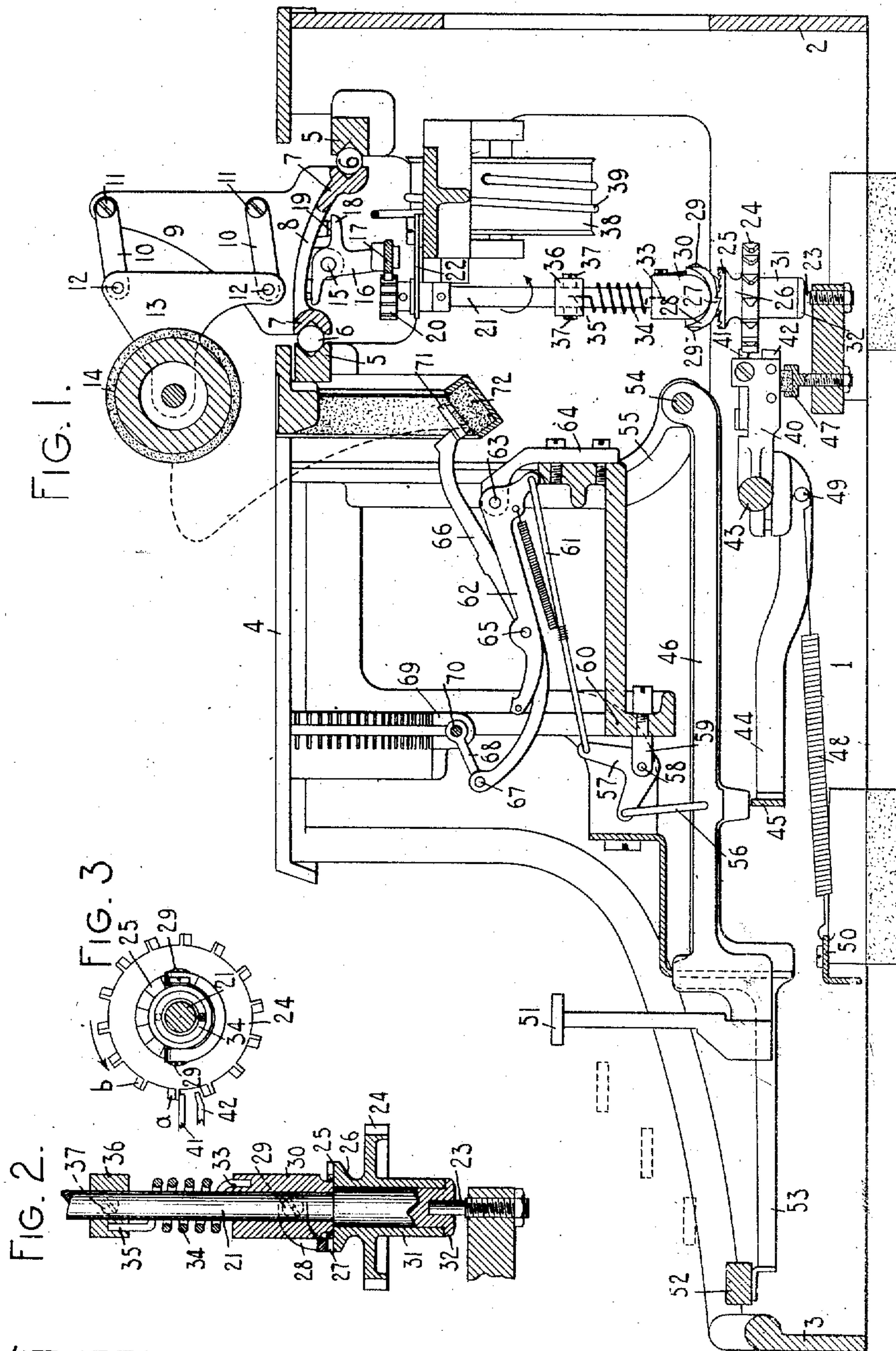


A. W. SMITH.
TYPE WRITING MACHINE.
APPLICATION FILED MAR. 18, 1910.

975,170.

