

No. 641,875.

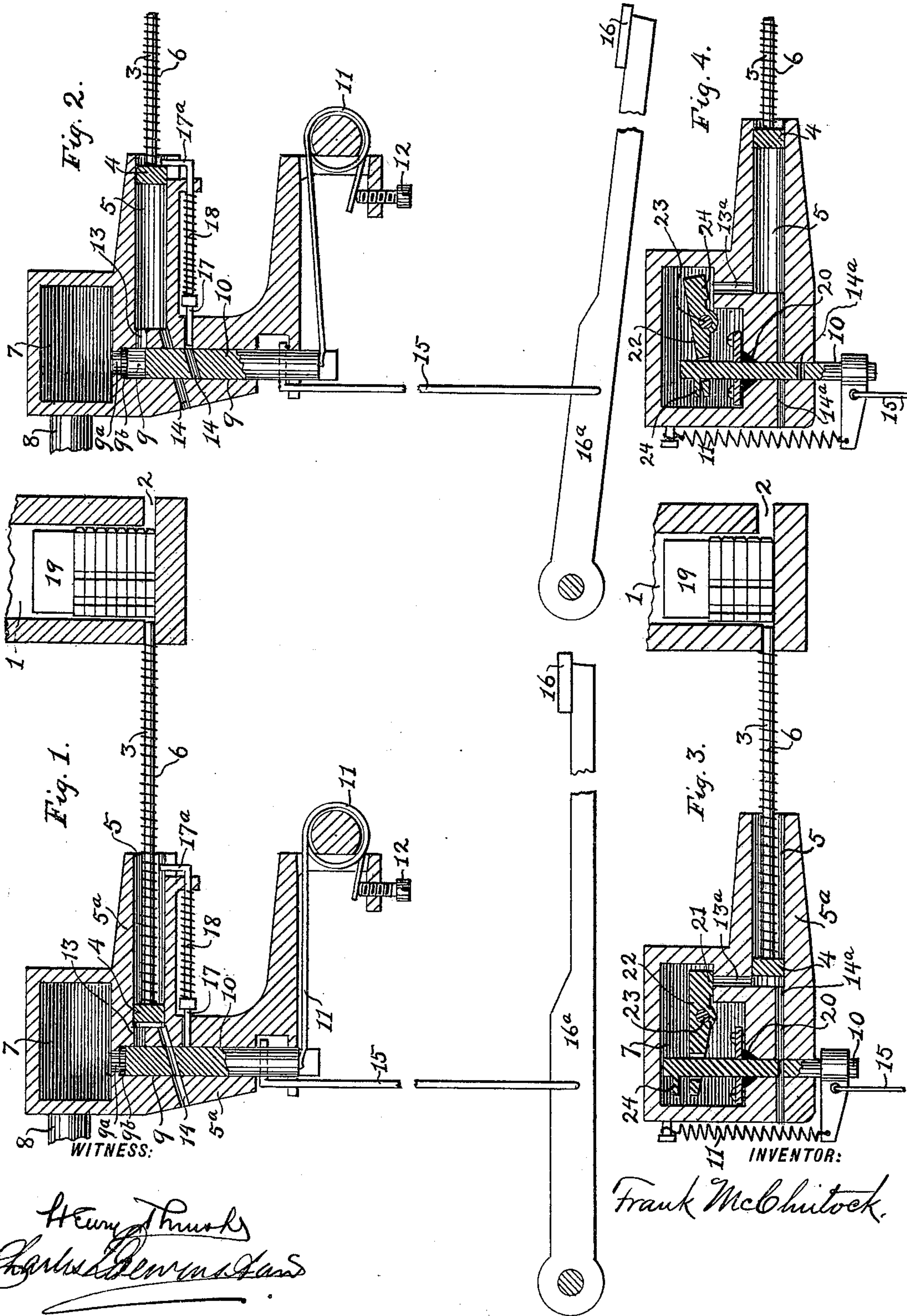
Patented Jan. 23, 1900.

F. McCLINTOCK.

KEY MECHANISM FOR TYPE SETTING MACHINES.

(Application filed Apr. 22, 1899.)

(No Model.)



Henry Throck
Charles Bennett

Frank McClintock.

UNITED STATES PATENT OFFICE.

FRANK McCLINTOCK, OF COLORADO SPRINGS, COLORADO, ASSIGNOR TO
THE EMPIRE MACHINE CORPORATION, OF NEW JERSEY.

