

G. G. GOING & J. A. RUFFIN.
TYPE WRITER.

APPLICATION FILED MAR. 15, 1909. RENEWED APR. 12, 1911.

1,008,964.

Patented Nov. 14, 1911.

3 SHEETS—SHEET 1.

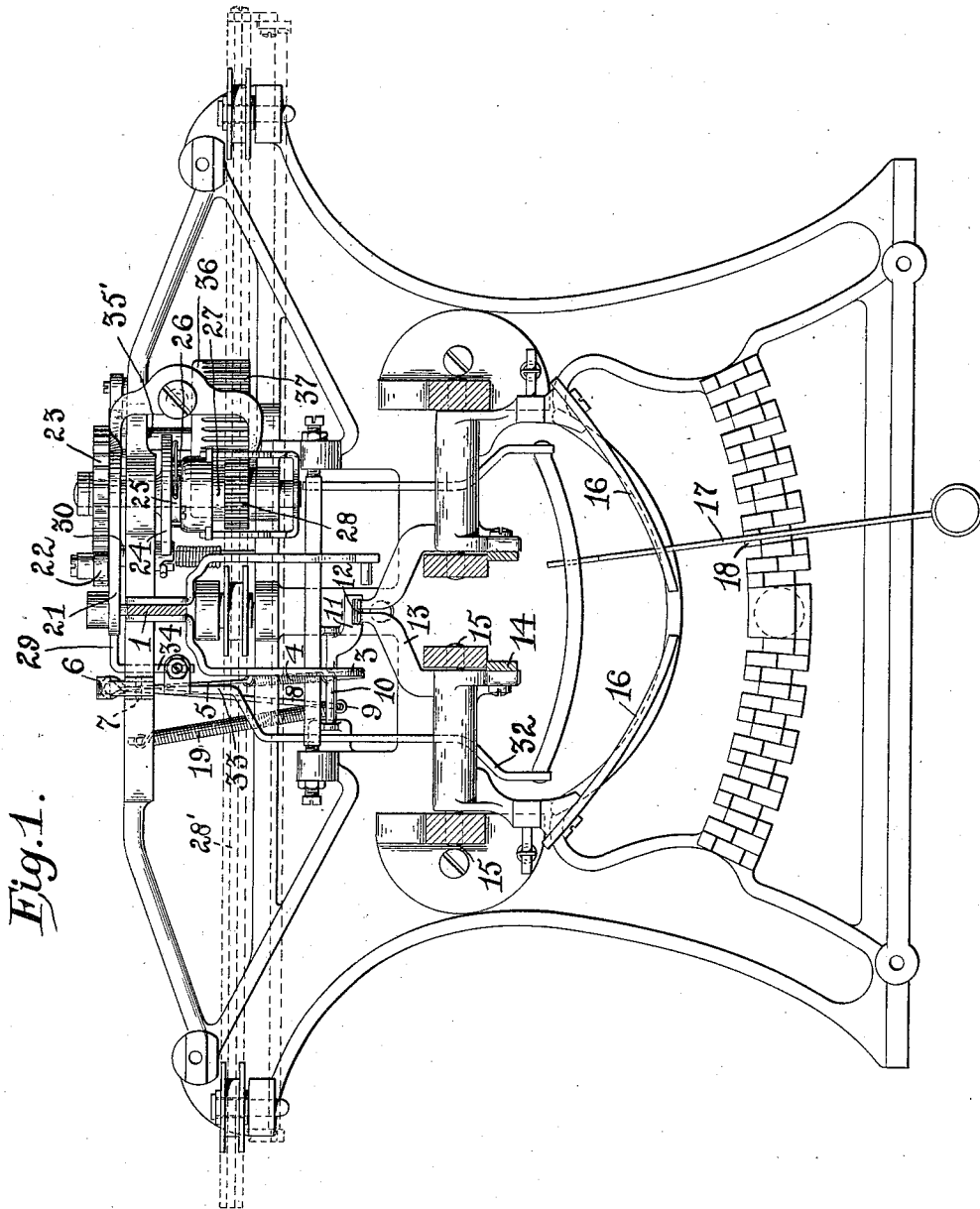


Fig. 1.

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TYPE WRITER.

