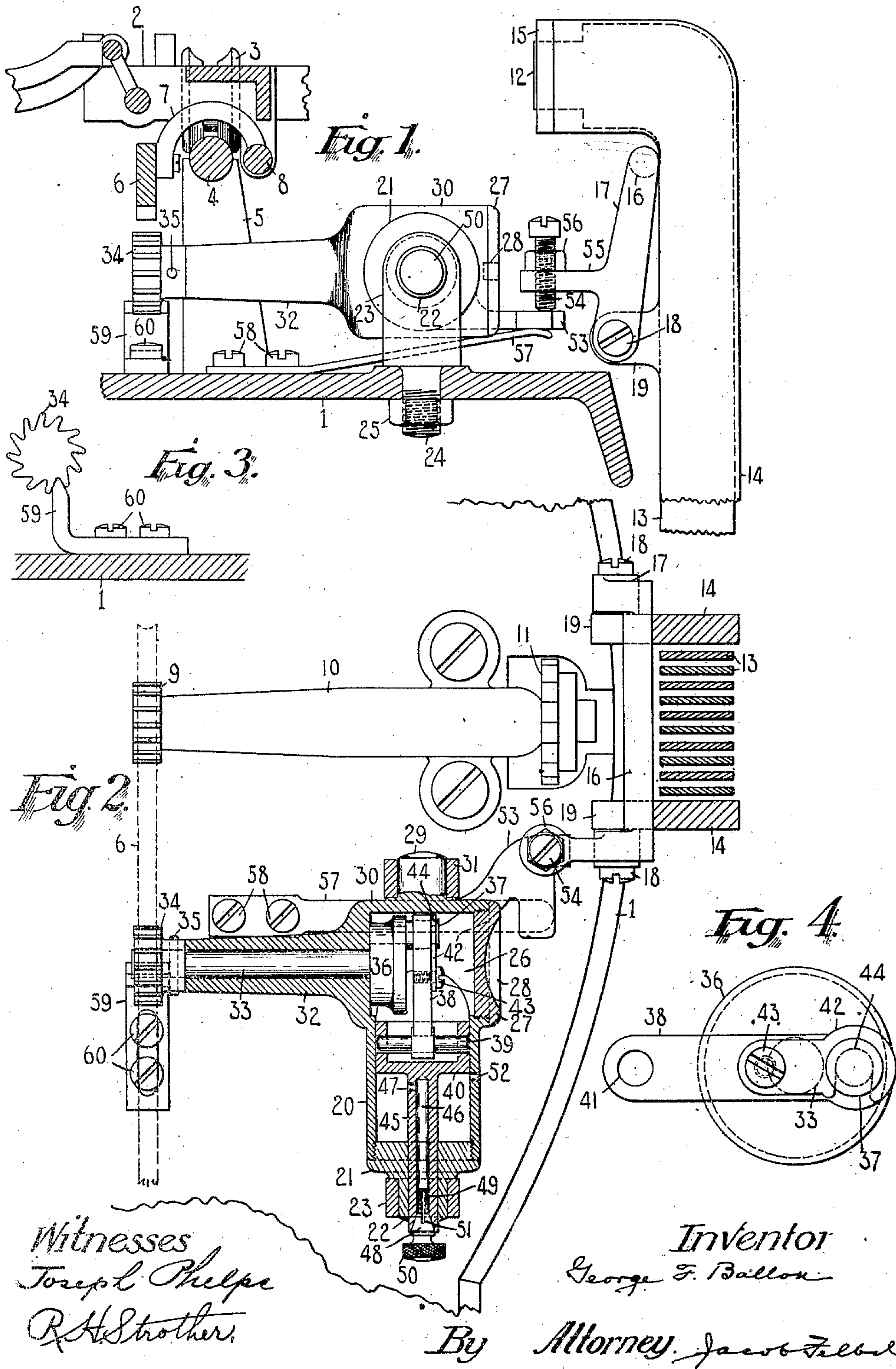


G. F. BALLOU.
TYPE WRITING MACHINE.
APPLICATION FILED MAY 8, 1905.

929,271.

Patented July 27, 1909.



UNITED STATES PATENT OFFICE.

