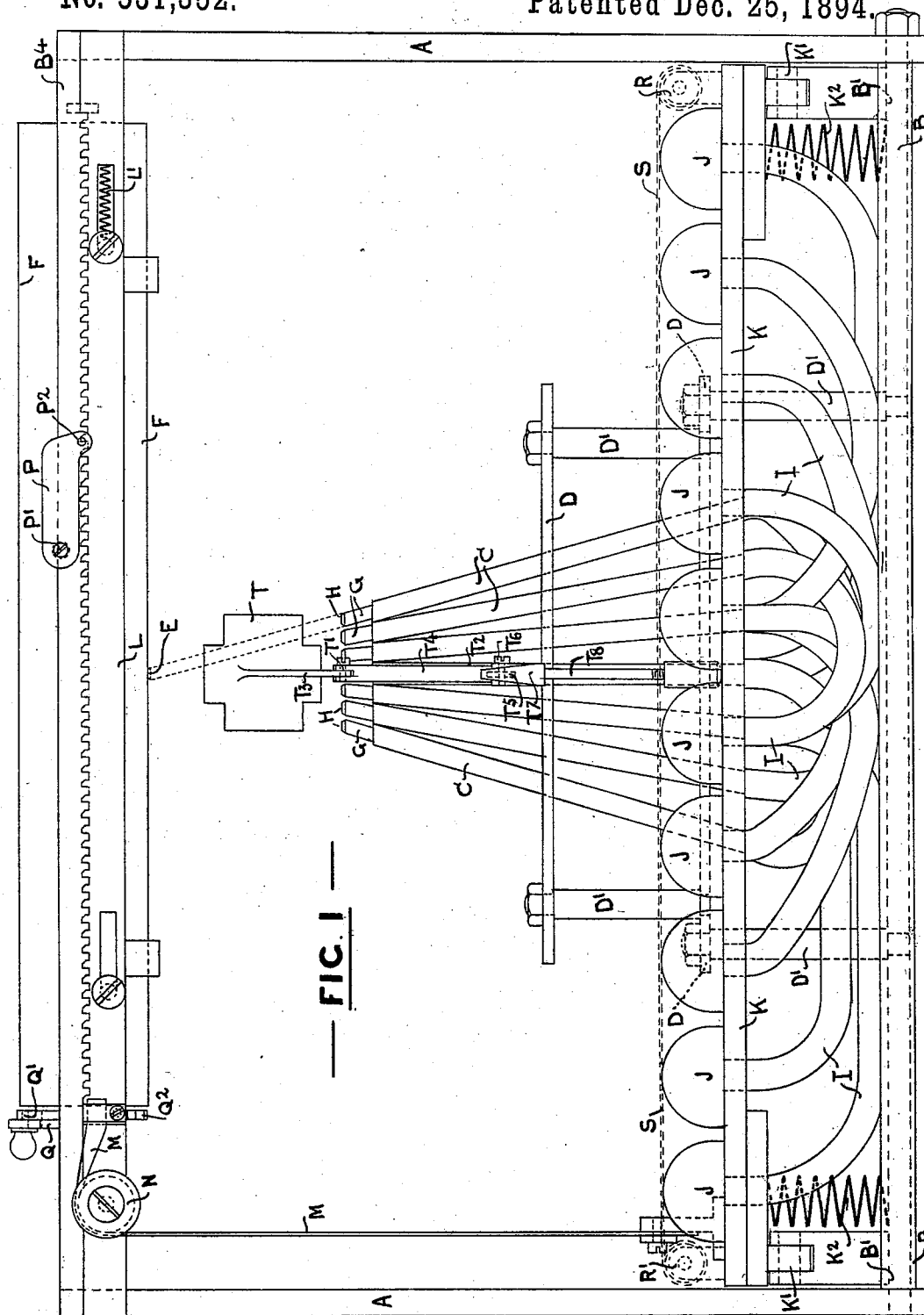


M. A. WIER.
TYPE WRITING MACHINE.

No. 531,352.

Patented Dec. 25, 1894.



— FIG. 1 —

William Henry Beck
Stephen Edward Gungor.