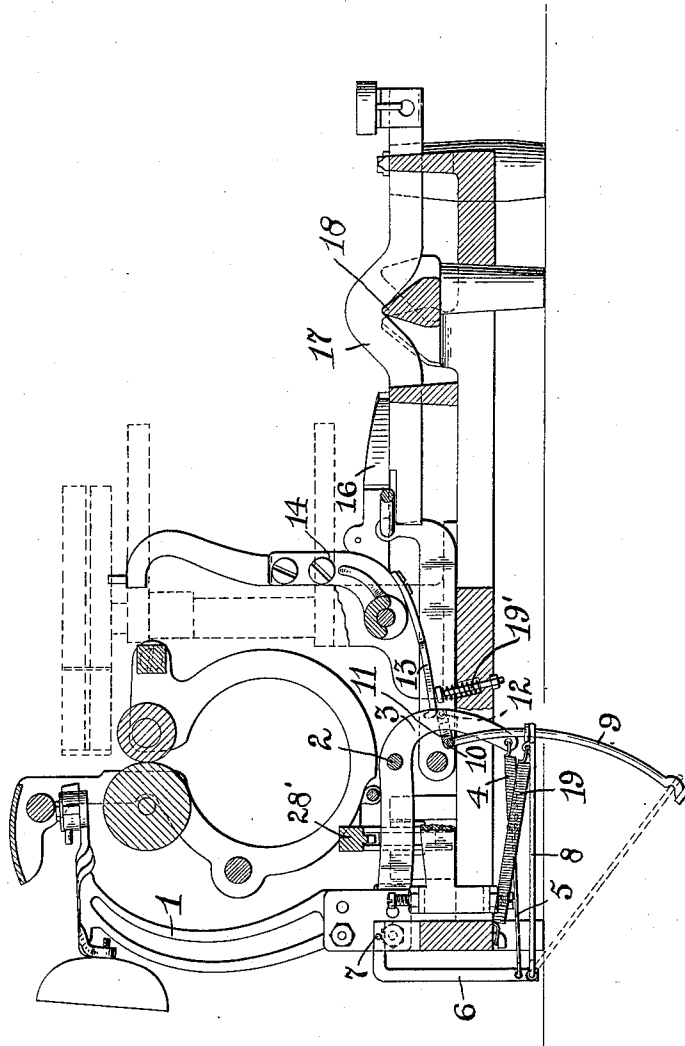
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3 SHEETS—SHEET 2.

Fig. 2.



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3 SHEETS-SHEET 3.

Fig. 3.

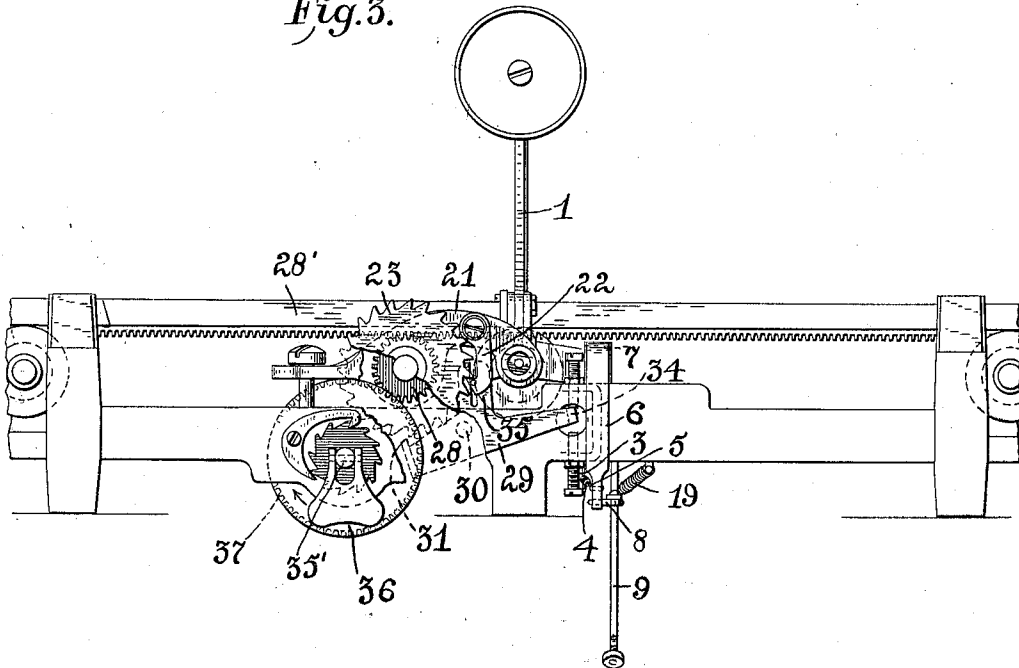
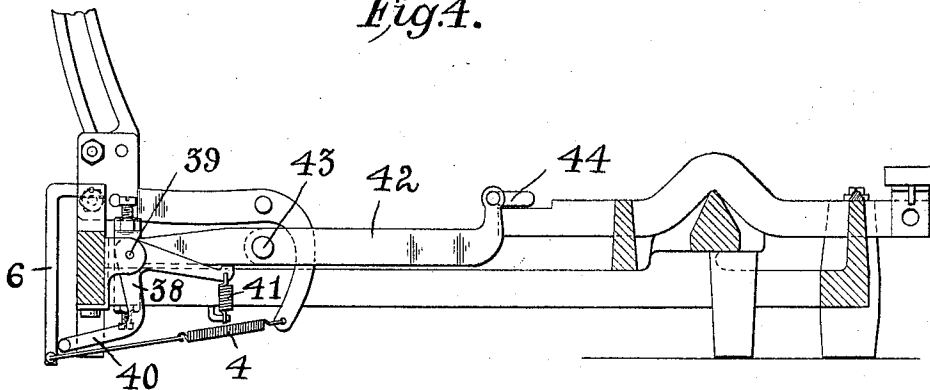