GEORGE FREDERICK BALLOU, OF NEW YORK, N. Y., ASSIGNOR TO WYCKOFF, SEAMANS & BENEDICT, OF ILION, NEW YORK, A CORPORATION OF NEW YORK.

TYPE-WRITING MACHINE.

No. 929,271.

Specification of Letters Patent.

Patented July 27, 1909.

Application filed May 8, 1905. Serial No. 259,358.

To all whom it may concern:

Be it known that I, GEORGE FREDERICK BALLOU, citizen of the United States, and resident of New York city, in the borough of Manhattan 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 to typewriting machines and has for its principal object to provide improved means for releasing the carriage and for controlling the speed with which the carriage moves when released.

My invention is more especially intended for use as part of a tabulating mechanism.

My invention consists of certain features of construction and combinations and arrangements of parts which will be fully set forth herein and particularly pointed out in the claims.

In the accompanying drawings, Figure 1 is a front to rear sectional view of a portion of a typewriting machine having my invention embodied therein. Fig. 2 is a top plan view of the same, partly in section. Fig. 3 is a detail as seen from the front of the machine. Fig. 4 is a detail view of a crank and pitman as seen from the rear.

I have shown my invention applied to a No. 6 Remington typewriter. As this machine is of well known construction I have shown only so much thereof as is necessary to illustrate the application of my invention thereto. The main frame of said typewriter comprises a top plate 1, and a carriage 2 is mounted to move transversely across the machine. Said carriage has rollers 3 which run on a rail 4 which is supported from the top plate by posts or brackets 5. A feed rack 6 is mounted on said carriage, being supported by arms 7 which are pivoted to the carriage at 8. Said feed rack has gear teeth on the under side thereof which mesh with a feed pinion 9 which is fixed on a shaft that is journaled in a housing 10 secured to the top plate, and an escapement wheel 11 mounted on said shaft is controlled by feed dogs in the usual manner. The carriage is drawn across the machine by a spring drum. The construction is such that ordinarily a step-by-step feed of the carriage is afforded by the escapement mechanism, but the rack 6 may be raised, the arms 7 turning about their piv-

ots, and the rack be thus disengaged from the pinion 9 of the step-by-step feed mechanism.

The tabulating mechanism comprises denomination stops 12 consisting of the upper ends of levers 13 which are pivoted in a frame which comprises uprights 14 which come up behind the top plate and which are joined at their upper ends by a transverse plate 15 in which are slots through which the stops 12 play, said slots serving to properly space said stops. The stops 12 cooperate with column stops mounted on a tabulator bar which in turn is mounted on the carriage 2. The frame pieces 14 are suitably secured to the main frame of the machine and the levers 13 are controlled by denomination keys at the front of the machine through push rods extending beneath the character key levers. I have not shown these details of the tabulator mechanism partly because they are well known and partly because their precise construction is immaterial so far as the present invention is concerned, this invention having to do with the means for releasing the carriage and for preventing it from moving at too high a speed when released.

The upper ends of the frame pieces 14 and of the levers 13 extend toward the front of the machine, as shown in Fig. 1. A universal bar 16 lies in front of the levers 13 and below the forward extensions of said levers. Said universal bar is in the nature of a yoke bar connecting two arms 17 which are pivoted on shouldered and headed screws 18 threaded into lugs or brackets 19 projecting toward the front of the machine from the frame pieces 14.

I provide a dash pot cylinder having a to and fro moving piston therein connected with a crank on a shaft having a pinion which is adapted to be moved into engagement with the rack 6 and to lift said rack. Said cylinder, the bearing for said shaft and a chamber for said crank are all preferably formed of a single casting tiltably mounted on trunnions. The dash pot cylinder 20 lies horizontally above the top plate on one side of the housing 10 of the escapement mechanism. One end of said cylinder is closed by a screw cap 21, a reduced extension 22 of which constitutes one of the trunnions referred to. Said trunnion is journaled in a bracket 23, the lower end 24 of which is reduced and passes