Patented Nov. 8, 1910.



WITNESSES:

E. M. Kelly
Wm. E. Smith

INVENTOR

Arthur W. Smith

By atty Jacob F. Felt

HIS ATTORNEY

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.

975,170.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, ARTHUR W. SMITH, a 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.

10 My invention relates to typewriting machines and more particularly to carriage controlling or letter feed mechanism.

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 space movements thereof.

20 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.

30 A further object of my invention is to provide means of the character specified which are adapted to be applied to existing forms of typewriting machines without modifying, or materially modifying, the structural features of said machines as they now exist.

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.

40 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 of one form of typewriting machine embodying my invention. Fig. 2 is a detail fragmentary vertical sectional view taken through the escapement wheel and some of the associated parts. Fig. 3 is a fragmentary detail plan view showing the escapement wheel and some of the associated parts.

50 The present invention has certain of the same general objects in view as the constructions disclosed in two companion ap-

plications filed by me on the 11th day of March 1910, Serial Nos. 548,578 and 548,579 55 respectively, the present invention being from certain aspects, in the nature of a modified form of the invention disclosed in said applications.

I have shown my invention in the present instance embodied in a Yost visible machine. It should be understood, however, that the invention may be embodied in various styles of typewriting machines and that the escapement devices may be variously arranged, 65 constructed and applied.

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 to the side plates 70 of the machine and receive anti-friction balls or rollers 6 which are likewise received in oppositely grooved rails 7. The rails 7 are formed as a part of the carriage 8 provided with upwardly extending end plates 9 to 75 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 80 carry, at their lower ends, a feed rack 17. The depending arms 16 are likewise provided with rearwardly extending arms 18 with which leaf spring 19 coöperates to move the arms 16 forwardly around their pivots 85 to maintain the feed rack in mesh with its coöperative feed pinion 20. In the present instance the feed pinion 20 is fixed to a shaft 21 supported in a bracket arm 22 at the upper end portion thereof, the shaft being supported at its lower end by a bearing screw 90 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. Thus a ratchet wheel 25 95 is formed on the upper face of a hub-like portion 26 on the escapement wheel, and a pawl 27 coöperates with the ratchet wheel. This pawl is formed on a yoke-like member 28 pivoted at each end, as at 29, to a sleeve 100 30 which loosely surrounds the shaft 21 and bears at its lower end against the hub-like portion 26 of the escapement wheel. The escapement wheel itself is supported by a downwardly extending hub 31 which bears 105 against a flange 32 formed on the lower end

of the shaft 21. The sleeve 30 is connected at 33 to one end of a coiled spring 34 which surrounds the shaft 21 and is secured at its upper end, as at 35, to a collar or sleeve 36 fixed to the shaft 21 by a set screw 37.

The usual spring drum 38 has one end of a band 39 connected thereto, the opposite end of the band being connected in the usual manner to the carriage to apply the power of the spring drum to move the carriage in its step-by-step letter feed movements under control of the escapement mechanism. The movement of the carriage is transmitted through the feed rack 17, pinion 20, the shaft 21, spring 34 and pawl and ratchet devices 25 and 27, respectively, to the escapement wheel. The pressure of the spring 34 is such that it will be slightly flexed when the pressure of the carriage spring is exerted thereon through the train of connections referred to; the spring 34 substantially balancing the power of the carriage spring for purposes which will hereinafter more clearly appear.

