

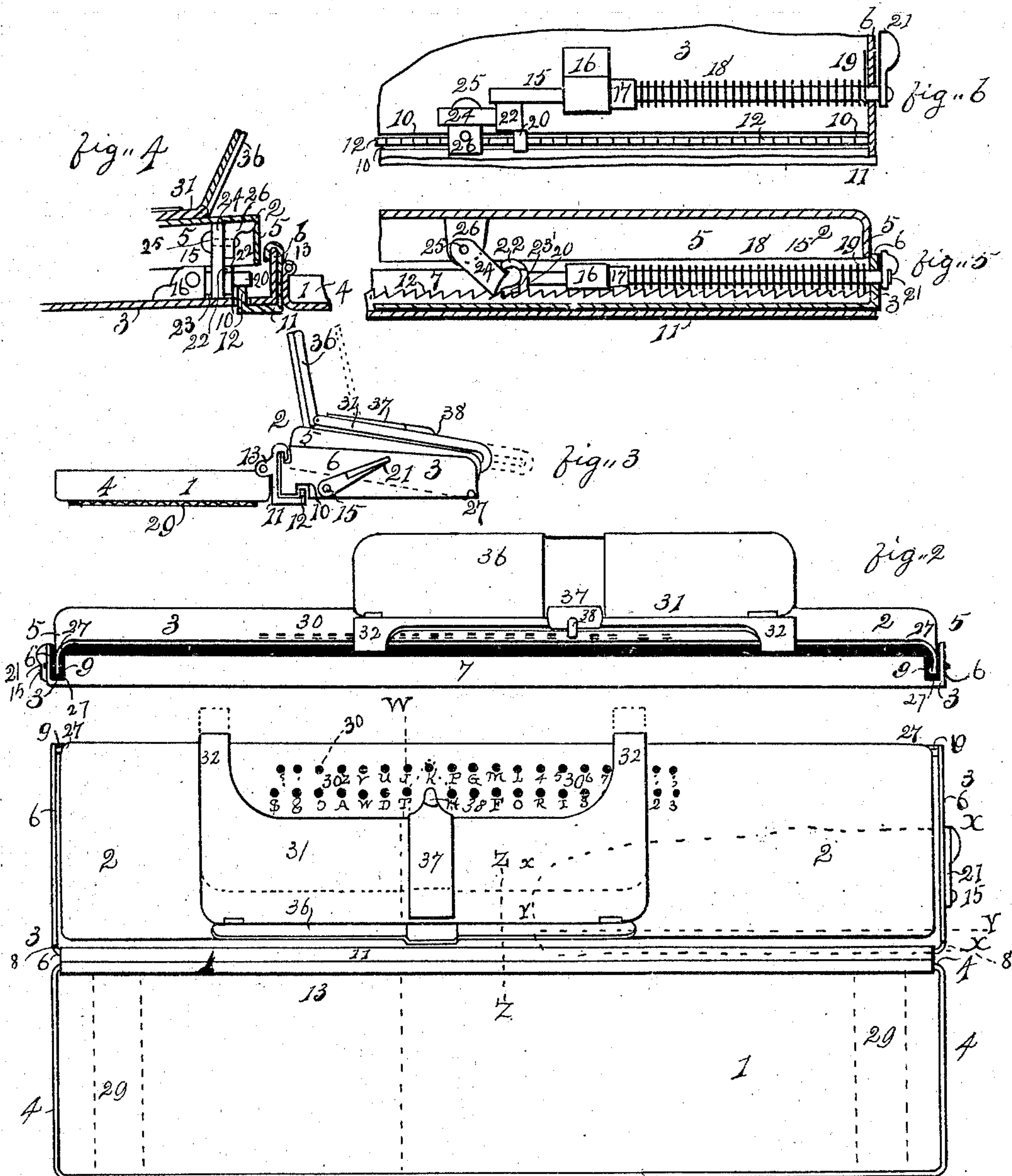
(No Model.)

4 Sheets—Sheet 1.

G. P. DAVIS.  
TYPE WRITING MACHINE.

No. 509,427.

Patented Nov. 28, 1893.



Witnesses  
Amos Eaton  
Alexander Brown

Inventor  
George P. Davis  
by Elliott & Stoddard  
his attorney.

