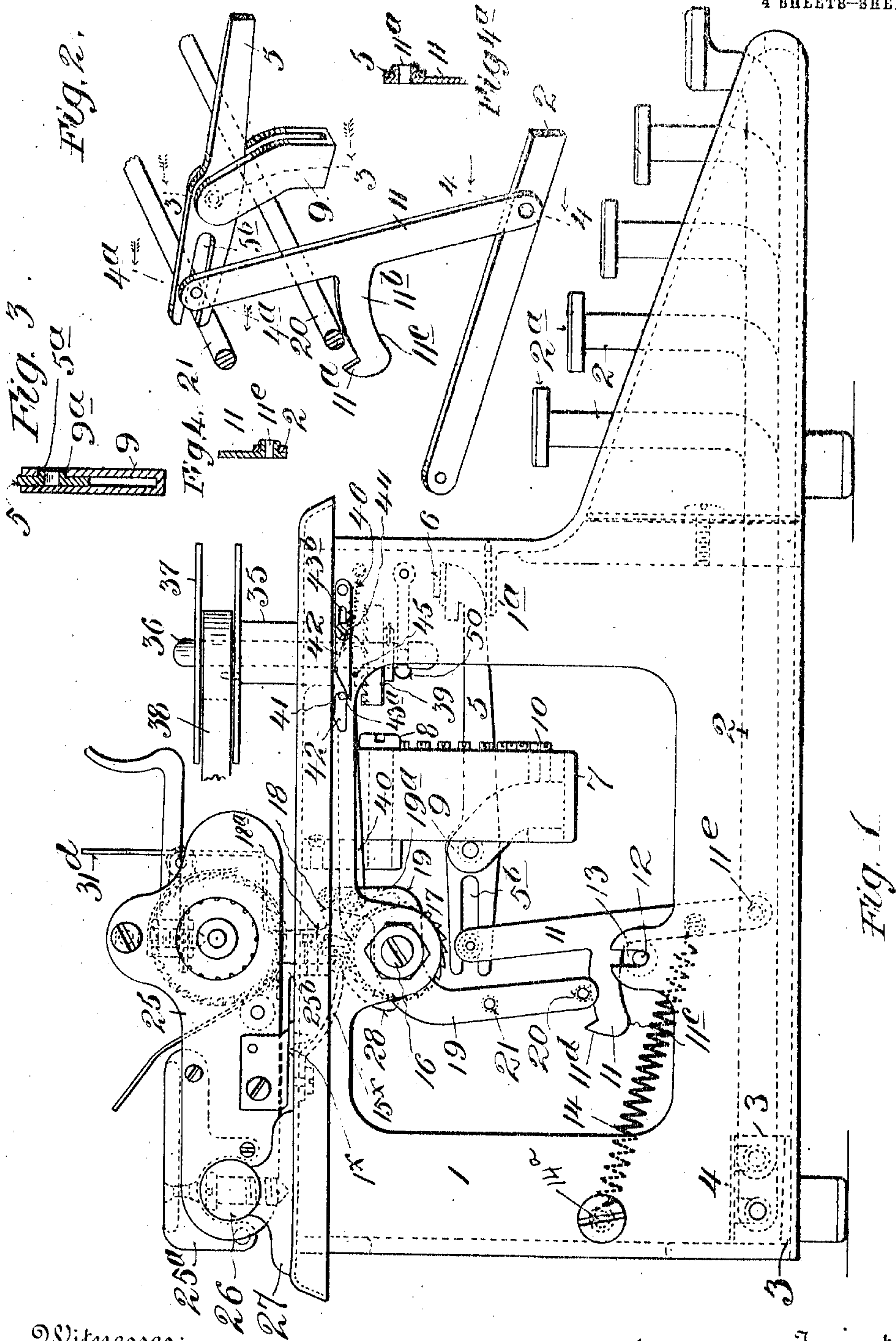


W. W. LASKER.
TYPE WRITING MACHINE.
APPLICATION FILED DEC. 12, 1908.

990,276.

Patented Apr. 25, 1911.

4 SHEETS—SHEET 1.



Witnesses:
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Marie J. Wainright

Inventor
W. W. Lasker
By his Attorney
D. F. Bourne

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4 SHEETS—SHEET 2.