A dog rocker 40 is provided with two ratchet dogs 41, 42, fixed to the dog rocker and spaced apart as shown in Fig. 3 to afford a "half and half" drop. That is to say, a half letter space movement of the escapement wheel is afforded on the depression of a finger key and a half letter space movement of the escapement wheel is afforded on the upstroke of a finger key. The dog rocker 40 is connected to or forms part of a rock shaft 43 which is mounted at its ends in suitable bearings on the base of the machine. The rock shaft 43 carries forwardly extending arms 44 which are connected at their forward ends to a universal bar 45. The universal bar extends transversely beneath the key levers 46, an adjustable leather faced stop 47 limiting the dog rocker in its return movement. A spring 48 is connected at one end, as at 49, to the dog rocker and at its opposite end to a plate 50 secured to the frame of the machine. This spring is effective to restore the dog rocker to the normal position shown in Fig. 1 when pressure is released on the finger keys 51 of the printing key levers or on the space bar 52 which is operative to actuate the universal bar through levers corresponding to the printing key lever. The printing key levers and levers 53 for the space key are all pivoted on a pivot rod 54 connected to an auxiliary frame 55 detachably secured in the main frame of the machine.

Upwardly extending links 56 are pivoted at their lower ends to the key levers 46 and at their upper ends to forwardly extending arms of angular sub-levers 57 pivoted at 58 to hangers 59. The hangers 59 are detachably secured to a segment 60 which forms part of the auxiliary frame. Rearwardly extending pull links 61 project upwardly

and rearwardly from the upright arms of the angular levers 57 and are connected at their rear ends with drivers 62 pivoted at 63 to hangers 64. Each driver is pivoted at 65 to a type bar proper 66 pivoted at its forward end, as at 67, to a guide link 68. The various guide links are radially disposed and work in guide slots 69, the links being pivoted on a pivot rod 70. The rear end of each type bar proper 66 carries a type block 71, the faces of the type normally resting on an ink pad 72. At the depression of a printing key 51 the corresponding type bar is moved to the printing position, the type on the bar following a path indicated by the dotted line in Fig. 1 and striking upwardly and rearwardly against the front face of the platen 14.

The entire construction described is the same, or substantially the same, as that employed in the Yost visible machine except that in the Yost machine the spring 34 and the sleeve 36 are dispensed with and the sleeve 30 is fixedly connected to the shaft 21 by set screws. It follows therefore that in the ordinary Yost machine there is a rigid or non-resilient connection between the carriage and the escapement wheel, in the step-by-step movements transmitted from the power employed to move the carriage to the escapement wheel. By providing a spring such as the spring 34, which substantially balances the power of the carriage spring, and interposing this spring between the carriage and the escapement wheel, I am enabled to provide a resilient connection or cushion between the carriage and the escapement wheel which absorbs the shock or energy of the carriage in its step-by-step letter space movements and prevents the transmission of the shock to the escapement devices proper, thus greatly reducing or entirely eradicating the noise ordinarily produced by the "drop" of the escapement wheel and the corresponding drop or let-off of the carriage at each step-by-step letter feed movement of the carriage. In the operation of the devices the depression of a finger key 51 is effective to move the universal bar 45 down, thus carrying the feed dog 41 out of engagement with the tooth *a* of the escapement wheel (see Fig. 1) and carrying the feed dog 42 into the path of the same tooth of the escapement wheel, thus affording a "half drop" or half letter space movement of the carriage at the depression of a finger key. As the carriage moves the half letter space movement is transmitted from the feed rack 17 through the pinion 20 and shaft 21 to the spring 34 and motion is transmitted through this spring 34, and through the pawl and ratchet mechanism operatively connected therewith, to the escapement wheel. The spring 34, however, absorbs the shock of suddenly arresting the

carriage and enables an actuation of the escapement to be effected in substantially a noiseless manner. As pressure on the finger key 31 is released the spring 48 is effective to restore the dog rocker to normal position, thus moving the feed dog 42 down out of engagement with the engaged tooth *a* of the escapement wheel and interposing the feed dog 41 in the path of the oncoming tooth *b* of the escapement wheel, thereby affording a "half drop" of the escapement wheel to complete the letter space movement.

While I have shown my invention embodied in a typewriting machine to which the invention is readily adapted without modifying the structural features of said machine, it should be understood that the invention may be readily embodied in various styles of typewriting machines irrespective of the general character of the escapement mechanism employed. Thus, for instance, it is immaterial for the purpose of the present invention what character of feed dogs are employed in connection with the escapement wheel, the invention being applicable with the same degree of efficiency to constructions in which different styles of feed dogs are employed.

