

No. 780,380.

PATENTED JAN. 17, 1905.

J. W. PAUL.
TYPE WRITER.

APPLICATION FILED SEPT. 24, 1902.

4 SHEETS—SHEET 1.

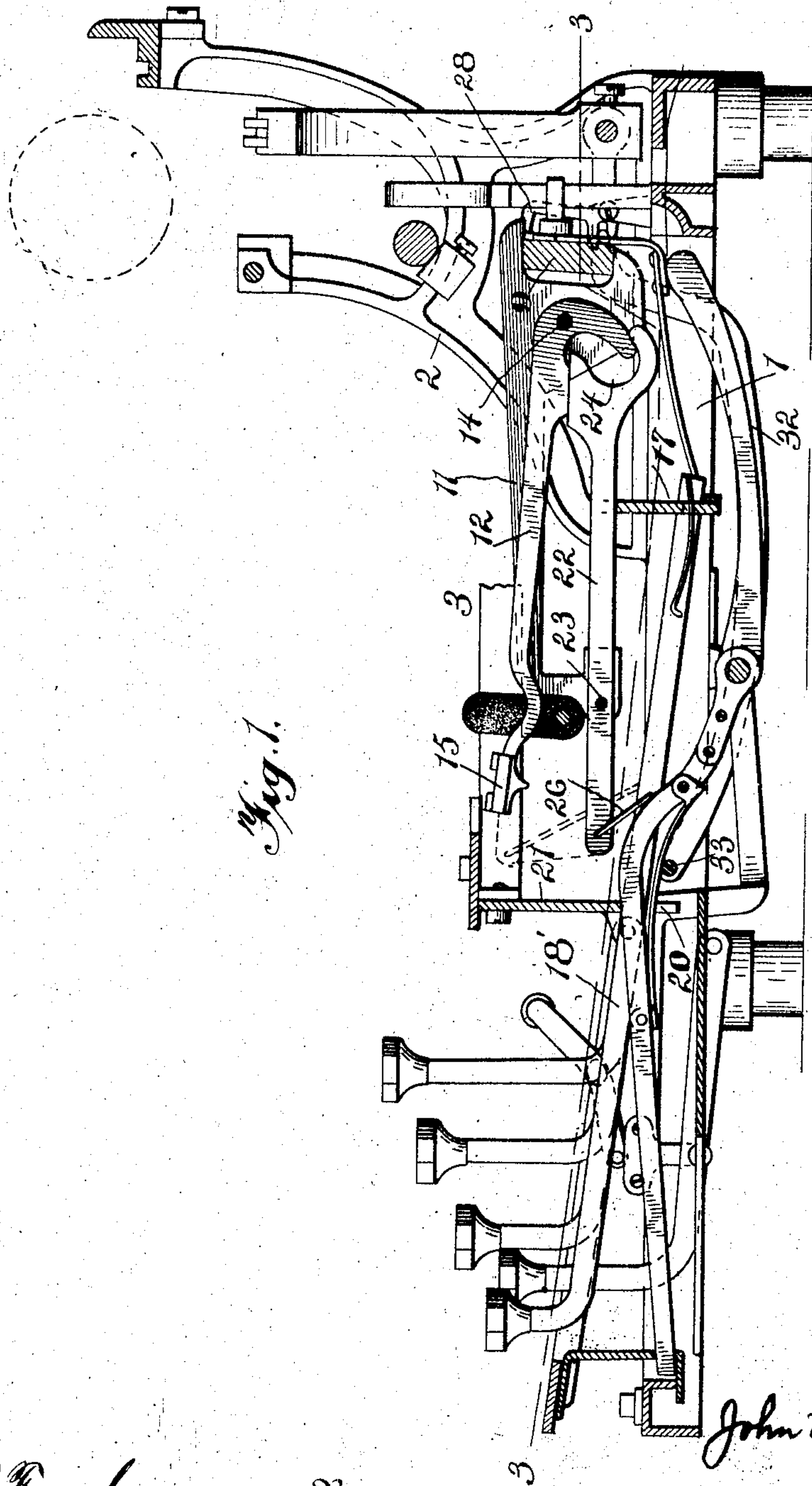


Fig. 1.

Witnesses

Geo. E. Frech.
Chas. P. Wright Jr.

By

Inventor

John W. Paul,

A. S. Pattison

Attorney.