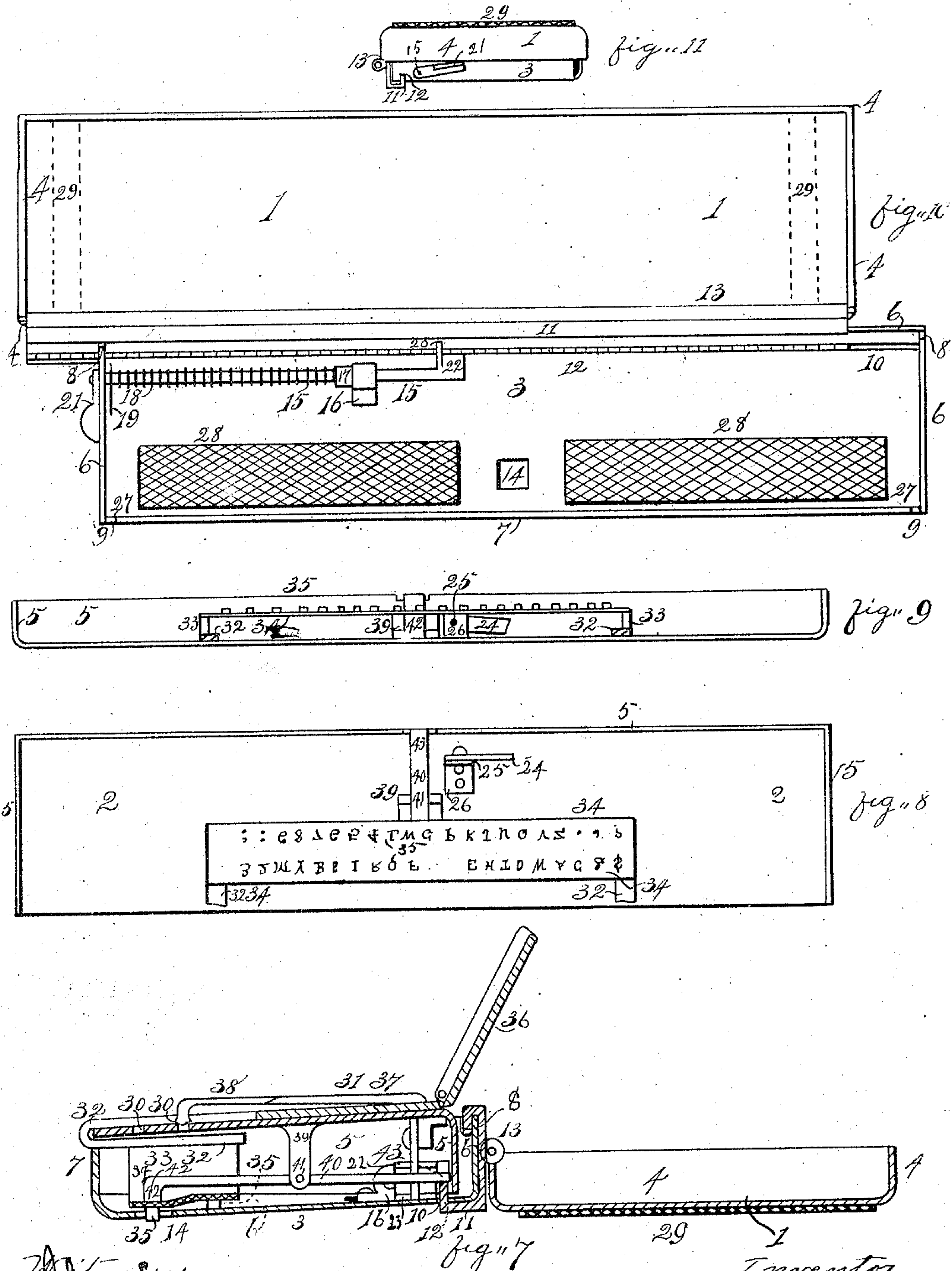
(No Model.)

4 Sheets—Sheet 2

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Witnesses—  
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George P. Davis  
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his Attys.



