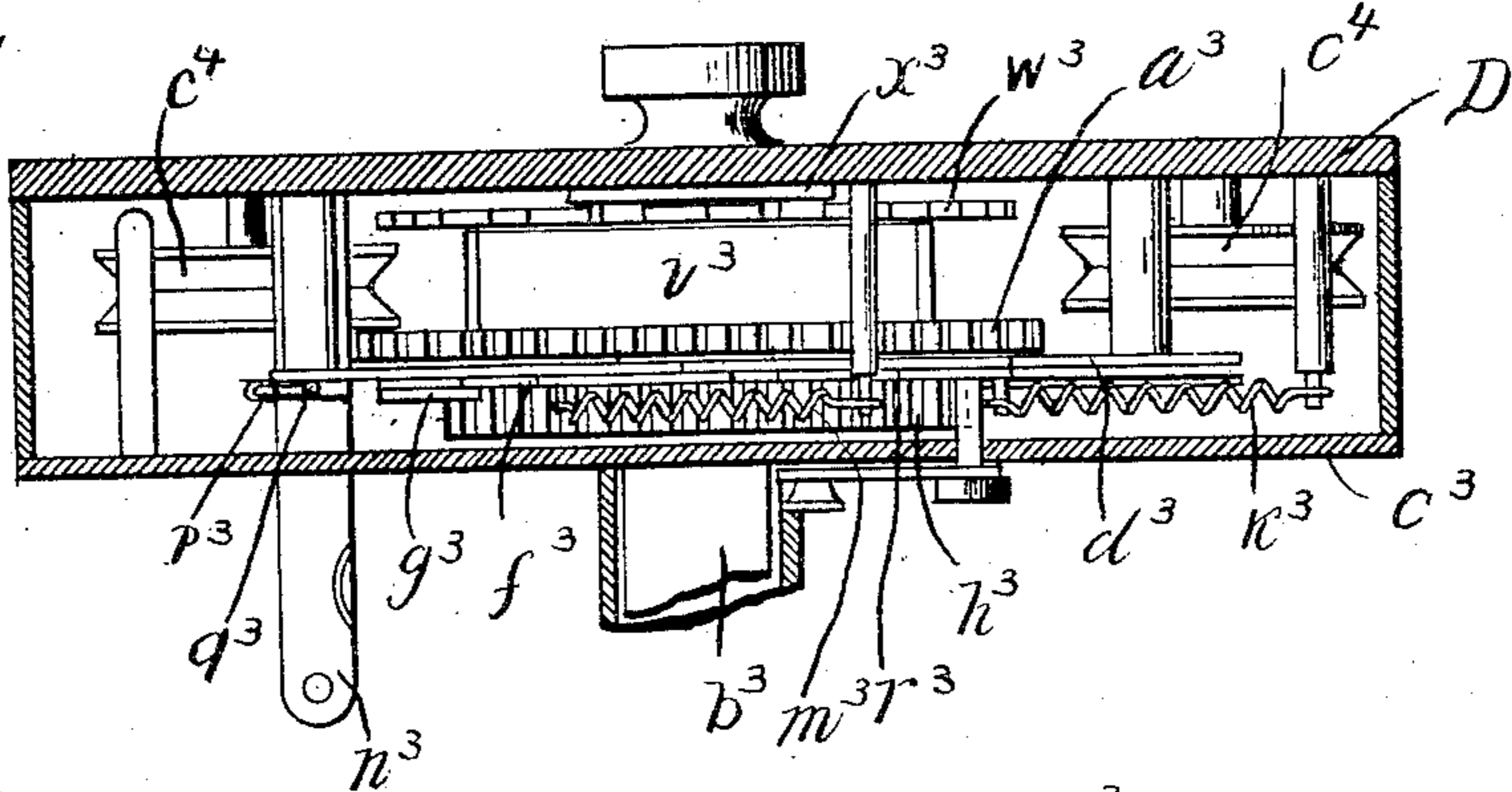


Fig. 6.