KEY MECHANISM FOR TYPE-SETTING MACHINES.

SPECIFICATION forming part of Letters Patent No. 641,875, dated January 23, 1900.

Application filed April 22, 1899. Serial No. 714,014. (No model.)

To all whom it may concern:

Be it known that I, FRANK McCLINTOCK, a citizen of the United States, residing at Colorado Springs, in the county of El Paso and State of Colorado, have invented certain new and useful Improvements in Key Mechanism for Type-Setting Machines, of which the following is a specification, reference being had therein to the accompanying drawings.

My invention relates to improvements in the keyboard and mechanism connected therewith of type-setting and linotype machines. In such machines as usually constructed heretofore it has been usual to provide suitable means whereby the types or matrices may be ejected or released from their containing-channels by power, the depression of the key by the operator serving only to connect the type-ejecting element or elements temporarily with a continuously-rotating shaft or roller by means of ratchet-wheels, friction-rollers, or some similar mechanism. Such constructions are generally more or less complicated, noisy in operation, and subject to rapid wear and frequent breakage. Furthermore, unless the key is promptly released the mechanism will "repeat" or cause the ejection of one or more additional types from the compartment in addition to the one intended.

The objects of my improvement are to provide a simple type-ejecting mechanism which may be operated by air or other gas under pressure and a suitable valve of simple construction so connected to a key-lever that the depression of the key will simultaneously, or nearly so, open the inlet and close the outlet to the cylinder in which the operative piston moves, to provide means whereby the pressure of the valve against its seat may be readily adjusted so that it may be moved by a light touch on the key, and also to provide a simple locking device whereby the key will remain depressed whenever from any cause the ejecting mechanism fails to eject or release a type, thus at once indicating such fact to the operator.

The invention may be best understood by reference to the accompanying sheet of drawings, which show it applied to that class of type-setting machines in which a vertical case is used containing the types in channels, from

which they are removed singly by means of type-ejectors, which are adapted to force the lowermost type in the channel forward out of the channel, whereupon it may be carried to the point of assemblage by any suitable means. Only a single key-lever and its connections and type-ejector are shown and described; but it will be obvious that the complete machine will require as many sets as there are type letters and characters.

Figure 1 is a sectional view through the reservoir, a valve, cylinder, and type-channel of the preferred construction. Fig. 2 is a similar sectional view after the key has been depressed, thus opening the valve and allowing the compressed air to force the type-ejector forward; and Figs. 3 and 4 are similar views of a construction wherein another form of inlet-valve is used.

Similar reference-figures refer to similar parts in each of the views.

1 is the type-channel, in which a supply of types is placed, having an opening 2 in front through which the lowermost type may be ejected. A type-ejector rod 3 is arranged so that its front end may be forced into and through the type-channel against the foot of the lowermost type therein, thus pushing it out. A piston 4 on the rear end of the ejector-rod 3 fits in a cylinder 5. A spring 6, which is preferably coiled around the ejector-rod 3, serves to return the rod 3 to its normal position after having ejected a type. The cylinder 5 is preferably bored in a block 5^a, which extends either continuously or in sections longitudinally the entire width of the whole number of type-channels, and the individual cylinders are so spaced that each one will be directly in line with its corresponding type-channel. The reservoir 7, extending longitudinally along the block 5^a, may be filled and replenished as used with air or other gas under pressure through the pipe 8 by any suitable means, such as a force-pump operated by hand or power. A hole 9 is bored directly in line with the axis of the cylinder 5 and to the rear of it. The lower portion of this hole is somewhat larger than the upper end, which opens into the reservoir 7. The valve 10, which is preferably formed of a cylindrical rod, is fitted to slide longitudinally in the hole

