B. C. STICKNEY.

TYPE WRITING MACHINE.

APPLICATION FILED JULY 16, 1902.

990,170.

Patented Apr. 18, 1911.

Fig. 1.

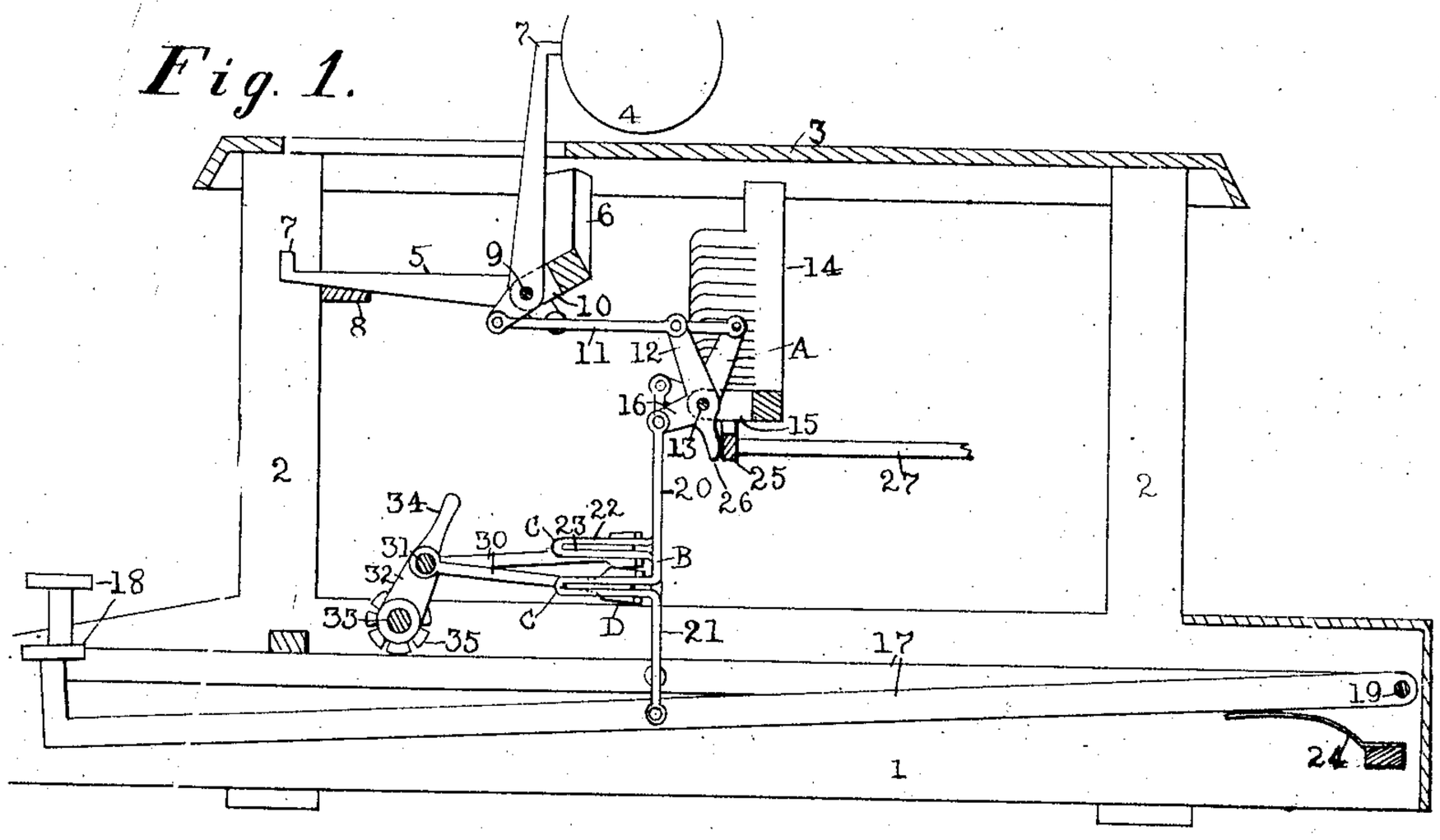


Fig. 2.

