

A. W. SMITH.
TYPE WRITING MACHINE.
APPLICATION FILED MAR. 11, 1910.

975,168.

Patented Nov. 8, 1910.

2 SHEETS—SHEET 1.

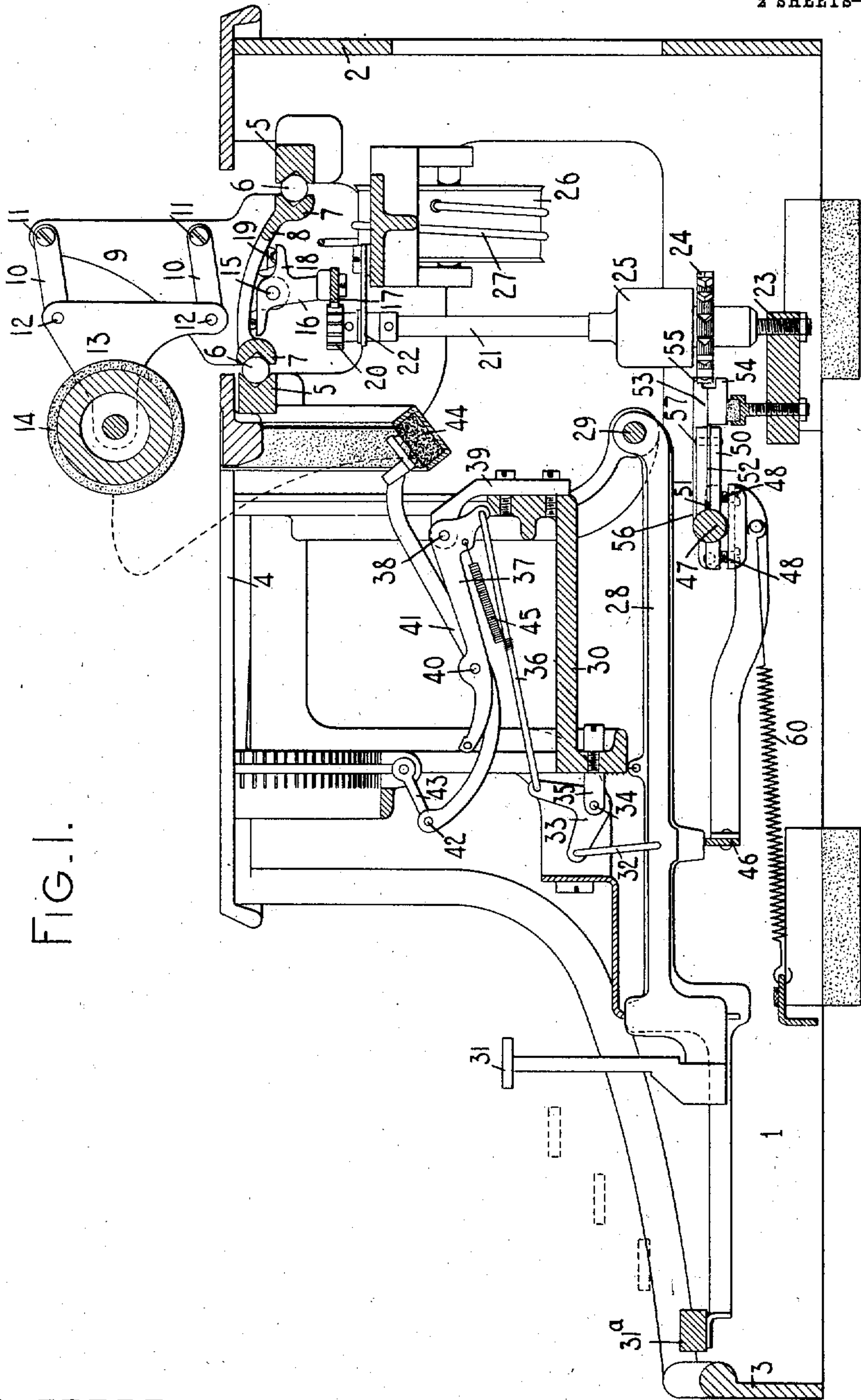


FIG. 1.

