

No. 871,081.

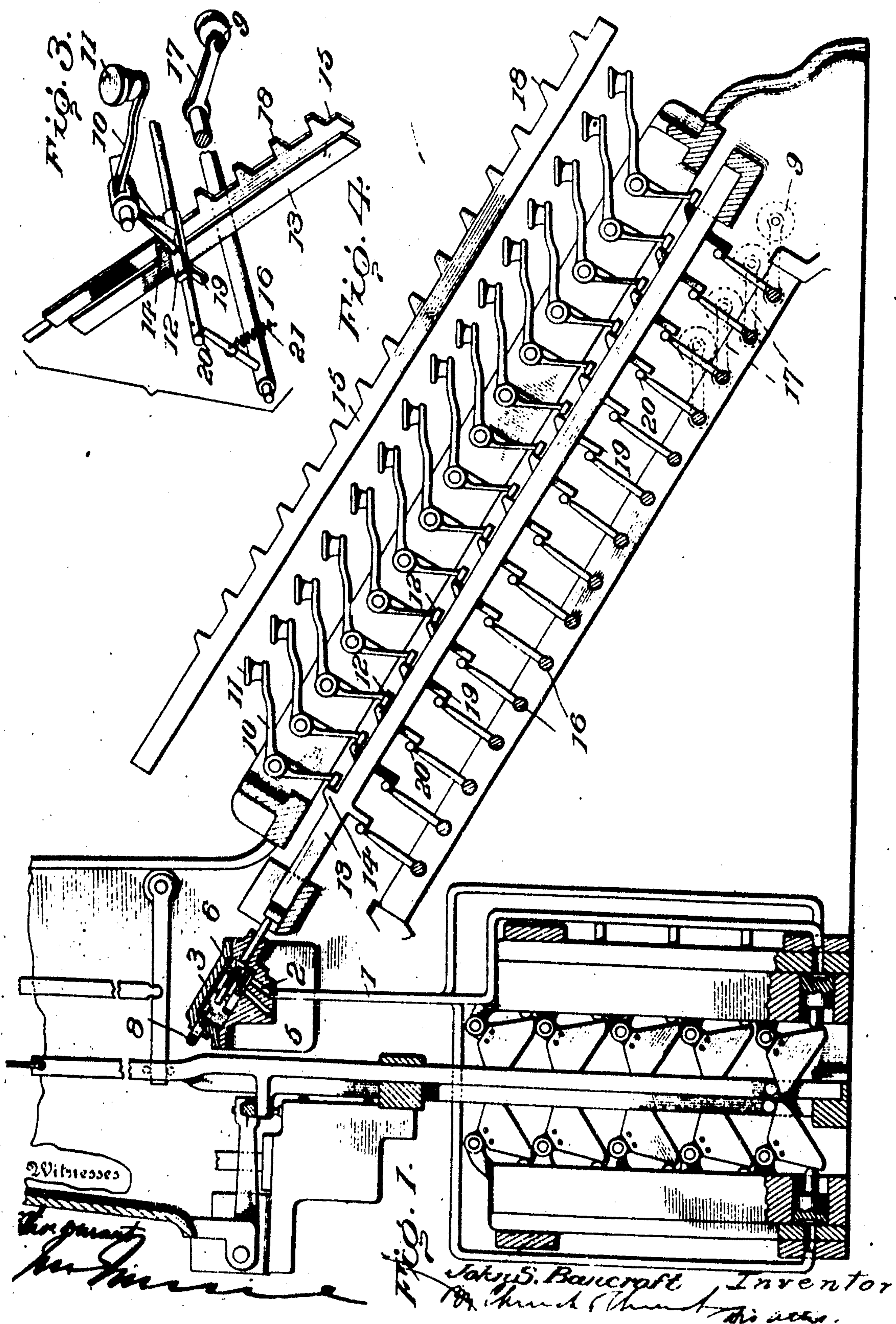
PATENTED NOV 12, 1907.

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KEYBOARD MECHANISM FOR PERFORATING AND OTHER MACHINES.
APPLICATION FILED JAN. 2, 1907.