9. A spring 11 serves to force the upper end of the valve-rod 10 against its seat formed by the shoulder where the smaller opening to the reservoir 7 joins the valve-cylinder, thus closing the valve against the pressure of the air or other gas in said reservoir. A screw 12 is provided, whereby the tension of the spring 11 may be varied in order to increase or decrease the pressure required on the key to open the valve. An annular washer 9^b, of leather or other suitable material, is placed in the upper end of the valve-cylinder, or a leather cap on the upper end of the valve-rod 10 may be used for the purpose of reducing the noise caused by the closing of the valve and making a more perfect air-tight joint between the valve and its seat. An inlet 13 is bored from the upper rear end of the cylinder 5 to connect with the valve-hole 9 a short distance below the valve-seat, while an outlet 14 is bored from the lower rear end of the cylinder 5 directly through the valve-rod 10 to the open air. A rod or wire 15 connects the valve-rod 10 to the usual key-lever 16^a, as shown, so that a depression of the key-lever, as shown in Fig. 2, will draw down the valve-rod 10 against the tension of the spring 11, which simultaneously closes the outlet 14 and opens the inlet 9^a and 13, allowing the compressed air or other gas to enter the cylinder 5 and force the piston 4 and type-ejector rod 3 forward, which ejects the lowermost type in the channel. Immediately on releasing the key 16 the spring 11 returns the valve-rod 10 to its normal position, (shown in Fig. 1,) closing the inlet 9^a and 13 and at the same time opening the outlet 14, whereupon the compressed air back of the piston 4 escapes and the spring 6 forces the piston and the ejector-rod 3 back to the normal position.

Since the pressure of the confined air or other gas is exerted directly on the upper end of the valve-rod 10, thus tending to force it down, it is evident that by properly adjusting the tension of the spring 11 by means of the screw 12 the pressure or "touch" on the key required to open the valve may be considerably varied, and this touch may be made very light whatever may be the pressure of the air or other gas in the reservoir, since only the difference between the upward pressure of the spring 11 and the downward pressure of the confined air or other gas on the valve-rod 10 is to be overcome in depressing the key 16.

It is desirable that means should be provided for indicating at once and clearly to the operator whenever from any cause the ejector 3 is prevented from advancing a sufficient distance to eject a type, and for this purpose a locking-pin 17 is provided, as shown in Figs. 1 and 2. This pin, by means of the spring 18, is drawn toward the valve-rod 10, with which its inner end is constantly in contact. When the valve-rod 10 is drawn down by the depression of the key 16, as shown in Fig. 2, the outlet-opening 14 through said rod is brought

directly opposite the end of the locking-pin 17, which by means of the spring 18 is caused to enter therein, and thus retain the valve-rod 10 and key 16 in their lower position. In order that the locking-pin 17 may be automatically withdrawn or prevented from locking the valve-rod 10 in its lower position when the piston makes its complete operative movement, the arm 17^a extends through a slot into the cylinder 5 in such a position that it will be engaged by the piston 4 whenever it is forced out a sufficient distance to cause the ejector-rod 3 to force out a type. In the practical operation of the device the forward movement of the piston 4, when not meeting any obstacle, is so nearly simultaneous with the depression of the key 16 that the locking-pin 17 does not enter the hole 14 before the arm 17^a has been engaged by the piston 4, so that it never operates to hold the valve-rod 10 and the key 16 in the depressed position except when the complete forward movement of the piston 4 and ejector-rod 3 is prevented. In order to indicate to the operator when the type-channel is empty, it is only necessary that a follower-block 19 be placed within the channel 1 on the top of types contained therein. This follower-block is too large to be ejected through the opening 2, and therefore when all of the types have been ejected it will rest on the bottom of the channel and prevent the forward movement of the ejector-rod 3 and piston 4, thus causing the locking-pin 17 to act as above described.

In the alternative construction shown in Figs. 3 and 4 the valve-rod 10^a extends up into the reservoir 7 through an air-tight packing 20. The inlet-valve 21 is secured to the short arm of the lever 22, which is pivoted at the point 23. An arm or pin 24 on the rod 10^a is adapted to engage the long arm of the lever 22 when said rod is drawn down by the depression of a key, which may be connected thereto in the same manner as shown in Figs. 1 and 2. The valve 21 is adapted to close the inlet 13^a to the cylinder 5, the pressure of the confined air or gas forcing it tightly against its seat. The outlet 14^a passes through the valve-rod 10^a and is therefore closed by a longitudinal movement of said rod. Upon drawing down the valve-rod 10^a by a key or other suitable means the pin 24 engages the lever 22, which raises the valve 21 from its seat, admits the compressed air or other gas to the cylinder 5, and forces the piston 4 forward, as shown in Fig. 4.

It is evident that the locking-pin shown in Figs. 1 and 2 may also be used in the alternative construction of Figs. 3 and 4 and also that forms of valve may be used other than the pivoted lever-valve shown, adapted to be opened by either an upward or a downward movement of the valve-rod.