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Charles Smith

INVENTOR.

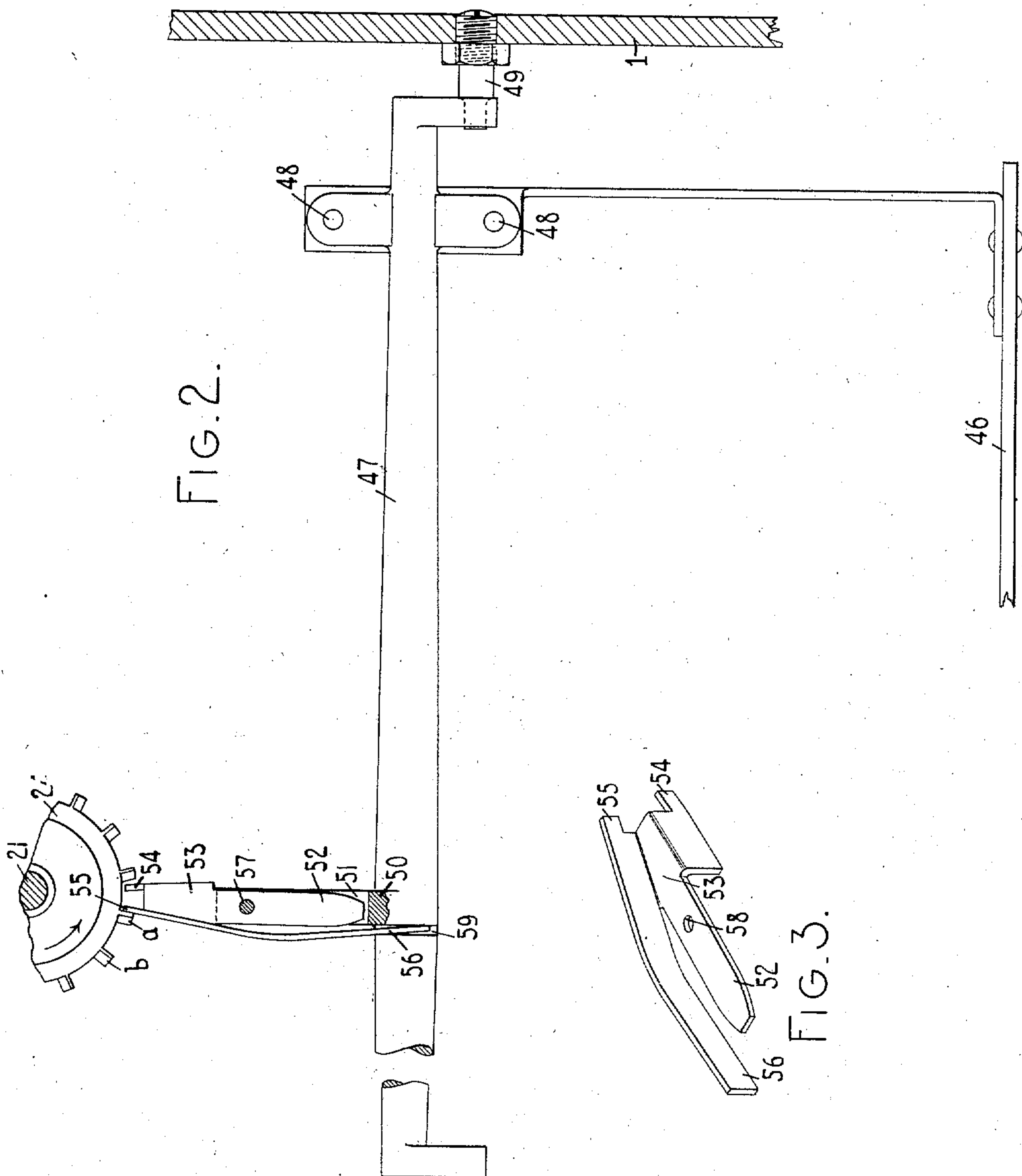
Arthur H. Smith
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HIS ATTORNEY

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Charles Smith

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UNITED STATES PATENT OFFICE.