APPLICATION FILED JAN. 8, 1907.

2 SHEETS—SHEET 1.



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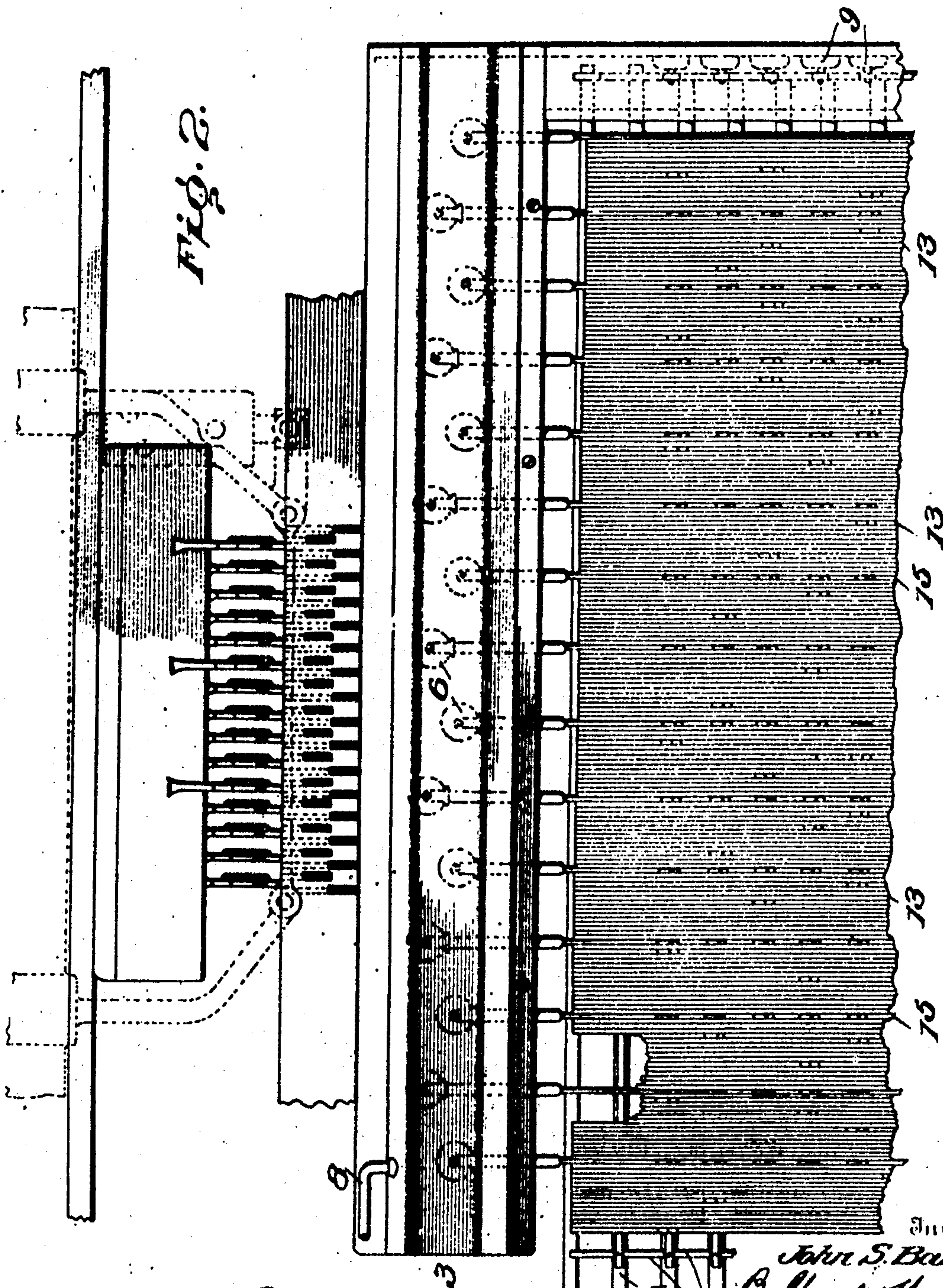
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2 SHEETS—SHEET 2.