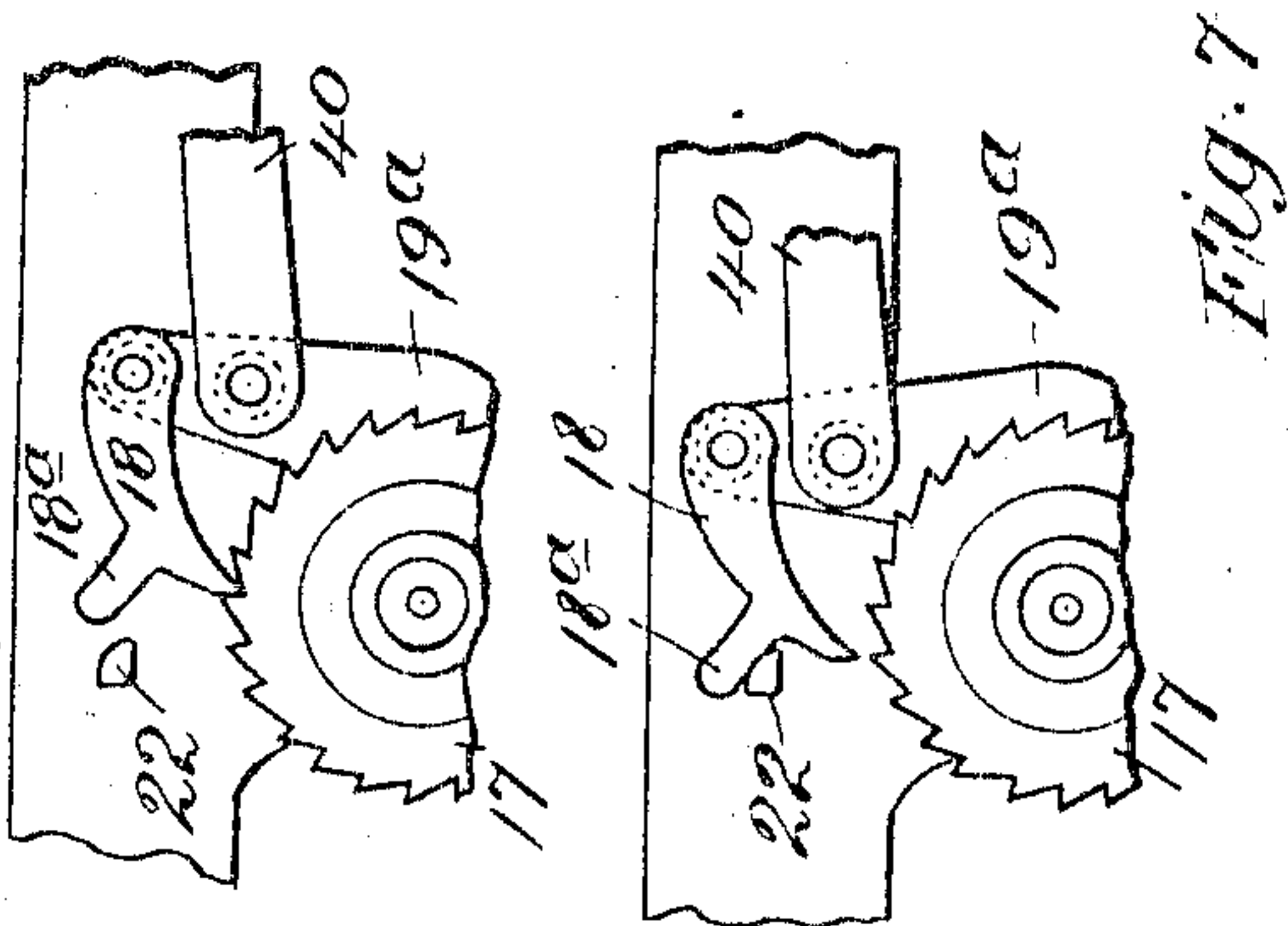


Fig. 6

Fig. 7

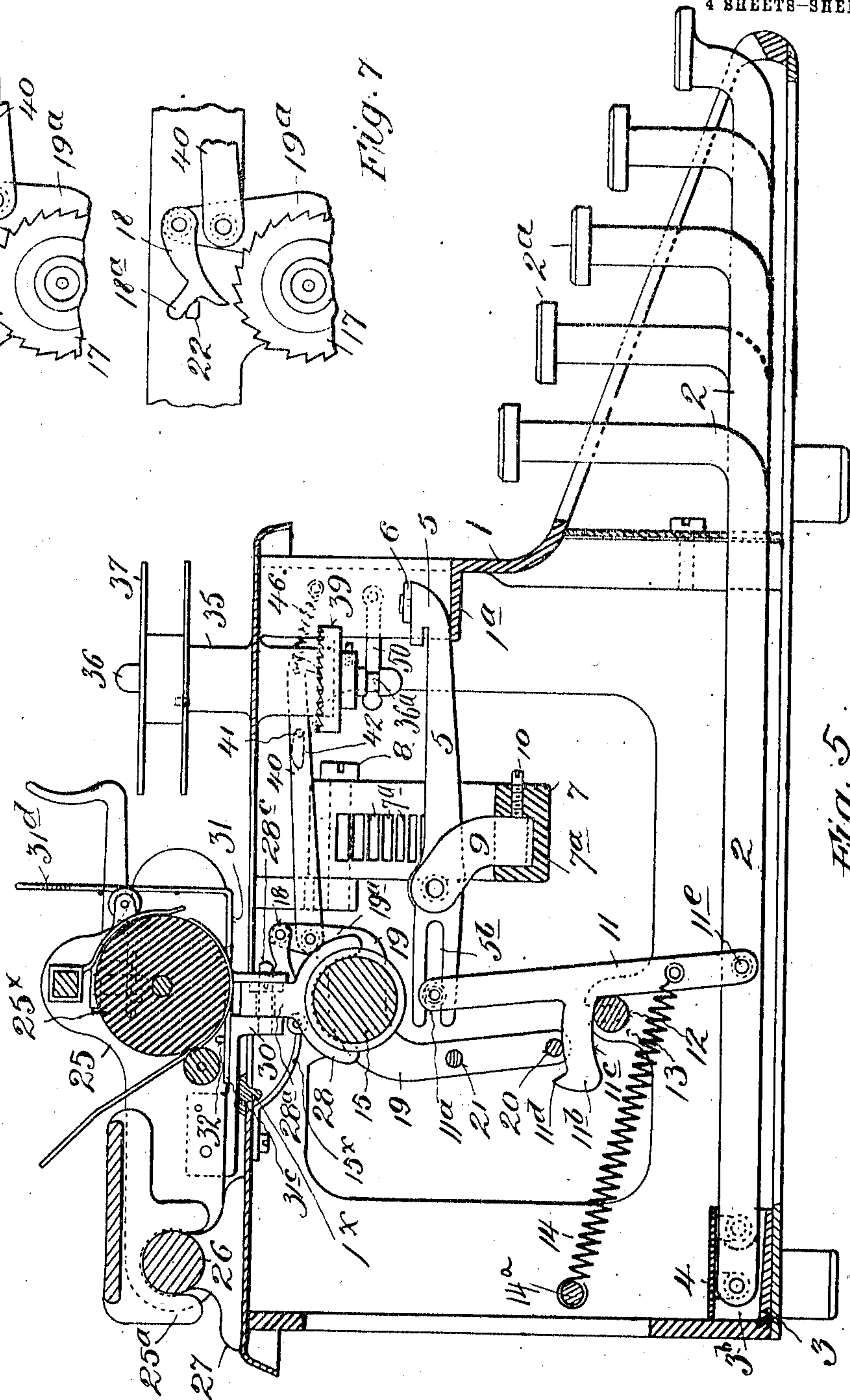


Fig. 5

Witnesses:
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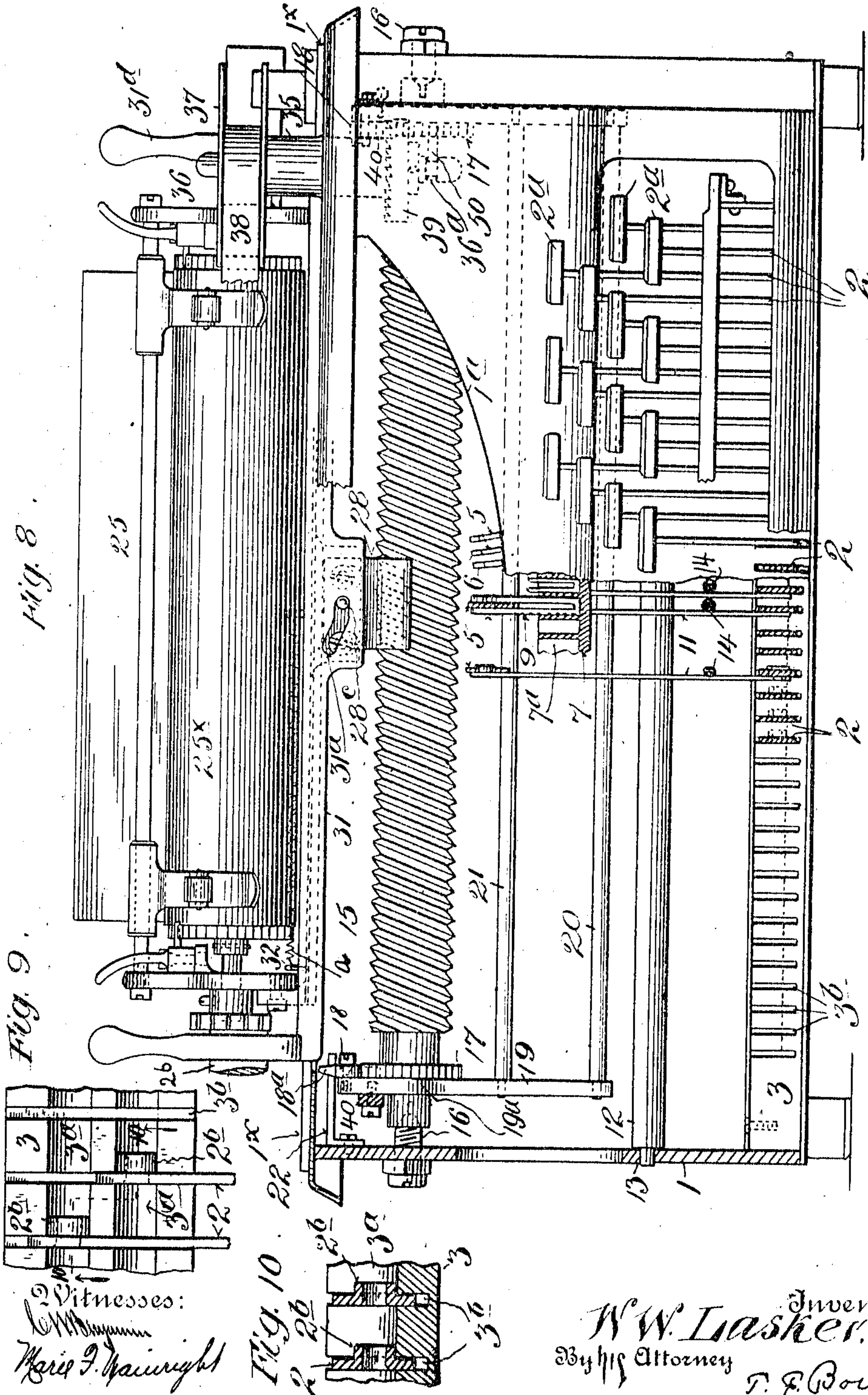
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4 SHEETS-SHEET 3.