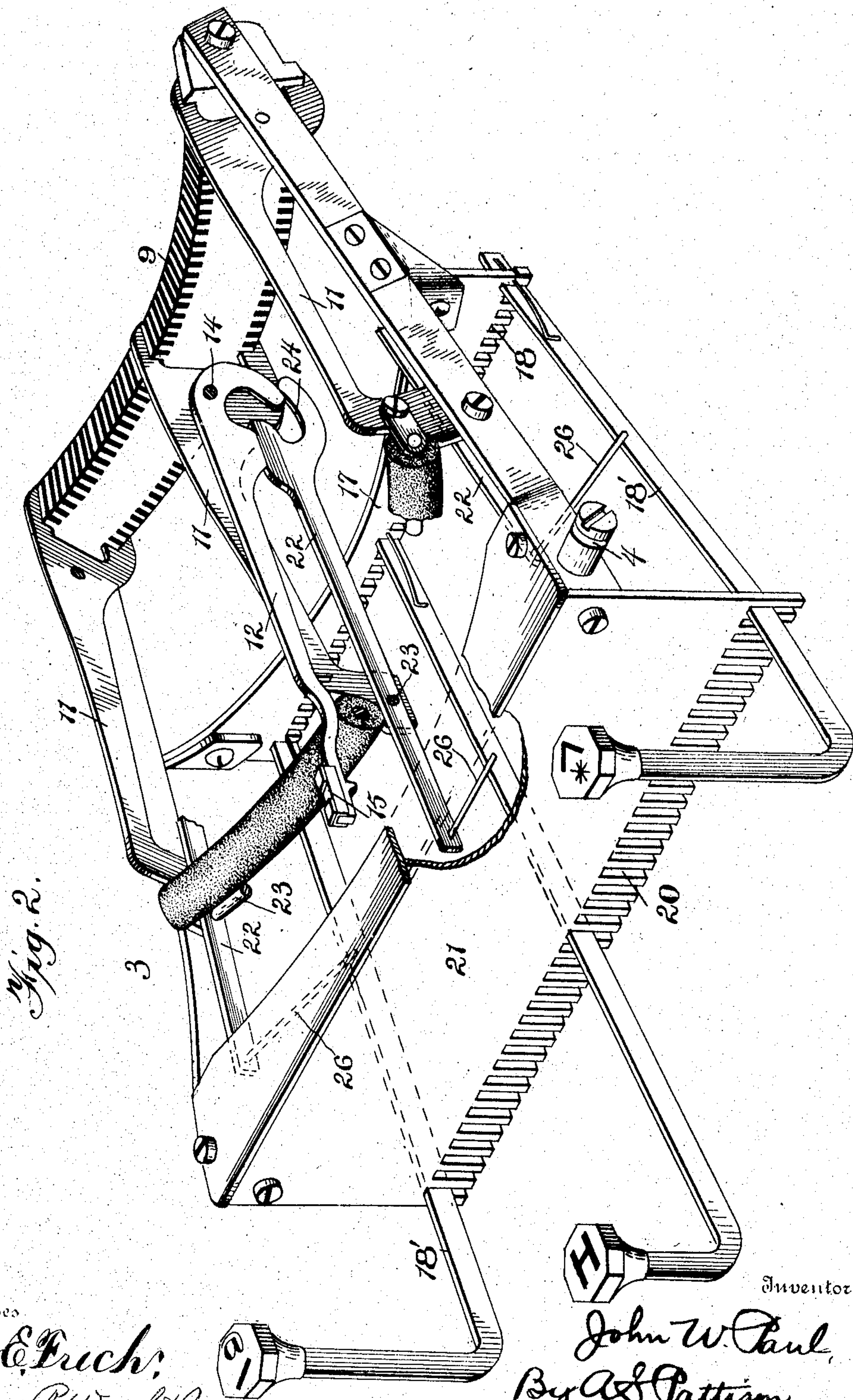
No. 780,380.

PATENTED JAN. 17, 1905.

J. W. PAUL.
TYPE WRITER.

APPLICATION FILED SEPT. 24, 1902.

4 SHEETS—SHEET 2.



Witnesses

Geo. E. Frick
Chas. P. Wright Jr.