through an opening in the top plate 1. The bracket is secured in position by a nut 25 threaded on to the reduced portion 24. The opposite end of the cylinder 20 opens into a chamber 26 which is closed by a screw-cap 27 having a slot 28 cut in its face for the insertion of a screwdriver. The screw-cap 27 constitutes the rear wall of the chamber 26 as indicated in Fig. 2. In the process of manufacture the cylinder 20 may be bored out from the right-hand end and the chamber 26 from the rear, the parts being subsequently closed by the caps 21 and 27. A trunnion 29 projects from the side wall 30 of the chamber 26 and is journaled in a bracket 31 similar to and mounted in the same manner as the bracket 23. The casting 20, 30 has a forwardly extending portion 32 which constitutes a housing and bearing for a shaft 33, on the forward end of which is mounted a pinion 34 which is secured to said shaft by a pin 35 passing through said shaft and the hub of said pinion. Within the chamber 26 the shaft 33 carries a wheel or crank disk 36, from which projects a crank pin 37 which is connected by a pitman 38 with a pin 39 in a piston 40 which is adapted to play back and forth in the cylinder 20. The face of the piston 40 next to the chamber 26 is chambered out as shown in Fig. 2, and the pin 39 passes through said chambered portion, said pin having a tight fit in suitable openings in the walls of the piston. The pin 39 passes loosely through an opening 41 (Fig. 4) in the pitman 38. In assembling the parts the shaft 33 is put in position and the piston 40 having the pitman 38 mounted thereon is inserted in the cylinder, said pitman being slid over toward the rear end of the pin 39. The pitman is then pushed back over the crank pin 37, sliding into its operative position on the pin 39, and said pitman is retained in this position by a latch or retaining device 42. Said device consists of a plate of metal mounted on the rear side of the pitman 38 by means of a headed screw 43. Said plate has an open-ended slot therein, the width of which is less than the diameter of the crank pin, and in the crank pin is formed an annular groove 44 (Fig. 2) into which the plate 42 is turned. Said plate is then secured in position by tightening the screw 43. The plate 42 prevents any motion of the pitman in a front or back direction.

The screw-cap 21 and trunnion 22 have a central longitudinal opening through which passes a piston rod 45 of the piston 40. Said piston rod extends out through the end of the trunnion, as shown in Fig. 2. Said piston rod has a longitudinal bore 46 which is open at the outer end of said rod, but does not extend through the piston. Said bore is connected by an opening or port 47 with that part of the cylinder which is back of the pis-

ton 40. The outer end of the bore 45 is tapered to receive a tapered valve 48 forming part of the hub of a screw 49 which is threaded into the bore 46. Said screw also has a milled head 50 for adjusting the same. A slot 51 in the screw 49 terminates about midway of the tapered valve 48, and said slot serves as a vent for the portion of the cylinder 20 behind the piston 40, and the size of said vent may be regulated by adjusting the screw 49 by means of the milled head 50.

A port or opening 52 is formed in the side of the cylinder 20 about midway of its length in such position that when the piston is at one end of its stroke, said port opens into the outer end of the cylinder and when the piston is at the other end of its stroke said port opens into the end of the cylinder connected with the chamber 26, but said port is closed during the greater part of the stroke of the piston.

A bracket 53 projects from the casting 20, 30 into position to be engaged by the lower end of a screw 54 which is threaded through an arm 55 projecting toward the front of the machine from one of the arms 17 of the universal bar 16. The screw 54 is provided with a lock nut 56. The construction is such that when any tabulator stop is moved toward the front of the machine into operative position, the rear end of the trunnioned member will be depressed and the forward end carrying the pinion 34 will be elevated, thus raising said pinion into engagement with the rack 6. The screw 54 is so adjusted that the pinion 34 is not only raised into engagement with the rack 6 but also raises said rack out of engagement with the pinion 9, thus releasing the carriage from the step-by-step feed device. The trunnioned member is held in its normal position by a flat spring 57 which is secured by screws 58 to the top plate of the machine and which presses up beneath the bracket 53. Said spring presses the pinion 34 into engagement with an arresting and positioning tooth or bracket 59 which is secured by screws 60 to the top plate 1. As shown in Fig. 2, the screws 60 pass through elongated slots in the bracket 59 so that said bracket may be adjusted in a direction toward or from the pinion 34. The upper edge of said bracket serves as a tooth which enters the space between two of the teeth of the pinion, thus positioning the pinion when in its normal position. By adjusting the bracket 59 before the screws 60 are tightened, the normal position of the pinion 34 may be made such that when said pinion is raised into engagement with the rack 6 its teeth will mesh properly with the teeth of said rack.