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Witnesses

Witnesses



UNITED STATES PATENT OFFICE.

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KEYBOARD MECHANISM FOR PERFORATING AND OTHER MACHINES.

No. 871,081.

Specification of Letters Patent.

Patented Nov. 12, 1907.

Original application filed October 29, 1903, Serial No. 179,048. Divided and this application filed January 8, 1907.
Serial No. 351,391.

To all whom it may concern:

Be it known that I, JOHN SELLERS BANCROFT, of Philadelphia, in the county of Philadelphia, State of Pennsylvania, have invented a certain new and useful Improvement in Keyboard Mechanism for Perforating and other Machines; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming a part of this specification, and to the figures and letters of reference marked thereon.

This invention relates to a keyboard mechanism especially designed for use in connection with record strip perforating machines, but alike applicable to other varieties of keyboard machines and it has for its principal object to simplify and improve the mechanism whereby the action of the punches and other devices are controlled from the finger keys.

In a prior application (Serial No. 179,048, filed Oct. 29, 1903) of which this is a division is shown, described and claimed a keyboard mechanism consisting essentially of a plurality of keys, two series of valves materially less in number than the keys, and means whereby the keys may be selectively coupled with the valves of the two series irrespective of the particular location of the key.

The present invention consists in a modified construction in which the keybank is provided with a plurality of series of keys, each of the latter coupled with a valve of one series through an actuating bar common to that series of keys, while the individual keys of each series are coupled with the valves of the other series through actuating bars controlling said last named series of valves, the arrangement being such that each valve of one series is controlled by a single series of keys and the valves of the other series are separately controlled by the individuals comprising said series of keys.

It also consists in the employment of two series of actuating bars disposed in cross wise relation to each other below the keys, each actuating bar controlling one of a series of valves and being in turn controlled by a key.

In the accompanying drawings illustrating a preferred form of embodiment of the invention—Figure 1 is an end elevation of the keybank. Fig. 2 is a partial top plan view, the top plate and finger keys being removed. Fig. 3 is a perspective view of a portion of the transmission system, showing the manner of connecting each key to the actuators of the two series of valves. Fig. 4 is a side elevation of the valve actuating bar for one series of valves.

Like numerals designate corresponding parts in the several figures.

The invention is designed for use in connection with the perforating machine of Patent No. 654,115, as a substitute for the keybank and control valves thereof, to govern the admission of pressure to the series of supply pipes leading to the punch cylinders, and it is shown as applied to the improved arrangement of punch cylinders included in an application Serial No. 179,048, filed Oct. 29, 1903, of which latter this is a division. In the commercial machines of this type there are two hundred and twenty five keys, thirty one punches and thirty two punch bars and cylinders. Of the punch bars, fourteen represent successive degrees of adjustment, another fourteen represent corresponding adjustments in a direction transverse to the first, and, in addition, designate degrees of adjustment of the mold, while of the remaining four, one is blank, one represents the space type, and the remaining two the justification designating signals. Of the last named four, two,—the blank and space—operate upon the measuring devices making sixteen in all, and for purposes of description this group or series of sixteen punch bars will be designated the space-value group or series in that they all operate upon and affect the movements of the line measuring mechanism.

In the prior machine each punch bar was provided with a motor (in the form of a piston and cylinder) which, with one exception i. e., the justification space punch bar, was controlled by all the keys in a column or line, accordingly as it belonged to the space-value or non-space value group, and each key was equipped with a valve controlling a motor of each group, corresponding with the column and line in which said key was located, with the exception of the last or bottom row and right hand column, each of which controlled but a single motor. This arrangement necessitated the employment of not less than two hundred and twenty five valves to operate the thirty punches, and as the keys composing each row or column controlled but a single space-value punch bar and motor, the available area for the distribution of characters on the keyboard was circumscribed, and, because of the multiplicity of valves, the waste of pressure, due to leakage, as well as the cost of construction, adjustment and maintenance was excessive. As the present invention relates only to the means for controlling the punch bar motors it will suffice for present purposes to remark that each punch bar motor is connected by a pipe 1 to one of a series of inlet ports 2, located within a common valve chamber or trunk 3, the latter outside of and beyond

the keybank proper along the margin thereof, and communicating as through pipe 8, with the pressure supply.

