

981,028.

FIG. 1.

WITNESSES

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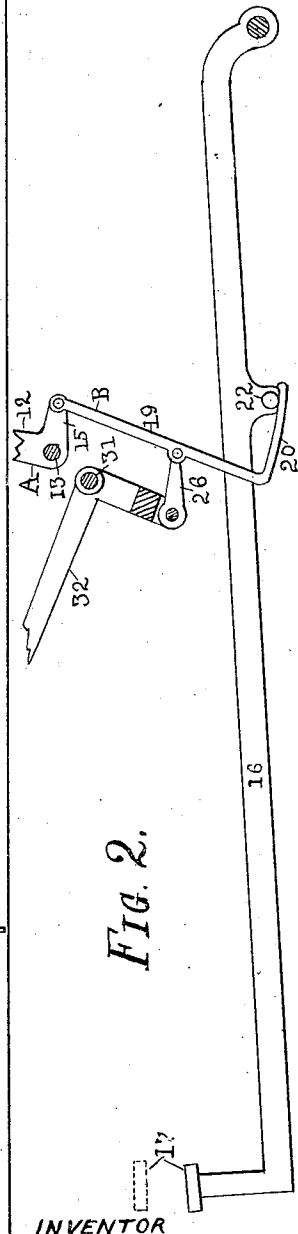


FIG. 2.

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BURNHAM C. STICKNEY, OF ELIZABETH, NEW JERSEY, ASSIGNOR TO UNDERWOOD TYPEWRITER COMPANY, OF NEW YORK, N. Y., A CORPORATION OF DELAWARE.

TYPE-WRITING MACHINE.

981,028.

Specification of Letters Patent.

Patented Jan. 10, 1911.

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To all whom it may concern:

Be it known that I, BURNHAM C. STICKNEY, a citizen of the United States, and resident of the city of Elizabeth, county of Union, and State of New Jersey, have invented certain new and useful Improvements in Type-Writing Machines, of which the following is a specification.

This invention relates to writing machines, especially those of the "front strike" variety; and its object is to provide simple but effective means for securing a wide range of variation in the touch of the finger keys, so that the machine may meet the requirements of all classes of operators.

My invention consists in certain combinations of devices, features of construction, and arrangements of parts, all as will be hereinafter particularly set forth, and pointed out in the concluding claims.

In the accompanying drawings, Figure 1 is a vertical longitudinal section of a front strike writing machine made in accordance with my improvements, the parts being adjusted for a hard touch, and one type bar and its key being in printing position. Fig. 2 is a fragmentary view showing a portion of the Fig. 1 mechanism, the key being in printing position, and the parts being adjusted for an extremely light key resistance.

In the views similar parts are designated by similar characters of reference.

The machine frame comprises a base 1, corner posts 2, and top plate 3. Over the latter runs the usual carriage (not shown) carrying a platen 4. A system of rearwardly striking type bars 5 is carried in a segment 6 at the front of the platen and below the top plate. The type bars carry types 7, rest upon a pad 8, and are pivoted at their rear ends upon a curved fulcrum wire 9 mounted in the segment 6, the hubs of the type bars working in radial slots 10 cut in the segment.

The type-bar operating devices comprise links 11 extending rearwardly and connecting the type bars to upright arms 12 of a system of bell cranks A, which are fulcrumed upon a transverse horizontal rod 13 mounted at its ends in ears 14 formed upon opposite walls of the base 1. Short rearwardly extending arms 15 of said bell cranks A are connected by pendent yielding links

B to a system of key levers 16 of the second order, said levers bearing keys 17 and extending rearwardly beneath the type bars and bell cranks, and being fulcrumed at their rear ends upon a transverse fulcrum rod 18. Each of the links B comprises a pendent stem 19 and a rearwardly directed arm 20, curved concentrically with the pivot 21 of the link, and hooking under a stud 22 carried by the contiguous key lever. Springs 23 may be connected to the bell cranks A, for returning them and their associated type bars and key levers to normal position. A universal bar 24 may be operated by the arms 12 of the bell cranks; and by means of suitable connections, a fragment whereof is shown at 25, may control the letter-feeding movements of the platen carriage.