ARTHUR W. SMITH, OF NEW YORK, N. Y., ASSIGNOR TO YOST WRITING MACHINE COMPANY, OF ILION, NEW YORK, A CORPORATION OF NEW YORK.

TYPE-WRITING MACHINE.

975,168.

Specification of Letters Patent.

Patented Nov. 8, 1910.

Application filed March 11, 1910. Serial No. 548,578.

To all whom it may concern:

Be it known that I, ARTHUR W. SMITH, citizen of the United States, and resident of the borough of Manhattan, city of New York, in the county of New York 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 more particularly to escapement devices for such machines.

Heretofore great objection has been found to the noise produced through the operation of the carriage escapement mechanism of typewriting machines, the noise ordinarily being most pronounced at each "drop" of the carriage in the letter feed movements thereof.

One of the main objects of my invention is to provide simple and efficient mechanism to overcome these objections, the mechanism being so constructed as to greatly reduce or entirely eradicate the noise ordinarily produced by an operation of the escapement devices.

To the above and other ends which will hereinafter appear, my invention consists in the features of construction, arrangements of parts and combinations of devices to be hereinafter described and particularly pointed out in the appended claims.

In the accompanying drawings wherein like reference characters indicate corresponding parts in the various views, Figure 1 is a vertical central fore and aft sectional view showing a sufficient number of parts of one form of typewriting machine to illustrate my invention in its embodiment therein. Fig. 2 is an enlarged detail fragmentary plan view showing parts of the escapement mechanism. Fig. 3 is an enlarged detail perspective view of the feed dogs and carrier on which they are formed.

I have shown my invention embodied in the present instance in a Yost visible machine but it should be understood that the invention may be embodied in various styles of typewriting machines and that the escapement devices may be variously arranged, constructed and applied within the broad aspects of my invention, the particular construction in the present instance

being but one form which I have chosen to illustrate my invention, although from certain aspects I prefer the form illustrated because of its simplicity in construction and its proven efficiency in use.

The frame of the machine comprises side plates 1, a rear cross plate 2, a front cross plate 3 and a top plate 4. Grooved carriage rails 5 are fixedly secured on the side plates of the machine and receive anti-friction balls or rollers 6 which are likewise received in oppositely grooved rails 7 formed as a part of a carriage 8 provided with upwardly extending end plates 9 to which parallel links 10 are pivoted at 11, the forward ends of said links being pivoted at 12 to a platen frame 13 which supports a cylindrical platen 14. The carriage has pivoted thereto at 15 depending arms 16 which carry at their lower ends a feed rack 17. The depending arms 16 are likewise provided with rearwardly extending arms 18 with which leaf springs 19 cooperate to move the arms 16 forwardly around their pivots to maintain the feed rack 17 in mesh with its cooperative feed pinion 20. The feed pinion 20 is fixed to a shaft 21 supported by a bracket arm 22 at the upper end portion thereof and supported at its lower end by a bearing screw 23. An escapement rack 24 which in the present instance is shown as a circular rack or escapement wheel, is operatively connected to the shaft 21 by the usual clutch mechanism contained within a housing 25. A spring drum 26 has a cord or band 27 connected at one end thereto, the other end of the band being connected to the carriage to move it from right to left across the machine under control of the escapement mechanism. Key levers 28 are pivoted at 29 to an auxiliary frame 30 secured to the main frame of the machine. Each key lever is provided with a finger key 31. Each key lever is pivotally connected to an upwardly extending link 32 which in turn is connected at its upper end to the forwardly extending arm of an angular lever 33 pivoted at 34 to a hanger 35. The upwardly projecting arm of each angular lever is connected to the forward end of a pull link 36 which in turn is connected at its rear end to a driver 37 pivoted at 38 to a hanger 39. The driver 37 is pivoted intermediate its ends, as at 40, to a type bar

proper 41. The forward end of the type bar is pivoted at 42 to a guide link 43, the rear or type carrying end of the bar normally bearing against the face of an ink pad 44.