Witnesses:
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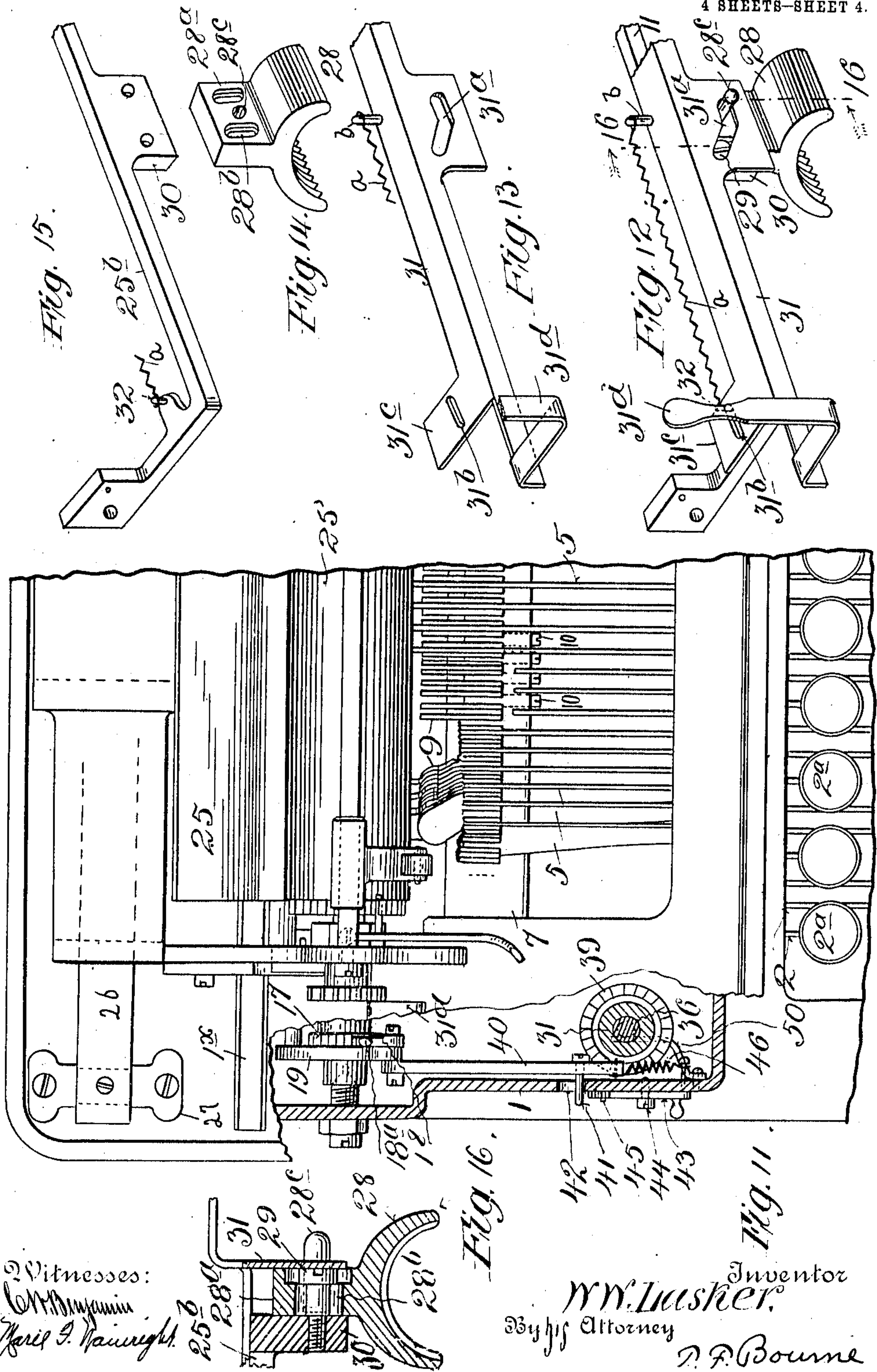
W. W. Lasker, Inventor
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4 SHEETS-SHEET 4.



Witnesses:
C. H. Thompson
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UNITED STATES PATENT OFFICE.

WILLIAM W. LASKER, OF NEW YORK, N. Y.