Inventor

John W. Paul
By *A. S. Pattison*
Attorney

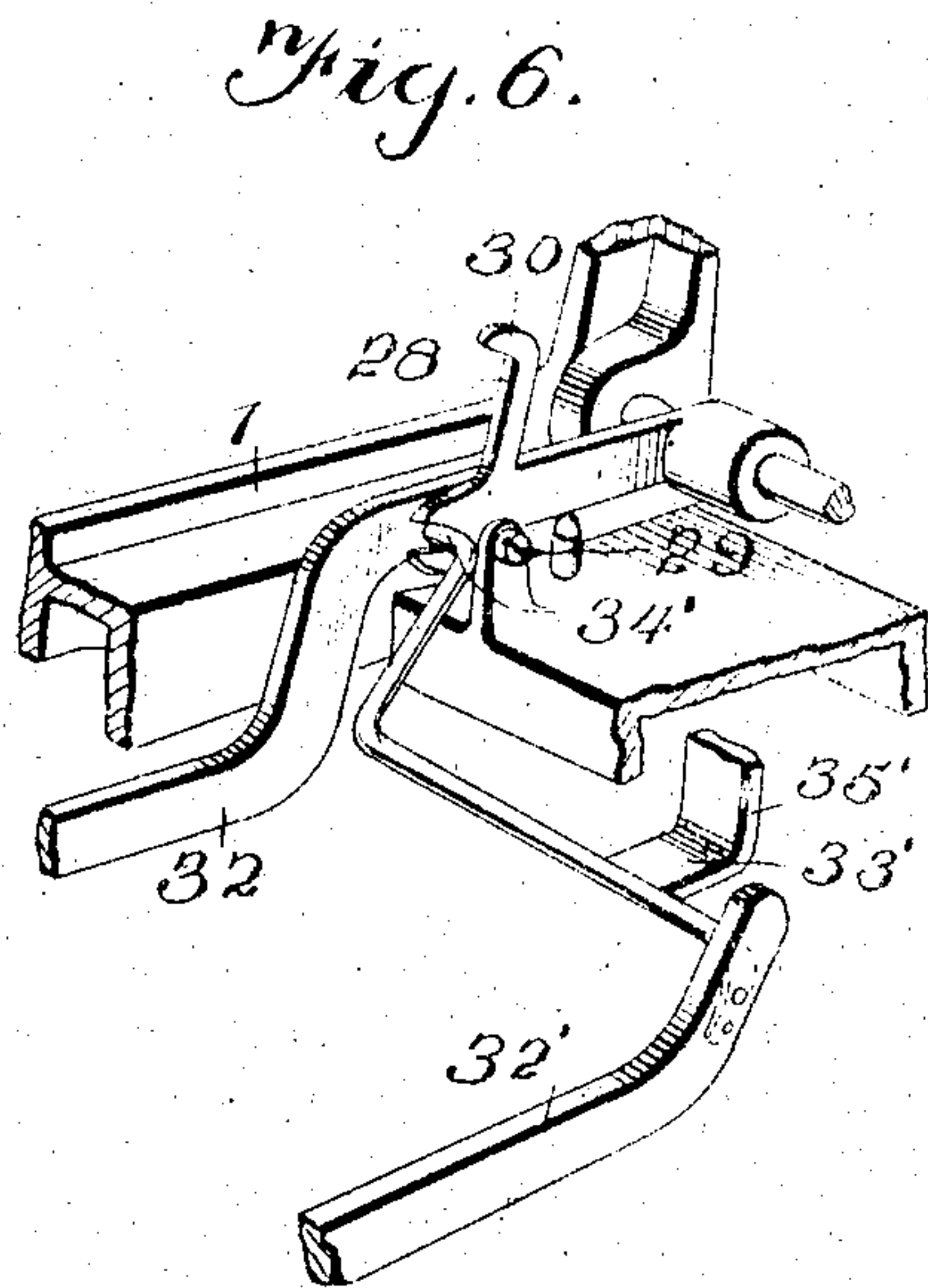