In operation one of the tabulator levers 13 is moved toward the front of the machine by a tabulator key or by whatever means are provided for the purpose, thus moving one

of the stops 12 into the path of the column stop on the carriage. The universal bar is moved by the lever 13, depressing the rear end of the trunnioned member and elevating the pinion 34 which raises the rack 6 and releases the carriage from the step-by-step feed device. As the carriage is drawn toward the left by the spring drum, the pinion 34 is rotated, and the piston 40 is moved to and fro in the cylinder 20. The outer end of said cylinder acts as a dash pot, the air compressed therein escaping through the slot 51. During the outward stroke of the piston a partial vacuum will be formed in the nearly closed chamber, which vacuum contributes toward retarding the piston. If this partial vacuum continued after the outward stroke of the piston was completed and the return stroke begun it would tend to accelerate the return stroke of the piston; but when the piston reaches its extreme outer position the port 52 is opened into the chamber 26, thus admitting air to fill the partial vacuum so that on the return stroke of the piston it is compressing the air within the chamber. On said return stroke of the piston there is also a certain amount of suction in the outer end of the cylinder, but when the piston reaches its extreme inner position the port 52 is opened into said cylinder, thus filling the partial vacuum. The port 52 thus plays a very important part in the operation of a to and fro moving dash pot device of this character. I have not shown any adjustable vent in the chamber 26, but the air leaks into and out of said chamber around the shaft 33 and the cap 27; I shall, therefore, refer to this in the claims as a nearly closed chamber, meaning that said chamber is not absolutely air-tight but that it has about the amount of leakage that is needed in a dash pot.

When the carriage is arrested by the tabulator stops the tabulator key is released and the parts are restored to normal position by the spring 57, thus disconnecting the carriage from the returning device and connecting it with the step-by-step feed device.

Various changes may be made in the details of construction and arrangement without departing from my invention.

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

1. In a typewriting machine, the combination of a carriage; a step-by-step feed device for said carriage; a dash-pot retarding device; means for simultaneously releasing said carriage from said step-by-step feed device and connecting it with said dash-pot retarding device, and means for continually reciprocating a part of said dash-pot device during the motion of the carriage in one direction.

2. In a typewriting machine, the combination of a carriage; a step-by-step feed device for said carriage; a tabulator mechanism,

a dash-pot retarding device, means operated by said tabulator mechanism for releasing said carriage from its step-by-step feed device and simultaneously connecting it with said dash-pot retarding device, and means continually reciprocating a part of said dash-pot device during the motion of the carriage in one direction.

3. In a typewriting machine, the combination of a carriage; a step-by-step feed device for said carriage; a tabulator mechanism; a dash-pot; a gear connected with said dash-pot; means operated by said gear continually to reciprocate a part of said dash-pot during the run of the carriage; and means controlled by said tabulator mechanism for releasing said carriage from its step-by-step feed device and connecting said gear with said carriage.

4. In a typewriting machine, the combination of a carriage; a dash-pot; gearing for connecting said dash-pot with said carriage; and means operated by said gearing for continually reciprocating a part of said dash-pot during the motion of the carriage in one direction.

5. In a typewriting machine, the combination of a carriage; a dash-pot; gearing for connecting said dash-pot with said carriage; means operated by said gearing for continually reciprocating a part of said dash-pot during the motion of the carriage in one direction; and means for coupling up and uncoupling said gearing.

6. In a typewriting machine, the combination of a carriage having a feed rack; a dash-pot device pivotally mounted and having a pinion; means for rocking said dash-pot device to move said pinion into or out of mesh with said rack; and means operated by said pinion for continually reciprocating a part of said dash-pot during the motion of the carriage in one direction.

7. In a typewriting machine, the combination of a carriage, a step-by-step feed device and a release device for said carriage; a dash-pot device; and means whereby said carriage, when it is released, imparts a plurality of to-and-fro motions to a part of said dash-pot device during the run of the carriage.

8. In a typewriting machine, the combination of a carriage; a shaft adapted to be geared to said carriage; and a to and fro moving dash pot device connected with said shaft, said dash-pot device having a plurality of to-and-fro motions during the travel of the carriage in one direction.