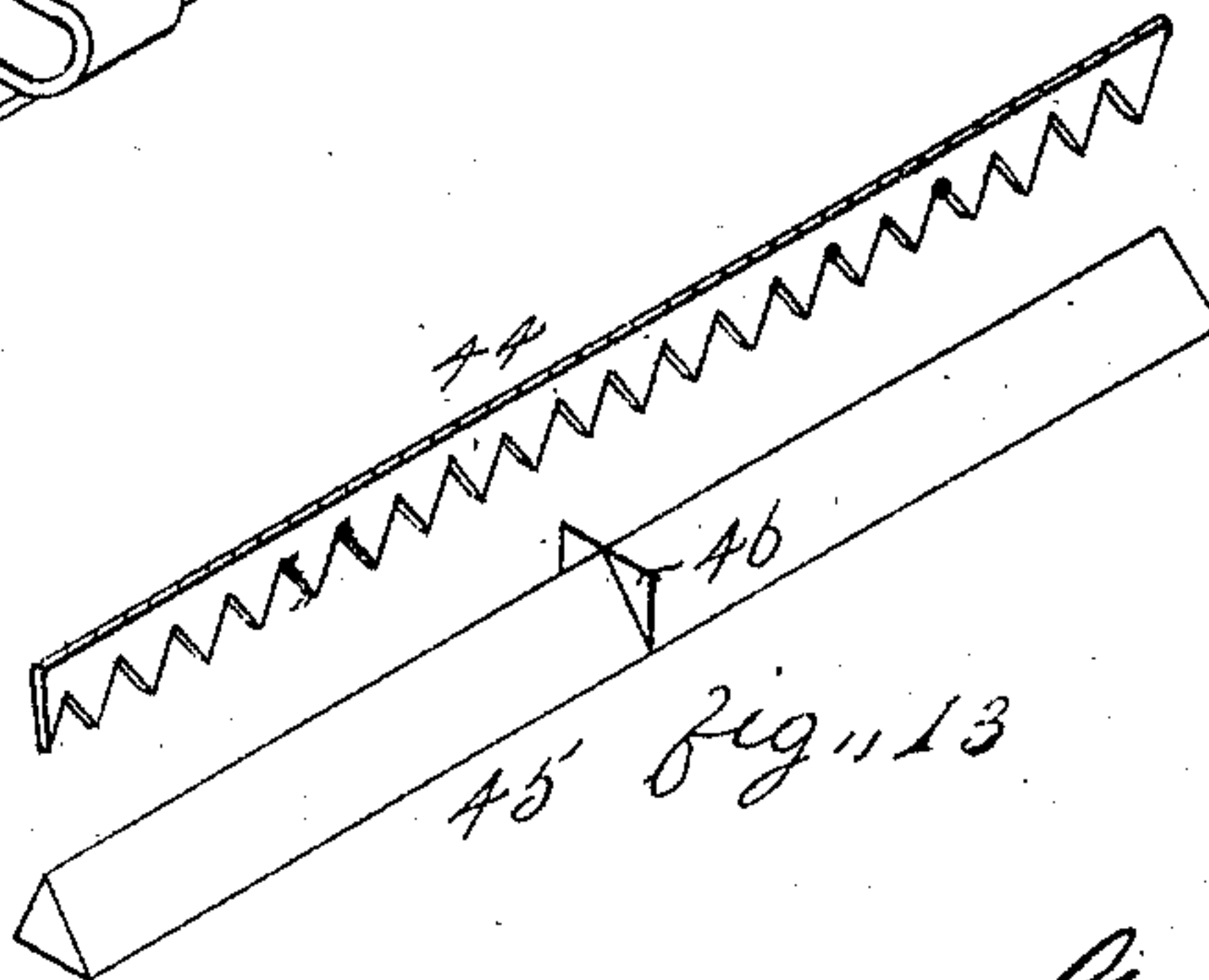
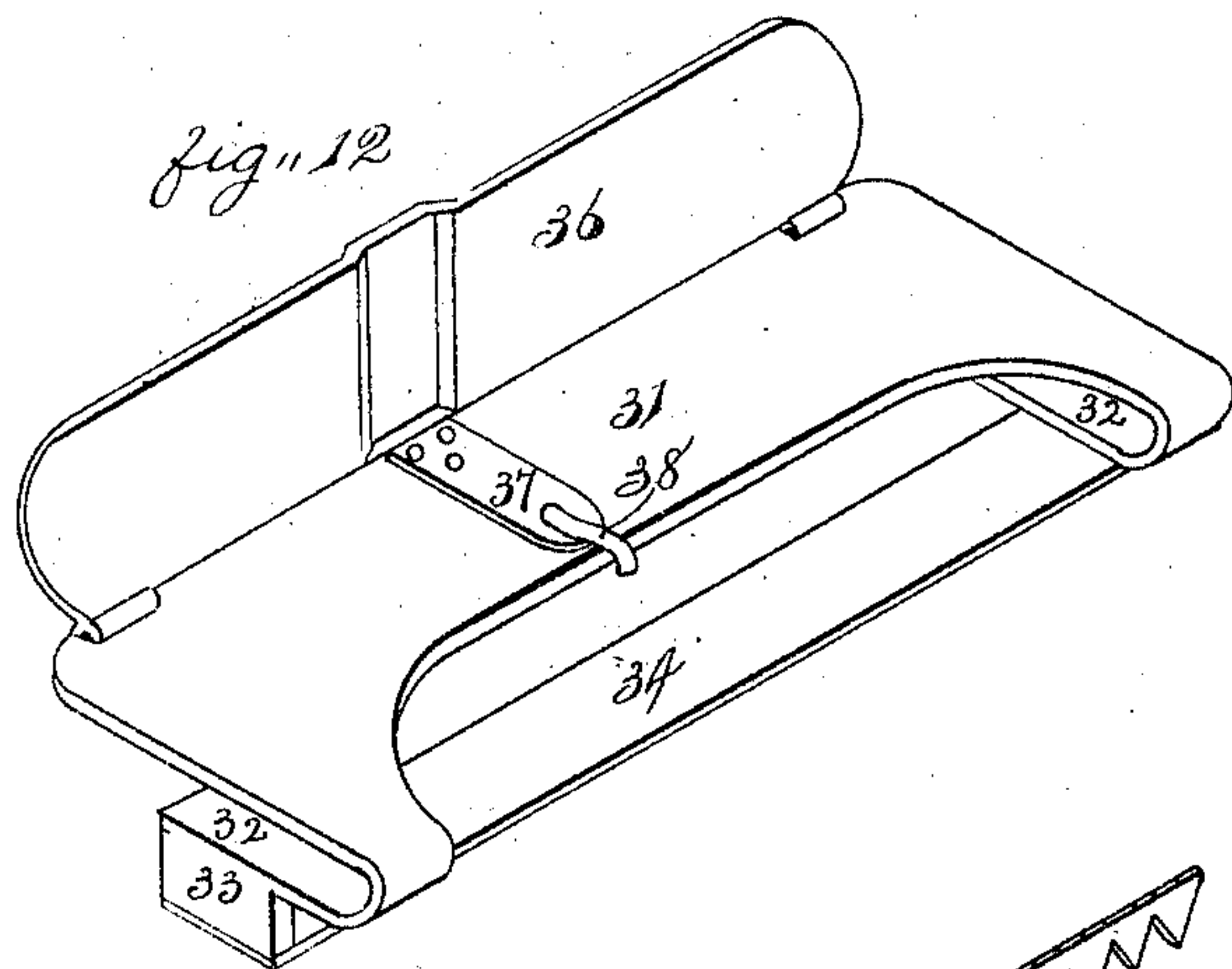
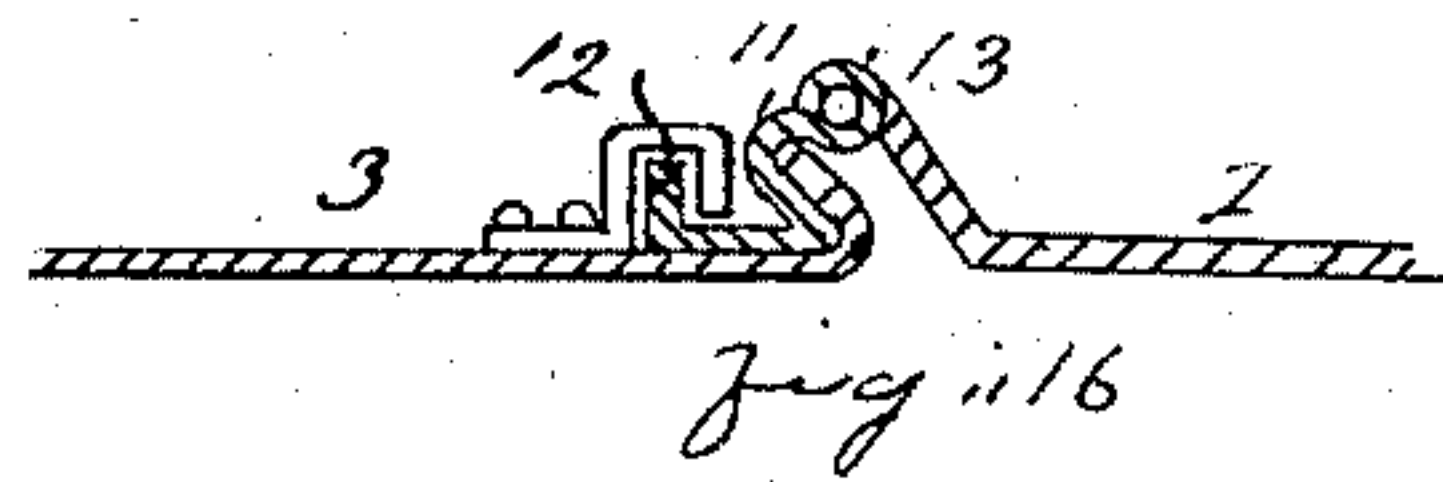
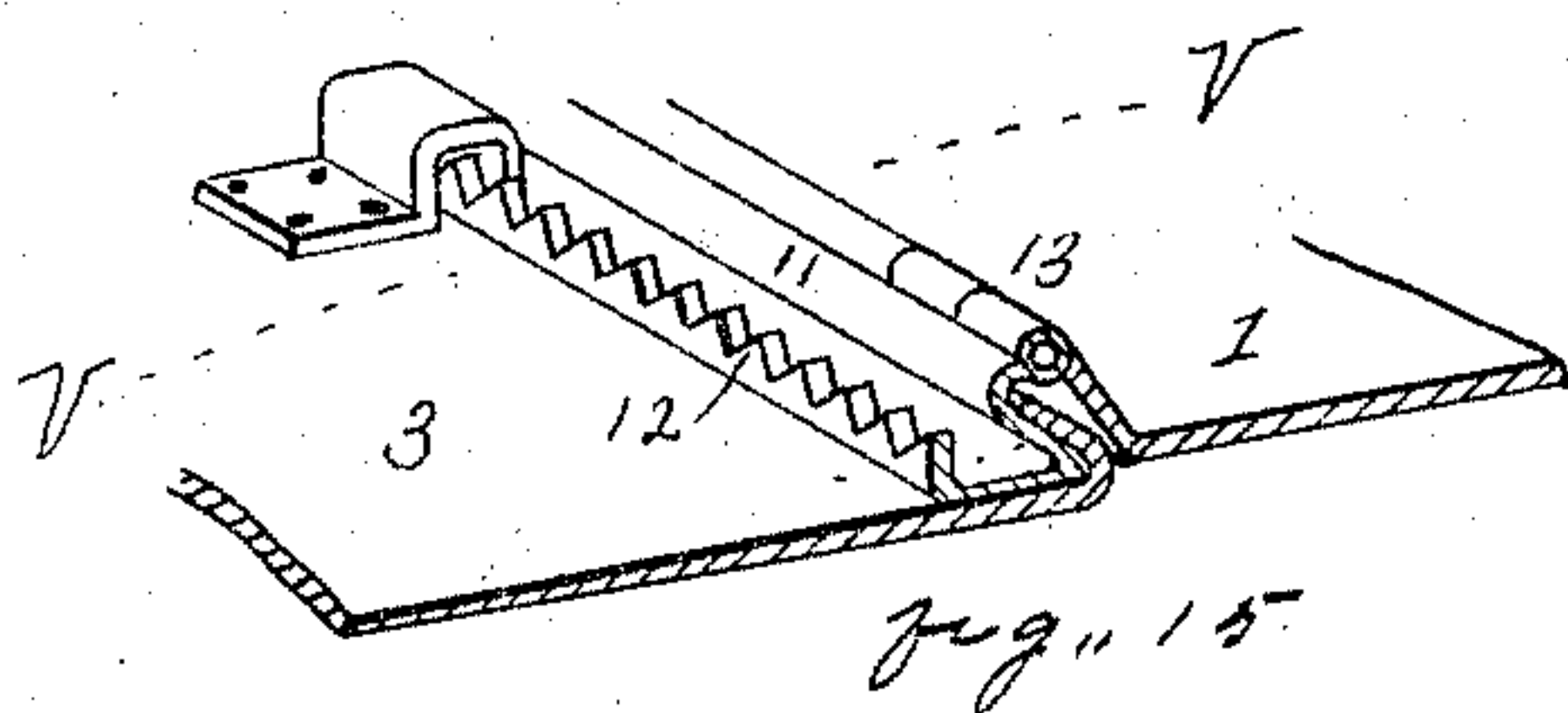