5 At each depression of the finger key 31 the type carrying end of the associated type bar moves in the path indicated by the dotted line in Fig. 1 and strikes against the front face of the platen.

10 The parts of each type action are assisted in their restoration to normal position by a restoring spring 45. A universal bar 46 extends beneath the key levers and is operatively and adjustably connected to a rock

15 shaft 47 by screws 48. The rock shaft 47 constitutes part of a dog rocker which is mounted to turn on pivot screws 49 received in tapped openings in the side plates 1 of the machine. The rock shaft is provided

20 with a rearwardly extending bifurcated arm 50 which is adapted to receive in the slot 51 thereof an arm 52 formed as a part of a sheet metal dog carrier 53. The dog carrier is struck up as shown in detail in Fig. 3 to

25 provide two rigidly connected feed dogs 54 and 55 spaced apart as shown in Figs. 2 and 3. An arm or projection 56 is formed on the carrier and is resilient so as to constitute a spring for normally maintaining the carrier

30 and feed dogs in normal position and in fixed relation with reference to the dog rocker. A pivot pin 57 passes through openings in the bifurcated rocker arm 50 and through an opening 58 in the dog carrier so

35 as to provide a pivotal connection between the feed dog carrier and the arm 50. The rock shaft 47 is provided with a slot or cut-out 59 at one side thereof for the reception of the lower free end of the spring member

40 or portion 56 of the dog carrier. Thus it will be understood that the lower free end of the spring is anchored to the rock shaft 47, whereas, the part intermediate the lower end of the spring and the body portion of

45 the dog carrier is adapted to be flexed as will hereinafter more clearly appear.

The construction and arrangement of the feed dogs is such that the escapement wheel 24 normally bears against the feed dog 55.

50 The pressure of the escapement wheel under the power of the spring drum 26 is effective normally to slightly flex the spring 56, turning the dog carrier 53 slightly on the pivot 57 as indicated in Fig. 2, although the power

55 of the spring 56 is preferably such as to substantially balance the effective power of the carriage spring transmitted through the escapement wheel at escapement operations. A depression of a finger key 31 or of the

60 space key 31^a is effective to depress the universal bar, thereby turning the rock shaft 47 and elevating the feed dogs to carry the dog 55 out of engagement with the engaged tooth *a* of the escapement wheel and bringing the

65 tooth 54 into the path of the oncoming, pre-

viously engaged tooth *a* (Fig. 2) of the escapement wheel. This affords a "drop" of the escapement wheel for a half letter space in the present instance. As pressure is released on the depressed finger key the uni- 70 versal bar and dog rocker are restored to normal position by a spring 60, thus again lowering the dog 55 into the path of the oncoming tooth *b* of the escapement wheel and disengaging the feed dog 54 from engage- 75 ment with the tooth *a*. This movement of the dog rocker affords a "half drop" of the escapement wheel during the movement of the tooth *b* into engagement with the feed dog 55. It will be understood that at each 80 half drop of the escapement wheel the impact of the wheel under the power of the carriage spring is received against one of the feed dogs 54 and 55 which are rigidly connected together and are fixed or held 85 against feed movement. These dogs, however, are resiliently supported by the spring 56 which resists the movement of the dogs from normal position, and the shock of impact at letter space movements of the escape- 90 ment wheel and the weight of the spring-impelled carriage against the feed dogs is borne and resisted wholly by the spring 56 which resiliently receives and absorbs the shock and greatly reduces or entirely eradicates 95 the noise ordinarily incident to an actuation of the escapement mechanism. The construction and arrangement of the parts and the tension of the spring 56 are preferably such that the spring 56 will be but very 100 slightly overcome or flexed by the pressure of the carriage spring exerted through the escapement wheel on the feed dogs. The flexure of the spring 56 under impact of the teeth of the escapement wheel on the feed 105 dogs may vary in degree, depending on the manner in which the escapement mechanism is actuated, but in all cases the construction will automatically and resiliently, so to speak, absorb the shock incident to the im- 110 pact of the teeth of the escapement wheel on the feed dogs without effecting a letter space or having an appreciable effect upon the letter space movement of the carriage.

