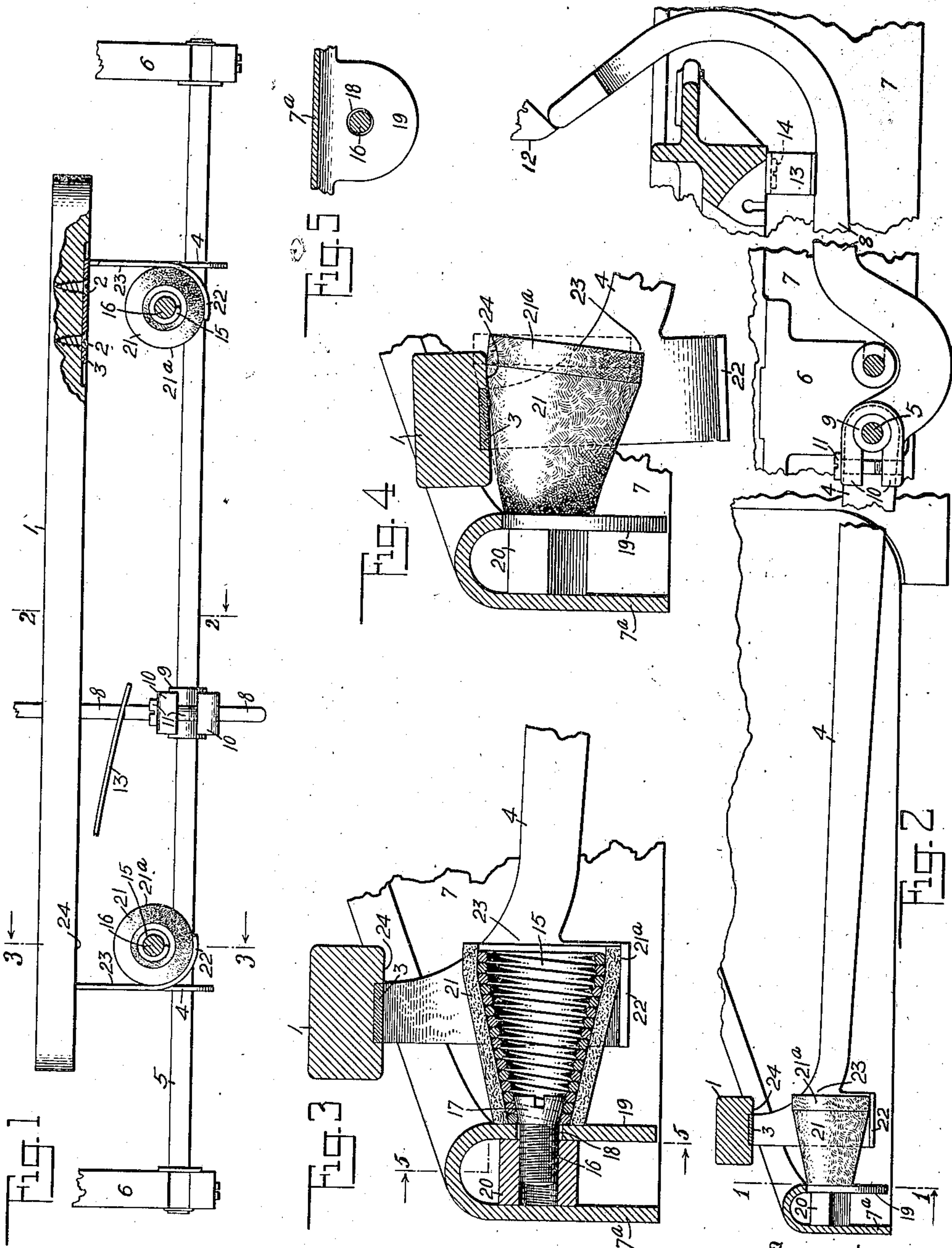


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A. W. SMITH.
TYPEWRITING MACHINE.
FILED DEC. 2, 1921.

1,440,703.



WITNESSES

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UNITED STATES PATENT OFFICE.

ARTHUR W. SMITH, OF NEW YORK, N. Y., ASSIGNOR TO REMINGTON TYPEWRITER COMPANY, OF ILION, NEW YORK, A CORPORATION OF NEW YORK.

TYPEWRITING MACHINE.