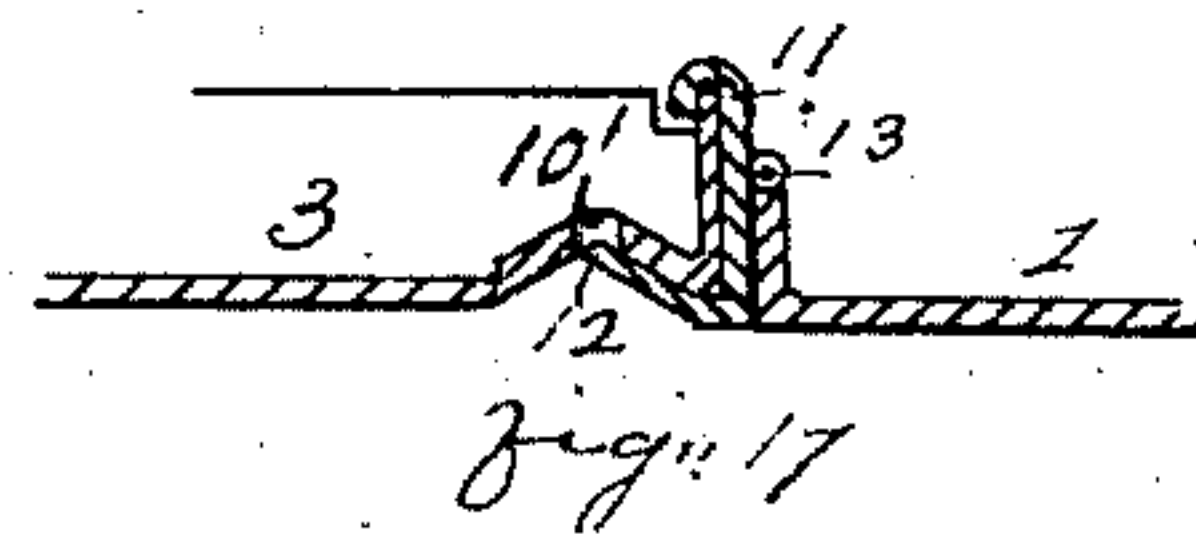
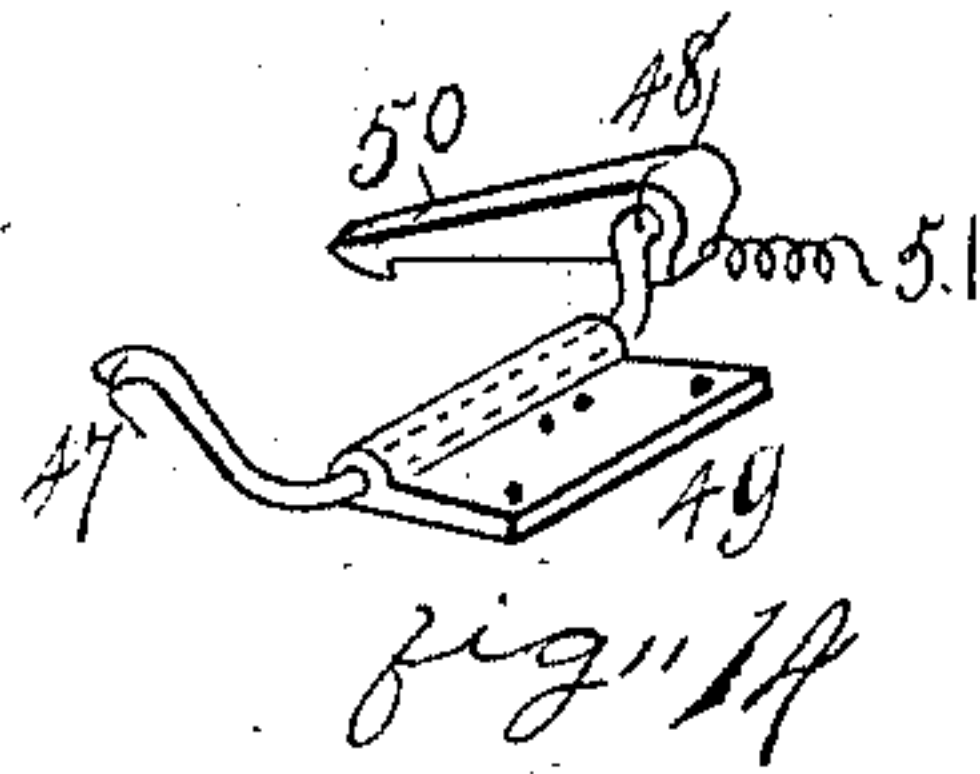
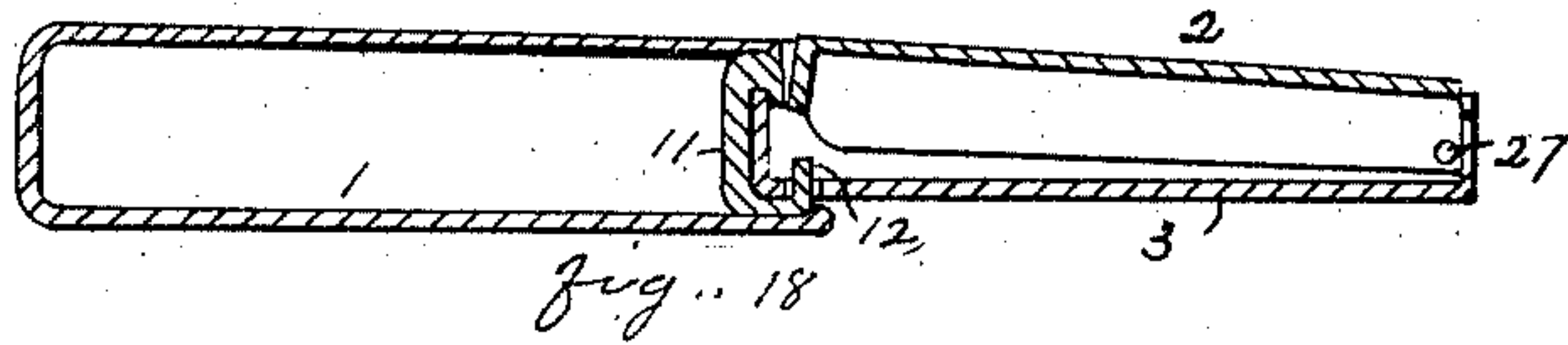
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4 Sheets—Sheet 3.