—Witnesses—

Marshall Alfred Wier
—Inventor—

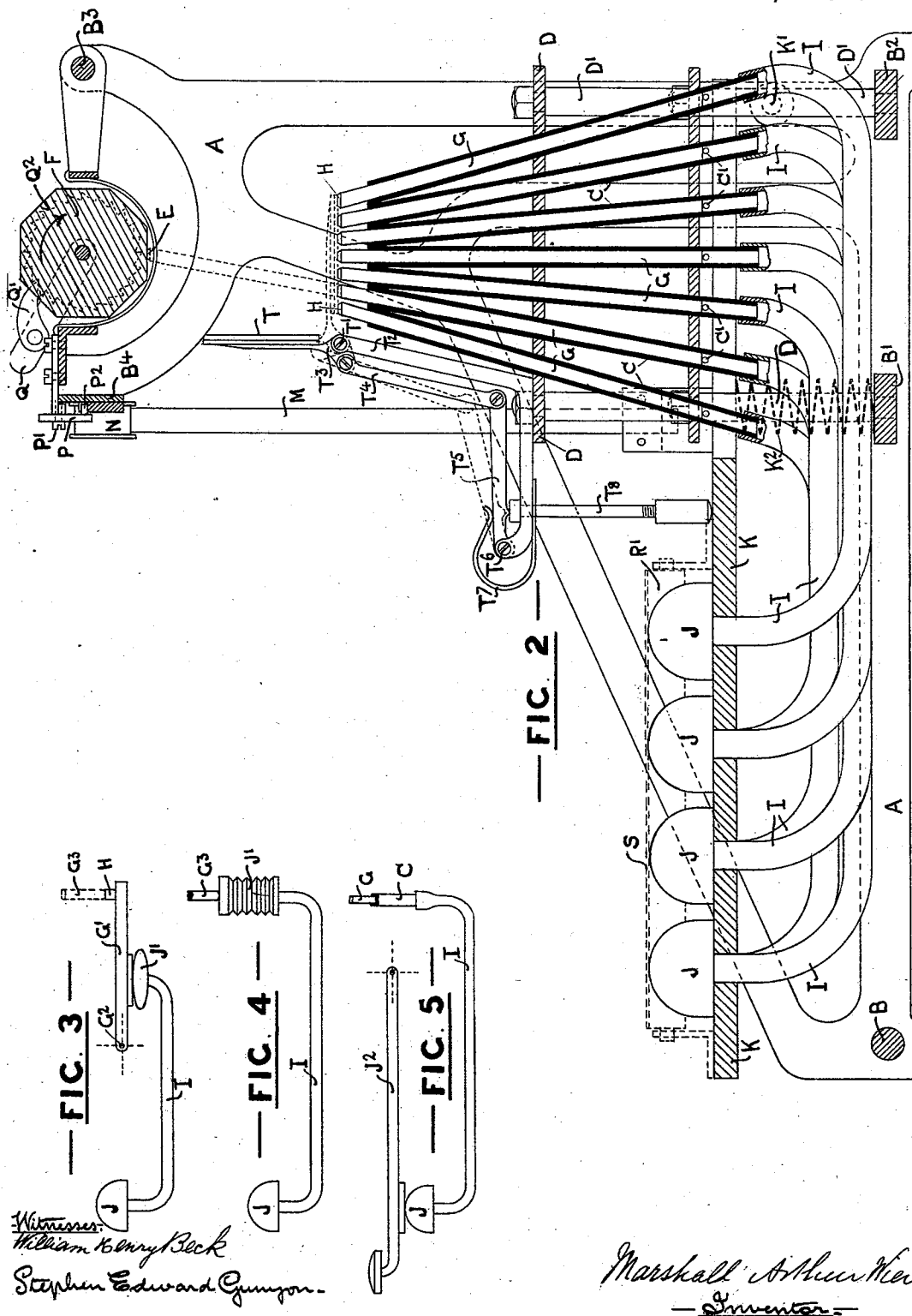
(No Model.)

2 Sheets—Sheet 2.

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UNITED STATES PATENT OFFICE.

MARSHALL ARTHUR WIER, OF KINGSTON-UPON-THAMES, ENGLAND.

TYPE-WRITING MACHINE.

SPECIFICATION forming part of Letters Patent No. 531,352, dated December 25, 1894.

Application filed October 29, 1891. Serial No. 410,267. (No model.) Patented in England September 7, 1891, No. 15,107.

To all whom it may concern:

Be it known that I, MARSHALL ARTHUR WIER, engineer, a subject of the Queen of Great Britain, residing at Elm Bank Place, Lower Ham Road, Kingston-upon-Thames, in the County of Surrey, England, have invented certain new and useful Improvements in Type-Writing Machines, (patented in Great Britain September 7, 1891, No. 15,107,) of which the following is a specification.