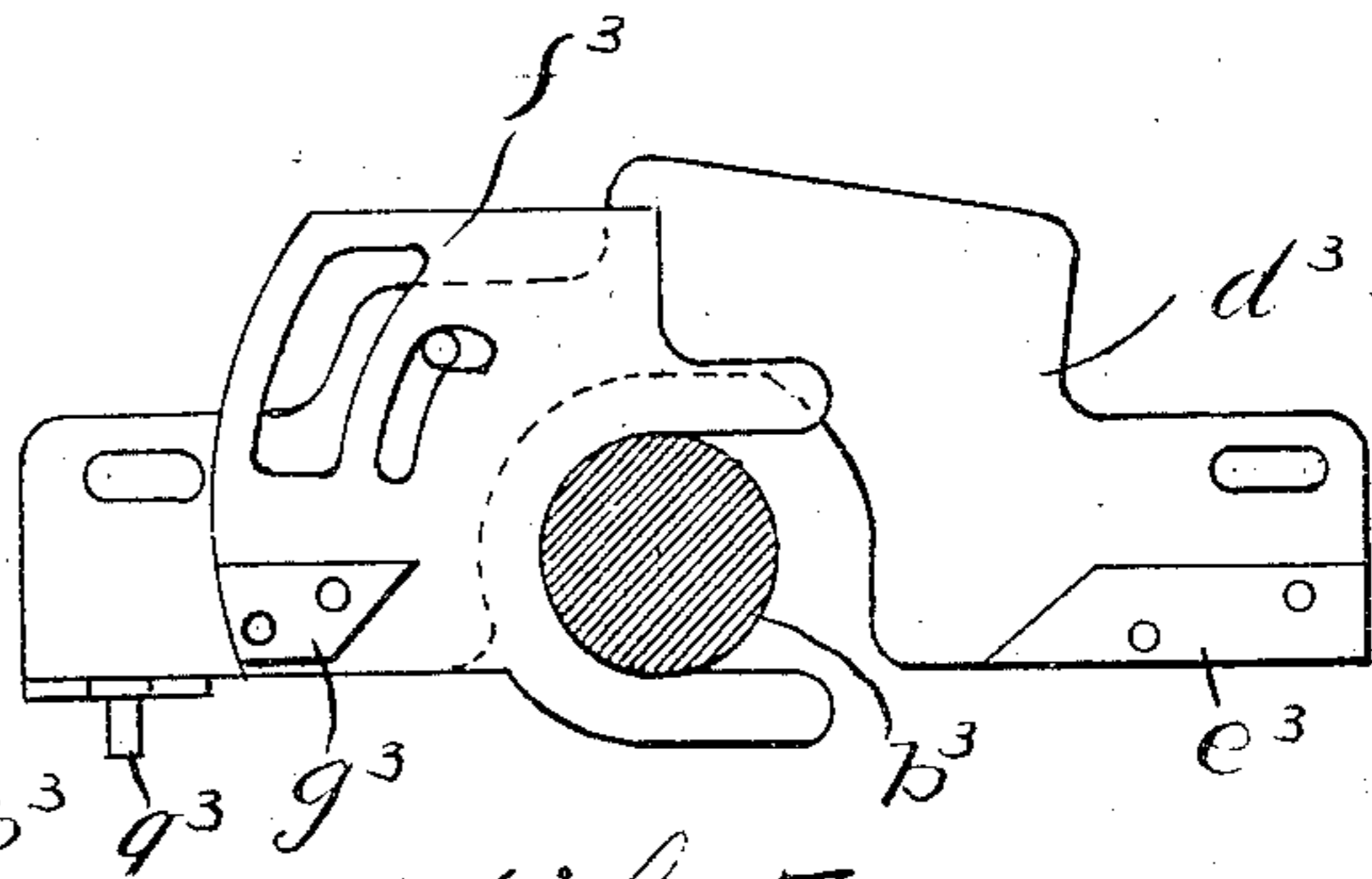


Fig. 7.

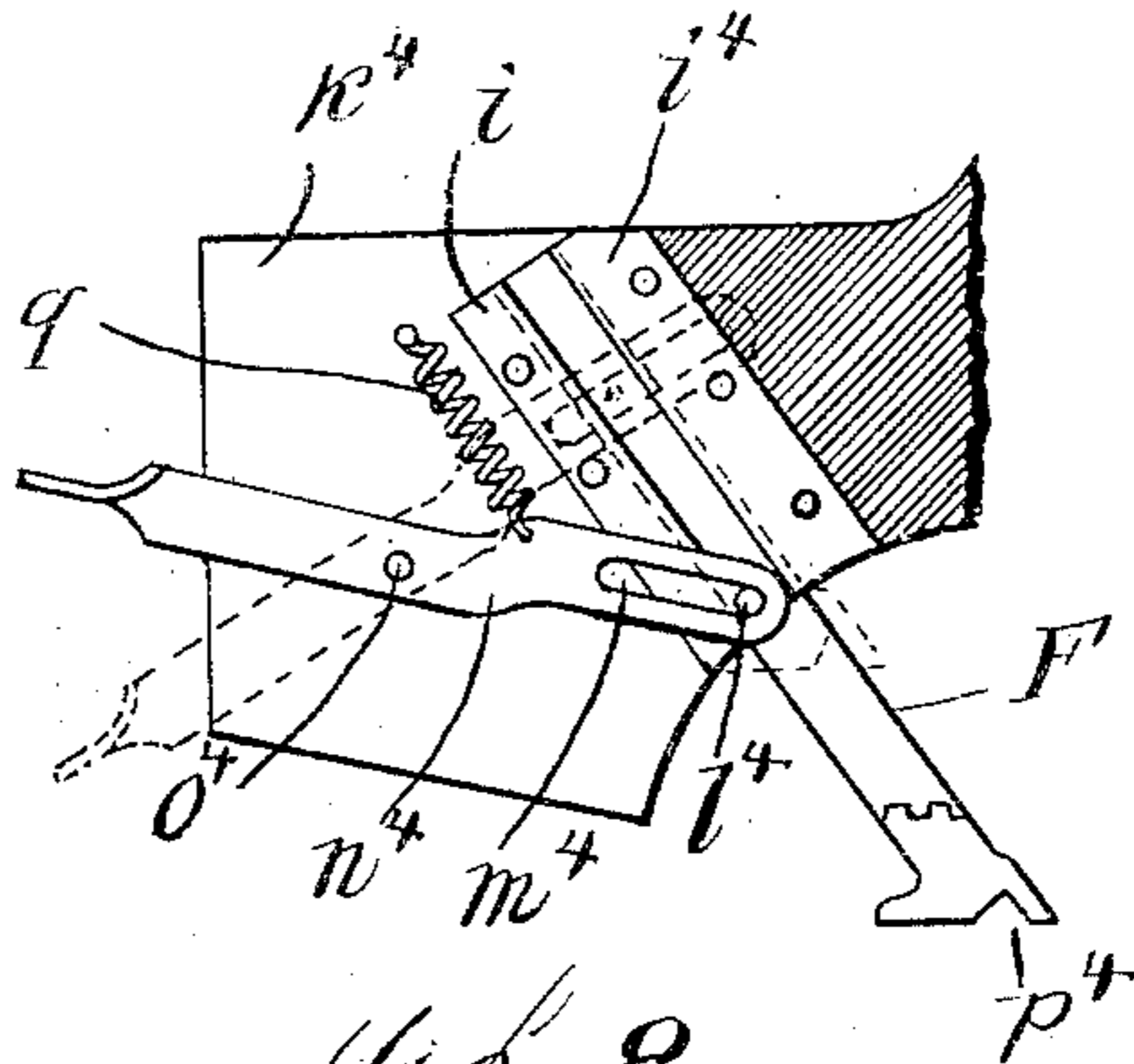


Fig. 8.

Witnesses
Philip Terrell.
E. H. Parry.