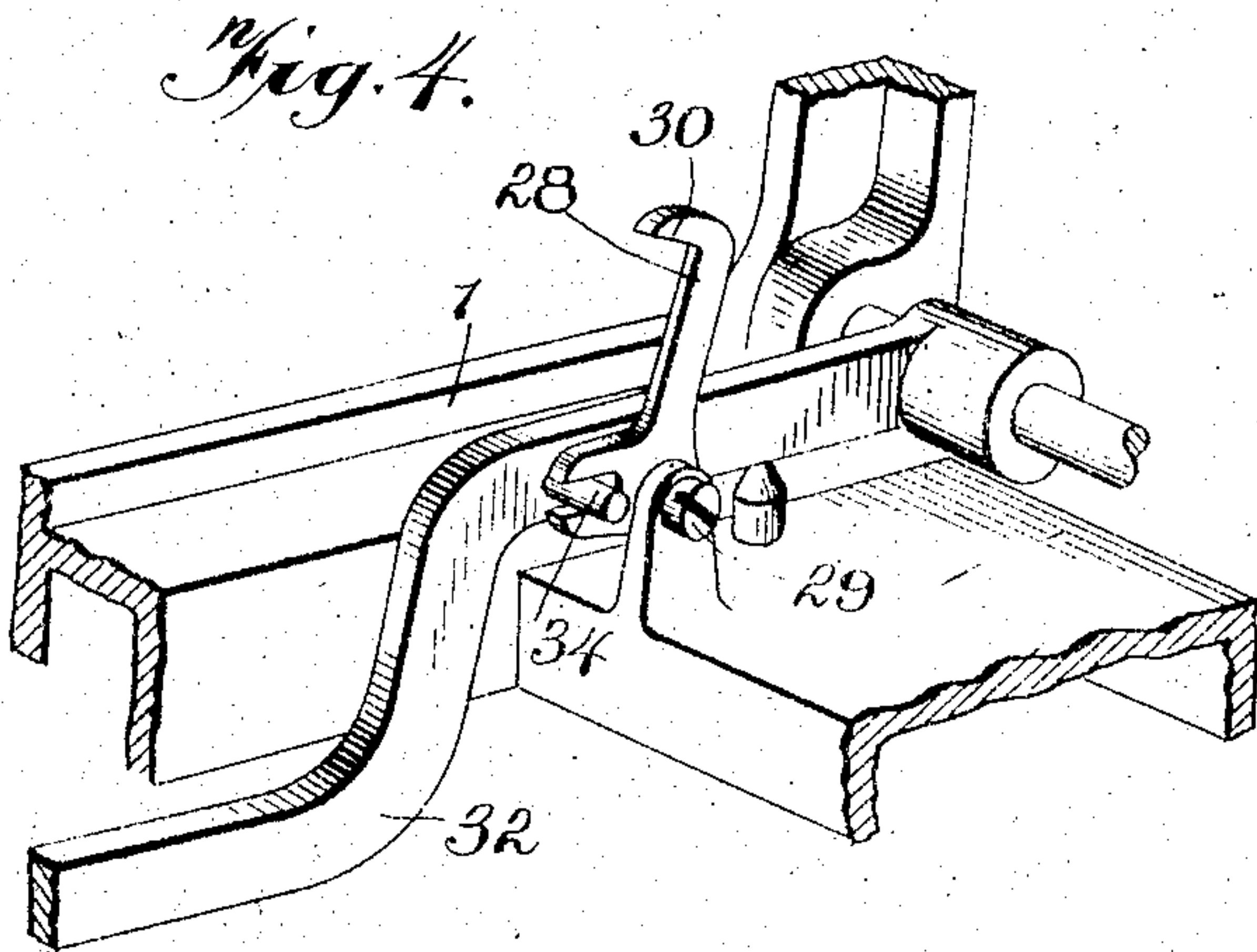
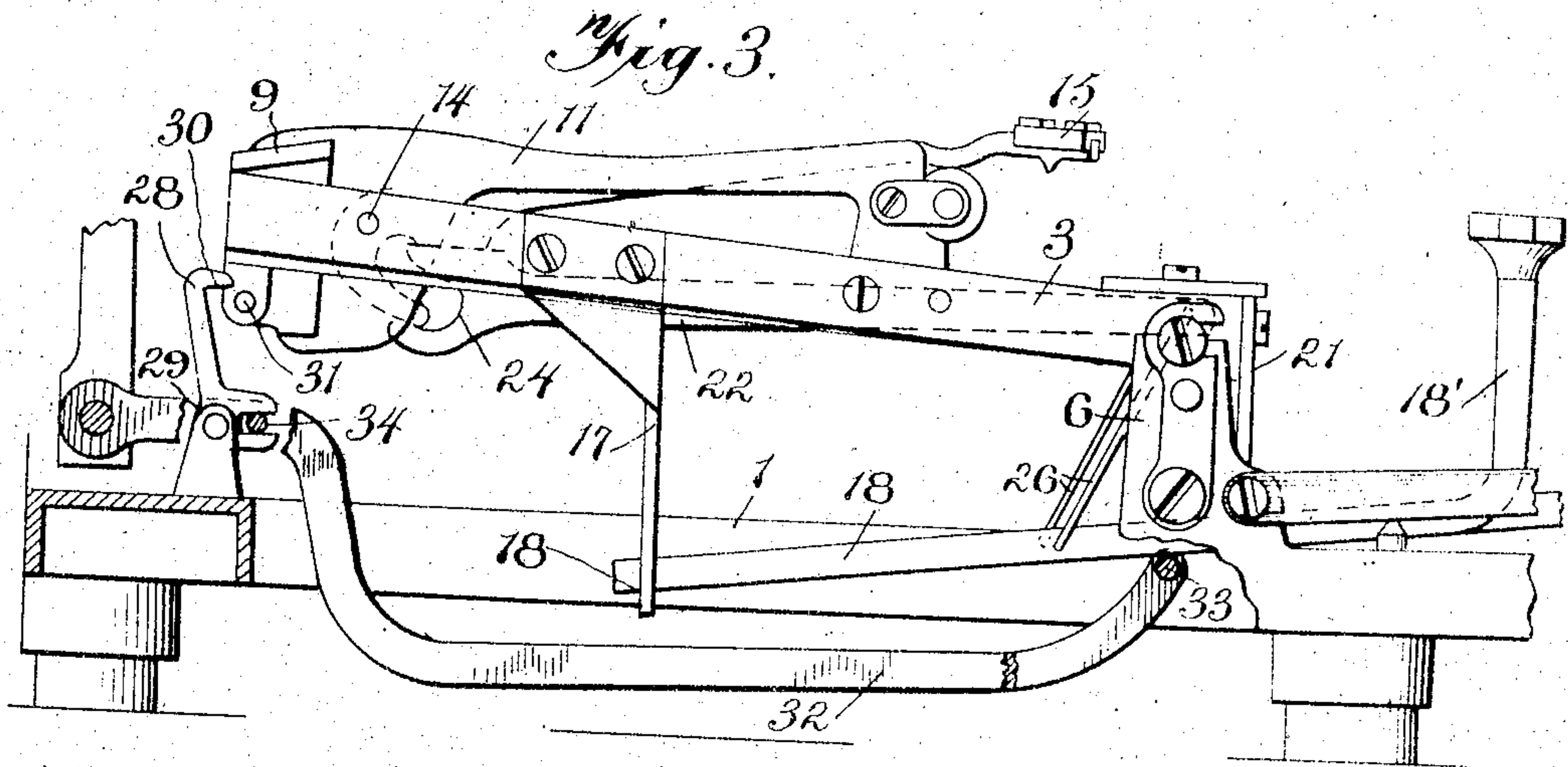
No. 780,380.