Fig. 4.



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UNITED STATES PATENT OFFICE.

GEORGE GOULD GOING AND JOHN A. RUFFIN, OF NEW YORK, N. Y.

TYPE-WRITER.

1,008,964.

Specification of Letters Patent. Patented Nov. 14, 1911.

Application filed March 15, 1909, Serial No. 483,456. Renewed April 12, 1911. Serial No. 620,695.

To all whom it may concern:

Be it known that we, GEORGE G. GOING and JOHN A. RUFFIN, citizens of the United States, residing at New York, N. Y., have
5 invented certain new and useful Improvements in Type-Writers, of which the following is a specification.

Our invention relates to typewriters of the class in which the impressions are made
10 by a spring pressed hammer. In this class of machines, as heretofore stated, the hammer is operated by a spring which is normally under sufficient tension to impel the
15 hammer forward to give the blow necessary to make the impression, and for returning the hammer to normal position reliance has heretofore been had upon the carriage
20 spring which applied its force to the hammer for returning the same through the paper carriage and connections leading therefrom. The objection to this arrangement is that an exceedingly heavy carriage
25 and a heavy tension on the carriage spring is necessary in order to return the hammer to its normal position ready for a new stroke.

One feature of our invention relates to means whereby the hammer is normally free from the tension of its spring, the said
30 spring being normally relaxed, and being placed under tension sufficient to impel the hammer forward only when a key has been operated. By our invention the weight of the carriage is materially reduced and, at the same time, we are enabled to maintain
35 hammer blows of equal force.

Our invention also concerns the arrangement of the spring drum for applying tension to the carriage, our improvement consisting in connecting the spring drum directly with the escapement mechanism instead of, as heretofore, making this connection by way of the paper carriage itself. By
40 our improvement, the carriage can be readily removed and replaced without affecting the spring drum or changing its adjustment in any way.

The invention consists in the features and combination and arrangement of parts hereinafter described and particularly pointed
50 out in the claims.

In the accompanying drawings Figure 1

is a plan view of so much of a typewriter of known form as is necessary to a clear understanding of our invention; Fig. 2 is a vertical sectional view from front to rear
55 of so much of a typewriter as is necessary to disclose our invention to those skilled in the art; Fig. 3 is a rear view of the escapement mechanism and the carriage spring drum; Fig. 4 is a view similar to Fig. 2
60 showing a modified arrangement of our invention.