An exhaust port 5 is located in proximity to each supply port 2, and each set of ports is controlled by a slide valve 6 or 9. There are as many of these slide valves as there are punch bar motors, one for each, to perform the work of the two hundred and twenty five valves of the prior machine. The valves are divided into two groups or series in accordance with the functions assigned; thus the valves 6 located in the chamber or trunk 3 to the rear of the keybank and corresponding with the columns of keys may represent the space-value motors, and the valves 9 to the right of the keybank and corresponding with the keys of each column may represent the non space value motors and vice versa. When in normal or inactive position each valve covers its ports 2 and 5, placing them in communication and thus opening the exhaust for the motor; and when advanced to active position said valve uncovers port 2 while still covering port 5, thereby admitting pressure to the motor and causing an operation of its punch bar.

It is the office of the finger keys to select and operate such of the valves 6 and 9 as represent the characters or functions designated by or assigned to the key operated; and in order that this may be accomplished the following novel arrangement has been devised.

The keys, preferably arranged in series in parallel columns, are in the form of bellcrank levers 10, one arm furnished with a designating button or finger piece 11 and the other with an extension or cross-bar 12, the latter bridging or extending over a series of parallel permutation bars 13. The purpose of this lateral extension 12 is to enable the same form of key lever to be used throughout the column, for effecting engagement with any one of the permutation bars, instead of using special forms of key levers for each permutation bar. Each permutation bar 13 is furnished with a shoulder or arm 14 in front of one of the cross-heads 12, there being at least one permutation bar for each key lever in any column, so that when any key lever is depressed the corresponding permutation bar will be advanced.

Below the key levers and in parallel with the permutation bars 13 is arranged a series of longitudinally reciprocating actuating bars 15, one for each column of keys and engaging the valve 6, pertaining thereto, and beneath said permutation bars and extending transversely thereof in cross-wise relation to said bars 15 is a second series of actuating bars 16 arranged to oscillate in bearings and each connected, as by an arm 17, to one of the group of valves 9. The actuating bars 15 are each provided with a series of lateral arms or bearings 18, equal in number to the keys in a column and located in position to be engaged by the cross bars 12 thereof and each permutation bar 13 is provided with one or more off sets or arms 19 in position to engage arms or bails 20 attached to the actuating bars 16, so that when any key is depressed it will operate valves in both groups 6 and 9, the valve 6 pertaining to the column and such of the valves 9 of the other group as are designated by the permutation bar 13 pertaining to the depressed key.

The object in providing a permutation bar 13 for each key lever, instead of causing corresponding keys in the several columns to engage the actuating bar 16 imme-

diately below them is to increase the flexibility of the system with respect to the arrangement and distribution of the characters, for while the keys of each column are restricted in their action to a single valve 6 of one group by virtue of their connection with a single actuating bar 15 common to all the keys of a column, the same is not true of the other series of valves 9, as any one or more of the actuating bars 16 can be coupled with any key irrespective of its position in the column, by the interposition of a permutation bar 13 provided with off-sets or shoulders 19 contiguous to the arms or bails 20 of the actuating bars 16, whose valves 9 it is desired to operate.

The permutation bars 13 and actuating bars 15 are preferably disposed at an angle to the horizontal so that they will be returned by gravity, being assisted in this by the pressure upon the valve stems; but this may be supplemented, if desired, by the addition of springs, weights or equivalent means, such as the springs 21, shown applied to bails 20.