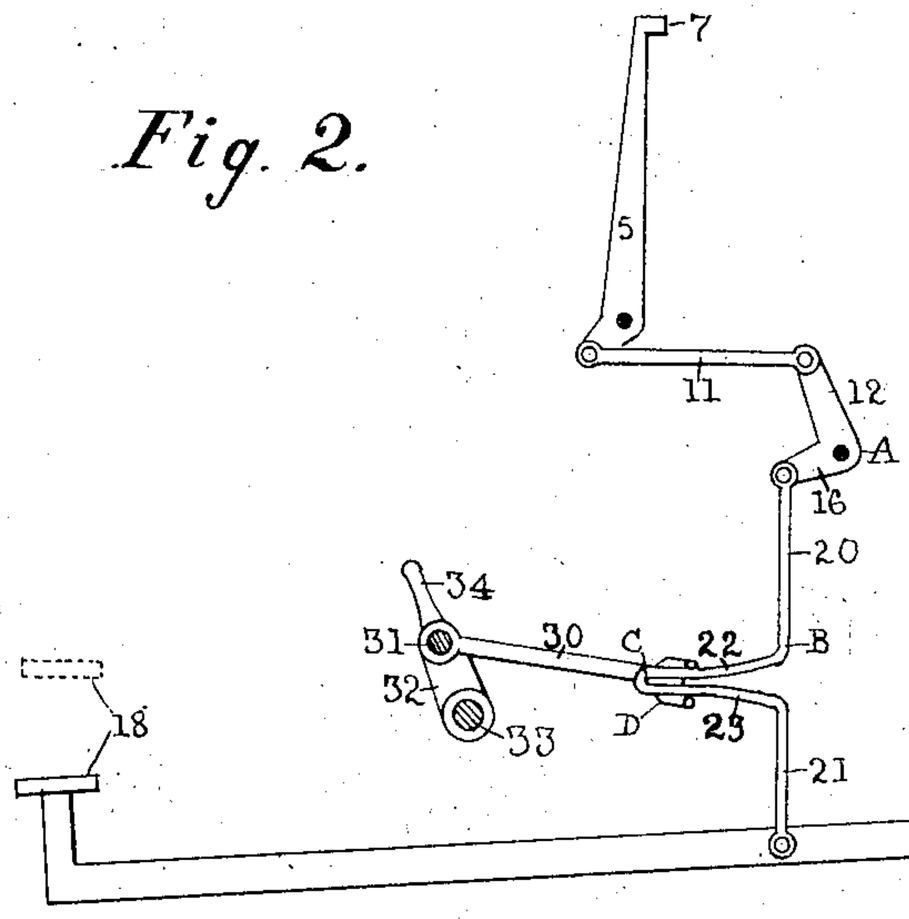
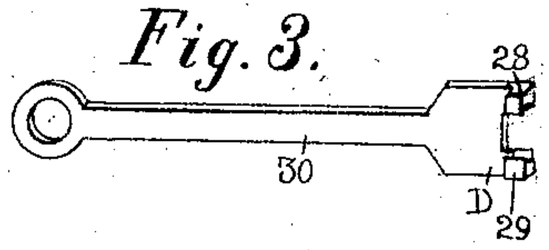


Fig. 3.



WITNESSES

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TYPE-WRITING MACHINE.

990,170. Specification of Letters Patent. Patented Apr. 18, 1911.

Application filed July 16, 1902. Serial No. 115,794.

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 typewriting machines, especially those of the "front strike" variety; and its object is to provide simple means for securing wide range of variation in the touch of the finger keys, and particularly to provide a series of connecting-rods of such a construction and having such appurtenances that they may either elongate or not when the keys are struck sharp blows, according to the position to which the appurtenances are set by the operator.

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 skeleton view of a type action shown at Fig. 1, the parts being in printing position, and the parts adjusted for a yielding touch. Fig. 3 is an enlarged perspective view of one of the idle links whereby the elasticity of the type-bar actuating links or devices may be controlled.

