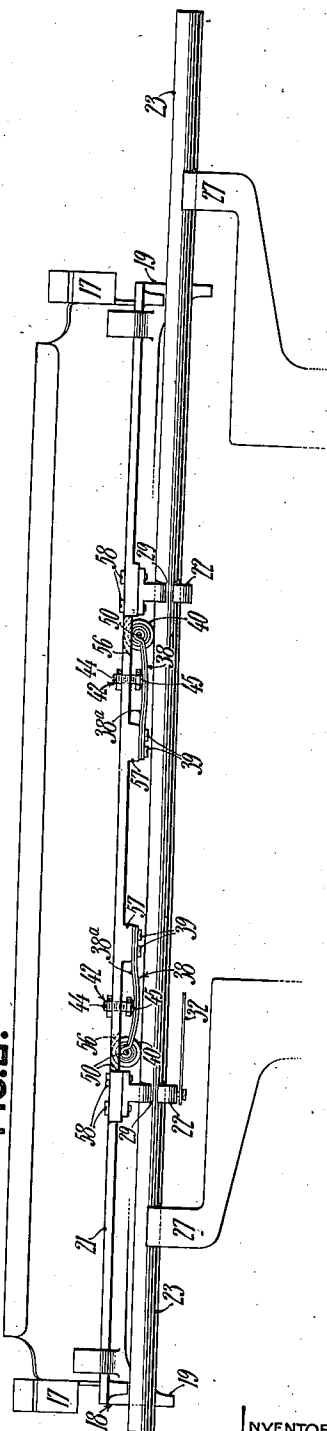
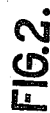


W. F. HELMOND
TYPEWRITING MACHINE
Filed April 3, 1935

2 Sheets-Sheet 1



INVENTOR:

INVENTOR: *William F. Almond*
BY *B. B. Stickney*
ATTORNEY.

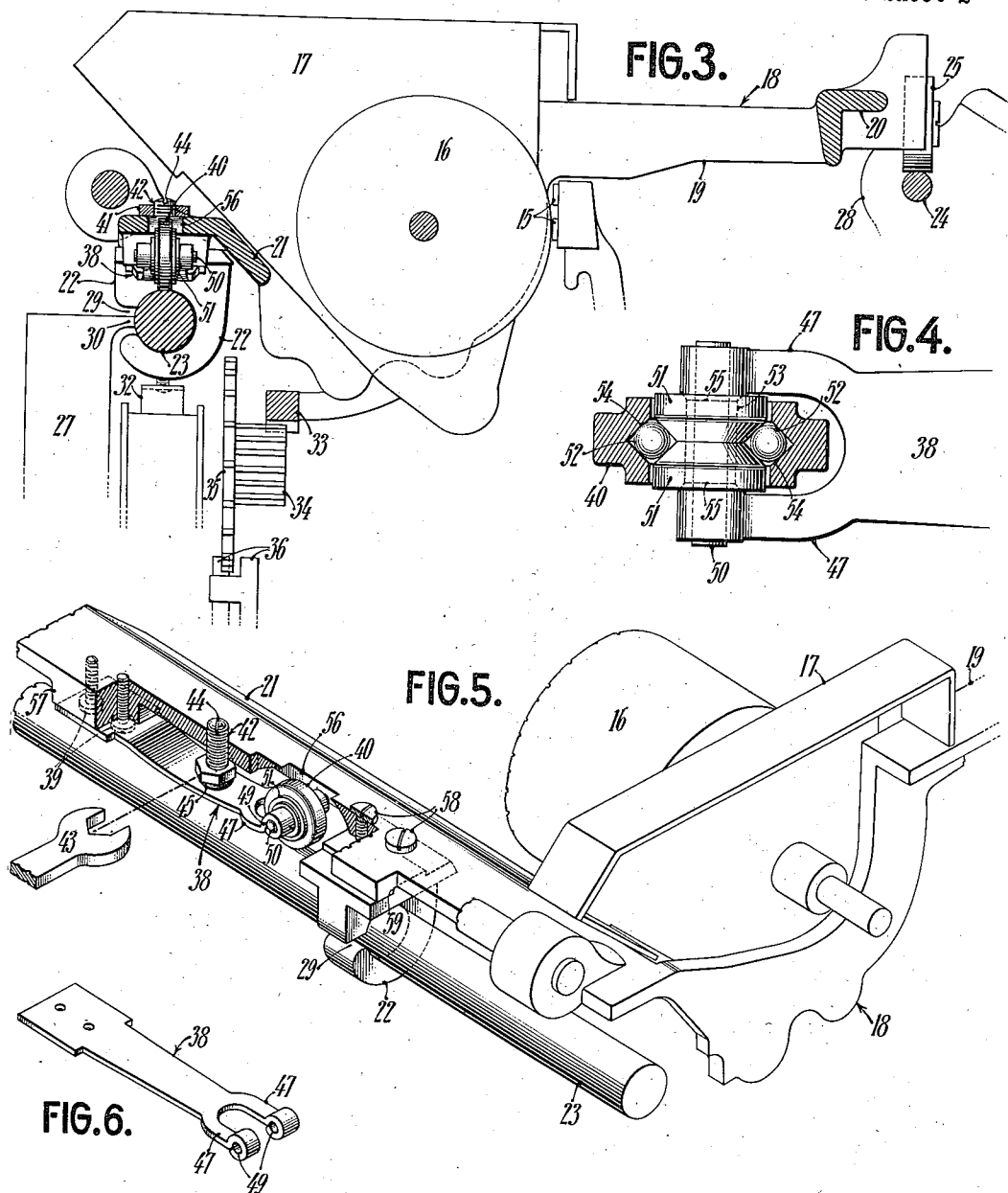
Aug. 18, 1936.