Inventor:
George W. Donning,
by *R. S. Dyer*
his attorney

G. W. DONNING.

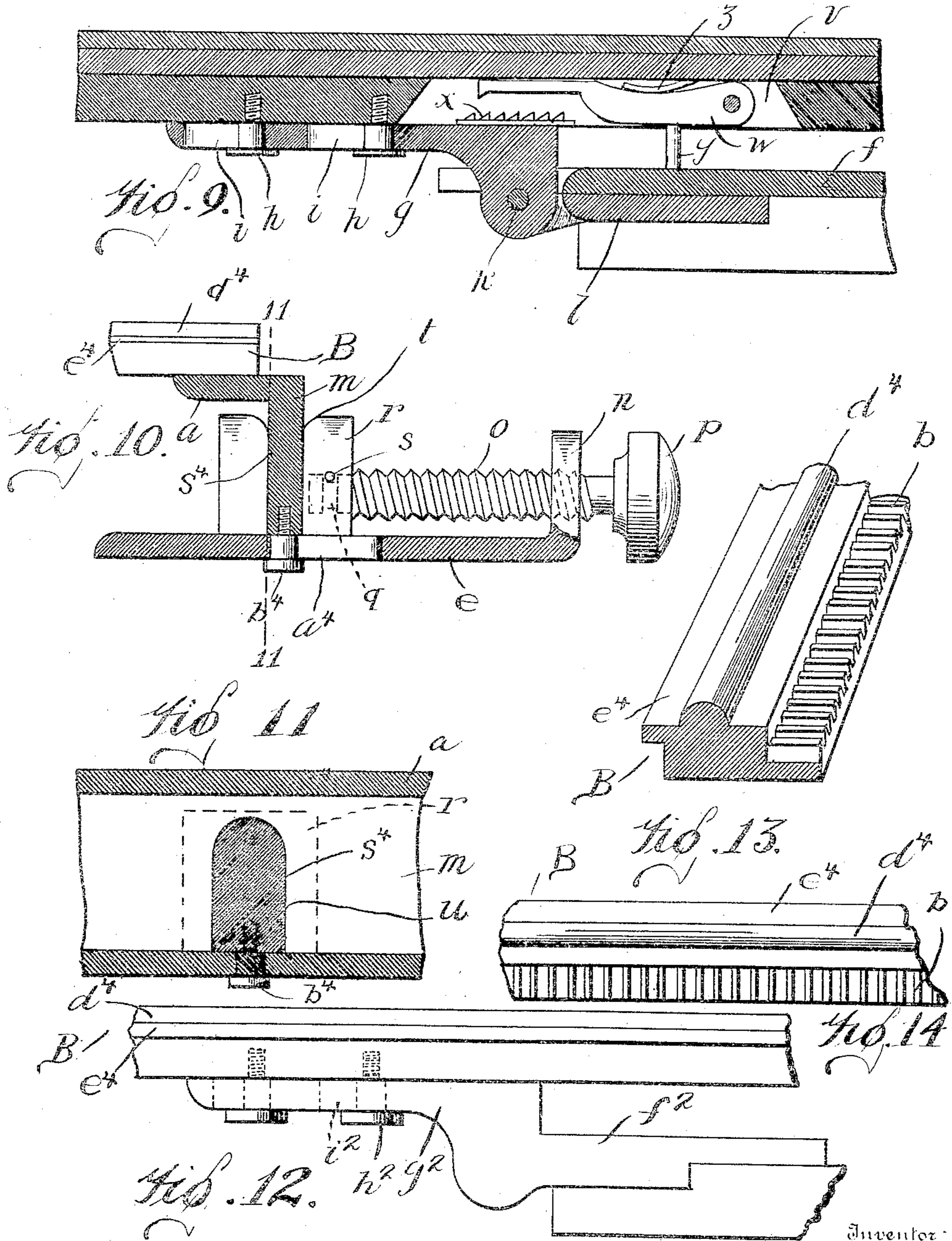
TYPE WRITER.

APPLICATION FILED FEB. 1, 1906.

929,840.

Patented Aug. 3, 1909.

5 SHEETS—SHEET 5.



Witnesses

Philip Scrull.
C. H. Parry.

George W. Donning,

by Reed & Smith,
his attorney.

UNITED STATES PATENT OFFICE.

GEORGE W. DONNING, OF STAMFORD, CONNECTICUT, ASSIGNOR TO HARRY T. AMBROSE,
OF ORANGE, NEW JERSEY.

TYPE-WRITER.

No. 929,840.

Specification of Letters Patent.

Patented Aug. 3, 1909.

Original application filed April 26, 1902, Serial No. 104,842. Divided and this application filed February 1, 1906.
Serial No. 299,022.

To all whom it may concern:

Be it known that I, GEORGE W. DONNING, a citizen of the United States, residing at Stamford, in the county of Fairfield and State of Connecticut, have invented certain new and useful Improvements in Type-Writers; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to flat-platen writing-machines, and its object is to produce certain improvements in the supporting or carriage portions of such machines and to provide means for permitting and effecting fine longitudinal adjustment of the part of such a machine which moves longitudinally under the control of suitable feed-mechanism for the purpose of line spacing.

In the use of machines of this character it would frequently be desirable to be enabled to imprint characters between the lines of writing determined by the feed mechanism. Such machines; too, are largely employed for making up bills, and for writing in blanks of various descriptions, in which event the entries are made at various times and the work must be placed upon and removed from the platen repeatedly before the writing is completed. Under such conditions, it is obvious that there will necessarily be considerable difficulty attendant upon replacing the work sheet in exactly the same position longitudinally of the platen, and that if the work is not positioned exactly in this manner faulty alinement will result. To satisfy these two classes of requirements, one feature of the invention contemplates the provision for a longitudinal shifting of the writing mechanism over the platen distinct from the ordinary step-by-step line spacing movement governed by the feed mechanism. In one aspect this feature of the invention may be said to consist in means for positioning the writing mechanism for inter-line writing; and in another aspect it may be looked upon as constituting means for effecting fine longitudinal shifting of the writing mechanism relatively to the platen.