It should be understood that at each letter 115 feed movement of a power driven carriage a shock is ordinarily exerted throughout the entire train of connections between the carriage and the final point of resistance or support. In the present construction the 120 final point of resistance would be the shouldered pivot 49 which is the point at which the thrust of the dog rocker under the impact of the escapement wheel on the dogs is communicated to the solid frame-work of 125 the machine.

While in the present instance I have elected to place the spring 56 in the position shown to absorb the shock and thus provide a practically noiseless escapement, I may, 130

nevertheless, from the broader aspects of my invention, place the spring at any point in the train of connections between the carriage and the final point of resistance. Thus
 5 for example, I have disclosed in a companion application Serial No. 548,579, filed of even date herewith a spring that opposes axial movement of the dog rocker 47 to the right so that the shock is borne at the point
 10 of final resistance. Certain of the claims contained herein are intended to cover such a construction. It will be understood therefore that various changes may be made without departing from my invention.
 15 Within certain other aspects of my invention any spring means which wholly supports one of the escapement members or wholly and resiliently resists the impact of one escapement member on another at the
 20 letter space movements of the carriage, and when the carriage is brought to rest by said escapement members, may serve the purpose of my present invention.

It will be observed that the devices of my
 25 invention are simple in construction and are efficient in use, and in accordance with the construction as shown in the present instance the carrier 53, feed dogs 54 and 55 and spring 56 may all be made from a single
 30 piece of sheet metal, and the spring 56 directly supports and resiliently resists the movement of the feed dogs in a letter-space direction under the pressure or impact of the teeth of the escapement wheel thereon.
 35 Moreover, it will be seen that the feed dogs are adapted to move with the dog rocker in a direction transverse to the plane of the escapement wheel and that the feed dogs and the carrier 53 are also pivoted at 57 to receive a slight movement in a direction at
 40 right angles to the transverse, or first mentioned, direction of movement of said dogs. Although this movement of the feed dogs around the pivot 57 produced at a flexion of the spring 56, is in the general direction of
 45 the movement of the escapement rack, such movement is insufficient to produce or in any manner effect a letter space movement of the escapement, which latter is effected
 50 and determined in the present instance wholly by the "drop" between the teeth of the escapement wheel and the dogs. The feed dogs may therefore be properly referred to as fixed or held against letter space movement.
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While ordinarily the spring 56 wholly resists the movement of the carriage under power of the spring drum thereof and as a consequence constitutes a cushion or resilient
 60 support for the carriage, yet in exceptional circumstances the arm 52 may be moved sufficiently far to contact with the lower anchored portion of the spring 56 and thus positively arrest the pivotal movement of
 65 the dogs. This action, however, only takes

place on rare occasions as when a positive pressure is exerted, by hand or otherwise, to move the carriage in the direction of its feed while the feed rack 17 is engaged with its cooperative feed pinion. The arm 52
 70 contacting with the spring 56 therefore merely operates to oppose a positive resistance in exceptional circumstances and acts as a safety device to prevent an overflexing of the spring 56 and a possibility of injuring the spring or other parts of the mechanism by such undue flexing of the spring.
 75