PATENTED JAN. 17, 1905.

J. W. PAUL.
TYPE WRITER.

APPLICATION FILED SEPT. 24, 1902.

4 SHEETS—SHEET 3



Witnesses

Geo. E. Koch,
Chas. P. Wright Jr.

Inventor

John W. Paul,
By A. S. Pattison
Attorney.

No. 780,380.

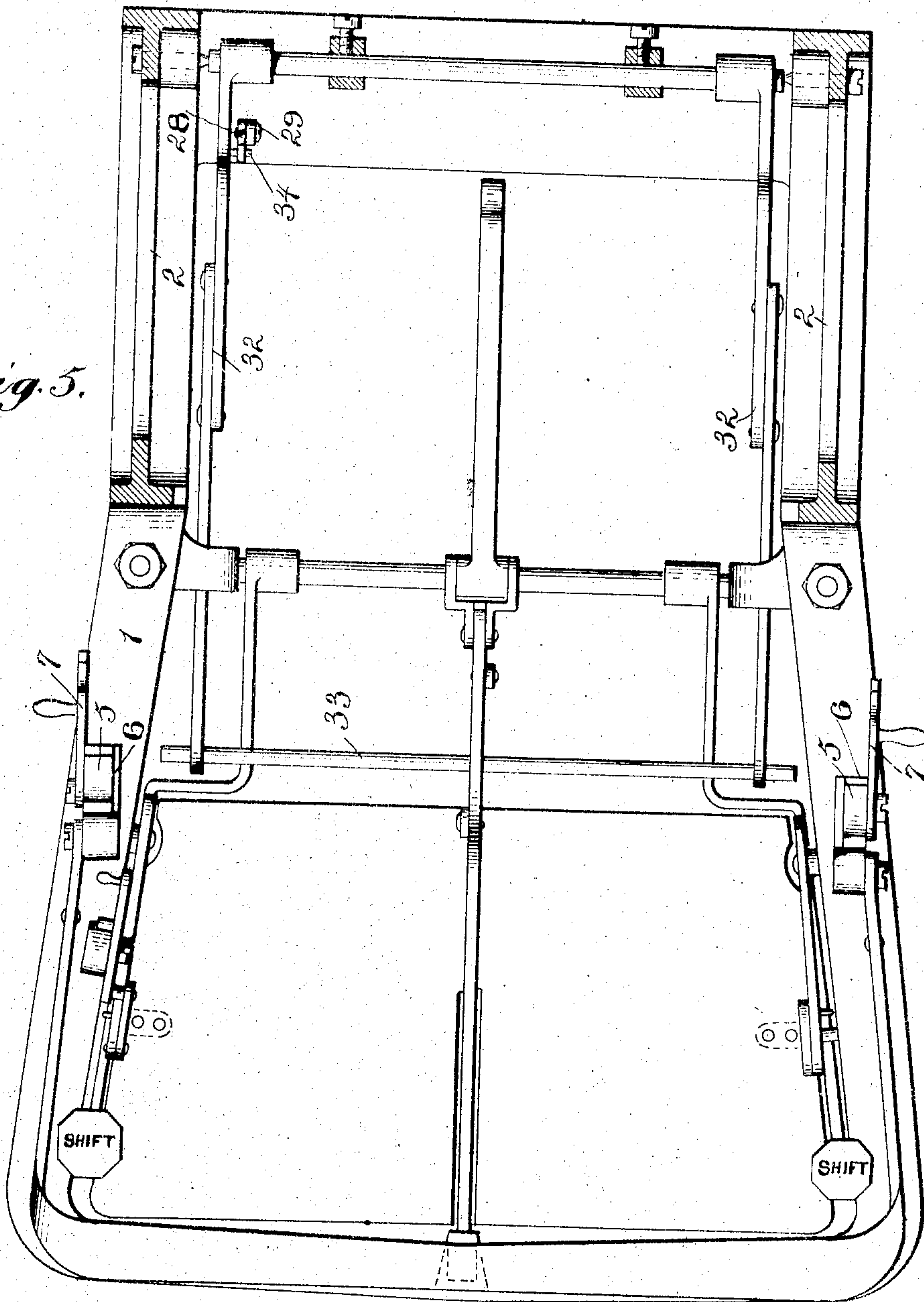
PATENTED JAN. 17, 1905.