A closely allied feature of novelty in the invention is the provision in connection with the adjustable writing mechanism of an indicator capable of being positioned directly at the printing point and mounted to move

with the writing mechanism, so that as the latter is adjusted it will indicate when the proper degree of shifting has been reached.

As a simple and efficient mode of bringing about the adjustment of the writing mechanism, I propose to provide means for producing fine longitudinal shifting of the line spacing racks by means of which the writing mechanism travels over the platen with its step-by-step movement. I also propose to make such means self-retaining, so that the racks, and therefore, the writing mechanism, will be secured in the longitudinally shifted position.

The line spacing racks form part of the longitudinal track rails upon which travel standards carrying the writing mechanism; and a further feature of the invention resides in the particular construction of these tracks whereby proper longitudinal travel of the writing mechanism is insured.

In the drawings: Figure 1 is a side elevation of a complete writing machine embodying the present improvements; Fig. 2 is a perspective view, showing the line indicator or finder in projected position, the writing mechanism in this view being represented by its laterally traveling carriage; Fig. 3 is a vertical longitudinal section through the longitudinal feed mechanism, looking toward the outside of the casing; Fig. 4 is a similar view looking toward the inside of the feed mechanism casing; Fig. 5 is a horizontal section through the casing; Fig. 6 is a vertical transverse section through the longitudinal feed mechanism and the underlying track; Fig. 7 is a detail of the rigid and loose dog plates; Fig. 8 is a detail bottom plan of the line finder; Fig. 9 is a vertical longitudinal section through one of the tracks at its pivotal point; Fig. 10 is a side elevation, partly in section, of the forward part of the track frame and the adjusting devices; Fig. 11 is a section on the line 11—11, Fig. 10; Fig. 12 is a side elevation showing the rear mounting of a non-tiltable track rail; Fig. 13 is a perspective view of a portion of one of the track rails; and Fig. 14 is a plan view of the same.

Referring to the drawings, A indicates any suitable form of base, such as a table, upon which are mounted longitudinal track rails B, connected at front and back by transverse rails *a* and provided longitudinally with line spacing racks *b*.

E is a flat platen, and C is the writing

mechanism, mounted to travel laterally for letter spacing by reason of being hung by rollers c from guides d connecting standards D, which travel longitudinally upon the track rails to impart to the writing mechanism the required line-spacing movement. Each standard D is provided at its base with peripherally grooved rollers c^4 , which run upon a longitudinal, rounded rib or track-way d^4 projecting upward from rail B and disposed adjacent to and outside of rack b . Each track rail is further provided with an outward extending horizontal flange e^4 , against whose under surface work rollers f^4 mounted on stub shafts g^4 projecting inward from a depending flange h^4 which is formed on the bottom of standard D and projects below track flange e^4 . It will be recognized that owing to the standards having bearing upon both upper and lower surfaces of the track a much more even movement of the standards, and therefore of the writing mechanism, is insured than were the standards to travel on the tops of the rails only.

Referring now more particularly to Fig. 8, it will be seen that a line finder F is slidably mounted upon the lower surface of base plate k^4 of the writing mechanism. The finder has a projecting pin l^4 which works in slot m^4 formed in an operating lever n^4 pivoted at o^4 to plate k^4 . When lever n^4 is turned in one direction as far as permitted by slot m^4 , indicating tip p^4 at the end of the finder is positioned immediately behind the printing point. When the hand of the operator is removed from lever n^4 , a spring q^4 returns lever and finder to normal position.

Each standard D is provided within a casing c^3 on the inner face thereof with a pinion a^3 meshing with the corresponding line spacing rack b ; and these pinions are connected by a shaft b^3 to which they are rigidly secured. Within one of the casings c^3 is a rigid dog plate d^3 carrying rigid dog e^3 and mounted for longitudinal reciprocation within the casing; and f^3 is a loose dog plate mounted on the rigid dog plate to move therewith, and also having an independent movement about shaft b^3 , the loose dog being indicated at g^3 . The loose and rigid dogs cooperate with the ratchet wheel h^3 rigid with shaft b^3 , there being a spring k^3 disposed so as normally to maintain the loose dog in engagement with wheel h^3 and the rigid dog out of engagement therewith, and a second spring m^3 tending to turn the loose dog plate upward about shaft b^3 . A lever n^3 pivoted within the casing is provided with a slot p^3 which receives a stud q^3 depending from the rigid dog plate and affords means for reciprocating the plates d^3 and f^3 , it being obvious that it is immaterial to the present invention whether such actuation be manual or automatic. When the loose and rigid dog plates are shifted to carry the loose dog out of en-

gagement with wheel h^3 and the rigid dog into engagement therewith, the ratchet wheel is practically unaffected, while the loose dog plate and loose pawl, under the actuation of spring m^3 move upward past a certain number of teeth on the ratchet wheel, the exact number of teeth so passed over being determined by a spacing regulator r^3 pivoted above loose dog plate f^3 and having detaining faces s^3 and t^3 . The face s^3 is disposed to engage with plate f^3 , when regulator r^3 is in its lowest position, to stop the plate after the loose dog has moved upward a distance corresponding to a single line space. When the spacing regulator is lifted a certain distance, face t^3 is in position to arrest plate f^3 , after the latter has moved twice as far as before, whereby double spacing is provided for; and in like manner other forms of spacing may be secured. Loose dog g^3 having been moved up a certain distance about the periphery of the wheel the parts are now allowed to return to normal position, the rigid dog passing out from the ratchet teeth, and the loose dog passing into engagement therewith, but higher up than normally. A driving spring v^3 connected at one end to pinion a^3 and at the other to a pinion w^3 loose on shaft b^3 now turns the pinions a^3 a distance corresponding to the number of ratchet teeth over which the loose dog passed in its idle movement, and the turning of ratchet wheel h^3 returns the loose dog to normal or lowest position, where it locks the parts against further movement. A lantern wheel x^3 may be provided for rotating pinion w^3 to regulate the tension of the driving spring, the lantern wheel and pinion being designed to be self-locking so as to secure the spring against unwinding except by reason of the longitudinal travel of the writing mechanism.