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

1. In a typewriting machine, the combination of a power driven carriage, escapement devices which afford a free unretarded movement of the carriage at each letter feed movement thereof, and a shock absorbing spring intermediate the carriage and the
 80 final point of resistance to the power employed to move the carriage, said shock absorbing spring being free from pressure of the power driven carriage during its letter feed movement and resisting the power employed to move the carriage at the termination of each letter feed movement, whereby the carriage is allowed to travel freely during its letter feed movement and the shock due to the arrest of the carriage at the termination of each letter feed movement is absorbed.
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 90
 95

2. In a typewriting machine, the combination of a carriage, a feed rack, one or more feed dogs, the construction of the parts being such that an intermittent step-by-step feed movement of the carriage is afforded by a "drop" between the feed rack and dog or dogs, and resilient means for receiving the weight of the carriage at each
 100 "drop."
 105

3. In a typewriting machine, the combination of a carriage, a feed rack, two feed dogs cooperative therewith, and spring means cooperative with both of said dogs to resist
 110 a movement thereof from normal position.

4. In a typewriting machine, the combination of a carriage, a feed rack, two feed dogs cooperative therewith, and spring means cooperative with both of said dogs to resist
 115 a movement thereof from normal position, the construction of the parts being such that a feed movement of the carriage is afforded by a relative "drop" between the feed rack and dogs.
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5. In a typewriting machine, the combination of a carriage, a feed rack, two rigidly connected dogs, and spring means for affording and resisting a slight movement of both of said dogs due to the shock of arrest at the end of a stepping movement of said rack.
 125

6. In a typewriting machine, the combination of a carriage, a feed rack, two feed dogs separated to afford a "drop" of the feed rack from one to the other, and spring means
 130

for resisting the movement of both of said dogs in the direction of the feed movement of said rack.

7. In a typewriting machine, the combination of a power driven carriage, a feed rack, a dog rocker, two feed dogs carried by said dog rocker and which are moved by the dog rocker transversely to the plane of the feed rack, and spring means which resists the movement of both of said dogs from normal position and in the direction of the feed movement of the feed rack.

8. In a typewriting machine, the combination of a power driven carriage, coöperative escapement devices, and a spring the power of which substantially balances the power employed to move the carriage and which with said coöperative escapement devices resists the feed movement of the carriage at the termination of each intermittent feed movement thereof.

9. In a typewriting machine, the combination of a power driven carriage, coöperating escapement devices constructed and arranged to afford a feed movement of the carriage by a free "drop" between one escapement device and the other, and spring means which absorbs the shock of each drop.

10. In a typewriting machine, the combination of a power driven carriage, an escapement member comprising a rack, a coöperative escapement member comprising feed dogs both of the latter being held against letter-space movement, and spring means for absorbing the impact of the rack member on the dog member.

11. In a typewriting machine, the combination of a power driven carriage, a feed rack, feed dogs coöperative therewith, both of aid feed dogs being held against letter-space movement, and spring means which resists the power employed to move the carriage and which resists the movement of said dogs in a letter space direction.

12. In a typewriting machine, the combination of a power driven carriage, a feed rack, two rigidly connected feed dogs coöperative with said feed rack, a dog rocker, a carrier for said feed dogs, said carrier being pivoted to the dog rocker to afford a movement of the dogs in the direction of the feed movement of the rack, and spring means which resist the said pivotal movement of said carrier.

13. In a typewriting machine, the combination of a power driven carriage, a feed rack, and two feed dogs which coöperate with said feed rack, said dogs being held against letter space movement but slightly movable in the direction of the letter space movement of the feed rack and resiliently supported to absorb the impact of the rack against the dogs.

14. In a typewriting machine, the combination of a power driven carriage, a feed

rack, a coöperative escapement member comprising two rigidly connected feed dogs, and spring means which resist the movement of said dogs in the direction of the feed movement of the rack.