TYPE-WRITING MACHINE.

990,276.

Specification of Letters Patent.

Patented Apr. 25, 1911.

Application filed December 12, 1908. Serial No. 467,238.

To all whom it may concern:

Be it known that I, WILLIAM W. LASKER, a citizen of the United States, and resident of New York city, borough of Brooklyn, in the county of Kings and State of New York, have invented certain new and useful Improvements in Type-Writing Machines, of which the following is a specification.

My invention relates to improvements in typewriting machines, and has particular reference to such machines commonly called visible writing machines, and the objects of my invention are to lock the type bars from displacement to prevent them from becoming jammed together, to permit ready removal and replacement of the type bar supports, to cause positive feeding of the paper carriage, and generally to simplify the various parts and reduce the number thereof.

My invention comprises the novel details of improvement that will be more fully hereinafter set forth and then pointed out in the claims.

Reference is to be had to the accompanying drawings forming part hereof, wherein,

Figure 1 is a side elevation of a typewriting machine embodying my invention; Fig. 2 is a perspective view illustrating part of the type bar operating device; Fig. 3 is a detail section substantially on the line 3, 3, in Fig. 2; Fig. 4 is a detail section on the line 4, 4, in Fig. 2; Fig. 4^a is a detail section on the line 4^a, 4^a in Fig. 2; Fig. 5 is a cross section of the machine; Fig. 6 is a detail illustrating the carriage feeding ratchet and pawl device; Fig. 7 is a similar view, showing the parts in a different position; Fig. 8 is a front elevation of the machine, parts being broken away and other parts removed; Fig. 9 is a detail plan view illustrating the key lever supports or bearings; Fig. 10 is a section on the line 10, 10, in Fig. 9; Fig. 11 is a partly broken plan view of part of the machine; Fig. 12 is a detail perspective view of part of the carriage feeding device; Fig. 13 is a detail perspective of the shifting or sliding member of Fig. 12; Fig. 14 is a detail of the nut of the carriage feeding device; Fig. 15 is a perspective detail of part of the carriage, and Fig. 16 is a section on the line 16, 16, in Fig. 12.

Similar numerals of reference indicate corresponding parts in the several views.

The numeral 1 indicates the main frame of the machine, which may be of any suit-

able construction, and at 2 are the key levers having their keys 2^a arranged in any suitable or wellknown manner. As a simple and convenient means for detachably and pivotally supporting the key levers 2 I provide frame 1 with a transversely disposed bar 3 having one or more longitudinally disposed grooves 3^a and transversely disposed slots 3^b intersecting the grooves 3^a, in which slots the end portions of the key levers 2 fit snugly, and the key levers 2 are provided with hubs or projections 2^b which fit in the corresponding grooves 3^a, whereby said key levers are pivotally supported. The hubs or projections 2^b are shown formed on the key levers 2 by pressing the same out of the metal of said levers, whereby said hubs are made integral with the key levers. A plate 4 secured over bar 3 retains the key levers in position in the grooves 3^a, and by removing said plate any of the key levers may be readily removed and replaced individually without disturbing any of the other key levers. This arrangement provides a simple construction and reduces the number of parts usually employed in typewriting machines in pivotally supporting the key levers.

5 indicates the type bars, which may be made by stamping the same out of suitable sheet metal and attaching the type 6 to the free ends thereof by a screw or in any suitable manner. The type bars 5 are pivotally supported upon a curved or segment-like support 7 hung from frame 1, as by screws 8, and frame 1 is provided with a correspondingly curved ledge or rest 1^a upon which the free ends of the type bars normally rest. The type bars 5 have individual detachable bearings 9 carried by support 7, for which purpose said support is provided with recesses or pockets 7^a opening upwardly and in which the bearings 9 snugly fit. The bearings 9 are shown as having two side members receiving the type bars 5 between them, which bearings may be made by suitably stamping and bending sheet metal (see Figs. 2 and 3). As a simple and convenient means of pivotally supporting the type bars in the bearings 9 said type bars are provided with hubs or projections 5^a pressed out from the material of the bars and entering aperture 9^a in one member of the bearing 9 (see Fig. 3), the opposite side of the type bar being shown resting flush against the corresponding side of bearing 9.

To apply the type bars to bearings 9 the side members of the latter may be sprung apart to permit the type bars and their hubs to be pushed into place and then the members of the bearings 9 will spring back to pivotally support the type bars, as in Fig. 3. The bearings 9 are each set in a seat or pocket 7^a of support 7, and said bearings are held firmly in place by screws 10 entering threaded apertures in support 7. The arrangement is such that one screw 10 may bear against and hold two bearings 9 thereby reducing the number of screws required for such purpose (see Fig. 11). By the means described any one of the type bars may be removed and replaced without disturbing any other type bar, and the bearings 9 may be adjusted up and down as required, for alinement of the type, it being understood that the type bars and their bearings are so set that the several type always strike a given point with respect to the carriage.