In these drawings, 1 indicates a hammer pivoted at 2 to the frame, and having a tail piece 3 extending forwardly and downwardly, to which is connected a hammer
65 spring 4 which is also connected, through a rod 5, with an arm 6 pivoted at 7 to the frame. This spring 4 is normally relaxed and, in our machine, it is placed under tension to drive the hammer forward only
70 when the keys are operated. For this purpose, the pivoted arm 6 is connected to a hammer spring regulator 8 in the form of a link or rod which, at its forward ends, is
75 connected with a hammer spring actuator 9 consisting of an arm depending from a rock shaft 10 suitably journaled in the frame and having a forwardly extending arm 11 provided with a roller 12 in the path
80 of a cam piece or arm 13 attached to the shuttle driving arm 14, which is pivotally mounted at 15 to the frame. There are two of these hammer spring cams or arms 13, one for each of the shuttle driving arms, 85 it being understood that for the purpose of illustrating our invention we have selected that form of machine known as the Hammond, in which a shuttle and shuttle driving arms and an impression hammer are employed, though we do not limit ourselves in this respect. The shuttle driving arms, as
90 in the Hammond machine, are combined with arms 16 overlying the keyboard, one key of which is indicated at 17 fulcrumed at 18 upon the frame. It will now be seen that when the key lever is operated—and this applies to all the character keys—the hammer spring cam 13, acting upon the roller 12 of the hammer spring actuator, 100 will operate the said actuator and this, through the hammer spring regulator 8, will

impart movement to the arm 6, and this movement will be transmitted through the link 5 to the hammer spring 4, placing the same under tension, and the hammer, when released from the escapement mechanism, will be impelled forwardly by the said spring 4 to make the impression; and this having been effected and the key released, the spring 4 will relax and the hammer will return to its rearward position ready for a new action. In restoring the parts to normal position and by the releasing of the hammer spring, the actuator 9 will be returned to normal position, thus returning also the shuttle driving arms. We provide an equalizing spring at 19 connected at one end to the frame of the machine, and at the other end to the hammer spring actuator.

It will be seen from the above that the hammer spring is placed under tension from a normally relaxed condition each time one of the character keys is operated, and having been placed under tension before the escapement is released, the hammer will fly forward as soon as it is released from the escapement mechanism, this release taking place as in the ordinary Hammond typewriter; and when the hammer is in its position of rest, it will not be under the tension of its spring 4; and consequently a light carriage spring and a light carriage may be employed, as these parts, in our arrangement, do not perform the function of returning the hammer to normal position as in ordinary practice against the tension of the hammer spring.

In order to increase the hammer blows for manifolding, we make the hammer spring regulator 8 adjustable along the hammer spring actuator 9. One position of these parts is shown in full lines, and another position for a greater hammer blow is indicated in dotted lines. It is simply necessary to slip the hammer spring regulator along the actuator arm to different points thereof in order to secure different degrees of force in the blows of the hammer. The regulator may be adjusted to any point intermediate of the positions just mentioned. In our invention, the hammer blows will be uniform regardless of the varying depressions of the several character keys or the different degrees of movement of the shuttle driving arms, this being due to the use and particular arrangement shown of the hammer spring cam 13 in its relation to the hammer spring actuator 9, for it will be seen that as the hammer spring cam 13 operates the actuator through a roller, the movement will extend only to the point where the cam slips in engagement with the roller after the actuator has been moved to the predetermined extent. When the cam arm moves or slips on the roller, the stretch-

ing of the hammer spring will cease, notwithstanding the fact that the key lever or shuttle driving arm may be further moved. In other words, the cam arm 11 will move the actuator only a certain distance for all character keys irrespective of the stroke which these character keys may have.

It will be observed that the end of the arm 13 is turned up so that while the lower corner or edge of the arm may slip past the center of the roller when the parts are operated, the bent end will maintain its engagement with the roller, and one effect of this will be that when the key is released, the hammer spring 4 will react through the actuator and arm 13 to return the shuttle driving arm to normal position, and the springs usually employed on the ordinary Hammond machine and attached to the arms 16 for returning the shuttle driving arms are omitted, as will be seen from an inspection of our drawings. This enables the touch to be light, and this effect is also aided by the equalizing spring which, being a pull spring, as shown, and being under slight tension, will assist initially the key action when first struck or started. In other words, the equalizing spring assists initially the stretching of the hammer spring.

We provide at 19' a spring plunger, the function of which is to start the cam or arm 13 back past the center of the rollers 12 in order that the various parts may assume their normal positions.