15. In a typewriting machine, the combination of a power driven carriage, a feed rack, a coöperating escapement member comprising two rigidly connected feed dogs, means for mounting said rigidly connected dogs for movement in two directions, one being in the direction of the movement of the rack and the other being transverse there and spring means which tends to resist the movement of the dogs in the direction of the feed movement of the rack.

16. In a typewriting machine, the combination of a power driven carriage, a feed rack, and a coöperating escapement member comprising two rigidly connected feed dogs, a spring arm to which said dogs are connected, a dog rocker on which said rigidly connected dogs are pivoted, and means for connecting said spring arm to the dog rocker, so that the spring arm will resist the movement of the rigidly connected dogs with the feed rack in a letter feed direction.

17. In a typewriting machine, the combination of a power driven carriage; two escapement members for controlling the movement of the carriage, one of said members being driven by the carriage and the other controlling the movement of the driven member; and a spring which constitutes the sole resistance to the movement of the controlling member under the action of the carriage driven member thereon, so that said spring alone resiliently supports the controlling escapement member against the power which tends to move the carriage.

18. In a typewriting machine, the combination of a power driven carriage, two escapement members for controlling the movement of the carriage, one of said members being driven by the carriage and the other controlling the movement of the driven member and receiving an impact therefrom at the end of each letter feed movement of the carriage, and a spring which through its resistance receives the impact of the companion or carriage driven member at the end of each letter feed movement of the carriage and resiliently resists its movement.

19. In a typewriting machine, the combination of a power driven carriage, two coöperating escapement members therefor and one of which receives the impact of the other at the end of each letter feed movement of the carriage, and spring means wholly supporting the impact of one escapement member on the other at the end of each letter feed movement of the carriage.

20. In a typewriting machine, the combination of a power driven carriage, and two coöperating escapement members therefor,

one of said escapement members moving under control of the carriage and the other being held against letter space movement but spring supported to wholly resist by its spring support the impact of the other or carriage driven escapement member thereon at each letter space movement of the carriage.

21. In a typewriting machine, the combination of a power driven carriage, two co-operating escapement members therefor, one of said members being a rack driven by the carriage and the other comprising two feed dogs rigidly connected and held against letter space movements, and a spring rigidly connected to said dogs and which receives and wholly resists the impact of the rack on said dogs.

22. In a typewriting machine, the combination of a power driven carriage, two co-operating escapement members therefor, one of said members being a rack driven by the carriage and the other two feed dogs rigidly connected and held against letter space movements but mounted for movement transversely of the rack, said dogs being arranged to afford a partial drop of the carriage at each transverse movement in one direction and at each transverse movement in the opposite direction, and spring means which wholly support the dogs against movement in a letter feed direction and wholly resist the impact of the rack on the dogs at letter space movements.

23. In a typewriting machine, the combination of a power driven carriage, an escapement rack, rigidly connected feed dogs arranged to afford a half drop at each forward and at each backward movement of the feed dogs, a dog rocker to which the rigidly connected feed dogs are pivoted and by which they are moved transversely of the feed rack, and a spring rigidly connected to the feed dogs and to said dog rocker and which constitutes the means by which the feed dogs are prevented from receiving a letter space movement and which resists the impact of the rack on the dogs during the letter feed movements of the carriage and resiliently supports the feed dogs when subjected to such impacts, the resilient support of the dogs being afforded by said spring and by the pivotal connection by which the dogs are connected to the dog rocker.

24. In a typewriting machine, the combination of a spring driven carriage, two escapement members which cooperate to control the feed movement of the carriage, one of said members being spring supported to resist the movement of the other under the power of the carriage spring, the energy of the spring of said spring supported member alone supporting and resisting a letter feed movement of both members under control of the carriage spring.

25. In a typewriting machine, the combination of a spring driven carriage, an escapement rack, and an escapement dog member, said dog member comprising a piece of sheet metal formed with two dogs and an integral spring which resists the movement of said dogs under pressure of the rack thereon.