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(No Model.)

4 Sheets—Sheet 4.

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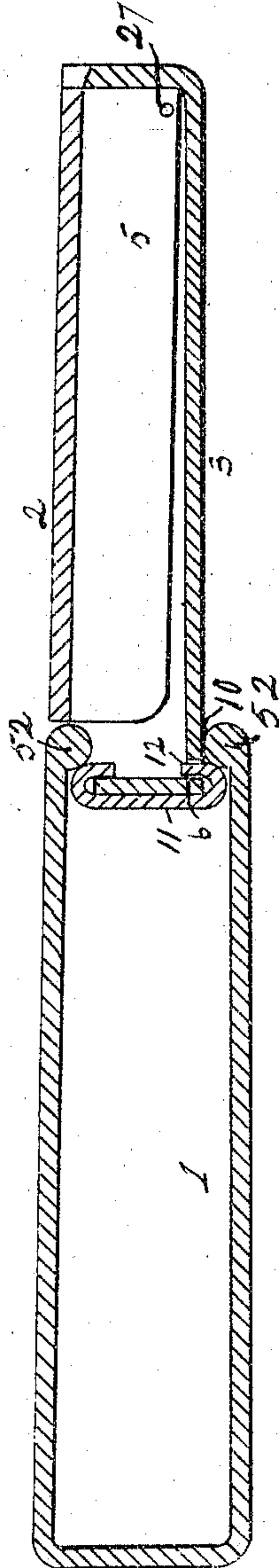


fig. 19

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his Attorney



# UNITED STATES PATENT OFFICE.

GEORGE P. DAVIS, OF BUFFALO, NEW YORK.