When our invention is applied to the particular type of machine known as the Hammond, the hammer lever will be connected to the hammer returning arm 21, which is mounted in a manner similar to that on the ordinary Hammond machine, the said arm or lever carrying the escapement pawl 22 to engage the escapement wheel 23 which is connected, through a disk 24 and a pawl 25, with a ratchet wheel 26 on a sleeve 27 carrying the escapement gear 28 with which engages the rack of the carriage 28'. The escapement ratchet is controlled by an escapement lever 29 pivoted at 30 and having a detent 31 shown in dotted lines to engage the teeth of the escapement ratchet 23, the said escapement lever 29 being operated through a trip frame 32 of substantially ordinary form, which has a rearwardly extending arm 33 to engage an extension 34 of the escapement lever. The escapement lever has also an upwardly extended slotted arm 35 to operate the escapement pawl 22, all of these parts being substantially the same as in the ordinary Hammond typewriter. With our improvement the hammer is quickly controlled because the return of the hammer is effected from the carriage spring drum through the escapement and

the hammer return lever, and this return does not take place against the tension of a hammer spring and which is being placed under greater tension for the purpose of forcing the hammer forward, but the returning action of the carriage spring takes place in conjunction with a relaxing or relaxed hammer spring.

In ordinary practice, the carriage spring drum has a gear meshing directly with the carriage rack, so as to apply tension thereto for its step by step movement, and through this rack the tension of the spring is transmitted through the escapement mechanism described and through the escapement pawl, to the hammer returning lever 21, so that, after the hammer blow is delivered and the key released, the tension of the carriage spring will become effective to return the hammer to normal position. In this ordinary construction where the carriage spring drum is geared directly to the carriage rack, the carriage cannot readily be removed, as its removal allows the carriage spring to run down and interfere with its adjustment. In order to avoid this, we arrange the carriage spring drum independently of direct connection with the carriage, and for this purpose we mount it in the frame at 35' adjacent the escapement mechanism. The spring drum is indicated at 36, and its gear at 37. This gear, instead of meshing with the carriage rack, engages directly with the escapement gear 28, before mentioned, and therefore the escapement, in this instance, is operated regardless of the rack of the carriage, and also the escapement controls the spring drum independently of the medium of the carriage rack. With our present improvement the carriage can be removed and replaced without disturbing the adjustment of the carriage spring, the spring drum being held by the escapement pawl 22 through the described escapement connections.

We do not limit ourselves to the form of spring hammer mechanism above described, for, as shown in Fig. 4, the hammer spring may be placed under tension when the character keys are operated through a lever or frame 38 pivoted to the frame at 39, and having an arm 40 to operate against the pivoted arm 6 before described, this arm 6 being connected with the hammer spring 4 as above explained. The frame or lever 38 is provided with an equalizing spring 41. The frame is operated through a frame or lever 42 pivoted at 43 and connected or in engagement with the character key levers at its front end, as shown at 44.

It will be observed that the arms 13 connected with the shuttle arms have their rear ends bent upwardly after they engage the roller 12 of the actuator arm. This gives an extended bearing for the arm 13 to work

against the arm of the actuator, and a connection is thus maintained when the keys are operated, between the actuator and the arms 13, so that the actuator will react upon the arms 13 to restore the shuttle arms to normal position, the spring 19' serving as a starter for this movement.

We claim as our invention:—

1. In combination with the typewriter hammer character key levers, a spring, an actuator for the spring operated from the key levers, and consisting of a lever arm, and a regulator forming a connection between the same and the hammer spring and having its point of connection with the actuator adjustable toward and from the pivot thereof, substantially as described.

2. In combination the hammer, the hammer spring connected to the hammer, the character key levers, an actuator lever operated from the key levers, an arm pivoted to the frame, a link connection between the same and the actuator, and a connection between the pivoted arm and the hammer spring, substantially as described.

3. In combination the hammer, the hammer spring, the character key levers, an actuator lever operated from the key levers, an arm pivoted to the frame, a link connection between the same and the actuator, and a connection between the arm and the hammer spring, the said link being adjustable toward and from the pivot of the actuator to regulate the operation of the spring, substantially as described.

4. In combination the typewriter hammer, a spring therefor, character key levers, an actuator operated by the key levers, a connection between the actuator and the hammer spring to strain the same, and an equalizing spring connected with the actuator, substantially as described.

5. In combination the typewriter hammer, a spring, the two shuttle driving arms for operating the shuttle in opposite directions, key levers for operating the same, and a single connection between both of the shuttle driving arms and the hammer spring for placing the same under tension when either is operated, substantially as described.

6. In combination a typewriter hammer, a spring therefor, shuttle driving arms, character key levers for operating the same, and a lost motion connection between the character key levers and the hammer spring whereby the hammer spring will be strained to equal degrees for different degrees of motion of the shuttle driver arms, substantially as described.