In operation, a key 17 is depressed, and by means of the lever 16 and stud 22 thereon the link B is pulled down, vibrating the bell crank A, and through the link 11 pulling the type bar up to print. Upon relief of the key from pressure, the parts are returned to normal position by the spring 23.

At Fig. 1, the link or hook B hangs so that the stem 19 of the link is close to the stud 22 on the key lever, so that the link, although thin and somewhat flexible, is sprung little or none by the pull of the key lever thereon, and hence the type bar is swung to the platen by a minimum stroke of the key. At Fig. 2, however, the link B is shown as swung forward, so that the outer or rear end of the arm 20 thereon catches under the key-lever stud 22, and the pull of the key lever causes the arm 20 to bend down and also springs the stem 19, so that the key has an extra yielding action when struck a sharp blow; although when the key is given a light touch or moved with moderate speed, its dip may be substantially the same at one adjustment of the link B as at another, the extra dip being caused by the extra pressure upon the key by the operator.

The adjustment of the links B may be effected simultaneously by means of a series of idle links 26, extending horizontally forward from the links B, and at their front ends working in vertical slots 27 cut in a horizontal transverse bar 28, and pivoted on

a wire 29 mounted on said bar. The latter is normally stationary, and the idle links 26 guide the links B in their up and down strokes. The bar 28 is provided at its ends with rigid upwardly directed arms 30, which are fixed upon a transverse rock shaft 31 journaled at its ends in the ears 14.

A forwardly extending lever or handle 32 is provided for rocking the shaft 31, together with arms 30 and bar 28, thereby to adjust the idle links 26 and swing the links B all together forwardly or backwardly upon their pivots 21. At Fig. 2 the handle 32 is shown elevated to its highest position, and the links B to their extreme forward position. Adjustments between the extremes shown at Figs. 1 and 2 may be effected, thereby varying the springiness of the keys and making the touch as stiff or yielding as may be required; and a curved rack 33 may be attached to the front corner post 2, for holding the lever 32 where adjusted. At its forward end the lever may have a finger piece 34.

The response of the mechanism may be made very prompt by putting sufficient tension upon the springs 23 and the usual universal-bar spring (not shown), without however rendering the key touch harsh, inasmuch as such adjustment does not affect the yielding action of the links B.

By making the links B of suitable strength, and so proportioning the connections from the keys to the type bars that the normal dip of the keys is slight, the key touch may be rendered much stiffer than is usually practicable, and may also, at the pleasure of the operator, be rendered softer than usually practicable, or else adjusted to some intermediate point, without the necessity of altering the tension of the usual key-lever returning-spring (as 23) or the universal-bar spring. Hence the machine may be originally set to act as promptly as desired for both hard and soft key strokes, without the least liability of the operator thereafter deranging the action of the delicate carriage-feeding mechanism in attempting to adjust the key touch.

It will be observed that adjustable means, including the bar 28, are common to the devices which connect the levers 16 to the types 7, for enabling said connecting devices to have an extra yielding action or not at will of the operator; that the yielding link B is adjustable at its point of connection with one of the arm and lever elements 15 and 16, so as to vary at will the resistance offered by the key; that one of the lever and link elements 16 and B, preferably the latter, has a yielding arm, and that the link may be adjusted relatively to the lever so as to vary the point of engagement of the yielding arm; that means are controlled by the single finger piece 34 for adjusting the sys-

tem of links B relatively to the key levers, thereby to regulate the yielding action of the arms 20 thereof; and that the hinged device 28 extends transversely of the links B, and is also connected to all of said links.

Variations may be resorted to within the scope of my improvements. For instance, the links may have widely different construction and be otherwise connected to a single device for regulating their yielding action.