J. W. PAUL.
TYPE WRITER.

APPLICATION FILED SEPT. 24, 1902.

4 SHEETS—SHEET 4

Fig. 5.



Witnesses

Geo. C. Frick.
Chas. P. Wright

Inventor

John W. Paul
By A. S. Patterson Attorney

UNITED STATES PATENT OFFICE.

JOHN W. PAUL, OF KITTANNING, PENNSYLVANIA, ASSIGNOR TO
PITTSBURG WRITING MACHINE COMPANY, OF PITTSBURG,
PENNSYLVANIA.

TYPE-WRITER.

SPECIFICATION forming part of Letters Patent No. 780,380, dated January 17, 1905.

Application filed September 24, 1902. Serial No. 124,710.

To all whom it may concern:

Be it known that I, JOHN W. PAUL, a citizen of the United States, residing at Kittanning, in the county of Armstrong and State of Pennsylvania, have invented new and useful Improvements in Type-Writers, of which the following is a specification.

My invention relates to improvements in type-writers, and pertains particularly to that class of machines in which the writing is visible and in which the type-bars are pivoted in the arc of a vertical circle and extend outward and normally lie in a horizontal or approximately horizontal position.

One feature of my present invention relates to an arrangement of key-levers which move in a vertical plane and the connection between the key-levers and type-bars whereby an exceedingly easy and quick-acting key-lever touch is provided.

Another feature of my present invention pertains to means for automatically locking the vertically-shifting type-bar basket or action against movement when a key-lever is depressed, thus enabling me to provide a light shift and at the same time absolutely prevent any possible imperfection of alinement no matter how heavy, uneven, or jerky the touch of the operator.

In the accompanying drawings, Figure 1 is a longitudinal central vertical section of a machine embodying my invention. Fig. 2 is a detached perspective view of the type-bar basket with only a portion of the type-bars shown in position therein to more clearly disclose the specific construction and relative arrangement of the type-bars and key-lever connections. Fig. 3 is a side elevation of my improved type-writer, the frame of the machine being broken away to disclose the automatic type-bar-basket lock. Fig. 4 is an enlarged detached perspective view of the automatic type-bar-basket lock. Fig. 5 is a top plan view on line 3 3 of Fig. 1, the type-bar basket being removed to disclose the universal feed-bar and its connection with the automatic type-bar-basket lock. Fig. 6 is an enlarged detached perspective view of a modified form of the lock for the type-bar basket.

In a machine of the character herein shown there is provided an essentially horizontal frame 1, having at one end the vertically-arranged standards 2, upon which is supported a suitable carriage, and situated within the said horizontal frame 1 below the carriage is a vertically-shifting type-bar basket 3, in which are arranged in the arc of a vertical circle the type-bars, and below the type-bars are arranged the key-levers. The key-levers, however, in the construction here shown are not arranged in the arc of a vertical circle, as are the type-bars, and hence the key-levers have a true vertical movement.

The combined type-bar and key-lever basket 3 is pivotally supported upon suitable trunnions 4, which are adapted to rest in suitable grooves 5, formed in the upper ends of the standards 6, which project upward from the horizontal frame 1, and these trunnions are removably held within the said grooves through the medium of any suitable locking device—such, for instance, as a hook or lug 7, here shown.

Referring now to the construction and arrangement of the type-bar basket, the type-bars, and the key-levers, it will be noticed that one end of the type-bar basket consists of a block 9, having grooves in its upper and lower sides, and that the type-bar division-plates 11 are located in these grooves. The type-bars 12 are situated between these division-plates and are pivotally supported by the said division-plates 11 at their inner ends through the medium of a suitable rod 14. The outer and free ends of the type-bars carry type-bar blocks 15, which contain the caps and small letters, as is well understood by those skilled in the art.

Depending downward at a point intermediate the end of the type-bar basket is a vertically-arranged plate 17, having on its underside a plurality of slots 18, thus constituting a comb. The key-levers 18' have their inner ends resting in these slots 18, and the outer ends of the key-levers are moved in or guided by the vertically-arranged slots 20, formed in a downwardly-projecting plate 21, which is situated at the opposite or outer end of the

type-bar basket to that at which the type-bars are pivoted. In a type-writer of the character here shown it is necessary that the type-bars be arranged in the arc of a vertical circle and radially in respect thereto; and it is one object of my present invention to provide means whereby improved connections are arranged between the key-levers and type-bars which will permit the key-levers to have a true vertical movement irrespective of the radial movement of the type-bars and at the same time provide an easy and quick-acting key-lever touch.