26. In a typewriting machine, the combination of a spring driven carriage, an escapement rack, and an escapement dog member, said dog member comprising a piece of sheet metal formed with two dogs which are spaced apart to afford a partial drop of the rack at each forward and at each backward movement of the dogs through the rack, and an integral spring which resists the movement of said dogs under pressure of the rack thereon.

27. In a typewriting machine, the combination of a power driven carriage, a final point of resistance which opposes the movement of the carriage at letter feed movements, and intermediate connections between the carriage and the said final point of resistance, said connections including escapement devices which afford a free drop of the carriage at each letter feed operation, and a cushion, the cushion resisting the force of the carriage in its letter feed movement only at the termination of such letter feed movement and receiving and absorbing the shocks due thereto.

28. In a typewriting machine, the combination of a power driven carriage, escapement mechanism therefor, and a spring interposed between the carriage and the final point of resistance to the letter feed movements of the carriage exerted through the escapement devices, said spring being operative to sustain the escapement devices against letter feed movement under the power of the carriage applied to said devices and to absorb the shock produced by the step-by-step movements of the carriage.

29. In a typewriting machine, the combination of a power driven carriage; escapement mechanism therefor, said escapement mechanism including an escapement device driven by the power employed to move the carriage, a cooperative escapement device to resist said movement of said first-mentioned escapement member, a support for the second mentioned escapement device, and a spring interposed between said support and said second mentioned escapement device, said spring being operative to prevent letter feed movement of said second mentioned devices under the power of the carriage applied thereto and to absorb the shock produced by the step-by-step feed movements of the carriage.

30. In a typewriting machine, the combination of a carriage, two cooperative escapement members, one of which is resiliently

supported to resiliently resist the movement of the carriage at the termination of the feed movement of the carriage, and means whereby a positive resistance is offered to the movement of the carriage when undue pressure is exerted thereon.

31. In a typewriting machine, the combination of a carriage, a feed rack, one or more feed dogs, the construction of the parts being such that an intermittent step-by-step feed movement of the carriage is afforded by a "drop" between the feed rack and feed dogs, resilient means for receiving the weight of the carriage at each "drop," and means whereby a positive resistance is offered to the weight of the carriage when undue pressure is exerted on the carriage.

32. In a typewriting machine, the combination of a carriage, a feed rack, two feed dogs coöperative therewith, spring means coöperative with both of said dogs to resist a movement thereof from normal position, and means for positively resisting the movement of said dogs when undue pressure is exerted on the carriage.

33. In a typewriting machine, the combination of a spring driven carriage, two escapement members which coöperate to control the feed movement of the carriage, one of said members being spring supported to resist the movement of the other under the power of the carriage, the energy of said spring supported member alone supporting and resisting a letter feed movement of both members under control of the carriage

spring, and means whereby a positive resistance is offered to the spring supported member when undue pressure is exerted on the carriage.

34. In a typewriting machine, the combination of a power driven carriage, a feed rack, two feed dogs which coöperate with said feed rack, said dogs being held against letter space movement but slightly movable in the direction of the letter space movement of the feed rack and resiliently supported to absorb the impact of the rack against the dogs, and means whereby said dogs are rigidly supported when undue pressure is exerted on the carriage.

35. In a typewriting machine, the combination of a power driven carriage, two coöperative escapement members one of which receives a blow from the other at the end of each letter feed movement of the carriage, and a cushion interposed in the train of connections between one of said members and its final point of support or resistance, said cushion being operative to receive and absorb the blow of one of said members on the other at the end of each letter feed movement of the carriage.

Signed at the borough of Manhattan, city of New York, in the county of New York and State of New York, this 10th day of March, A. D. 1910.

ARTHUR W. SMITH.

Witnesses:

CHARLES E. SMITH,
E. M. WELLS.