## TYPE-WRITING MACHINE.

SPECIFICATION forming part of Letters Patent No. 509,427, dated November 28, 1893.

Application filed August 31, 1891. Serial No. 404,178. (No model.)

*To all whom it may concern:*

Be it known that I, GEORGE P. DAVIS, of Buffalo, in the county of Erie and State of New York, have invented a new and useful Improvement in Type-Writers, of which the following is a specification.

My invention relates to type-writers, and my improvements consist in adapting a type-writer to be folded, and in the various details of construction hereinafter described and shown in the accompanying drawings in which—

Figure 1, is a plan view of a type-writer embodying my invention, in position to be used. Fig. 2, is an elevation of the same showing the side which is toward the top of the sheet in Fig. 1. Fig. 3, is an end elevation of the same showing that end which is toward the left in Fig. 2. Fig. 4, is a section on the line Z, Z, Fig. 1. Fig. 5, is a section on the line Y, Y, Fig. 1. Fig. 6, is a plan view, showing the interior construction of that portion of the device within the lines X, X, X, Fig. 1. Fig. 7, is a section on the line W, W, Fig. 1. Figs. 8 and 10, are plan views showing the interiors of the larger parts of the device. Fig. 9, is an elevation of the part shown in Fig. 8, showing that side which is toward the bottom of the sheet in Fig. 8. Fig. 11, is an end elevation of the device shown in Fig. 1, folded together. Fig. 12, is an isometric view of that portion of the device, by which the required type is brought into position for writing. Fig. 13, is a detail isometric view showing a modified form of the apparatus by which the required type is brought accurately into position for writing. Fig. 14, is a detail perspective view of a modified form of the feeding apparatus. Fig. 15, is a detail perspective view showing a modified attachment by which the plate 3, may be secured to the plate 11. Fig. 16, is a section on the line V, V, Fig. 15. Fig. 17, is a cross-section showing a second modified attachment by which the plate 3, may be secured to the plate 11; and Fig. 18, is an elevation in section showing a modified form of the device, by which modification the parts are adapted to be folded together by sliding the plates 2, and 3, within the plate 1, and Fig. 19 is an enlargement of Fig. 18.

The same reference figures refer to the same parts throughout the several views.

1, 2, 3, are plates, or trays, adapted to be placed one within the other, and connected as hereinafter described. The plate 1, has its edges turned up to form the flanges 4, 4, 4, 4, and is hinged at 13, so as to turn over upon, and form a cover for the other parts, as shown in Fig. 11. The plate 2, has its edges at its ends and one of its sides turned up to form the flanges 5, 5, 5. The plate 3, has its four edges turned up to form the flanges 6, 6, 6, 7.

8, 8, are vertical slots in the end flanges 6, 6, next to the side flange 6.

9, 9, are vertical slots in the flange 7 next to the end flanges 6, 6.

10, is a slot formed through the bottom of the plate 3, parallel with and a short distance from the side flange 6. The ends of the slot 10, extend about half-way up the end flanges 6, 6.

11, is a thin metal plate, of the same length as plates 1, 2, 3 bent at the top over and down upon the inner side of the side flange 6. The plate 11, is bent at the bottom under the plate 3, then up vertically through the slot 10. Ratchet teeth are formed at the edge of the plate 11, which extends through the slot 10, thus forming, of said edge, a rack indicated in the drawings by the reference figure 12. The end flanges 5, 5, of the plate 2, are pivoted at 27 to the plate 3, the ends of said flanges at the unflanged side of the plate 2 passing into the slots 9, 9, as best shown in Fig. 2. The flanges of the plate 2, pass inside of the flanges of the plate 3.

By the above described construction the side of the plate 2, which is toward the plate 1, has a free movement up and down with reference to the plate 3, and the plates 2 and 3, are adapted to move with reference to the plates 1, and 11, in the direction of the length of said last mentioned plates, the vertically extending edges of the plate 11, passing through the slots 8, 8, and 10, in the end flanges 6, 6.

14, is an aperture through the plate 3, midway between the ends of said plate.

28, 28, are inking pads secured to the inside of the plate 3, at either side of the aperture 14, and parallel to the flange 7.

30 are holes formed through the plate 2, parallel with and nearer to the hinged side of said plate. Characters are printed on plate



2, opposite each of said holes, which together form a key-board.

31, is a metal plate provided with arms 32, 32, extending from the side, at the ends of said plate, and bent downward and backward to extend parallel to said plate.

33, 33, are hangers extending downward from the ends of the arms 32, 32.

34 is a type-strap extending between the ends of the hangers 33, 33, (as shown in Fig. 12.)

35 are type extending from the lower surface of the type-strap 34.

Before hinging the plate 2, to the plate 3, the plate 31, is placed upon the plate 2, so that the arms 32, 32, shall be bent around the edges of plate 2 at which there is no flange, and pass under said plate. When the plate 2, is secured to the plate 3, the hangers are inside of the flanges 6, 6, and 7, which will prevent the removal of plate 31.

36, is a metal plate, forming a handle, which is hinged at the edge of plate 31, opposite to the arms 32, 32.

37, is a spring secured to the plate 31, near that edge to which the plate 36 is hinged and extending across the plate 31.