Application filed December 2, 1921. Serial No. 519,402.

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 Typewriting Machines, of which the following is a specification.

My invention relates to typewriting machines, and more particularly to cushion stop means for noiselessly arresting a movable part, such as the space key of the machine.

One of the main objects of my invention, generally stated, is to provide simple and efficient means of the character specified.

More specifically stated, the objects of the invention are:

1st. To cushion the impact of a movable part in such a manner that no noise results in effecting an arrest thereof.

2nd. To provide means of the character stated in which the spring or cushion stop offers no resistance to the operating movement of the key or movable part which it arrests until at about the time when such arrest is to be effected.

3rd. To cause the cushion means to coact with the movable part in such a manner as to counteract any lateral movement or vibration of the movable part during the operation thereof, and thus prevent a rattling of the movable part and any noise that might result therefrom.

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 set forth in the following description and particularly pointed out in the appended claims.

In the accompanying drawings wherein like reference characters indicate corresponding parts in the different views,

Figure 1 is a detail fragmentary transverse vertical sectional view showing the space key and some of the associated parts, including the means for arresting the space key; the section being taken on the line 1—1 of Fig. 2 and looking in the direction of the arrow at said line.

Figure 2 is a fore-and-aft vertical sectional view of the same taken on a line 2—2

of Fig. 1 and looking in the direction of the arrow at said line.

Figure 3 is an enlarged detail fore-and-aft vertical sectional view showing some of the parts illustrated in the preceding figures, the section being taken on the line 3—3 of Fig. 1 and looking in the direction of the arrow at said line.

Figure 4 is a like view of the same showing the space key depressed.

Figure 5 is a detail fragmentary inside face view of one of the ears on the frame by which a spring stop is supported, the view corresponding to a section taken on the line 5—5 of Fig. 3 and looking in the direction of the arrow at said line.

In the present instance I have shown my invention embodied in a typewriting machine of the character disclosed in the patent to A. J. Dudley, No. 1,394,614, dated October 25, 1921 to arrest the space key, though the invention may be used in connection with other keys or movable parts and may be embodied in various styles of typewriting machines.

As shown in the present instance the space key or bar 1 is secured by screws 2 to bracket arms 3 received in counter-sunk openings in the lower side of the space bar. The bracket arms 3 are shown formed as part of parallel space key levers 4 secured at their rear ends to a rock shaft 5. The latter is mounted at its ends to turn in bearing openings in bracket plates 6 secured to the frames 7 of the machine. Attached to the rock shaft 5, to the left of a point midway in the length thereof, is a rearwardly and upwardly extending arm 8. This arm is fixed to the shaft, or to a fixed cylindrical enlargement 9 thereof, by a clamping yoke 10 formed on the arm 8. The arms of the yoke 10 are drawn together by a screw 11 to connect the arm 8 to turn with the rock shaft. The rear end of the arm 8 contacts with the tail of a member 12 which controls the dog rocker and the operation of the escapement from the space key. A leaf spring 13 is secured at one end by a screw 14 to a fixed part of the machine and bears downwardly against the arm 8 to return it, together with the shaft 5, levers 4 and space key 1, to normal position.

The movable part to be noiselessly ar-

rested, which in the present instance is the space key 1, is limited in its movements both away from and back to normal position by the novel cushion stop means of my invention. In the construction as illustrated, two such cushion stops are employed, one near each end of the space key. Each cushion stop comprises a metallic coiled spiral spring 15 preferably conoidal in form and anchored at one end, and having its axis extending transversely of the path of movement of and beneath the space key. I prefer to anchor each spring 15 at its small end only to a fixed part. For this purpose I provide a suitable supporting screw 16 having a conoidal or beveled head 17. The screw is passed through the central opening at the larger end of the associated spring 15 so that the stem of the screw may pass through the contracted opening at the small end thereof. This enables the head of the screw to engage the convolutes of the spring near its contracted end and anchor the spring in place, leaving the larger end free to be flexed laterally. The stem of each screw 16 passes through a slightly enlarged opening 18 (see Fig. 5) in a depending ear 19 formed in the present instance as a part of the base of the frame 7, and spaced apart from the front cross bar 7^a thereof. In the space between each ear 19 and the front cross bar 7^a is received a nut 20 in which the stem of the associated screw 16 is threaded, to firmly clamp one end of the spring in place by the action of the head of its screw thereon. The slightly enlarged opening 18 for each screw 16 enables a limited lateral adjustment of the screw and spring stop carried thereby to be effected. I prefer to surround each spring with a sleeve-like pad 21 of felt or like material to further aid in effecting a noiseless arrest of the key. Preferably the pad or sleeve 21 conforms substantially to the contour of the spring which it surrounds. As shown herein I have formed integral with each of the key levers 4 a depending inwardly directed hook-like contact or stop member 22 which conforms to the contour of the associated spring stop member at the largest diameter thereof, so as to contact therewith, or with the pad carried thereby, at the under side and limit the upward or return movement of the space key, as shown in Fig. 1. As will be understood more particularly from a consideration of this last mentioned figure, the inner side of each space key lever, at 23, constitutes a vertically disposed contact face or member adapted to coact with the outer side of the associated spring stop. The construction is such that normally the stop springs exert no lateral force against the contact faces 23. However, if in the operation of the space key there should be any tendency thereof to move or vibrate laterally, or in the direc-