The feed mechanism just described forms the subject-matter of my co-pending application for patent, Serial No. 104,842, filed April 26, 1902, and patented July 17, 1906, as No. 826,483, of which the present application is a division; and it is, therefore, not now claimed specifically.

It will be recognized that this form of feeding mechanism is but one of a large number of feed mechanism providing for manual or spring-actuated movement of the writing mechanism over the platen, any one of which might be employed in connection with the present improvements.

Referring now more particularly to Figs. 1, 2, and 9-11, at the front of table A is disposed a transverse plate e and at the rear is another plate f . Upon these plates rest the track rails B. The latter, in Figs. 1, 2 and 9, are shown as being provided; preferably to the rear of their longitudinal centers—by this means providing for a counterbalancing of the track frame by the traveling machine—with hinge members g to which they

are slidably secured by enlarged headed pins h projecting downward from the lower faces of the rails and occupying longitudinal slots i formed in the hinge members. Each hinge member g is pivoted at k to a complementary hinge member l secured to the plate f , whereby tilting of the track rails is provided for. At their front ends, the tracks are furnished with a depending flange member m , which slides upon plate e and maintains the tracks in a horizontal plane. The plate e has formed at its forward edge an upstanding flange n , through which is threaded a longitudinal adjusting screw o , having a milled operating head p . At its rear end, the screw o is not threaded, but is provided with a circumferential groove q ; and this end is swiveled within an adjusting block r , by means of a pin s which is mounted in the adjusting block and which takes into the groove q . Said adjusting block is slidably mounted on plate e , and is provided with a transversely disposed neck s^4 , the distance between whose walls, except at the top, is just equal to the thickness of the flange member m of the track rails. At the top, the walls of the neck flare outward and upward, so as to form beveled or inclined guiding faces t . Neck s^4 of the adjusting block is designed to receive a downward opening slot u formed in flange member m , so that when the track rails are in normal position they, and the writing mechanism, may be shifted back and forth by means of the adjusting screw o , the slotted connection of the tracks with the hinge members g permitting such sliding or adjusting movement. A screw b^4 on the adjusting block cooperates with a slot a^4 in plate e . It will be understood, of course, that any suitable form of adjusting device may be used in connection with the track rails without affecting the fundamental conception underlying this invention.

While, of course, it is not essential that the track rails shall be tiltable, yet I regard it as one of the subordinate features of novelty of the present invention to provide tracks which are both slidably and tiltable mounted on their support. But, in order to prevent the tracks, when raised, from sliding rearward, it becomes necessary to provide locking means for the rails operative when the latter are swung up out of engagement with the adjusting block r . In Fig. 9, more especially, I have illustrated one form of such locking means. According to this construction, the under surface of each track, adjacent its hinge member g , is cut away so as to form a downward opening chamber v , in which is pivoted a pawl w whose working tip is designed to engage with the teeth of a rack x formed on the top of the hinge member g . Said rack and pawl are arranged to lock the track against rearward movement, and means, in the shape of a stud y depend-

ing from the pawl intermediate its pivot and tip, is provided for automatically removing the pawl from engagement with the rack when the tracks are swung downward into normal position. As will be readily understood, this stud y is of sufficient length to contact with plate f before the tracks are all the way down, thereby holding the pawl against further downward movement, while the rack continues to move downward till it is freed from the pawl. Gravity may be depended upon to cause the automatic engagement of the pawl with the rack x , or a spring z bearing upon the upper surface of the pawl may be used for this purpose.

In the operation of the machine, when the tracks are tilted, the pawl w locks the rails against any material longitudinal movement; and such movement as may have occurred on rising, is, on depression of the tracks to normal position, automatically corrected by the adjusting block r , which, of course, will have remained stationary, and whose inclined guiding faces t direct the flange member m of the tracks into the neck s^4 , whereby the tracks are returned to exactly the same position that they occupied before tilting. It will now be seen that operating screw o and its related parts constitute one embodiment of means for effecting longitudinal shifting of the track rails, and therefore of the writing mechanism, back or forth to any point within a certain range, this range being determined by the length of the slot a^4 , though it will be apparent that it might be determined by the length of the threaded portion of the operating screw. Further, it will be seen that this longitudinal adjustment of the writing mechanism may be performed either at the outset of writing, to adjust the positions of the lines of writing to the spaces in a piece of work, or at any one of the points of rest governed by the feed mechanism, for the purpose of permitting interlineations. Both of these results I regard as broadly new achievements in the art. From still another point of view, the parts near the pivotal points of the track rails may be regarded as means for permitting the longitudinal adjustment of the writing mechanism, while the adjusting screw serves to retain the writing mechanism in any adjusted position. Or the screw and its correlated parts may be looked upon as constituting means for both adjusting and retaining the track rails. It may also be proper, before passing on to the claims, to point out that the cooperation of the line finder F with the adjustable track rails is a very important one, since the finder moves with the writing mechanism, as the latter is shifted by the movement of the rails, and, when projected forward to the printing point, indicates to the operator when operating screw o has been turned to the proper degree.

In Fig. 12 there is shown a rear mounting for the track rails that does not permit of tilting. According to this arrangement, the track rails B are of exactly the same construction as before, but are mounted slidably by means of pins h^2 and slots i^2 upon blocks g^2 formed integral with plate f^2 , which latter takes the place of plate f described in connection with the tiltable mounting for the tracks. It will be apparent that locking pawl w and rack x are not present in this construction and that the same form of adjusting device may be employed as formerly.