38 is a detent secured to the free end of the spring 37, and extending beyond said spring. The free end of detent 38 is bent downward and is pointed so as to extend into the holes 30, as shown in Figs. 1 and 7. By moving plate 31 so that detent 38 may enter any one hole in plate 2, a similar character to that set opposite said hole will be directly over the aperture 14, through which aperture all impressions are made.

39, is a hanger secured to the lower side of plate 2, and extending downward.

40, is a lever pivoted near its center at 41 to a hanger 39, so as to oscillate in a vertical plane at right-angles to the length of plates 2, and 3. One arm, 43, of the lever 40 extends over the rack 12. The other end of said lever extends over the type-strap 34, and is provided with a downwardly extending head 42, adapted to press the letter on type-strap 34 through the aperture 14, when that end of the lever is forced downward.

16, is a standard secured to and projecting upward from plate 3, and 15, is a rod passing through standard 16, and extending through the end flange 6. Said rod is adapted to reciprocate in a direction parallel to the rack 12, and to rock in a vertical plane at right-angles to said rack.

17 is a collar upon rod 15 adapted to limit the motion of said rod parallel to the rack 12, by striking against the standard 16.

18 is a coiled spring upon the rod 15, compressed between the end-flange 6, and collar 17, and secured to rod 15 at collar 17, so that it cannot turn around said rod. There is a torsional strain to spring 18 which presses the end 19, of said spring against the plate 3, so that said spring tends to turn said rod toward the rack 12.

20 is an arm extending at right-angles from rod 15 over the rack 12, and forming a pallet which engages with the teeth of said rack.

22, and 23, are arms extending from the pallet 20, at right-angles to said pallet, and at an angle with each other.

21, is a lever secured to the rod 15 outside of the end flange 6, and extending at right-angles to said rod.

26 is a hanger which is secured to the under side of plate 2 and extends downward, and 24 is a dog pivoted to hanger 26 at 25. Said dog is so located and pivoted to hanger 26 that its free end shall come in contact with arms 22 and 23 its lower edge resting upon plate 3, at the same time, and so that said dog shall be adapted to oscillate in a vertical plane parallel to the rod 15. The length of the dog 24 and its location relative to the arms 22, and 23, is such that when said dog rests against the end of one of said arms its length extends in a direction which forms an angle less than a right-angle with the planes of the plates 2 and 3, and the plate 2, is supported by said dog. The size and form of the lower or free end of the dog 24 are such that before the plate 2 is pressed down against the resistance of said dog the upper corner of the free end of said dog extends a short distance under and touches the arm 22, and the lower corner comes against the plate 3, at a point which is in a vertical line nearer to the pivot 25, than the vertical line through said upper corner.

29, 29, are strips of rubber secured to the outside of the plate 1.

The operation of the above described device is as follows: The type-writer is laid upon the paper, placed flat upon a level surface, in the position shown in Fig. 1. The pallet 20 is raised out of engagement with the teeth of the rack 12, by pressing down upon the lever 21, and the plates 2, and 3, are moved to the left until the pallet 20 is at the left hand end of the rack 12. The left hand of the operator is laid upon the plate 1, holding said plate stationary because of the cohesion of the rubber strips 29, 29, with the surface upon which the device is placed. The handle 36 is grasped by the right hand of the operator, with the fingers upon the plate 31, and spring 37. The plate 31 is moved until the end of the detent 38 enters that one of the holes 30 against which is marked the character which the operator desires to write. The plate 2, is forced down by the right hand of the operator. As said plate descends the pivot 41 of the lever 40 is forced down and, the end 43 of said lever being held stationary by the rack 12, the head 42 of said lever is pressed down against the type-strap 34, thus forcing the required type through the aperture 14, and impressing the required character upon the paper beneath said aperture. As the plate 2, descends the free end of the dog 24 is forced in a parallel direction to the rod 15 forcing its end under and



against the arm 22 thus raising the pallet 20 out of engagement with the teeth of the rack 12, and forcing the rod 15 along against the resistance of the spring 18. The lower corner of the dog 24 coming against the arm 23 forces arm 22 off from the upper corner of dog 24, allowing the pallet 20 to fall into engagement with the teeth in rack 12. By this operation the spring 18 has been compressed and the rod 15 has been forced a short distance along allowing the pallet 20 to fall into the next tooth of the rack 12. The expansion of the spring 18, when the pressure is removed from the plate 2 forces the plates 2 and 3, along because of the engagement of the pallet 20 with a tooth of the rack 12, the rod 15 and consequently said pallet being moved by the impulse of said spring, until the standard 16 again comes into contact with the collar 17. As the plates 2 and 3 move along under the impulse of the spring 18 the dog 24 is pressed backward by the arm 23 thus raising plate 2, and bringing said dog into position to repeat the above described operation. The distance between the teeth of the rack 12, and consequently the distance the plates 2 and 3 move after each character is written, is equal to the space the letters are to be placed apart. The space between words is formed by pressing the plate 2, downward when the detent 38 is at a position where no type is over the aperture 14. Each time the plate 2 is forced down all the type except that over the aperture 14, are pressed against the pads 28, 28, and reinked.

When the above described device is to be folded to put away or to carry in the pocket, the dog 24 is laid on top of the arm 22 and the plate 2 pressed toward the plate 3. The plate 1 is then turned over at its hinges upon the plates 2 and 3 forming a cover as shown in Fig. 11.