W. F. HELMOND
TYPEWRITING MACHINE

2,051,041

Filed April 3, 1935

2 Sheets-Sheet 2



INVENTOR:

INVENTOR:
William F. Helmond

BY

B. B. Stickney

ATTORNEY.

UNITED STATES PATENT OFFICE

2,051,041

TYPEWRITING MACHINE

William F. Helmond, West Hartford, Conn.,
assignor to Underwood Elliott Fisher Company,
New York, N. Y., a corporation of Delaware

Application April 3, 1935, Serial No. 14,381

12 Claims. (Cl. 197—69)

This invention relates to the means for supporting and guiding a typewriter-carriage for travel, and particularly to machines in which the carriage has sliding contact with the guiderail structure, as distinguished from machines in which the carriage-guiding contact with the rails is effected solely by means of rollers.

The sliding contact is preferred inasmuch as means employed therefor are better adapted to prevent shakiness of the carriage on the rails than are the usual roller-bearings. For example, the collar-like rail-riding lugs employed on a carriage, such as the Underwood, can be made to engage the companion guide-rail with a play-free sliding fit which will endure to prevent development of shakiness of the carriage on said guide-rail.

Moreover the sliding contact is a desideratum, in that a certain momentary augmentation of friction arising thereat as the carriage is arrested at the end of the letter-feeding step conduces to minimizing rebound of the carriage, thereby, together with the prevention of shakiness, conducing to proper letter-spacing and alignment, and uniformly clear printing by the types.

In some machines, such as those having extra long carriages or carriages burdened by attachments, the friction upon the guide-rail, due to the carriage-weight, may tend to be excessive.

It is an object of the invention, therefore, to provide, for carriages which are guided by sliding contact with the rail-structure, carriage-weight-counterbalancing means whereby excess weight-friction may be avoided and whereby the remaining modicum of weight-friction may be closely regulated irrespective of the weight of the carriage.

Another object is to have said weight-counterbalancing or weight-friction-minimizing means unfailingly effective throughout the range of carriage-travel.

A further object is to arrange said means so that they will be efficient, simple and therefore inexpensive, and readily applicable to existing designs of machines.