7. In combination in a typewriter hammer, a spring therefor, character keys, an actuator connected with the spring for straining the same, shuttle driving arms, and a connection between the shuttle driving

arms and the actuator to operate the same uniformly for different degrees of depression of the character key levers, said operating connection having a slip joint connection with the actuator, substantially as described.

8. In combination in a typewriter, a hammer, a spring therefor, character keys, an actuator connected with the spring for straining the same, shuttle driving arms, and a connection between the shuttle driving arms and the actuator to operate the same uniformly for different degrees of depressions of the character key levers, said operating connection having a slip joint connection with the actuator, and a spring acting upon the said connection, substantially as described.

9. In combination in a typewriter, a hammer, a carriage, an escapement, and a carriage spring drum connected with the hammer independently of the carriage, substantially as described.

10. In a typewriter, a hammer, an escapement mechanism, a carriage, and a spring drum connected with the hammer through the escapement mechanism independently of the carriage and its rack, substantially as described.

11. In combination in a typewriter, a hammer, an escapement wheel, a hammer return lever, a pawl engaging with the escapement wheel and carried by the hammer return lever, means for operating the pawl, and a carriage spring drum connected with the hammer through the escapement wheel independently of the carriage and its rack, substantially as described.

12. In combination a hammer, a hammer spring normally relaxed, key connections for straining the hammer spring to apply force to the hammer, and an equalizing spring, tending to strain the hammer substantially as described.

13. In combination in a typewriter, a hammer, an escapement wheel, a hammer return lever connected with the hammer, a pawl on the hammer return lever engaging the escapement wheel, means controlled from the keys for releasing the pawl to allow the hammer to fly forward, a normally relaxed hammer spring, and means controlled from the keys for placing the said spring under tension previous to the release of the pawl from the escapement wheel, substantially as described.

14. In combination in a typewriter, a hammer, an escapement wheel, a hammer return lever connected with the hammer, a pawl on the hammer return lever engaging the escapement wheel, means controlled from the keys for releasing the pawl to allow the hammer to fly forward, a normally relaxed hammer spring, means controlled

from the keys for placing the said spring under tension previous to the release of the pawl from the escapement wheel, and a carriage spring connected with the escapement, substantially as described.

15. In combination in a typewriter, a hammer, a hammer return lever connected thereto, an escapement wheel, a pawl carried by the hammer return lever and engaging the escapement wheel, means for releasing the pawl from the escapement wheel, and an escapement gear 28 for engaging the rack of the carriage, a connection between said escapement gear and the escapement wheel, and a carriage spring drum meshing with the escapement gear and arranged independently of the carriage and its rack, substantially as described.

16. In combination in a typewriter, a hammer, a normally relaxed hammer spring, key connections for placing the spring under tension, and a carriage spring with connections independent of the carriage for returning the hammer when the keys are released and the hammer spring allowed to relax, substantially as described.

17. In combination in a typewriter, a hammer, carriage escapement mechanism, a normally relaxed hammer spring, key connections for placing the spring under tension, and a carriage spring operating through the escapement for returning the hammer when the keys are released and the spring allowed to relax, substantially as described.

18. In combination in a typewriter, a hammer, carriage escapement mechanism, a normally relaxed hammer spring, key connections for placing the spring under tension, and a carriage spring operating through the escapement independently of the carriage for returning the hammer when the keys are released and the spring allowed to relax, substantially as described.

19. In combination shuttle driving arms, a hammer, key connections for operating the driving arms, and a normally relaxed hammer spring placed under tension when the keys are operated to drive the hammer, said spring acting to return the shuttle driving arms, substantially as described.

20. In combination a hammer, shuttle driving arms, key levers for operating the same, and a normally relaxed hammer spring operated from the keys through the shuttle driving arms and acting to return said driving arms, substantially as described.

21. In combination in a typewriter, a hammer, a spring therefor normally relaxed, key levers, a connection between the same and the hammer spring to place it under tension, and an equalizing spring to assist the placing of the hammer spring under tension, substantially as described.

22. In combination in a typewriter, shuttle driving arms, a hammer, a hammer spring normally relaxed, key levers for operating the shuttle driving arms, and operated
5 connections between the shuttle driving arms and the hammer spring to place the same under tension, substantially as described.

In testimony whereof, we affix our signatures in presence of two witnesses.

GEORGE GOULD GOING.
JNO. A. RUFFIN.

Witnesses:

F. ECKLIN,
E. K. STEPHENSON.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents,
Washington, D. C."