The present invention contemplates broadly the embodiment of a cushion or resilient means between the carriage and the escapement devices to absorb the shock incidental to the letter space movements of the carriage; and various changes, therefore, may be made without departing from the spirit of my invention.

It will be observed that the devices of my invention are simple in construction and efficient in use and that the invention may be readily embodied in existing forms of typewriting machines without changing, or materially changing, the constructions embodied therein. In short, the simple addition of the spring 34 and a loosening of the sleeve 30 on the shaft 21 is all that is required to embody the invention in the present construction of Yost visible machines.

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, an escapement rack, escapement means coöperative with said rack, and a spring constituting an operative connection between said carriage and escapement rack and communicating movement from one to the other.

2. In a typewriting machine, the combination of a power driven carriage, an escapement wheel, escapement means coöperative with said escapement wheel to afford a step-by-step feed movement of the carriage, means for communicating movement from said carriage to the escapement wheel, said last mentioned means including a spring through which the power of the carriage is

communicated to the escapement wheel and which absorbs the shock incidental to each step-by-step movement of the carriage.

3. In a typewriting machine, the combination of a power driven carriage, escapement devices therefor, and resilient means which operatively and resiliently connects certain of said escapement devices to move in unison with the carriage in its letter feed movements.

4. In a typewriting machine, the combination of a power driven carriage, escapement devices therefor, pawl and ratchet mechanism between certain of said escapement devices and the carriage and which operatively connects the two to move in unison during letter feed movements, and a spring for resiliently connecting the pawl to the part which controls it.

5. In a typewriting machine, the combination of a power driven carriage, a feed rack carried thereby, a feed pinion with which said rack meshes, an escapement wheel, escapement means which coöperate with said escapement wheel, and intermediate connections between said feed pinion and escapement wheel, said intermediate connections including a spring through which motion is communicated from the feed pinion to the escapement wheel.

6. In a typewriting machine, the combination of a power driven carriage, a feed rack carried thereby, a feed pinion with which said rack meshes, a shaft carrying said pinion, an escapement wheel, a spring between said shaft and the escapement wheel and through which motion is communicated from one to the other, and escapement means coöperative with said escapement wheel.

7. In a typewriting machine, the combination of a power driven carriage, a feed rack carried thereby, a feed pinion with which said rack meshes, a shaft carrying said pinion, an escapement wheel, pawl and ratchet means between said shaft and escapement wheel, a spring connected at one end to said shaft and at the other end to one of the pawl and ratchet members and through which movement is transmitted from the shaft to the escapement wheel.

8. In a typewriting machine, the combination of a power driven carriage, escapement devices for said carriage, and a spring between the carriage and the escapement devices and through which movement is transmitted from the carriage to certain of said escapement devices, said spring substantially balancing the power employed to move the carriage.

9. In a typewriting machine, the combination of a power driven carriage, an escapement wheel, a spring interposed between the carriage and escapement wheel, said spring substantially balancing the power employed to move the carriage, means

whereby the power employed to move the carriage is transmitted to the escapement wheel through said spring, and an escapement device which coöperates with said escapement wheel.

10. In a typewriting machine, the combination of a power driven carriage, escapement devices therefor, and means for reducing the shock on the escapement devices at each letter feed movement of the carriage, said means comprising a cushion which substantially balances the power employed to move the carriage and through which motion is communicated from the carriage to certain of said escapement devices.

11. In a typewriting machine, the combination of a power driven carriage, escape-

ment devices therefor, and a cushion which resists the movement of the carriage in the direction of its feed under the power employed to move the carriage and absorbs the energy of the carriage at each step-by-step letter feed movement thereof, said cushion being arranged between the carriage and said escapement devices.

Signed at the borough of Manhattan, city of New York, in the county of New York, and State of New York, this 17th day of March A. D. 1910.

ARTHUR W. SMITH.

Witnesses:

CHARLES E. SMITH,
M. F. HANNWEBER.