My improved connection consists in pivoting a plurality of levers 22 at the point 23, which is intermediate the ends of the said levers, the inner ends of the levers being suitably operatively connected with the inner pivoted ends of the type-bars. As here shown, the connections between the levers 22 and the type-bars consist of sockets 24, carried at the inner ends of the levers 22, and the coacting members 25, carried by the pivoted ends of the type-bars. These levers 22 are arranged in the arc of a vertical circle. It will be noticed that the pivots of the type-bars and the intermediate levers 22 lie in the surface of a cylinder the axis of which passes through the printing-point. The opposite ends of the levers 22 are connected with the key-levers through the medium of wire links 26, and these wire links are arranged alternately out of line, as shown, for the purpose of preventing any interference of their curved ends at the adjacent sides of key-levers and intermediate levers 22.

A connection between the key-levers and the type-bars such as here shown enables me to provide a simple yet very effective arrangement by means of which a very easy and quick-acting key-lever touch is accomplished, while at the same time the key-levers move in a true vertical plane.

In machines of the character here shown and described, and which include a vertically-shifting type-bar basket, it is desirable to provide an easy shift. However, since the key-levers are carried by the type-bar basket and their finger-operating portions being located at the opposite side of the fulcrum of the type-bar basket from that occupied by the type-bars, without provision to prevent it a very heavy or jerky touch upon the key-levers is likely to cause a vibration of the inner end of the type-bar basket, and thus affect the alinement. In order to enable a light shift and at the same time to prevent any possible imperfection in the alinement because of a vertical vibration of the inner end of the type-bar basket, I provide an automatic lock which automatically engages and locks the inner vertically-shifting end of the type-bar basket when a key-lever is depressed, thus making it impossible to affect the alinement no matter how imperfect, how heavy, or how jerky the touch of the op-

erator may be. Generically speaking, the lock consists of a member which is controlled by either a key-lever or a shift-lever, whereby the basket is locked in its downward position when the key-lever is depressed and is released when a shift-key is depressed for shifting the inner end of the type-bar basket. The specific arrangement here shown is under the control of the key-levers, though, as just stated, without affecting the scope of my invention the lock may be under the control of the shift-key. In the form here shown a vertically-arranged latch 28 is provided, and the said latch is pivotally supported by the frame of the machine at the point 29. This latch 28 is located adjacent the inner vertically-pivoted end of the type-bar basket, and its shouldered end 30 is adapted to engage a pin or shoulder 31, carried by the movable portion of the type-bar basket. The universal feed-frame 32 has its free end 33 located under the key-levers and adapted to be actuated thereby in the usual manner. The opposite and pivoted end of the universal frame 32 is provided with a member 34, which interlocks with the latch 28 for the purpose of moving the latch over the shoulder or pin 31 of the type-bar basket when a key-lever is depressed. As soon as the key-lever is depressed the latch immediately engages the shoulder or pin 31 of the type-bar basket and before the key-lever reaches the limit of its downward movement, and hence absolutely locks the type-bar basket against any vertical vibration under a jerky, heavy, or imperfect touch, as will be readily understood. Each time a key-lever is depressed the latch is brought over the pin or shoulder 31 of the type-bar basket and immediately locks the same against any vertical vibration whatever, and thus absolutely preventing any imperfect alinement on account of any vibration of the free or vertically-shifting end of the type-bar basket. While I have here shown and described the lock under the control of the key-levers, it will be readily understood (as already stated) that the shift-key may be connected with the latch and in which instance the latch will be normally in engagement with the shoulder or projection upon the movable portion of the type-bar basket. When, however, the shift-key is depressed, the latch will be moved out of engagement with the shoulder or projection and permit the basket to be shifted vertically. Therefore my generic invention consists in providing a lock for the type-bar basket which is controlled either by a type-bar key-lever or a shift-key lever, and the term "key-lever" as hereinafter used in claims relating to this locking device is intended to include either a type-bar/key-lever or a shift-key lever unless prefixed by a limitation, such as "type-bar" or "shift."

In Fig. 6 I show a form of lock for the type-bar basket which is controlled by the

shift-lever 32'. A rod or extension 33' extends from the said lever 32' and engages the notch 30' of the latch 28. In this instance the inner end of the lever 32' is located sufficiently below the type-bar-basket shoe 35' to permit sufficient movement thereof to operate the latch before engaging the shoe, and the latch 28 is in this modified form in constant engagement with the pin 31 of the type-bar basket.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

1. A type-bar action including a plurality of outwardly-extending type-bars pivotally supported upon a segment of a vertical circle, a plurality of intermediate levers below the type-bars and pivoted upon a segment of a vertical circle, the center of each circle being in the line of the axis of a cylinder passing through the printing-point, said intermediate levers having horizontally-projecting ends, the inner ends of said levers and type-bars operatively connected, a plurality of key-levers supported upon a horizontally-arranged fulcrum, and links having their ends loosely connected respectively with said horizontally-projecting ends and said key-levers.