Instead of the holes 30 and detent 38 the device shown in Fig. 13 may be used to assist the operator to adjust the type accurately in position to impress a required character. In said figure 44, is a serrated flange to be attached with its teeth downward to the ends of the arms 32, 32, said arms being made somewhat longer to receive said flange. 45, is a double inclined plane provided with the thin transverse plate 46 at its center. The double inclined plane 45 is secured to the plate 3, at the inside of, and near the center of said plate, and extends in a direction parallel to the sides of said plate. When the plate 2, is forced downward carrying the plate 31 with it, the plate 46 acts upon the sides of the teeth of the flange 44, to adjust the plate 31 accurately to the position for writing the required character; the plate 46 acts as described to adjust the plate 31 in the direction of the length of the plate 3, and the double inclined plane 45 acts upon the flange 44 to adjust said plate 31 in the direction of the width of the plate 3. When the plate 2, is in its highest position the flange 44, is entirely

above the inclined planes 45 and plate 46, and the plate 31 is therefore free to be adjusted, by the hand of the operator into the approximate position to write a required character.

Various feed devices may be substituted for that above described as, for instance, that shown in Fig. 14, in which 47 48 is a double crank-lever pivoted in a bearing upon a standard 49. 50 is a pawl pivoted to the crank 48, and 51 is a tension-spring adapted to draw said pawl backward. The standard 49 is to be secured to the plate 3, so that the cranks 47 48, shall turn in planes parallel to the rack 12, and so that the pawl 50 shall engage with the teeth of said rack. The plate 2, in descending will press upon the crank 47 thus turning it and turning the crank 48, thus causing the pawl 50 to engage the next tooth of the rack 12. When the plate 2 is allowed to rise the spring 51 will draw the plate 3 along in a way entirely analogous to that above described.

Figs. 15, 16, and 17, show modified forms of the attachment by which the plate 11, may be secured to the plate 3. These are so strictly analogous to that above described, that no separate description beyond that furnished by said figures will be required, further than to note that in the form shown in Fig. 17, the pallet which engages with the rack 12 extends through a slot 10' formed through the plate 3 for this purpose.

Fig. 18, shows a modified form of the above described apparatus, by which modification the device is adapted to be folded by sliding the plates 2, 3, and 11, sidewise into the plate 1, which last mentioned plate is formed for this purpose in the approximate form of a rectangular box with one of its sides removed. The plate 11, is adapted to slide in the plate 1, but is prevented from being removed therefrom by lugs 52, 52, formed at the edges of the top and bottom of the plate 1, which are adjacent to the open side of said plate. In other respects this form of the device is constructed like that above described.

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

1. The combination of the plates 1, 2, 3, the plates 2 and 3 being secured to and adapted to slide longitudinally with reference to the plate 1, and the plate 2, being adapted to reciprocate vertically with reference to the plate 3, substantially as shown and described.

2. The combination of the plates 1, 2, and 3, the plates 2, and 3, being secured to and adapted to slide longitudinally with reference to the plate 1, and plate 1, being hinged to and adapted to fold over the plates 2 and 3 substantially as shown and described.

3. The combination of the plates 2 and 3, and 11, and means for holding the plate 11, stationary, the plate 3, being provided with a slot or groove 10, the plate 11 being turned over the edge of the plate 3, one edge of the



plate 11 being turned up into the slot or groove 10, and provided with teeth to form the rack 12, substantially as shown and for the purpose described.

5 4. The combination of the plate 3, provided with an aperture 14, a plate 2, adapted to reciprocate in a vertical direction over the plate 3, a plate 31, upon the outside of the plate 2, arms 32 extending from the plate 31 around  
10 the edge of and under the plate 2 the flexible type-strap 34 extending between the arms 32 and provided with type 35, and means for pressing the type through the aperture 14, by depressing the plate 2, substantially as  
15 shown and described.

5. The combination of a plate 3 provided with an aperture 14, a plate 2, adapted to reciprocate in a vertical direction over the plate 3, a plate 31 upon the outside of the plate 2,  
20 arms 32 extending from the plate 31 under the plate 2, the flexible strap 34 extending between the arms 32 and provided with type 35, the lever 40 pivoted to the plate 2, and having one arm extending over the strip 34  
25 and the aperture 14, and having the other arm restrained from downward motion substantially as shown and described.

6. The combination of the plate 11 means for holding said plate stationary, the plates  
30 2 and 3, secured to and adapted to slide in the direction of the length of the plate 11, the plate 2 being adapted to reciprocate in vertical direction with reference to the plate 3, a rack 12 upon the plate 11, and a pallet upon  
35 the plate 3, adapted to engage with the teeth of the rack 12, and to feed the plates 2 and 3 along when operated by the motion of the plate 2, substantially as shown and described.

7. A feeding device for typewriters consisting of the rack 12 the rod 15, adapted to reciprocate in the direction of the length of said  
40 rack, and provided with a pallet for engaging the teeth of said rack, a spring 18 adapted to

return the rod 15 to place and a dog 24 having its free end bearing against the rod 15  
45 and resting upon a surface parallel to said rod, extending at an angle with said surface and pivoted to a part of the device which reciprocates in a direction approximately at right angles to said rack, substantially as and  
50 for the purpose described.

8. The combination of the rack 12, the rod 15, adapted to reciprocate in the direction of the length of said rack, and provided with a  
55 pallet 20 for engaging with the teeth of said rack, the arms 22, 23, extending from the rod 15 parallel to the length of said rack and at an angle with each other, a dog extending under the arm 22, and abutting against the  
60 arm 23, said dog resting at its free end against a surface parallel to the rod 15 extending at an angle to said surface and being pivoted to a part of the device which reciprocates in a direction approximately at right angles to said  
65 rack, the part of said dog which comes against the arm 22, being somewhat in advance of that part of said dog upon which its free end rests, substantially as and for the purpose described.

9. The combination of the rack 12, a pallet engaging with the teeth of said rack, a  
70 dog 24 adapted to lift and move said pallet backward, and allow said pallet to fall into the teeth of said rack, and a spring for restoring said pallet to place, substantially as  
75 and for purpose described.

10. The combination of the plate 3, the plate 11, secured to the plate 3, so as to permit the plate 3, to slide longitudinally with  
80 respect to the plate 11, and the plate 1, hinged to the plate 11, substantially as shown and described.

GEORGE P. DAVIS.

Witnesses:

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