This invention relates to improved means and apparatus for mounting and actuating the printing type in type printing machines, and consists essentially in the employment of pneumatic means for the actuation of the type instead of or in combination with the mechanical appliances heretofore in use; and in order that the said invention may be fully understood, I will now proceed to describe the same with reference to the accompanying two sheets of drawings, in which—

Figure 1 is a front elevation of a type writing machine acting on the principle of the well known "Remington" machine but constructed in accordance with my invention. Fig. 2 is a transverse section of the same taken on line X X of Fig. 1.

Similar letters of reference relate to like parts in all the figures of the drawings.

A A are the two side frames of the machine. B, B', B², B³ and B⁴ are stretcher bars uniting these two frames together.

C C are a series of tubular type holders or carriers of square or other suitable internal section. These type holders or carriers are secured in and supported by two plates D D carried by pillars D' on the stretcher bars B' B³ of the framing of the machine. The said type holders or carriers C C are placed so that they each and all converge toward a point E on the printing roller F as will be well understood in connection with this class of machine. In each of the tubular type holders C is placed a rod G of wood or other comparatively light material of corresponding section and adapted to slide easily but steadily up and down therein.

The type-holders C and the rods G sliding therein are preferably of square or oblong section in order to prevent the rods G from turning round in the type holders C. On the outer end of each rod G is mounted a type H, the

face of which is placed at such an angle to its supporting rod G as will cause it to stand in the same plane as the faces of all the other type as shown in the drawings when the rods G are down in their lowest positions in the type holders C, that is to say resting on the stop pins C' passing across the type holders.

The lower end of each type-holder C is connected by a flexible or other tube I to a collapsible air chamber J mounted in a position corresponding to the ordinary key of a type-writing machine. On pressing any one of the said collapsible air chambers J with the finger, the air in the said chamber and tube is compressed and acts on the lower end of the corresponding rod G, forcing the said rod upward in its tubular type holder and the type H strikes against the paper (which is carried under the roller F, or other suitable surface placed in a proper position with reference to the type holders) so as to print the corresponding letter thereon as shown by dotted lines in Figs. 1 and 2. When the collapsible chamber is released, it resumes its original form and thereby assists the action of gravity to return the rod G quickly to its normal position.

The necessary step by step movements of the paper in order to present a fresh point for receiving the impression of each successive letter, and movements of the paper for commencing a fresh line, or for the spacing between adjacent words, may be effected by any suitable means. For example the collapsible air chambers J may be mounted, as shown in the drawings, on a rocking board K turning on a fulcrum at K' so that each time one of the said collapsible chambers is pressed by the finger, the said rocking board is depressed at its front end and draws the sliding bar L to the left by means of the band or cord M connected at one end to the said bar L, and, after passing over the guide pulley N, connected at the other end to the said rocking board K. The bar L is furnished with teeth on its upper edge as shown.

P is a pawl pivoted at P' to the frame carrying the printing roller F. When the bar L is drawn to the left by the depression of the rocking board K, a tooth on it presses against the tooth P² of the pawl P, moving the latter and with it the printing roller F and paper a predetermined distance to the left. When

the rocking board K is released from the action of the finger of the operator, it is restored to its normal position by means of the springs K² and a spring L' then draws the bar L to the right, bringing another tooth of its rack behind the tooth P² of the pawl P in readiness for another operation.

When it is required to bring forward the paper for the commencement of a fresh line of type-writing, the crank handle Q is moved in the direction of the arrow and the pawl Q' taking into one of the teeth of the ratchet wheel Q², which is fixed on the axis of the roller F, moves the paper forward to the required distance in a manner well understood in connection with machines of this kind.

The rods G, carrying the type, may be arranged in the type holders in any required order, so that a type-writing machine, constructed in accordance with my invention, can readily be used as a cryptograph or cipher writer when the lettering on the collapsible chambers is made to correspond with the type on the ends of the rods in the corresponding type-holders, and for this purpose such machines may be furnished with movable scales, indices, or pointers, as described in the specification of a patent granted to me, dated August 19, 1887, No. 11,341. For example such a movable scale may be arranged as shown in the drawings, in which—

R R' are two rollers mounted one at each side of the machine.

S is a flexible band, one end of which is attached to the roller R and the other end to the roller R'. This band S has printed, or otherwise marked, thereon, letters or other signs corresponding to the type on the rods G, such letters or signs being so placed on the band S that when the latter is in its normal position they stand over the corresponding collapsible air chambers J, and the latter can be operated by pressing on the part of the band S where the corresponding letters or signs are found, and ordinary type writing can be executed; but when the said band is moved one or more places to the right or left by winding it more or less on to one of the rollers R or R' and unwinding it to the same extent from the other the letters or signs on the band S will stand over air chambers J which do not correspond to them, and the machine can then be used as a cryptograph in the manner described in the specification of my aforesaid patent, No. 11,341.