2. A type-bar action including a plurality of outwardly-projecting type-bars pivotally supported upon a segment of a vertical circle, a plurality of intermediate levers intermediately pivoted upon a segment of a vertical circle located below the type-bars, the center of each circle being in the line of the axis of a cylinder passing through the printing-point, the inner ends of said levers and type-bars provided with interlocking members and the opposite ends of said levers projecting horizontally outward, a plurality of key-levers located below the said intermediate levers, and links having their ends loosely connected respectively with said horizontal ends of the intermediate levers and said key-levers.

3. The combination in a type-writer, of a vertically-shifting type-bar action, a lock therefor, a universal feed member operatively connected with said lock, and key-levers adapted to operate said universal feed member.

4. The combination in a type-writer, of a vertically-shifting type-bar action, a lock therefor, a plurality of type-bar key-levers, and a member common to said key-levers and operatively connected with said lock.

5. The combination in a type-writer, of a vertically-shifting type-bar action, a lock therefor normally out of locking engagement therewith, a plurality of depressible type-bar key-levers, a member common to said key-levers and operatively connected with said lock to move it in locking engagement with the type-bar action when any one of the said type-bar key-levers is depressed.

6. The combination in a type-writer, of a vertically-shifting type-bar action, a pivoted lock

therefor, a universal feed member operatively connected with said lock and key-levers adapted to operate said universal feed member.

7. A type-writer comprising a main frame, a vertically-shifting type-bar action pivotally mounted thereon, a lock pivoted on said frame, and means operated by the key-levers carried by the type-bar action for causing the lock to engage said type-bar action.

8. A type-writer comprising a main frame, a vertically-shifting type-bar action pivotally mounted thereon, a lock pivoted on said frame, a universal feed member operatively connected to said lock, and key-levers adapted to operate said universal feed member.

9. A type-writer comprising a main frame, a vertically-shifting type-bar action pivotally mounted thereon, a hook pivotally mounted on said frame and adapted to engage said type-bar action, a universal feed member operatively connected to said hook, and key-levers adapted to operate said universal feed member.

10. A type-bar action including a plurality of outwardly-extending type-bars pivotally supported in a segment of a vertical circle, a plurality of intermediate levers intermediately pivoted below the type-bars in a segment of a vertical circle, the center of each circle being in the line of the axis of a cylinder passing through the printing-point, the intermediate levers swinging in a radial plane passing through the printing-point, a plurality of key-levers having their inner ends arranged upon horizontal fulcrums, the inner ends of said intermediate levers operatively connected with the said type-bars, and links having their upper ends loosely connected with the outer ends of said intermediate levers and their lower ends loosely connected with the key-levers at points between the ends of the latter.

11. A type-bar action including a plurality of outwardly-extending type-bars, a plurality of intermediately-pivoted intermediate levers pivoted below the pivots of the type-bars, the type-bars and intermediate levers swinging in planes passing through the printing-point, key-levers below the intermediate levers, the inner ends of the intermediate levers operatively connected with the type-bars, and links having their upper ends loosely connected with the outer ends of the intermediate levers and their lower ends loosely connected with the key-levers.

12. A type-bar action including a plurality of outwardly-extending type-bars pivotally supported upon a segment of a vertical circle, a plurality of intermediate levers below and throughout their length parallel with said type-bars and intermediately pivoted upon a segment of a vertical circle and swinging in the same radial plane passing through the printing-point, the inner ends of said levers operatively connected with the type-bars, a plurality of key-levers below and pivoted in

a horizontal plane to swing in vertical planes, and links connecting the outer ends of the intermediate levers and the key-levers between the ends of the latter.

5 13. The combination in a type-writer, of a vertically-shifting type-bar basket carrying a plurality of type-bars, a positive lock for the basket, and means automatically actuating the lock for holding the basket down and auto-
10 matically releasing the lock to permit the basket to be shifted upward.

14. The combination in a type-writer, of a vertically-shifting type-bar basket carrying a

plurality of type-bars, a positive lock for the basket when printing lower-case characters, 15 and an automatically-acting means for releasing the lock to permit the basket to be moved for printing upper-case characters.

In testimony whereof I have hereunto set my hand in the presence of two subscribing 20 witnesses.

JOHN W. PAUL.

Witnesses:

PRESTON E. WHITNEY,
CLARENCE E. TUBBS.