Having described my invention, what I claim as new and desire to secure by Letters Patent of the United States is as follows:

1. In a typewriting machine, the combination of a system of types, a system of levers provided with keys, yieldable devices connecting said levers to said types, and a single adjustable means common to said connecting devices, for enabling them to have yielding action or not at will.

2. In a typewriting machine, the combination of a system of types, a system of keys, an intermediate system of yielding links, and a single device common to said links and adjustable at will for varying the yielding action of said links.

3. In a typewriting machine, the combination of a type, an operating arm therefor, a lever provided with a key, a link connecting said lever to said arm, one of said link and lever elements having a yielding arm, and means for adjusting said link relatively to said lever so as to vary the point of engagement of said yielding arm, to regulate its yielding action.

4. In a typewriting machine, the combination of a type bar, a lever provided with a key, a pivoted link between said lever and said type bar, said link comprising a stem and an arm projecting therefrom, a device engaged by said arm, and means for swinging said link upon its pivot so as to vary at will the point of engagement of said arm.

5. In a typewriting machine, the combination of a type, a type-operating arm, a yielding link pivoted thereon and consisting of a stem portion and an arm portion, a lever provided with a key and also having a projection engaged by the arm portion of said link, and means for swinging said link upon its pivot so as to vary the point of engagement of said arm portion with said projection.

6. In a typewriting machine, the combination of a system of types, a system of type-operating arms, a system of levers provided with keys, and a system of links connecting said levers to said arms, each of said links having a yielding construction, and means for simultaneously adjusting said links so as to vary at will the yielding action of said links.

7. In a typewriting machine, the combination of a system of types, a system of operat-

ing arms therefor, a system of levers provided with keys, a system of links connecting said levers to said arms, one of said systems of levers and links being provided with yielding arms, and means controlled by a single finger piece for adjusting said system of links relatively to said system of levers so as to vary the points of engagement of said yielding arms.

8. In a typewriting machine, the combination of a series of type bars, a series of keys, an intervening series of links having yielding arms, and a single device common to said links for regulating the yielding action of said arms simultaneously.

9. In a typewriting machine, the combination of a series of type bars, a series of levers provided with keys, a series of pivoted yielding links between said levers and said type bars, each of said links comprising a stem and an arm projecting therefrom, and a device connected to all of said links and movable at will to swing said links upon their pivots.

10. In a typewriting machine, the combination of a series of types, a series of type-operating arms, a series of yielding links pivoted upon said arms and depending therefrom and each consisting of a stem portion and an arm portion, a series of levers provided with keys and having projections engaged by the arm portions of said links, and a bar extending transversely of said links and connected thereto, and movable to swing said links upon their pivots.

11. In a typewriting machine, the combination of a system of rearwardly striking type bars, a system of levers provided with keys, a system of sub-levers between said levers and said type bars, and a system of pendent yielding links pivoted to said sub-levers and connected to said key-levers by means of arms projecting from said links at their lower ends and curved concentrically with the link pivots and engaging studs on the key-levers; and a bar extending transversely of said links and provided with a finger piece, and movable by said finger piece in a direction to swing said links upon their pivots.

12. In a typewriting machine, the combination of a system of types, a system of operating arms therefor, a system of levers provided with keys, and a system of links connecting said levers to said arms, each of said links having a yielding construction, and means for adjusting said links so as to vary at will their yielding action; said adjusting means including a bar arranged transversely of said links, and a series of links mounted upon said bar and connected to said yielding links.

13. In a typewriting machine, the combination of a system of types, a system of operating arms therefor, a system of levers pro-

vided with keys, a system of links connecting said levers to said arms, one of said systems of levers and links being provided with yielding arms, a hinged bar extending transversely of said links, a finger-lever rigid with said bar, and links pivoted upon said bar and also pivoted to said connecting links.

14. In a typewriting machine, the combination of a series of type bars, a series of keys, an intervening series of links each having a yielding construction, and means, including a series of idle links connected to said intervening links, for regulating the yielding action of the latter.