9. In a typewriting machine, the combination of a carriage; a tabulator device; a dash-pot device including a to and fro moving part and means controlled by said tabulator device for simultaneously releasing said carriage and throwing said dash-pot device into operation, said part having a plurality of to-

and-fro motions during the run of the carriage.

10. In a typewriting machine, the combination of a carriage; a shaft adapted to be geared to said carriage; and a dash-pot device connected with said shaft by an eccentric and pitman.

11. In a typewriting machine, the combination of a carriage having a feed rack; a shaft having a pinion adapted to mesh with said feed rack; a to and fro moving dash-pot device connected with said shaft; and a tabulator mechanism adapted to move said pinion into engagement with said rack and to raise said rack by said pinion to release the carriage, said dash-pot device having a plurality of to-and-fro motions during the run of the carriage.

12. In a typewriting machine, the combination of a carriage and a dash-pot device including a to and fro moving part for controlling the movement of said carriage, said dash-pot device having a vent at one end and a port that is opened at the end of a stroke.

13. In a typewriting machine, the combination of a carriage; a shaft adapted to be geared to said carriage; a crank on said shaft; and a dash-pot comprising a cylinder and a piston, said piston being connected with said crank, and said crank being located in a chamber into which said cylinder opens at one end, said chamber being tight enough to cause the air to be compressed therein by said piston.

14. In a typewriting machine, the combination of a carriage; a shaft adapted to be geared to said carriage; a crank on said shaft; a chamber in which said crank is located; a dash-pot cylinder opening at one end into said chamber; a piston in said cylinder connected with said crank; an adjustable port opening into the other end of said cylinder; and a port in said cylinder near the middle of its length, said chamber being tight enough to cause the air to be compressed therein by said piston.

15. In a typewriting machine, the combination of a carriage; a shaft adapted to be geared to said carriage; a crank on said shaft; a chamber in which said crank is located; a dash-pot cylinder opening at one end into said chamber; a piston in said cylinder; a transverse pin in said piston; a pitman loosely mounted on said pin and slidable along said pin to connect it with said crank; means for holding said pitman in position on said crank; and a cover for said chamber.

16. In a typewriting machine, the combination of a carriage; a feed-rack movably mounted on said carriage; a step-by-step device controlling said feed-rack; a dash-pot device pivotally mounted in the frame of the machine; means for rocking said dash-pot device on its pivot and thereby raising said rack to release the carriage from its step-by-

step device and connecting said carriage with said dash-pot device; and means for continually reciprocating a part of said dash-pot device during the run of the carriage in one direction.

17. In a typewriting machine, the combination of a carriage; a feed rack on said carriage; a step-by-step device cooperating with said feed rack; a dash-pot device pivoted to the frame of the machine; a pinion connected with said dash-pot device; a tabulator; means whereby said tabulator, when operated, rocks said dash-pot device, moving said pinion into engagement with said rack and raising said rack to release the carriage; and means operated by said pinion for continually reciprocating a part of said dash-pot device during the run of the carriage.

18. In a typewriting machine, the combination of a carriage; a feed rack on said carriage; a step-by-step feed device cooperating with said rack; a tabulator device comprising a series of stops movable to position to arrest the carriage; a universal bar lying in front of said stops; an arm projecting from said universal bar; a tilting retarding device pivoted on the frame of the machine and having a part in the path of said arm, said retarding device comprising a pinion that normally stands below said rack and that is adapted, when said retarding device is tilted, to raise said rack to release the carriage; and a positioning tooth against which said pinion normally rests.

19. In a typewriting machine, the combination of a carriage; a rack bar on said carriage; a tabulator device; and a retarding device for retarding the motion of the carriage when released, said retarding device comprising a dash-pot cylinder and a chamber into which one end of said cylinder opens, a piston in said cylinder, a crank in said chamber connected with said piston, a shaft for said crank having a pinion on its outer end, trunnions on which said cylinder and chamber may rock to move said pinion into and out of engagement with said rack; and means whereby said tabulator tilts said retarding device on its trunnions.

20. In a typewriting machine, the combination of a carriage, escapement devices therefor, a shaft arranged to be rotated by a part moving with the carriage, key-actuated means for connecting said shaft with said moving part and disconnecting said escapement devices, and a fluid-pressure device for retarding the speed of the carriage connected with and operated by said shaft, said fluid pressure device comprising a part continually reciprocated by said shaft during the motion of the carriage in one direction.