To the above ends, a spring-device may be used to counterbalance the carriage-weight; and traveling preferably with the carriage, such spring-device may react upon the guide-rail through practically frictionless contact as by means of a roller. Means may be provided to finely adjust the spring-device to regulate its counterbalancing effect, thereby to adjustably counteract the weight-friction at the points of sliding contact of the carriage with the guide-rail.

The spring-device is, by reason of its resilient reaction upon the carriage and guide-rail, unfailingly effective throughout the range of carriage-travel.

Other features and advantages will hereinafter appear.

In the accompanying drawings,

Figure 1 is a rear elevation view of a typewriter-carriage provided with collar-like lugs to ride a rear guide-rail, the view showing the preferred form of spring-device and its application to avoid excess carriage-weight friction upon the rail.

Figure 2 is a rear elevation view similar to Figure 1, and represents a longer, heavier carriage and corresponding reinforcement of the spring-device.

Figure 3 is a side view of a section taken substantially at the line 3—3 of Figure 1.

Figure 4 is an enlarged plan view showing details of a rail-engaging roller and its attachment to a leaf-spring employed in the spring-device.

Figure 5 is a perspective view showing the spring-device, represented in Figure 1, and its disposition relative to the carriage and the guide-rail.

Figure 6 is a perspective of the leaf-spring by itself.

In the Underwood machine, types strike against a platen, journaled in a frame, supported in the usual manner in a carriage-frame, which comprises side-bars, a front bar and a rear bar.

To support and guide the carriage for travel, the rear bar of said carriage-frame has two spaced collar-like shoes or lugs, fitted to slide along, and at the same time embrace, without play, a cylindrical rear guide-rail. A rail supports the carriage-frame at the front, the front carriage-frame bar having a roller riding upon said front rail. The rails are respectively supported by standards of the machine-framework. Each lug has the usual gap in its rail-embracing portion to clear rail-supporting tongues of the standards.

A spring-drawn tape advances the carriage in letter-feeding steps controlled by co-operation of the usual feed-rack, pinion, escape-wheel, and dogs.

It will be seen that the lugs have the usual capability of preventing shakiness of the carriage by reason of their rigidity and their sliding but enduring, play-free rail-embracing contact with the rear rail. It will further be seen that the usual momentary augmentation of frictional reaction at the rail-contacting surfaces of the

lugs 22, at the instant the carriage is arrested by one of the dogs 36, conduces to minimizing rebound of the carriage at the end of its letter-feeding step.

5 The friction at the rail-contacting surfaces of the lugs 22, due to gravitation, or, in other words, carriage-weight, is to be minimized, inasmuch as such weight-friction tends to impede acceleration of the carriage in its letter-feeding step.

10 The preferred and herein-illustrated means whereby the carriage-weight is adjustably counterbalanced to minimize the carriage-weight friction upon the rear guide-rail 23 will now be described.

15 Interposed between the top of the rear guide-rail 23 and the under side of the overhead rear bar 21 of the carriage-frame 18 is a leaf-spring 38. This leaf-spring may react directly upon said rear guide-rail 23 to co-operate with the lugs 22 in supporting the portion of the carriage-weight borne by said rear guide-rail 23. It will be noted that, to the extent to which the spring by its resilient force co-operates to support the carriage-weight, the load carried through the rail-riding lugs 22, and therefore the carriage-weight friction at said lugs, is diminished.

20 There are preferably two of the springs 38, as indicated in Figures 1 and 2, inasmuch as there are two of the lugs 22, and it may be desired to have the spring-device control the weight-friction at each lug 22 independently or differently.

25 In order to be in unvarying placement relative to the rail-riding lugs 22 throughout the range of carriage-travel, the spring or springs 38 travel with the carriage. Each of the two springs 38 may accordingly be fastened at one end to the bottom of the carriage-frame bar 21 by screws 39, and in such place on said bar 21 that the free end of the spring is near its associate lug 22. To make its engagement with the top of the rear guide-rail 23 substantially frictionless, said free end of the spring may be provided with a rail-engaging roller 40.