15. In a typewriting machine, the combination of a series of type bars, a series of keys, an intervening series of links having yielding arms, idle links pivoted to said links and arranged transversely thereto, and a finger piece connected to said idle links for causing them to swing said intervening links and vary the points of action of said arms thereon.

16. In a typewriting machine, the combination of a series of type bars, a series of levers provided with keys, a series of pivoted yielding links between said levers and said type bars, each of said links comprising a stem and an arm projecting therefrom, a hinged device extending transversely of said links, a series of idle links connecting said yielding links to said hinged device, and means for turning said hinged device so as to swing said yielding links upon their pivots.

17. In a typewriting machine, the combination of a series of types, a series of type-operating levers, a series of yielding links pivoted upon said levers and depending therefrom and each consisting of a stem portion and an arm portion, a series of levers provided with keys and having projections engaged by the arm portions of said links, a bar extending transversely of said links and connected thereto by idle links, means for adjusting said bar so as to swing said idle links, and means for maintaining the adjustment of said bar.

18. In a typewriting machine, the combination of a system of rearwardly striking type bars, a system of levers provided with keys, a system of sub-levers between said levers and said type bars, and a system of pendent yielding links pivoted to said sub-levers and connected to said key levers by means of arms projecting from said links at their lower ends and curved concentrically with the link pivots and engaging studs on the key levers; a hinged bar extending transversely of said pendent links, idle links connecting said pendent links to said bar, and a finger-lever upon said bar, and a rack for said finger-lever.

19. In a typewriting machine, the combination with a series of types and a series of

of keys, of a series of intervening yielding links, a device to which said links are connected, said device being normally stationary during the type-actuating movements of said links, and means for moving said device so as to regulate the yielding action of said links.

20. In a typewriting machine, the combination with a series of types and a series of keys, of a series of intervening yielding links, and a single regulator for increasing or diminishing at will the yielding action of said links.

21. In a typewriting machine, the combination with a series of types and a series of keys, of a series of intervening links each having a yielding arm; and means for calling into action at will shorter or longer portions of said arm, so as to render the key touch harder or softer.

22. In a typewriting machine, the combination with a key, a type, and a yielding member, of means for adjusting the yielding member; said yielding member being between the key and the type for transmitting movement from the former to the latter, and said adjusting means being mounted upon the frame of the machine and serving as a guide for said yielding member.

23. The combination with a series of levers, a series of type-bars, and a series of intervening yielding links, of means for moving the series of links laterally to vary the extent of yielding.

24. The combination with a series of keys and a series of type-bars of an intervening series of elbow-like devices forming floats or links transmitting movement between the keys and the type-bars; each of said elbow-like devices so constructed that it is flexed by the operation of its key, so as to cushion the key strokes.

25. The combination with type-bars and key-levers, of flexible arms as 20 connected to the type-bars, projections 22 upon the key-levers, and means for shifting said arms along said projections to regulate the extent to which the arms shall flex or yield at the key strokes.

26. The combination with a type-operating member and an endwise immovable key lever, of an intervening hook having a pivot at one end to connect it to the type-operating member and a pivotal support upon the framing between its ends, the point of the hook having a pin-engaging surface concentric with the first pivot, and a pin upon the key-lever to engage said surface, the hook being shiftable to vary its point of engagement with the pin.

27. In a typewriting machine, the combination of a system of types, a system of keys, a system of intervening members provided with yielding arms through which movement may be transmitted from the keys to

the types, and means for regulating the yielding action of all of said arms simultaneously.

28. The combination with a platen, of a series of type actions, each comprising a key, a lever, a type-bar, two links intervening between said lever and type-bar, one of said links being yielding, and a lever connected between said links.

29. The combination with a series of type actions, each comprising a key, a series of links, one of the links having a yielding construction, and a lever connected between the links, of adjusting means for the yielding links.

30. The combination with a series of type-bars, of a series of keys, yielding devices connecting the keys to the type-bars, and an adjustable member having idle links extending to all of the yielding devices, for adjusting the tension thereof.