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 from and connecting the type bars to upwardly extending or upright arms 12 of a system of bell cranks or sub-levers A, which may be disposed in an arc in rear of the type bars and mounted upon a fulcrum wire 13 curved concentrically with the system of type bars, said fulcrum wire being mounted in a fixed segment 14, having vertical slots 15 for the bell cranks, which are arranged vertically in said slots, and are of substantially uniform size. Short forwardly extending arms 16 of said bell cranks are connected by pendent yielding links B to a system of key levers 17 of the second order, said levers being provided at their forward ends with keys 18 and extending horizontally and rearwardly or from front to rear of the machine beneath the type bars and bell cranks, and being mounted at their rear ends upon a transverse fulcrum rod 19. The links B may stand vertically and extend in a single plane across the machine; those at the middle of the system being shortest, and their lengths gradually increasing, to compensate for the increased elevation of the curved system of bell cranks, and the longest links being at the sides of the system. Each of the links comprises upper and lower stem portions 20 and 21, connected by a forwardly projecting elongated loop portion C, the upper and lower arms whereof are designated as 22 and 23. Preferably each complete link is bent up from a single length of wire, which may be spring-tempered. The object of introducing the loop is to render the link extensible and also resilient, so that when the key is given a sharp blow, the link may stretch or elongate and thereby cushion the touch and prevent undue jarring of the finger of the operator. By making the parts of proper strength and proportions, the spring loop may recover its normal form during the printing stroke, thereby accelerating the movement of the type bar and improving the type-impression, while to some extent cushioning the arrest of the operator's hand at the termination of the down stroke of the key. The links 11 may extend beneath the pivots of the type bars.

Springs 24 may be provided for returning the key-levers and connected parts to normal position. A universal bar 25 may

be operated by short third arms or projections 26 depending from the bell cranks A, and by means of suitable connections, a fragment whereof is shown at 27, may control the letter-feeding movements of the platen carriage.

In operation, a key 18 is depressed, and by means of the lever 17 the link B is pulled down, vibrating the bell crank A, and through the link 11 thrusting the type bar up to print. Upon relief of the key from pressure, the parts are returned to normal position by the spring 24. During the down stroke of the key, the link B need not yield unless the key is struck a sharp blow; and the extent of its yielding action may be regulated by devices now to be described, so that the extra yielding action of the key under a sharp blow may be increased or reduced, according to the preference of the operator.

Each of the loops C is provided with a slide-clasp D, preferably in the form of a yoke or fork, the opposite members 28 and 29 whereof embrace the loop. By adjusting the clasp along the loop, a greater or less extent thereof is enabled to yield at the printing stroke, and the key-touch is varied accordingly. For convenience of adjustment, the slide-clasps D are formed upon the ends of idle links 30, all of which are pivoted at their forward ends to a transverse horizontal rod 31, by a forward or backward movement whereof all of the idle links and clasps may be adjusted simultaneously, and the touch of all the keys affected. For effecting this movement, the rod may be mounted upon the upper ends of opposite rock-arms 32, fixed upon a rock-shaft 33 parallel with the rod 31 and journaled at its ends in the side walls of the base 1. One of the arms 32 may be provided with a handle 34; and a friction washer 35 may be placed between the rock-arm and the side wall, for retaining the hinged frame in any position to which it is adjusted. By thrusting the handle or finger-piece 34 to the rear, as at Fig. 1, the clasps D are adjusted close to the stems of the links B, and the latter are permitted to yield but little if any at the depression of the keys, and hence the key touch is rendered resisting or hard. If, on the contrary, said handle 34 is pulled forward, as at Fig. 2, the clasps are slidden to the forward portions of the loops C, leaving each arm of the latter free to yield, so that when the keys are given hard strokes the links B may elongate, thus cushioning the key touch, or giving it an extra yielding action. It will be understood that during the movements of the links B, the links 30 vibrate idly upon their common support 33. The response of the mechanism may be made very prompt by putting sufficient tension upon the springs 24 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 latter 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 24) or the universal-bar spring.

It will be observed that one of the members connecting the key to the type is formed with a loop extending transversely to the general direction of the member, so that during the actuation of the type said member may yield, and thereby cushion the key touch; that in this instance said member yields in the direction of its length; that preferably the yielding construction lies between the ends of said member, and is preferably in the form of an arm consisting of the discrete yielding parallel portions 22. 23; that the clasp or brace D is carried by or articulated to said yielding arm and is adjustable therealong; that the yielding action of all of the loop-arms may be regulated simultaneously; that the function of the brace D is to stiffen the loop-arm, said clasp being suitable for a pull link, and that normally the loop portions 22 and 23 are substantially parallel.