30 The spring 38 may extend lengthwise of the carriage-frame bar 21 and rail 23 as best seen in Figure 5, and may be of such length as to afford the desired degree of carriage-weight-upholding resilient force. The spring 38 may react, at a point between its ends, against an abutment which is adjustable to vary the carriage-upholding force of the spring. Such abutment may be the end of a screw 42, threaded into the carriage-frame bar 21. By turning said screw one way or the other, as by means of a wrench 43, Figure 5, or by means of a screw-driver slot 44, a spring-abutting end 45 of the screw may be projected more or less to flex the spring 38 differentially whereby the force of the spring necessary to relieve the lug or lugs 22 of the carriage-weight to reduce the weight-friction at said lugs, may be closely adjusted. A check-nut 41 locks the screw 42.

35 Although two springs 38, or, in other words, a spring-device acting at two different points, are shown, it will be evident that the provision or use of only one spring 38 will be of substantial benefit in minimizing and regulating the carriage-weight friction at the lugs 22; and it will be understood that such single spring may be placed at any requisite distance from one or another, or both, of the lugs 22.

40 The free end of the spring 38 may have forked tongues 47, looped as at 49, Figures 5 and 6, to retain and receive the opposite ends of an axle-pin 50 for the roller 40. As shown in Figure 4,

a pair of inner raceway-forming cones 51 co-operate with anti-friction balls 52 and an internal raceway-groove 54 of the roller 40 to provide for frictionless rotation of said roller 40. Said cones 51 may fit over a common bushing 53 whose ends may be upset, as at 55, to hold the cones 51 together. The bore of the bushing 53 fits the axle-pin 50 which may be held in place as by a force fit in said bore.

45 The spring may consist of a plurality of leaves. Thus, for example, at Figure 2, which represents an extra long, and therefore heavier, carriage, the roller-carrying leaf-spring 38 is shown reinforced by an overlying leaf 38^a, both leaves being secured by the screws 39, and the overlying leaf 38^a reaching merely to the looped end 49 of the roller-carrying leaf. It will be understood that the screws 42 will also serve to regulate the carriage-upholding force of the reinforced spring, and that, because of the reinforcement, 20 the spring need not be flexed unduly, by means of said screw, to afford the necessary force to uphold the extra weight carriage.

25 The carriage-frame bar 21 may have recesses 56 to clear the roller 40, as indicated in Figures 1, 3 and 5. Said carriage-frame bar 21 may also have bosses 57 for attachment of the springs 38 and for the indicated spacing of said springs below said bar 21. The rail-riding lugs 22 may be the usual separate pieces secured to the carriage-frame bar 21 by screws 58 and maintained in alignment by the usual groove-and-spline joint 59, Figure 5.

30 It will be seen now that the described spring-device may be adjusted by means of the screws 42 so that the lugs 22 may just skim along the crown of the rear rail 23, and that the carriage-weight friction at said lugs will be correspondingly reduced. It will further be seen that, by reason of the resiliency of the spring-device, the minimization of friction at the lugs will obtain throughout the range of carriage-travel, irrespective of irregularities in the rail-crown surface. Furthermore, the described spring-device in no way interferes with the function of the lugs 22 in maintaining the carriage without shakiness upon the guide-rail 23; nor does the spring-device prevent the operativeness of said lugs to conduce to minimizing rebound of the carriage at the end of the letter-feeding step.

45 Variations may be resorted to within the scope of the invention, and portions of the improvements may be used without others.

Having thus described my invention, I claim:

50 1. A typing-machine carriage and supporting structure including, in combination, a carriage, a guide-rail upon which said carriage slides in its travel, and a spring-device arranged to resiliently exert a carriage-weight-upholding force effective throughout the range of carriage travel to minimize the carriage-weight friction upon said rail.

55 2. A typing-machine carriage and supporting structure including, in combination, a carriage, a guide-rail upon which said carriage slides in its travel, and a spring-device arranged to resiliently exert a carriage-weight-upholding force effective throughout the range of carriage travel to minimize the carriage-weight friction upon said rail, said spring-device including means adjustable to regulate said carriage-weight-upholding force.