31. The combination with type operating members and links connected thereto, of keys connected to the links to operate the type operating members, and means extending forwardly from the links convenient to the keyboard and constructed to affect the links in a manner to vary the resistance of the keys to the touch at the printing strokes of the type operating members.

32. In a typewriting machine, the combination of a system of types, a system of keys, a system of intervening members provided with yielding arms through which movement may be transmitted from the keys to the types, and means for regulating the yielding action of all of said arms simultaneously.

33. In a typewriting machine, the combination of a system of types, a system of keys, a system of intervening members provided with yielding arms through which movement may be transmitted from the keys to the types, and means for adjusting said members simultaneously so as to adjust the yielding action of said arms.

34. In a typewriting machine, the combination of a series of types, a series of keys, intervening movement-transmitting members each having arms whereof at least one is yielding, and a single device having a connection with all of said arms for regulating their relative yielding movement and thereby adjusting the touch of all of the keys simultaneously.

35. The combination with type bars, of levers, links intervening between the type bars and the levers and having yielding constructions, and a single device common to the links for adjusting the same simultaneously.

36. The combination of type bars and keys, intervening tension members, and a single device common to the tension members for adjusting the same simultaneously.

37. In a typewriting machine, the combination with type bars, of levers connected thereto, operating links connected to said levers, guide links connected to said operating links and themselves pivoted to stationary supports on the machine, and keys connected to the operating links.

38. In a typewriting machine, the combination with type bars, of levers connected thereto, operating links connected to said levers, guide links connected to said operating links and themselves pivoted to stationary supports on the machine, and key levers mounted upon the framework and having connections to said operating links.

39. In a typewriting machine, the combination with type bars, of levers connected thereto, operating links connected to said levers, guide links connected to said operating links and themselves pivoted to stationary supports on the machine, key levers mounted upon the framework and having connections to said operating links, and a universal bar operated by the first-mentioned levers.

40. In a typewriting machine, the combination with type bars, of levers connected thereto, operating links connected to said levers, guide links connected to said operating links and themselves pivoted to stationary supports on the machine, key levers mounted upon the framework and having connections to said operating links, and springs attached to the first-mentioned levers to return the key actions to normal positions.

41. In a front strike writing machine, the combination with rearwardly striking pivoted type bars, of upstanding arms, as 12, connected thereto by links, a universal bar engaged by said upstanding arms, and key levers connected by links to horizontal arms provided upon said upstanding arms.

42. In a front strike writing machine, the combination with rearwardly striking pivoted type bars, of upstanding arms, as 12, connected thereto by links, springs connect-

ed to said upstanding arms, and key levers connected by links to horizontal arms provided upon said upstanding arms.

43. In a typewriting machine having a framework, the combination with type-operating levers, of operating links pivoted thereto, idle links mounted upon the framework and pivoted to said operating links for guiding the latter, and actuating means connected to said operating links independently of the guide links.

44. In a typewriting machine, the combination with a platen and type bars pivoted to strike rearwardly against the same, of key-bearing levers, bell cranks in rear of the type bars and connected by links to said levers, links extending from the bell cranks to the type bars, and a universal bar engaged by the bell cranks.

45. In a typewriting machine, the combination of a series of type bars, a series of key-actuated operating devices therefor, a series of freely-swinging, anchored bearing links, one for each of said type bar operating devices, and means for simultaneously adjusting all of said bearing links.

46. In a typewriting machine, the combination of a series of type bars, a series of key-actuated operating devices therefor, a series of bearing links for said operating devices, each of said links being anchored at one end and pivotally connected at its opposite end to one of said key-actuated operating devices, and means for simultaneously adjusting the anchored ends of all of said links.

47. In a typewriting machine, the combination of a series of type bars, a series of key levers, a series of floating devices actuated by said key levers and operatively connected with said type bars, a series of bearing links for said floating devices, and means for simultaneously adjusting all of said links.

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Witnesses:

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