What is claimed as new is:

1. In a typewriter, the combination with a flat-platen, an overlying traveling writing-mechanism, track-rails upon which the writing-mechanism is supported, and feed-mechanism for imparting to the writing-mechanism a longitudinal step-by-step line-spacing movement of the writing-mechanism on said track-rails relative to the underlying platen, of manually-operated screw-controlled means acting directly on the rails to effect minute movement thereof in either direction longitudinally of the platen and for a distance less than the regular line-spaces.

2. In a typewriter, the combination with a flat-platen, track-rails arranged adjacent the platen, a traveling writing-mechanism supported on said track-rails and arranged to travel over the platen laterally and longitudinally, and feed-mechanisms for imparting to the writing-mechanism a longitudinal step-by-step movement of the writing-mechanism on said track-rails for line spacing, of manually-operated screw-controlled means acting directly on the rails to effect minute movement thereof in either direction longitudinally of the platen and for a distance less than the regular line-spaces.

3. In a typewriter, the combination with a flat-platen, track-rails arranged adjacent the platen, a traveling writing-mechanism supported on said track-rails and arranged to travel over the platen laterally and longitudinally, and feed-mechanism for imparting to the writing-mechanism a longitudinal step-by-step movement of the writing-mechanism on said track-rails for line-spacing, of manually-operated screw-controlled means acting directly on the rails to effect minute movement thereof in either direction longitudinally of the platen and for a distance less than the regular line-spaces, and means for retaining said rails in such shifted position.

4. In a typewriter, the combination with a flat-platen, track-rail members arranged adjacent thereto, and a traveling writing-mechanism supported by said track-rail members and overlying the platen, of means for effecting full line-spacing of the writing-mechanism over the platen, manually-operated screw-controlled means acting directly on

the rails at the front to effect minute longitudinal movement thereof and of the writing-mechanism in either direction relative to the platen and for less than the regular line-spaces and for interline-writing.

5. In a typewriter, the combination with a flat-platen, track-rail members arranged adjacent thereto, and a traveling writing-mechanism supported by said rail-members and overlying the platen, of means for effecting full line-spacing of the writing-mechanism over the platen, a manually-operated screw-controlled device acting directly on the rail-members for positioning said rail-members, with the writing-mechanism for interline writing in either direction relative to the platen, and means for maintaining the rail members and writing-mechanism against longitudinal movement during such interline writing.

6. In a typewriter, the combination with a flat-platen, track-rail members arranged adjacent to the sides thereof, a traveling writing-mechanism supported upon said rail-members and overlying the platen, and feed-mechanism for effecting regular line-spacing of the writing-mechanism on said track-rails, of a manually-operated screw-controlled interline-shifting device acting directly on the rail-members and operative at the several points of rest governed by said feed-mechanism for shifting said rail-members and writing mechanism relative to the platen and intermediate of the regular line-spaces in either direction.

7. In a typewriter, the combination with a flat platen, an overlying writing mechanism, and feed mechanism for positioning the writing mechanism over the platen for imprinting successive lines of writing, of manually-operated screw-controlled interline-shifting means for imparting to said writing mechanism a fine longitudinal shifting in either direction relative to the platen and distinct from the line spacing movement.

8. In a typewriter, the combination with a flat platen, an overlying writing mechanism, and feed mechanism for positioning the writing mechanism over the platen for imprinting successive lines of writing, of manually-operated screw-controlled interline-shifting means distinct from said feed mechanism for imparting longitudinal adjustment to said writing mechanism in either direction relative to the platen.

9. In a typewriter, the combination with a flat platen, an overlying writing mechanism, and feed mechanism for positioning the writing mechanism over the platen for imprinting successive lines of writing, of manually-operated screw-controlled interline-shifting means distinct from said feed mechanism for effecting longitudinal adjustment of said writing mechanism in either direction relative to the platen and for retaining the same

in adjusted position against longitudinal shifting.

10. In a flat platen typewriter, the combination with a flat platen, an overlying writing mechanism, and feed mechanism for positioning the writing mechanism over the platen for imprinting successive lines of writing, of manually-operated screw-controlled interline-shifting means operable at the successive points of rest governed by said feed-mechanism for effecting longitudinal shifting of the writing mechanism in either direction relative to the platen.

11. In a typewriter, the combination with a flat platen, an overlying writing mechanism, and feed mechanism for imparting to said writing mechanism a longitudinal step-by-step line spacing movement over the platen, of manually-operated screw-controlled interline-shifting means operable at the several points of rest in such longitudinal movement for effecting fine longitudinal back or forth adjustment of the writing mechanism relative to the platen.

12. In a typewriter, the combination with a flat platen, an overlying writing mechanism, and feed mechanism for positioning the writing mechanism over the platen for imprinting successive lines of writing, of self-retaining manually-operated screw-controlled interline-shifting means distinct from the feed mechanism for effecting longitudinal adjustment of the writing mechanism in either direction relative to the platen.

13. In a typewriter, the combination with a flat-platen, and line-spacing racks adjacent to, and manually-controlled screw-operated longitudinally-adjustable in either direction with reference to, said platen.

14. In a typewriter, the combination with a flat platen, of line spacing racks, and hand-controlled screw means for effecting longitudinal shifting of said racks in either direction relative to the platen.

15. In a typewriter, the combination with a flat platen, of line spacing racks, manually-operated, screw-controlled means for effecting longitudinal adjustment of said racks in either direction relative to the platen, and means for retaining the racks in shifted position.

16. In a typewriter, the combination with a flat platen, of line spacing racks, and self-retaining manually-operated, screw-controlled means for effecting fine longitudinal shifting of said racks in either direction relative to the platen.

17. In a typewriter, the combination with a flat-platen and a support, of line-spacing racks disposed at the edges of said platen, tiltable away from the same, and slidably-mounted on said support and minutely-adjustable longitudinally and independent of said platen.

18. In a typewriter, a support, tiltable

line-spacing racks, and screw-operated means for minutely-adjusting said racks longitudinally of the support.

19. In a flat platen typewriter, the combination of a support, a flat platen, track rails mounted tiltable and longitudinally slidably on said support, minutely-operating means for slidably-shifting said rails, and means for securing said rails at the desired longitudinal position.