Many variations in construction, operation and arrangement may be resorted to within the scope of my invention; and portions of my improvements may be used without others.

Certain features herein shown are claimed in my pending application No. 112,030, filed June 17, 1902.

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

1. In a typewriting machine, the combination with a type and a key of a member transmitting movement from the key to the type, said member being formed with a loop, such that during the actuation of the type said member may yield, and thereby cushion the key touch and means for adjusting the yielding action of said loop.

2. In a typewriting machine, the combination with a type bar and a key lever of an intervening link, said link being formed with a loop transverse to its length, and said loop permitting the link to yield in the direction of its length during the actuation of the type bar by the key lever and means for adjusting the yielding action of said loop.

3. In a typewriting machine, the combination of a system of types, a system of keys, an intermediate system of links, each

link having a yielding construction between its ends, and a single means common to said links and adjustable at will for varying the yielding action of said links.

4. In a typewriting machine, the combination of a type, a key, an intervening member provided with a yielding transverse arm through which movement may be transmitted from the key to the type, and a member carried by said yielding arm and adjustable therealong for regulating its yielding action.

5. In a typewriting machine, the combination of a type bar, a key, an intervening link having a yielding transverse arm, and means adjustable upon said arm for regulating its yielding action.

6. In a typewriting machine, the combination of a type, a key, a link which transmits movement from said key to said type, said link having a loop construction, and a device movable along said loop for regulating the yielding action thereof.

7. In a typewriting machine, the combination of a type, a key, an intervening movement-transmitting member, said member having arms whereof at least one is yielding, and a device movable along said arms, to engage both of them at different points, for regulating their relative yielding movement.

8. In a typewriting machine, the combination with a system of types and a system of keys of a system of members transmitting movement from the keys to the types, each of said members being formed with a loop, and means for regulating the yielding action of said loops.

9. In a typewriting machine, the combination with a system of type bars and a system of key levers of a system of intervening links, each link being formed with a loop transverse to its length, and means for regulating the yielding action of said loops.

10. In a typewriting machine, the combination of a system of types, a system of keys, a system of intervening members provided with yielding looped 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.

11. 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, members carried by said yielding arms, and means for adjusting said members simultaneously upon said arms so as to adjust the yielding action of said arms.

12. In a typewriting machine, the combination of a type system, a system of keys, intervening links having yielding arms, devices adjustable upon said arms for regulating their yielding action, and a finger piece connected to means for adjusting said regulating devices.

13. In a typewriting machine, the combination of a system of types, a system of keys, links for transmitting movement from said keys to said types, each link having a loop construction, devices engaging said loops for regulating their yielding action, and a member common to said regulating devices, for adjusting them simultaneously.

14. In a typewriting machine, the combination of a series of types, a series of keys, intervening movement-transmitting members each having between its ends 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.

15. In a typewriting machine, the combination of a type, a key, an intervening member provided with a yielding construction, an idle link connected to said intervening member and adapted to stiffen the same, and means for adjusting said idle link along the yielding portion of said intervening member.

16. In a typewriting machine, the combination of a type, a key, an intervening member provided with a yielding-arm through which movement may be transmitted from the key to the type, an idle link connected at one end to said yielding arm in a manner to stiffen the latter, and means connected to the other end of said idle link for adjusting it along said yielding arm.

17. In a typewriting machine, the combination of a type, a key, an intervening member provided with parallel portions whereof at least one is yielding, a device connecting said parallel portions and adapted to stiffen said yielding portion, and means for adjusting said connecting device along said parallel portions.

18. In a typewriting machine, the combination of a type, a key, an intervening member provided with a yielding arm, said arm consisting of parallel portions which are arranged transversely to the general direction of said intervening member, a stiffening device connecting said parallel portions, an idle link connected to said stiffening device, and means connected to said idle link for adjusting the link and stiffening device along said parallel portions.

19. In a typewriting machine, the combination of a type bar, a key, an intervening link having a yielding arm, a link having a brace attached to said arm, and means for adjusting the last-named link along said arm.

20. In a typewriting machine, the combination of a type, a key, a link which transmits movement from said key to said type, said link having a loop construction, an idle

link having at one end a brace for coöperating with said loop, and adjustable means supporting the other end of said idle link.