The inking of the type may be effected by any of the well-known arrangements that may be best suited to the particular kind of machine to which the improvements are applied. For example, in the machine illustrated in the drawings, the inking is effected in the following manner:

T is an inking pad arranged to turn on a hinge at T' on a fixed bracket T².

T³ is an arm of the inking pad T pin-jointed by a link T⁴ to a lever T⁵ turning on a fulcrum at T⁶.

T⁷ is a spring which tends constantly to press the lever T⁵ downward and thereby to hold the inking pad T in the elevated position shown.

T⁸ is a sliding rod the lower end of which rests on the rocking board K and the upper end comes under the lever T⁵. When the rocking board K, after being pressed down to effect the lateral movement of the paper, as above described, is released, it rebounds under the action of the springs K² somewhat above its normal position, striking the lower end of the rod T⁸, causing the latter to push up the lever T⁵, turning the inking pad T on its hinge into the horizontal position shown in dotted lines so as to apply ink to the surfaces of the type H; but when the rocking board K has resumed its normal position, the spring T⁷ restores the parts to the positions shown in the drawings to allow of the next printing operation.

Instead of the type being mounted on the ends of the rods operated directly by the pressure of air in tubular type holders, the type may be mounted on levers, rods, or other instruments, operated directly or indirectly by the pneumatic appliance as illustrated diagrammatically in Figs. 3 and 4 of the drawings, in which—

J is a collapsible air chamber; J', an expansible air chamber such as for example a flattened india rubber ball in Fig. 3, or an expanding bellows in Fig. 4; I, a tube connecting the air chambers J and J' together.

G' (Fig. 3) is a lever or arm pivoted at G² and either carrying at its outer end a type H or acting on a rod G³ sliding longitudinally in suitable guides and carrying at its upper end a type in the same way as the rods G in Figs. 1 and 2. On causing the air chamber J to collapse by the pressure of the finger or otherwise, the air chamber J' expands, raising the lever G' and its type H, causing the latter to strike the paper placed in a suitable position above it; or, if the type is carried on a rod G³, the latter is raised by the lever G' and the type on it strikes the suitably placed paper. On removing the finger from the air chamber J, the latter expands and the air chamber J' collapses and the other parts return to the positions shown in the figure.

In Fig. 4 the type rod G³ is operated directly by the expansible air chamber J' without the intervention of the lever G'.

The collapsible air chamber, instead of being pressed directly by the finger of the operator, may be pressed by a lever key as illustrated at J² in Fig. 5.

It is obvious that the above described pneumatic means of operating the type may be applied to almost any kind of type writing machine, the mechanism, and the arrangement thereof being varied according to the nature of the machine employed and its mode of action.

The collapsible air chambers J, shown in Figs. 1, 2, 3, 4 and 5, consist of india rubber

hemispheres, but they may consist of cylinders and pistons, bellows, or any other known and suitable appliances for compressing air.

I claim—

5 1. In a typewriting machine, the combination with a rocking board provided with compressible air chambers of inking mechanism capable of actuation by said board, type-bars, carriers for said type-bars and connections between the compressible chambers and type-bars whereby the latter are actuated upon the movement of said rocking board, substantially as described.

15 2. In a typewriting machine, the combination with type-bars and their actuating mechanism, of an inking device, a rocking board capable of being depressed independently of, or by reason of, the operation of said mechanism, for communicating motion to said inking device, substantially as described.

20 3. In a typewriting machine, the combination with type-bars and their actuating mechanism, of a rocking board, capable of being depressed independently of, or by reason of, the operation of said mechanism, a hinged pad and a connection between said board and pad for operating the latter, substantially as described.

25 4. In a typewriting machine, the combination with type-bars and their actuating mechanism, of an inking device, a rocking board capable of being depressed independently of, or by reason of, the operation of said mechanism, for simultaneously imparting a step-by-step motion to the paper and operating the said inking device, substantially as described.

30 35 In testimony that I claim the foregoing as my invention I have signed my name in presence of two subscribing witnesses.

MARSHALL ARTHUR WIER.

Witnesses:

WILLIAM HENRY BECK,

STEPHEN EDWARD GUNYON,

Both of 115 Cannon Street, London.