60 3. The combination of a typing-machine carriage, a guide-rail, said carriage having a sliding bearing upon said rail, whereby it is guided in its travel, and a carriage-upholding spring working substantially between said carriage and rail, and 75

acting to minimize, by its resilient force, the carriage-weight friction at said bearing.

4. The combination of a typing-machine carriage, a guide-rail, said carriage having a sliding bearing upon said rail, whereby it is guided in its travel, a carriage-upholding spring working substantially between said carriage and rail, and acting to minimize, by its resilient force, the carriage-weight friction at said bearing, and means adjustable to regulate said resilient force of said spring.

5. The combination of a typing-machine carriage, a guide-rail, said carriage having a sliding bearing upon said rail, whereby it is guided in its travel, and a carriage-upholding spring acting to minimize, by its resilient force, the carriage-weight friction at said bearing, said spring being arranged to travel with said carriage and react against said rail.

6. The combination of a typing-machine carriage, a guide-rail, said carriage having a sliding bearing upon said rail, whereby it is guided in its travel, and a carriage-upholding spring acting to minimize, by its resilient force, the carriage-weight friction at said bearing, said spring being arranged to travel with said carriage and react against said rail by means of a roller running upon said rail.

7. The combination of a typing-machine carriage, a guide-rail, said carriage having a sliding bearing upon said guide-rail at two points spaced lengthwise of the carriage, whereby said carriage is guided in its travel, and a spring-device arranged to travel with said carriage, and to afford two individual carriage-upholding resilient forces at two places companion to said bearing-points, whereby the carriage-weight frictions at said bearing-points are individually minimized.

8. The combination of a typing-machine carriage, a guide-rail, said carriage having a sliding bearing upon said guide-rail at two points spaced lengthwise of the carriage, whereby said carriage is guided in its travel, and a spring-device arranged to travel with said carriage, and to afford two individual carriage-upholding resilient forces at two places companion to said bearing-points, whereby the carriage-weight frictions at said bearing-points are individually minimized, means being provided to adjust said spring-device for regulating said resilient forces individually.

9. The combination of a typing-machine carriage, a guide-rail, said carriage having a sliding bearing upon said rail, and a leaf-spring arranged to travel with said carriage and to exert a resilient carriage-upholding force to minimize the carriage-weight friction at said bearing, means being provided whereby said spring has three points of reaction with reference to said carriage and said rail, the reactions at the three points cooperating to flex said spring and thereby produce said carriage-upholding force, said means including provision whereby one of said points may be adjusted to vary the flexing of the spring and thereby regulate said force.

10. In a typewriting machine, the combination with a letter-feeding carriage and a guide-rail upon which said carriage has a sliding bearing to guide it in its travel, of a spring arranged to travel with said carriage, and at the same time tend to lift the carriage from the rail and correspondingly minimize the carriage-weight friction at said bearing.

11. In a typewriting machine, the combination with a letter-feeding carriage and a guide-rail upon which said carriage has a sliding bearing to guide it in its travel, of a spring arranged to travel with said carriage, and at the same time tend to lift the carriage from the rail and correspondingly minimize the carriage-weight friction at said bearing, and means adjustable to control the carriage-lifting effect of said spring, and thereby regulate said carriage-weight friction.

12. In a typewriting machine, the combination of a letter-feeding carriage, a guide-rail, said carriage having a sliding bearing upon said rail arranged to guide the carriage in its travel, and at the same time prevent shakiness of the carriage on the rail, said sliding bearing being further operative, by reason of a momentary augmentation of friction thereat, as the carriage is arrested at the end of a letter-feeding step, to prevent rebound of the carriage, and a spring-device reacting against said carriage and rail, and thereby tending to lift the carriage and correspondingly minimize the carriage-weight friction at said bearing, said bearing remaining operative to prevent said shakiness and rebound.

WILLIAM F. HELMOND. 50