The type bars 5 are operated by the key levers as follows: A link 11 is pivotally connected with each key lever, at 11^a, and is slidably connected with each type bar. For the latter purpose each type bar is shown provided with a longitudinally substantially horizontally disposed slot 5^b, (at the side of the pivot opposite type 6) receiving a hub or projection 11^a from a corresponding link 11. The hub or projection 11^a is shown pressed out of the metal of link 11 and turned back or bent over the opposite side of type bar 5 (see Fig. 4^a), whereby the link is slidably operatively connected with the type bar, and the link and type bar are retained in proper position. The links 11 each have a rearward projection 11^b the under surfaces of which are shown curved at 11^c and rest upon an abutment, shown in the form of a transverse bar or roller 12 supported by frame 1, as upon the slotted member 13 thereof, all whereby as a key lever is depressed it will tend to draw the corresponding link 11, and as the projection 11^b of such link rides over the abutment or bar 12 said link will be caused to swing toward the front, instantly causing a rapid accelerating movement, and as its hub 11^a slides through the slot 5^b of type bar 5 it will cause the latter to swing on its pivot to project its type 6 against the platen of the carriage or the paper thereon. A spring 14 attached to each link 11 and to a rod 14^a on frame 1 tends normally to draw and maintain the respective parts in the positions shown in Figs. 1 and 5, for as the key lever is released the spring 14 by drawing back the link 11 will cause the type bar to be depressed and the key lever to be raised. The arrangement is such that the type bars are locked in normal position resting upon ledge or support 1^a as the bearing 9 is disposed between ledge or support 1^a and the hub or projection 11^a,

and as the portion of the type bar above slot 5^b then bears upon hub 11^a the type bar cannot rise or swing because projection 11^b of link 11 by bearing upon abutment or rod 12 cannot be depressed by movement imparted direct to type bar 5, but only by the depression of a key lever. By locking the type bars in their normal positions the type bars cannot vibrate, collide or become wedged together and the operation of the machine is thus facilitated. The pivot 11^e is shown similar to 11^a, part of link 11 being pressed out and passed through a hole in the key lever and the end of part 11^e bent over, see Fig. 4.

My improved means for feeding the paper carriage step by step without jumping or vibration are as follows:—At 15 is a screw or spiral worm extending lengthwise below the paper carriage, and suitably journaled, as by pivots or studs 16 carried by frame 1, which screw or worm is of suitable pitch and preferably is a multiple thread screw. Step by step carriage feeding rotation of said screw is given for each depression of a type key or space key, for which purpose I have shown a suitable ratchet wheel 17 secured at opposite ends of the screw and operated by pawls 18 carried by rocking arm or lever 19 hung concentric with or upon a suitable portion of screw 15. The rocking arm or lever 19 is shown provided with two depending arms connected together by a cross bar 20 located above the projections 11^b of links 11, a brace 21 also being shown connecting the depending arms of the rocking arm or lever. The projections 11^b are provided with upwardly extending lugs 11^d adapted to engage cross bar 20 at the appropriate time. The relation of the parts is such that as a key lever or space key is depressed the corresponding lug 11^d will engage the cross bar 20 and thus cause pawls 18 to operate ratchets 17 to rotate screw or worm 15 the appropriate distance for each forward step of the paper carriage. Lugs 11^d are shown normally at a distance back of cross bar 20 so that there will be independent movement of key levers 2 before lugs 11^d engage cross bar 20, then before the completion of the down stroke of the key lever lug 11^d will engage cross bar 20 to cause appropriate movement of screw 15. To cause screw 15 to come to rest just before the key strikes the paper, pawls 18 are disengaged from the corresponding ratchets which may be accomplished by means of a lug 18^a on the pawl engaging stud 22 placed in suitable relation upon frame 1 (see Figs. 6 and 7), whereby pawls 18 will be in engagement with the ratchets for a suitable distance of the movement of the pawls and as lugs 18^a engage studs 22 and ride on the latter the pawls will be moved out of engagement with the ratchets and the

screw 15 and the carriage will be at rest at the moment the type strikes the paper. The paper carriage, indicated generally at 25, and which may be of any suitable construction, may be guided by rod 26 secured upon frame 1 (as by brackets 27), the carriage being shown provided with yokes 25^a open at the bottom fitting over and sliding upon rod 26, whereby the carriage may be readily lifted off the frame. The carriage 25 is provided with a nut or internally threaded piece 28 fitting the threads of screw or worm 15, and means are provided for raising and lowering nut 20 out of and into engagement with screw 15 as required for adjustment of the carriage. Nut 28 is movably connected with carriage 25, and for this purpose said nut is shown provided with a stem 28^a having slots 28^b receiving the shank portions of screws 29 which are secured in a lug 30 depending from the carriage, whereby nut 28 may have up and down movement. Nut 28 carries a pin 28^c that enters a suitable slot 31^a in a slide 31 that is carried by carriage 25. Slide 31 is shown mounted to slide along the bar 25^b of carriage 25, which slide is provided with longitudinally extending slots 31^b in portions 31^c that receive pins 32 extending from the carriage, and slide 31 is also shown provided with handles 31^d whereby the slide may be shifted upon the carriage. A spring *a* connected with pin *b* on slide 31, and with the carriage (as with pin 32) maintains slide 31 in the normal position shown in Fig. 12, and automatically returns slide 31. Slot 31^a is shown having a horizontal portion and an upwardly inclined portion, the arrangement being such that when the slide is in one position the pin 28^c of nut 28 will be in the horizontal portion of slot 31^a and thus the threads of the nut will be held in engagement with the threads of screw 15, and when the slide is moved to the opposite position pin 28^c will ride up the inclined portion of slot 31^a thereby raising nut 28 out of engagement with screw 15 to permit the carriage to be shifted by hand, whereupon slide 31 will again be moved in the opposite direction to cause nut 28 to engage screw 15. When the nut is raised from screw 15 the carriage may rest upon rail 1^x on frame 1. Spring detents 15^x acting on ratchets 17 retain screw 15 in normal position.