tion of its length, this would tend to move the members 23 laterally and such tendency would be resisted by the stop springs; one resisting the lateral movement in one direction, and the other resisting such movement in the opposite direction. The effect of this is to prevent any rattling of the space key and its mounting, and any noise that might result therefrom, without however retarding or resisting the operating movement of the key.

The downward movement of the key 1, or its movement away from normal position, is limited by the stop springs. Thus the upper face of the pad 21, at the larger end of each spring 15, coacts with a bottom contact face 24 formed by the lower face of the space key to arrest the depression of the key, as shown in Fig. 4. The space key in its operating or downward movement is free from the resistance of the springs 15, such resistance not being brought into action until at about, or just before, the point in the depression of the key where the arrest thereof is to be effected. The tension of the spring 15 is preferably such, that in the ordinary operation of the space key but little if any lateral deflection of the springs is brought about, depending somewhat on the operator's touch. This may be better understood when it is explained that ordinarily the machine is adjusted to allow a "drop" or feed of the carriage under the operation of the space key when the latter reaches, say, about one-half the extent of its depression, although, of course, this adjustment may be varied. Some operators, in practice, effect such a dip of the key that arrest thereof may be brought about by the stop springs without flexing the latter, whereas other operators may have a long following stroke on the space key, continuing a pressure thereon at the last part of the stroke. Even with a stroke such as that last referred to, the resistance of the springs is preferably such that each spring will be but slightly flexed, say from a position such as that indicated in dotted lines in Fig. 4, to the full line position represented in said figure, which latter may be supposed to represent the full extent of the dip of the key. In every instance the amount of resistance of the springs is such that it will effect an arrest of the key.

The shape of each spring 15 and the relation that it bears to the key are such that small co-operative contact surfaces are presented by the stops or arresting means, especially in arresting the downward movement of the key. Thus it will be seen that the conoidal form of each spring, mounted in the manner indicated, enables practically only the free end thereof, where the larger convolutes are, to be acted on by and first resist the force of the space key, and that practically a fore-and-aft line contact

is presented between each face 24 and a small part at the rear end of the associated pad 21. So therefore no broad, flat surfaces are presented to slap, one against another. In the return movement of the key to normal position, the members 22 likewise exert their force only against the rear enlarged coils of free ends of the springs where the comparatively small surfaces of the pads, indicated at 21^a, may contact at the under side thereof with said members 22.

From the foregoing, it will be understood that the stop spring devices of my invention are simple in construction and inexpensive to manufacture; that they may be readily applied to various styles of typewriting machines; that they are effective in noiselessly arresting the key in its movements both away from and back to normal position 2 without resisting the operating movement of the key, and are effective to prevent a lateral vibration and possible incidental rattling noise of the key, and the mounting therefor during operation.

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

1. In a typewriting machine, the combination of a movable part, and a coiled stop spring for arresting the movement of said movable part, said spring being disposed with its axis extending transversely of the path of the movable part and exerting a lateral resistance sufficient to arrest the movable part.

2. In a typewriting machine, the combination of a key, and a conoidal stop spring for arresting the movement of said key, the force of the key being exerted first against the larger coils and laterally of said spring.