20. In a typewriter, a support, line spacing racks tiltable thereon, and minutely-adjusting, screw-operated means for effecting longitudinal adjustment of said racks.

21. In a typewriter, a support, line spacing racks tiltable thereon, minutely-adjusting, screw-operated means for permitting fine longitudinal shifting of said racks, and means for securing the same in shifted position.

22. In a flat platen typewriter, a support, line spacing racks, means for connecting said racks tiltable to the support, and minutely-shifting, finger-operated means for effecting longitudinal adjustment of said racks and for securing the same at the desired degree of adjustment.

23. In a flat platen typewriter, longitudinal line spacing racks, means for permitting tilting thereof, means for effecting fine longitudinal adjustment of the racks, and means operative when the racks are raised to lock the same against rearward movement.

24. In a flat platen typewriter, tiltable and longitudinally slidable line spacing racks, means for effecting fine longitudinal shifting thereof, and means operative when the racks are raised to lock the same automatically against rearward sliding.

25. In a flat platen typewriter, tiltable and longitudinally slidable line spacing racks, self-retaining means for effecting fine longitudinal shifting thereof, and means operative when the racks are raised to lock the same automatically against rearward sliding.

26. In a flat platen typewriter, tiltable line spacing racks, means for permitting fine longitudinal shifting thereof, means for securing the racks against longitudinal shifting when in normal position, and means operative when the racks are raised to lock the same automatically against rearward shifting.

27. In a flat platen typewriter, tiltable line spacing racks, means for permitting fine longitudinal shifting thereof, means operative when the racks are raised to lock the same automatically against material rearward movement, and means operative when the racks are returned to normal position to exactly re-position the same.

28. In a flat platen typewriter, tiltable and longitudinally slidable line spacing racks, means for effecting fine longitudinal shifting

thereof, means operative when the racks are raised to lock the same automatically against material rearward movement, and a guide disposed to automatically return the racks to exact position when lowered.

29. In a flat platen typewriter, tiltable line spacing racks, means for permitting fine longitudinal shifting thereof, means for securing the racks in shifted horizontal position, means operative when the racks are raised to lock the same automatically against material rearward movement, and means operative upon lowering of the racks to automatically return the same to exact position.

30. In a flat-platen typewriter, the combination of a flat-platen, horizontally-disposed longitudinal line-spacing racks slidable horizontally in the direction of their length, and a manually-operated screw-controlled device arranged at the forward part of said racks and rotatable to effect minute, fractional movement of said racks longitudinal in either direction relative to the platen.

31. In a flat-platen typewriter, the combination of a flat-platen, horizontally-disposed longitudinal line-spacing racks slidable horizontally in the direction of their length, and a manually-operated screw-controlled device arranged at the forward part of but independent of said racks and rotatable to effect minute, fractional movement of said racks longitudinal in either direction relative to the platen.

32. In a flat-platen typewriter, a support, line-spacing racks tiltable and longitudinally slidable horizontally thereon, and a manually-operated screw-device mounted on the support and engaging the racks to shift them horizontally and for distances fractional of regular line-spaces for interline-writing.

33. In a flat platen typewriter, a support, spaced plates thereon, line spacing racks tiltable and longitudinally slidably connected to one of said plates and resting slidably upon the other plate, and an adjusting screw mounted on the last named plate to cooperate with the racks.

34. In a flat platen typewriter, a support, line spacing racks tiltable and longitudinally slidable thereon and provided at their forward ends with a depending flange, and an adjusting screw device mounted on the support in engagement with said flange.

35. In a flat platen typewriter, tiltable hinge members, and longitudinal line spacing racks secured thereto for upward-tilting and for sliding in the direction of their length.

36. In a flat platen typewriter, a support, a platen mounted thereon, hinge members tiltable connected thereto, and tiltable longitudinal line spacing racks secured to said hinge members for adjustment in the direction of their length when in their normal position.

37. In a flat platen typewriter, tiltable

hinge members provided with slots formed longitudinally therein, longitudinal line spacing racks mounted thereon, and enlarged-headed fastening devices let into said racks and working in said slots.

38. In a typewriter, a flat platen, tiltable hinge members, longitudinal line spacing racks tiltable with and slidable on said hinge members, and longitudinally disposed locking racks and pawls interposed between the racks and hinge members to prevent rearward movement of the line spacing racks when tilted.

39. In a typewriter, a flat platen, tiltable hinge members, longitudinal line spacing racks tiltable with and slidable on said hinge members, longitudinally disposed locking racks and pawls interposed between the line spacing racks and hinge members to prevent rearward movement of the spacing racks when tilted, and means for removing the pawls from engagement with the locking racks when the line spacing racks are depressed to normal position.

40. In a typewriter, a tiltable track frame, a tiltable hinge member on which said frame is mounted, a longitudinally disposed locking rack and pawl interposed between the track frame and hinge member, the pawl being arranged to engage automatically with the rack upon elevation of the frame, and means for automatically removing the pawl from engagement with the rack upon depression of the track frame to normal position.

41. In a flat platen typewriter, tiltable line spacing racks connected to move together, a tiltable hinge member upon which said racks are mounted, a longitudinal locking rack disposed upon the top of said hinge member, a pivoted pawl mounted on the line spacing racks and arranged to engage automatically with the locking rack upon tilting of the line spacing racks, and means for automatically disengaging the pawl upon depression of the racks to normal position.

42. In a flat platen typewriter, tiltable line spacing racks connected to move together, a tiltable hinge member upon which said racks are mounted, a longitudinal locking rack disposed upon the top of said hinge member, a pivoted pawl connected to the line spacing racks and arranged to engage automatically with the locking rack upon tilting of the spacing racks, and a stud depending from said pawl and disposed to automatically lift the same out of engagement with the locking rack upon depression of the spacing racks to normal position.