The inking ribbon devices are arranged as follows:—Near opposite ends of frame 1 are bearings 35 in which are journaled shafts or spindles 36 on which are mounted the inking ribbon rolls or spools 37, any suitable or wellknown guide being provided for retaining the ribbon 38 in line with the printing position of the platen 25^x of the paper carriage. The shafts 36 carry crown ratchets 39 adapted to be engaged by pawls 40 pivotally connected with the levers 19 so

that as the latter rock a ribbon spool may be rotated step by step. The pivots of pawls 18 and 40 may be made by pressing out the metal of said pawls and passing the same through holes in the corresponding lever arm 19^a, and bending back the metal of such pressed out hub or pivot in the manner shown in Fig. 4^a with respect to hub 11^a. The pawls 40 at opposite ends of the machine are intended to operate alternately upon the corresponding ratchet 39 to cause the ribbon to wind in one direction or the other on its corresponding spool 37, and for this purpose the pawls 40 are located on opposite sides of the corresponding shaft 36, each pawl carrying a pin 41, shown passing through a suitable slot 42 in frame 1, which pins are adapted to be engaged by a movable piece of slide 43 carried by frame 1 (see Figs. 1 and 11), said movable piece 43 having an inclined or beveled end 43^a adapted to engage pin 41 when slide 43 is pushed forward to raise pawl 40 from engagement with the corresponding ratchet 39. Slide 43 is shown provided with a slot 43^b receiving a screw 44 carried by frame 1, slide 43 also resting on a suitable support 45. Springs 46 connected with frame 1 and with pawls 40 serve to pull the pawls 40 and thus maintain pawls 18 and swinging frame or levers 19 in normal positions. By pushing one slide 43 under a pin 41 to raise the corresponding pawl 40 out of engagement with the corresponding ratchet 39 the opposite pawl 40 will cause rotation of the corresponding ratchet 39 and ribbon spool 37 to cause the ribbon to feed in one direction, and then by reversing the positions of the slides 43 the opposite pawl 40 will operate to wind the ribbon in the reverse direction. Springs 50 secured to frame 1 and bearing against shafts 36 prevent the spools 37 from overrunning. Said springs are shown entering grooves 36^a in shafts 36 and thus sustain said shafts in their bearings.

My invention is not limited to the details of construction and arrangements of parts shown and described, as the same may be varied within the scope of the appended claims without departing from the spirit of my invention.

Having now described my invention what I claim is:—

1. A typewriting machine having a pivoted type bar carrying type on one side of its pivot and having a projection on the opposite side of its pivot, a key lever, a vertically disposed link located beneath said projection pivotally connected with the key lever and slidably connected with said projection of the type bar to pull down said projection to rotate the type bar, and means independent of the key lever to prevent depression of the link except by the depression of the key lever.