It is evident that my invention is not limited in its application to the simple and direct acting ejecting-rod shown and described, but that any mechanism usually used for re-

leasing or ejecting types from their channels may be connected to and operated by said piston.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. In a key mechanism for type-setting and linotype machines the combination with suitable means for ejecting or releasing types from their containing channels or cases, of a piston adapted to be moved longitudinally within a cylinder and operatively connected to said type-ejecting mechanism, a reservoir or other means for supplying compressed gas to the cylinder, a valve or valves adapted to alternately admit and release compressed gas to and from said cylinder, and means for causing the proper movement of said valve or valves.

2. In a key mechanism for type-setting and linotype machines, the combination with suitable means for ejecting or releasing types from their containing channels or cases, of a piston adapted to be moved longitudinally within a cylinder and operatively connected to said type-ejecting mechanism, a reservoir or other means for supplying compressed gas to the cylinder, a valve or valves adapted to alternately admit and release compressed gas to and from said cylinder, and an operating-key connected to the valve or valves.

3. In combination with means for ejecting or releasing types from their containing-channels, a cylinder having a piston fitted therein which is connected to said type-ejecting mechanism, a reservoir containing compressed gas, a suitable valve or valves adapted to alternately admit and release compressed gas to and from said cylinder, a key or other suitable means for properly operating said valves, and means for locking the key in its depressed position whenever the piston is prevented from making a complete operative movement.

4. In combination with means for ejecting or releasing types from their containing-channels, a cylinder having a piston fitted therein which is connected to said type-ejecting mechanism, a reservoir containing compressed gas, an inlet from said reservoir to the cylinder, a longitudinally-movable valve-rod adapted to open and close said inlet, a spring adapted to hold the valve-rod normally in such position that the inlet will be closed, an outlet from the cylinder passing directly through the valve-rod when in its normal position, and means for causing the required longitudinal movement of said valve-rod.

5. In combination with means for ejecting or releasing types from their containing-channels, a cylinder having a piston fitted therein which is connected to said type-ejecting mechanism, a reservoir containing compressed gas, an inlet from said reservoir to the cylinder, a longitudinally-movable valve-rod having one end adapted to close the inlet, means for normally holding the valve-rod in position to close the inlet against the pressure of the con-

fined gas, an outlet from the cylinder passing directly through the valve-rod when in its normal position, and a key so connected to the valve-rod that its depression will cause the necessary longitudinal movement of said valve-rod.

6. In combination with means for ejecting or releasing types from their containing-channels, a cylinder having a piston fitted therein which is connected to said type-ejecting mechanism, a reservoir containing compressed gas, an inlet from said reservoir to the cylinder, a longitudinally-movable valve-rod having one end adapted to close the inlet, a spring for normally holding the valve-rod in position to close the inlet against the pressure of the confined gas, means for readily changing the tension of said spring, an outlet from the cylinder passing directly through the valve-rod when in its normal position, and a key so connected to the valve-rod that its depression will cause the necessary longitudinal movement of said valve-rod.

7. In combination with a type-ejecting rod adapted to be forced directly into and through a type-channel and having a spring adapted to return the ejecting-rod back to its normal position after ejecting a type, a cylinder having a piston fitted therein which is attached to said ejecting-rod, a reservoir containing compressed gas, a suitable valve or valves adapted to alternately admit and release compressed gas to and from said cylinder and a key or other suitable means for properly operating said valves.

8. In combination with a type-ejecting rod adapted to be forced directly into and through a type-channel and having a spring adapted to return the ejecting-rod back to its normal position after ejecting a type, a cylinder having a piston fitted therein which is attached to said ejecting-rod, a reservoir containing compressed gas, a suitable valve or valves adapted to alternately admit and release compressed gas to and from said cylinder a key suitably connected to operate said valves, means for locking the key in its depressed position whenever the piston and ejecting-rod are prevented from making a complete operative movement, and a follower-block on the types contained in the channel.

9. The combination with mechanism for ejecting or releasing types from their containing-channels by compressed gas or other equivalent means, of a suitable operating-key and a locking-pin adapted to retain the operating-key in a depressed position whenever the ejecting mechanism fails to complete its necessary normal movement to eject or release a type.

In testimony whereof I affix my signature in presence of two witnesses.

FRANK MCCLINTOCK.

Witnesses:

HENRY THRUST,

CLARENCE CRAVENS TURK.