43. In a flat platen typewriter, tiltable line spacing racks connected to move together, a tiltable hinge member upon which said racks are mounted, a longitudinal locking rack formed on said hinge member, a pawl pivotally connected to the spacing racks, a spring disposed to cause automatic

engagement of the pawl with the locking rack upon tilting of the spacing racks, and means for automatically disengaging the pawl upon depression of the spacing racks to normal position.

44. In a flat platen typewriter, tiltable hinge members having longitudinal locking racks disposed on their upper surfaces, longitudinal line spacing racks mounted on said hinge members to tilt therewith and having downward opening internal chambers, longitudinal slotted connection between the spacing racks and hinge members, and locking pawls mounted in said chambers.

45. In a typewriter, hinged track-rails constructed to be adjusted horizontally and, also, to be tilted vertically, a carriage movable longitudinally on said track rails, means for adjusting said track rails and their supported carriage horizontally, said rails being hinged intermediate their length to present sections extending to the front and rear of the hinge point, whereby said rails will be operated when the carriage is disposed to one side of the hinge point, and means for locking the said carriage and rails against shifting in the direction of adjustment while said rails are being tilted vertically.

46. In a typewriter, track rails movable vertically and horizontally, a carriage movable longitudinally thereon, means for adjusting rails and carriage horizontally, and means for effecting locking of said rails in their adjusted position while said rails are being moved vertically.

47. In a typewriter, track rails movable vertically and horizontally, a carriage movable longitudinally thereon, means for adjusting rails and carriage horizontally, means for effecting automatic locking of said rails in their adjusted position while said rails are being moved vertically.

48. In a typewriter, a flat platen, hinged, tiltable track rails, a carriage movable longitudinally thereon for line spacing, spacing mechanism carried by the carriage, and a key-operated line finder carried by and traveling with the carriage.

49. In a typewriter, a flat platen, hinged, tiltable track rails, a carriage movable longitudinally thereon for line spacing, spacing mechanism carried by the carriage, and a key-operated line finder normally retracted from the printing point and constructed to be projected thereto.

50. In a typewriter, the combination with track rails, a carriage constructed to traverse said rails for line spacing and hinges upon which said track rails are movably supported at their rear, of means for automatically locking the rails to the hinges when said rails are tilted.

51. In a typewriter, tiltable track rails, a longitudinally traveling carriage supported on the rails, hinges upon which said rails are

supported at their rear, and constructed to permit horizontal sliding of the rails thereon, and an automatically operating locking device constructed to lock the rails to the hinges when said rails are tilted, and constructed to be automatically unlocked when said rails are returned to their normal horizontal position.

52. In a typewriter, the combination with movable track rails, and a longitudinally traveling carriage disposed thereon, of means for supporting the forward end of the track rails and constructed to guide the same into operative position, and an adjusting screw for moving the track rails longitudinally.

53. In a typewriter, the combination with a flat platen and an overlying writing mechanism, and with feed mechanism for imparting to one of said members a longitudinal step-by-step line spacing movement relative to the other, of minutely-shifting, screw-operated means for effecting longitudinal adjustment of said member, and a line finder carried by the writing mechanism to indicate the proper degree of adjustment.

54. In a typewriter, the combination with a flat platen, an overlying writing mechanism, and feed mechanism for positioning the writing mechanism over the platen for imprinting successive lines of writing, of minutely-shifting, screw-operated means for imparting to said writing mechanism a fine longitudinal shifting distinct from the line spacing movement, and a line finder carried by the writing mechanism to indicate the proper degree of shifting.

55. In a typewriter, the combination with a flat platen, an overlying writing mechanism, and feed mechanism for positioning the writing mechanism over the platen for imprinting successive lines of writing, of minutely-shifting, screw-operated means for imparting to said writing mechanism a fine longitudinal shifting distinct from the line spacing movement, a line finder carried by the writing mechanism and normally retracted from the printing point, and means for projecting said finder to the printing point.

56. In a typewriter, the combination with a longitudinally traveling carriage, tiltable and longitudinally-adjustable track rails upon which said carriage travels and comprising a flat-faced body portion and a round-faced rib raised above said flat-face body portion, and rollers carried by the carriage and arranged to travel upon said rib.

57. In a typewriter, the combination of a longitudinally traveling carriage, tiltable and longitudinally-adjustable track rails upon which said carriage travels and comprising a flat-faced body portion and a round-faced rib raised above said flat faced body-portion, rollers carried by the carriage and provided with a peripheral groove constructed to en-

gage the rib and steady the carriage during its travel.

58. In a typewriter, the combination of a longitudinally traveling carriage, track rails upon which said carriage travels and comprising an upper flat-faced body portion, a round-faced rib disposed on and extending above the plane of said upper flat-faced body portion, a flange formed on one side of said body portion, peripherally grooved rollers carried by the carriage and constructed to engage said rib, and flat-faced rollers also carried by the carriage and constructed to engage the under surface of said flange.

59. In a typewriter, a longitudinally traveling carriage, track rails upon which said carriage travels, dog-mechanism carried by the carriage, toothed members connecting with said dog-mechanism, feed racks formed on said track rails and with which said toothed members engage, peripherally grooved rollers carried by said carriage, said track rails comprising a body portion, a rib formed on the upper face thereof and constructed to be engaged by said peripherally

grooved rollers, and a flange formed on the side of said rails and constructed to be engaged by said flat-faced rollers.

60. In a flat platen typewriter, a longitudinal track rail having a feed rack disposed on its upper surface, a guiding rib projecting above said upper surface, and a laterally projecting flange having a continuously level lower surface.

61. In a flat platen typewriter, the combination of longitudinal track rails, and a longitudinally traveling carriage mounted thereon and bearing against both the upper and lower surfaces thereof.

62. In a typewriter, the combination of a flat platen, of a support, and track rails longitudinally slidable on said support.

In testimony whereof, I affix my signature, in the presence of two subscribing witnesses.

GEORGE W. DONNING.

Witnesses:

W. L. BILLMYER,
H. T. AMBROSE.