21. In a typewriting machine, the combination of a system of types, a system of keys, an intermediate system of links, each link having a yielding construction between its ends, braces for the yielding portions of said links, a system of idle links connected to said braces, a rod whereon said idle links are pivoted, and means for adjusting said rod.

22. In a typewriting machine, the combination with a system of types and a system of keys, of a system of members transmitting movement from the keys to the types, each of said members being formed with a loop, idle links having braces which are articulated to said loops, a rod connected to said idle links, and a finger piece for adjusting said rod.

23. In a typewriting machine, the combination with a system of type bars and a system of key levers of a system of intervening links, each link being formed with a loop transverse to its length, clasps adjustable along said loops, idle links connected to said clasps, and means for adjusting said idle links and clasps.

24. In a typewriting machine, the combination of a system of types, a system of keys, links for transmitting movement from said keys to said types, each link having a loop construction, idle links formed with clasps engaging said loops, a rod whereon said idle links are pivoted, a rocking frame whereon said rod is mounted, and a finger piece connected to said rocking frame.

25. In a typewriting machine, the combination of a system of types, a system of keys, a system of key levers, links extending up from said key levers and connected to said type bars, each link having a horizontally extending loop, horizontal idle links formed with clasps engaging said loops, a transverse horizontal rod whereon said idle links are pivoted, a horizontal transverse rock shaft having upwardly extending arms whereon said rod is mounted, a finger piece for rocking said arms and shaft, and means for detaining said arms and shaft in their adjusted positions.

26. In a typewriting machine, the combination of a system of rearwardly striking type bars, a series of bell cranks pivoted in a curve in rear of said type bars, said bell cranks being of substantially uniform size and consisting of forwardly extending arms and upwardly extending arms, a segment having substantially vertical slots wherein said bell cranks are pivoted, links connecting said type bars to said upwardly extending arms, yielding links depending from said forwardly extending arms, and key-bearing levers of the second order to which the lower ends of said depending links are connected, and a single member for adjusting the yielding action of all the links simultaneously.

27. The combination of a type-bar, a lever, an intervening link having between its ends a yielding construction, and means for adjusting the yielding action of the link; said adjusting means comprising a finger-piece stationary during the movement of the link, and having a part connected to the link to move therewith.

28. The combination of a type-bar, a key, an intervening link, and adjusting means comprising a finger-piece stationary during the movement of said link, and having a part connected to said link between its ends to move therewith.

29. 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 formed with a yielding loop, and a lever connected between said links.

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

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

32. In a typewriting machine, the combination with rearwardly striking type bars and key-levers extending rearwardly from the keyboard beneath the type-bars, links extending up from the key-levers, bell-cranks in rear of the type-bars and having short forwardly extending arms attached to said links, and long upstanding arms, links extending forwardly from said upstanding arms and attached to the type-bars below their pivots; said upwardly extending links having yielding constructions, and means being provided for adjusting the extent to which they may yield.

33. In a typewriting machine, the combination with rearwardly striking type bars and key-levers extending rearwardly from the keyboard beneath the type-bars, links extending up from the key-levers, bell-cranks in rear of the type-bars and having short forwardly extending arms attached to said links, and long upstanding arms, links extending forwardly from said upstanding arms and attached to the type-bars below their pivots; said upwardly extending links having yielding constructions, and means being provided for adjusting the extent to which they may yield; said bell-cranks having short pendent arms which op-

erate a universal-bar of a carriage feeding mechanism independently of the extent of yielding action of said links.

34. In a typewriting machine, the combination with type-bars, key-levers, and intervening links, each provided with a yielding loop, of means for regulating the yielding action of the loops.

35. In a typewriting machine, the combination with type-bars and key-levers, of intervening links each provided between its ends with a yielding loop, provision being made for mechanically limiting the extent of yielding of the loop.

36. In a typewriting machine, the combination with a type-bar, a key lever, and an intervening link having a loop, of a clip shiftable upon the loop to vary the extent of yielding thereof.

37. The combination with rearwardly striking type bars, of links extending rearwardly therefrom, bell cranks connected to said links and mounted in a segment in rear of the type bars, links depending from said bell cranks, key-bearing levers connected to the lower ends of the depending links, and a universal bar operated by a third arm on each of said bell cranks.

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Witnesses:
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