21. In a typewriting machine, the combination with a carriage, of carriage-retarding means including a shaft arranged to be rotated by the carriage, and an air-compressor

comprising two coöperative parts, one of these parts being connected with and operative by said shaft to be continually reciprocated thereby during the motion of the carriage in one direction, and one of them containing an air-chamber in which the other is confined.

22. In a typewriting machine, the combination with the carriage, of carriage-retarding means including a shaft arranged to be rotated by the carriage, and an air-compressor comprising two coöperative parts, one of these parts being connected with and operative by said shaft to be continually reciprocated thereby during the motion of the carriage in one direction, and one of them containing an air-chamber in which the other is confined, said air-chamber having a vent.

23. In a typewriting machine, the combination with the carriage, of carriage-retarding means including a shaft arranged to be rotated by the carriage, and an air-compressor comprising two coöperative parts, one of these parts being connected with and operative by said shaft to be continually reciprocated thereby during the motion of the carriage in one direction, and one of them containing an air-chamber in which the other is confined, said air-chamber having a vent, and one of said parts having on it means for regulating the size of the vent.

24. In a typewriting machine, the combination with the carriage, of carriage-retarding means including a shaft arranged to be rotated by the carriage, and an air-compressor comprising two coöperative parts, one of these parts containing an air-chamber, and the other being confined in said air-chamber and being connected with and operative by said shaft to be continually reciprocated thereby during the motion of the carriage in one direction.

25. In a typewriting machine, the combination with the carriage, of carriage-retarding means including a shaft arranged to be rotated by the carriage, and an air-compressor comprising two coöperative parts, one of these parts containing an air-chamber having a vent, and the other being confined in said air-chamber and being connected with and operative by said shaft to be continually reciprocated thereby during the motion of the carriage in one direction.

26. In a typewriting machine, the combination with the carriage, of carriage-retarding means including a shaft arranged to be rotated by the carriage, and an air-compressor comprising two coöperative parts, one of these parts containing an air-chamber having a vent, and the other being confined in said air-chamber and being connected with and operative by said shaft to be con-

tinually reciprocated thereby during the motion of the carriage in one direction and one of said parts having on it means for regulating the size of the vent.

27. In a typewriting machine, the combination with the carriage, of carriage-retarding means including a shaft, a pinion fast on the shaft, and an air-compressor comprising two coöperative parts, one of them consisting of a block containing an air-chamber and having in it the bearing of said shaft and being movable to engage the pinion with and to disengage it from the carriage, and the other part being confined in said air-chamber and being connected with and operative by said shaft.

28. In a typewriting machine, the combination with the carriage, of carriage-retarding means including a shaft, a pinion fast on the shaft, and an air-compressor comprising two coöperative parts, one of them consisting of a block containing an air-chamber and having in it the bearing of said shaft and being movable to engage the pinion with and to disengage it from the carriage, and the other part being confined in said air-chamber and being connected with and operative by said shaft, and said air-chamber having a vent.

29. In a typewriting machine, the combination with the carriage, of carriage-retarding means including a shaft, a pinion fast on the shaft, and an air-compressor comprising two coöperative parts, one of them consisting of a block pivoted on a fixed support and containing an air-chamber and having in it the bearing of said shaft and being movable on its pivotal axis to engage the pinion with and to disengage it from the carriage, and the other part being confined in said air-chamber and being connected with and operative by said shaft.

30. In a typewriting machine, the combination with the carriage, of carriage-retarding means including a shaft, a pinion fast on the shaft, and an air-compressor comprising two coöperative parts, one of them consisting of a block pivoted on a fixed support and containing an air-chamber and having in it the bearing of said shaft and being movable on its pivotal axis to engage the pinion with and to disengage it from the carriage, and the other part being confined in said air-chamber and being connected with and operative by said shaft, and said chamber having a vent.

Signed at Ilion, in the county of Herkimer, and State of New York, this 2nd day of May A. D. 1905.

GEORGE FREDERICK BALLOU.

Witnesses:

OSCAR WOODWARD,
JOSEPH PHELPS.