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

1. A pneumatic keyboard, comprising a series of depressible keys, two series of subjacent actuating bars arranged crosswise in relation to each other, a bar of each series being arranged to be operated upon by each key, a marginal air trunk arranged outside the bank of keys and valves in the air trunk connected to and operated by the bars.
2. A pneumatic keyboard, comprising two crossed series of actuating bars with valves operated thereby and a bank of keys superposed over the bars, each key being arranged to operate upon a bar of each series.
3. In a key actuated mechanism, a bank of keys and subjacent actuating bars each having a plurality of lateral arms or projections adapted to receive the thrust of the keys, said bars being adapted to actuate movable parts contiguous thereto.
4. In a keyboard mechanism the combination of the following elements, to wit; a keybank provided with a plurality of series of keys; a series of valves one for each series of keys; a series of actuating bars, one for each valve, and means for coupling the keys of each series with one of the actuating bars.
5. In a keyboard mechanism the combination of the following elements, to wit; a series of valves; a series of actuating bars, one for each valve; and a keybank provided with a plurality of series of keys, each series coupled with a valve actuating bar to operate the latter.
6. In a keyboard mechanism, the combination of the following elements, to wit; a series of valves located within a pressure chamber; a series of oscillatory actuating bars, one for each valve; a keybank provided with a plurality of keys; and means for coupling said keys with said oscillatory valve actuating bars.
7. In a keyboard mechanism provided with two series of valves and a keybank for controlling said valves and in combination therewith the following elements, to wit; two series of actuating bars arranged in crosswise relation and in different planes below the keybank; and means whereby each key is coupled with an actuating bar of each series.
8. In a keyboard mechanism the combination of the following elements, to wit; a plurality of series of valves; two series of actuating bars, one bar for each valve; a keybank provided with a plurality of series of keys; means for connecting each series of keys with a separate actuating bar of one series; and means for selectively coupling the individual keys of the several series with the actuating bars of the other series.
9. In a keyboard mechanism the combination of the following elements, to wit; two series of valves each of the latter provided with an actuating bar, the bars of the two series being disposed in cross wise relation; a keybank

provided with a plurality of series of keys, each series coupled with an actuating bar of one series of valves; and a plurality of series of permutation bars, one for each series of keys, adapted to selectively engage any one or more of the actuating bars of the other series of valves.

10. In a keyboard mechanism the combination of the following elements, to wit: a keybank provided with a plurality of series of columns of keys; two series of actuating bars located beneath said keybank, one series disposed in parallel with the columns of keys and the other transversely thereto; a series of valves, one for each actuating bar, located in a valve chamber or air trunk beyond the keybank; and means for coupling each series or column of keys to one series of actuating bars and the individual members of each series of keys to the other series of actuating bars.

11. In a keyboard mechanism the combination of the following elements, to wit: a keybank provided with a plurality of series of keys in parallel relation; a series of valves, one for each series of keys; a series of valve actuating bars, one for each series of keys; coupling devices intermediate each series of keys and its valve actuating bar; a second series of actuating bars in crosswise relation to the first named series and each provided with a valve; and means for selectively and separately coupling the keys with individual actuating bars of the second series.

12. A pneumatic keyboard, comprising a series of de-

pressible keys, a series of subjacent and parallel rock-shafts operated upon by the keys, an air-trunk arranged outside of the bank of keys, and valves in the trunk connected to and operated by the rock-shafts.

13. A pneumatic keyboard, comprising a series of depressible keys, a series of subjacent and parallel rock-shafts having crank-arms arranged beneath the keys, an air trunk arranged outside the bank of keys and valves arranged in the trunk connected to and operated by the rock-shafts.

14. A pneumatic keyboard comprising a series of depressible keys, a series of subjacent parallel rock-shafts operated upon by the keys, an air-trunk arranged outside the bank of keys and having a plurality of outlets and valves fixed to the rock-shafts and controlling said outlets.

15. A pneumatic keyboard, comprising a series of depressible keys, a series of subjacent parallel rock-shafts operated upon by the keys, an air-trunk arranged outside the bank of keys, valves arranged in the trunk and operated by the rock-shafts, and springs for turning the rock-shafts.

16. In a pneumatic keyboard, the combination of a valve, a series of keys, and means connecting said valve with said keys whereby the valve may be operated by any key of the series.

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Witnesses:

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WILLIAM A. ROSSITER.