3. In a typewriting machine, the combination of a conoidal stop spring, and a part which is arrested in its movement by said spring but is free in its movement from normal position from the resistance of said spring until the arrest of the part is about to be effected, the force of said part being exerted first against the latter portion of said spring.

4. In a typewriting machine, the combination of conoidal stop spring anchored only at its smaller end, and a key which is arrested by said spring but is free in its movement from normal position from the resistance of said spring until the arrest of said part is about to be effected, the spring being engageable first at its free end and transversely of the spring.

5. In a typewriting machine, the combination of a movable part, and a coiled stop spring which coacts therewith and effects an arrest of said part in its movement both from and back to its normal position.

6. In a typewriting machine, the combination of a movable part, a coiled stop spring which coacts therewith and effects an

arrest of said part in its movement both from and back to its normal position, and padding interposed between said spring and movable part to aid in noiselessly effecting such arrest of the movable part.

7. In a typewriting machine, the combination of a key, and means for noiselessly arresting the movement of said key away from and back to normal position, said means comprising a stop spring anchored only at one end and with which the key coacts and the resistance of which spring is ineffective against the key in the operating movement of the latter from normal position and is effective only about the time when the key is to be arrested in such movement.

8. In a typewriting machine, the combination of a key, and means for noiselessly arresting the movements of said key away from and back to normal position, said means comprising a coiled stop spring, a member carried by said key and normally bearing against said spring to limit the return movement of the key, and a stop face on said key which coacts with said spring only at the last part of its operating movement to limit the movement of the key from normal position.

9. In a typewriting machine, the combination of a key, and means for noiselessly arresting said key, said means comprising two stop springs, means which coact therewith to arrest the key, and means which coact with said springs to enable the latter to resist a deflection of the key laterally from its path of movement.

10. In a typewriting machine, the combination of a key, and means for noiselessly arresting said key, said means comprising two stop springs, means which coact with each of said stop springs to arrest the key in its movement from and also in its movement back to normal position, and means which coact with said springs to enable the latter to resist a deflection of the key laterally from its path of movement.

11. In a typewriting machine, the combination of a key having stop faces that are spaced apart, and a coiled stop spring anchored only at one end and yieldable in opposite directions from its normal position of rest, said spring being interposed between said stop faces and co-operating with one of them to limit the motion of the key in one direction and co-operating with the other stop face to limit the motion of the key in the opposite direction.

12. In a typewriting machine, the combination of a key having stop faces that are spaced apart, a stop spring interposed between said stop faces and co-operating with one of them to limit the motion of the key in one direction and co-operating with the other stop face to limit the motion of the

key in the opposite direction, the operating movement of the key from normal position being free from the resistance of said spring, and padding interposed between said stop faces and spring, whereby the arrest of the key will be noiselessly effected at the limit of its movement in both directions.

13. In a typewriting machine, the combination of a space key, a pair of hook-like stop members carried by said key, a pair of stop springs each normally engaged from beneath by one of said hook-like stop members to limit the return movement of the key, and a pair of stop faces on said key, each impacting against one of said springs on the upper side thereof to limit the down stroke of the key.

14. In a typewriting machine, the combination of a space key, a pair of hook-like stop members carried by said key, a pair of stop springs each normally engaged from beneath by one of said hook-like stop members to limit the return movement of the key, a pair of stop faces on said key, each impacting against one of said springs on the upper side thereof to limit the down stroke of the key, upright contact members which co-act with said springs on opposite sides thereof to resist a lateral deflection or rattling of the key in its movements, and padding interposed

between said springs and the parts which co-act therewith to further aid in effecting a noiseless arrest of the key in its movements in both directions.

15. In a typewriting machine, the combination of a key, and a coiled stop spring anchored only at one end and the resistance of which limits the movement of the key in both directions and offers no resistance to the operating movement of the key until an arrest of the latter is about to be effected.

16. In a typewriting machine, the combination of a key, a coiled stop spring anchored only at one end and the resistance of which aids in guiding the key and which limits its movement both away from and back to normal position, and offers no resistance to the operating movement of the key until an arrest of the latter is about to be effected, and means by which a bodily adjustment of said stop spring may be effected.

Signed at the borough of Manhattan, city of New York, in the county of New York and State of New York, this 1st day of Dec., A. D. 1921.

ARTHUR W. SMITH.

Witnesses:

CHARLES E. SMITH,
E. M. WELLS.