2. A typewriting machine having a type bar, a key lever, a link connecting the latter with the type bar, the link having a lateral projection above its point of connection with the key lever, and an abutment upon which said projection slides as the link is depressed to cause lateral movement of the link upon depression of the key lever.
3. A typewriting machine having a pivoted type bar, a key lever, a link connecting the key lever with the type bar, said link having an outwardly disposed projection, and an abutment separate from the key lever upon which said projection slides to cause lateral movement of the link.
4. A typewriting machine having a pivoted type bar provided with an outwardly disposed projection on the side of the pivot opposite the type, a key lever, a link pivotally connected with the key lever, means for slidably connecting the link with the projection of the type bar, said link having a lateral projection, and an abutment upon which the link slides for causing the link to have lateral motion upon depression of the key lever to swing the type bar upon its pivot.
5. A typewriting machine having a pivoted type bar, a key lever, a link movably connected with the key lever and with the type bar, the link having a projection extending in the plane of the key lever, and an abutment separate from the key lever upon which said projection slides as the link is depressed to cause the link to have lateral movement upon operation of the key lever.
6. In a typewriting machine the combination of a plurality of pivoted type bars, a plurality of key levers, links movably connecting the corresponding type bars and key levers, said links each having a lateral projection, and an abutment separate from the key lever upon which said projections slide to cause lateral movement of the links upon operation of the corresponding key lever.
7. In a typewriting machine the combination of a plurality of pivoted type bars, a plurality of key levers, links movably connecting the corresponding type bars and key levers, said links each having a projection, and an abutment extending across the machine adjacent all of the links and their projections upon which said projections slide to cause each link to move transversely upon operation of the corresponding lever.
8. A typewriting machine having a pivoted type bar provided with a substantially horizontally disposed portion on the side of the pivot opposite the type, a key lever below the type bar, a link movably connected with the key lever and slidably connected with said extended portion of the type bar, a projection extending from said link, an abutment co-acting with said projection to prevent depression of the key lever by movement of the type bar, and means to maintain said projection in operative relation to said abutment.
9. A typewriting machine having a type bar provided with a hub pressed out of the metal thereof, a bearing having two parallel members receiving the type bar between them, one of said members having a hole receiving said hub, a support for said bar, and means to operate the type bar.
10. A typewriting machine having a type bar provided with a hub pressed out of the metal thereof, a bearing comprising a piece of metal bent into two members receiving the type bar between them, one of said members bearing against one side of the type bar and the other member having a hole receiving the hub of the type bar, a support for the bearing, and means to operate the type bar.
11. A typewriting machine having a carriage, a screw, a nut connected with the carriage for co-action with the screw, a ratchet connected with the screw, a lever and a pawl for operating said ratchet, a type bar, a key lever, a link connecting the type bar with the key lever, means for causing the link to have lateral movement, and means for causing said lateral movement of the link to operate said lever and pawl to rotate the screw.
12. A typewriting machine having a carriage, a screw, a nut connected with the carriage for co-action with the screw, a ratchet connected with the screw, a lever and pawl for operating said ratchet, a type bar, a key lever, a link connecting the type bar with the key lever, said link having a projection provided with a lug to operate the lever and pawl, and means for causing the link to have lateral movement to cause said lug to operate the lever and pawl.
13. A typewriting machine having a carriage, a screw, a nut connected with the carriage for co-action with the screw, a ratchet connected with the screw, a lever and pawl for operating said ratchet, a type bar, a key lever, a link connecting the type bar with the key lever, said link having a projection provided with a lug to operate the lever and pawl, and means for causing the link to have lateral movement to cause said lug to operate the lever and pawl, said lug being normally out of operative co-action with the last named lever.
14. A typewriting machine having a carriage, a screw, a nut connected with the carriage for co-action with the screw, ratchets at opposite ends of the screw, levers and pawls to co-act with said ratchets, a cross bar connecting said levers, type bars pivotally supported, key levers, links connecting the key levers with the type bars, said links having projections provided with lugs to engage the cross bar between said first mentioned levers, and means to cause the links

to have lateral movement upon operation of the corresponding key lever.

15. A typewriting machine having a carriage, means for feeding the carriage step by step, a type bar, a key lever, a link pivotally connected with the key lever to descend with the latter, the link having sliding connection with the type bar to rotate the latter, means for causing the link to have lateral movement, said link having means separate from the type bar for causing said lateral movement of the link to operate said carriage feeding devices.

16. A typewriting machine having a carriage, devices for feeding the carriage step by step, a type bar, a key lever, a link connecting the type bar with the key lever, said link having a projection provided with a lug to operate the carriage feeding devices, and means for causing the link to have lateral movement to cause said lug to operate said carriage feeding devices.

17. A typewriting machine having a carriage, devices for feeding the carriage step by step, a lever to operate the feeding devices, a type bar, a key lever, a link connecting the type bar with the key lever, said link having a projection provided with a lug to operate said lever, and an abutment over which said projection slides for causing the link to have lateral movement to cause said lug to operate the lever.

18. A typewriting machine having a carriage, devices for feeding the carriage step by step, a lever to operate the feeding devices, a type bar, a key lever, a link connecting the type bar with the key lever, said link having a projection provided with a lug to operate said lever, and an abutment over which said projection slides for causing the link to have lateral movement to cause said lug to

operate the lever, said lug being normally out of operative co-action with said lever.

19. A typewriting machine having a carriage, devices for feeding the carriage step by step, levers to operate said devices, a cross bar connecting said levers, type bars, key levers, links connecting the key levers with the type bars, said links having projections provided with lugs to engage the cross bar between said levers, and means to cause the links to have lateral movement upon operation of the corresponding key lever.

20. A typewriting machine having a carriage, devices for feeding said carriage step by step, a type bar, a key lever, a link connecting the type bar with the key lever, said link having a projection, an abutment over which said projection slides as the link is depressed to cause the link to have lateral movement, and means operated by the lateral movement of said link for operating said carriage feeding devices.

21. A typewriting machine having a carriage, devices for feeding said carriage step by step, a type bar, a key lever, a link connecting the type bar with the key lever, said link having a projection, an abutment over which said projection slides as the link is depressed to cause the link to have lateral movement, and a lever for operating the carriage feeding devices and arranged to be operated by the lateral movement of said link for operating said lever.

Signed at New York city, in the county of New York, and State of New York, this 5th day of December, A. D. 1908.

WILLIAM W. LASKER.

Witnesses:

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MARIE F. WAINRIGHT.