(No Model.) 3 Sheets—Sheet 1.

A. N. HEINE & W. K. H. WOERNER.

TYPE WRITING MACHINE.

No. 497,177. Patented May 9, 1893.

Fig. 1.

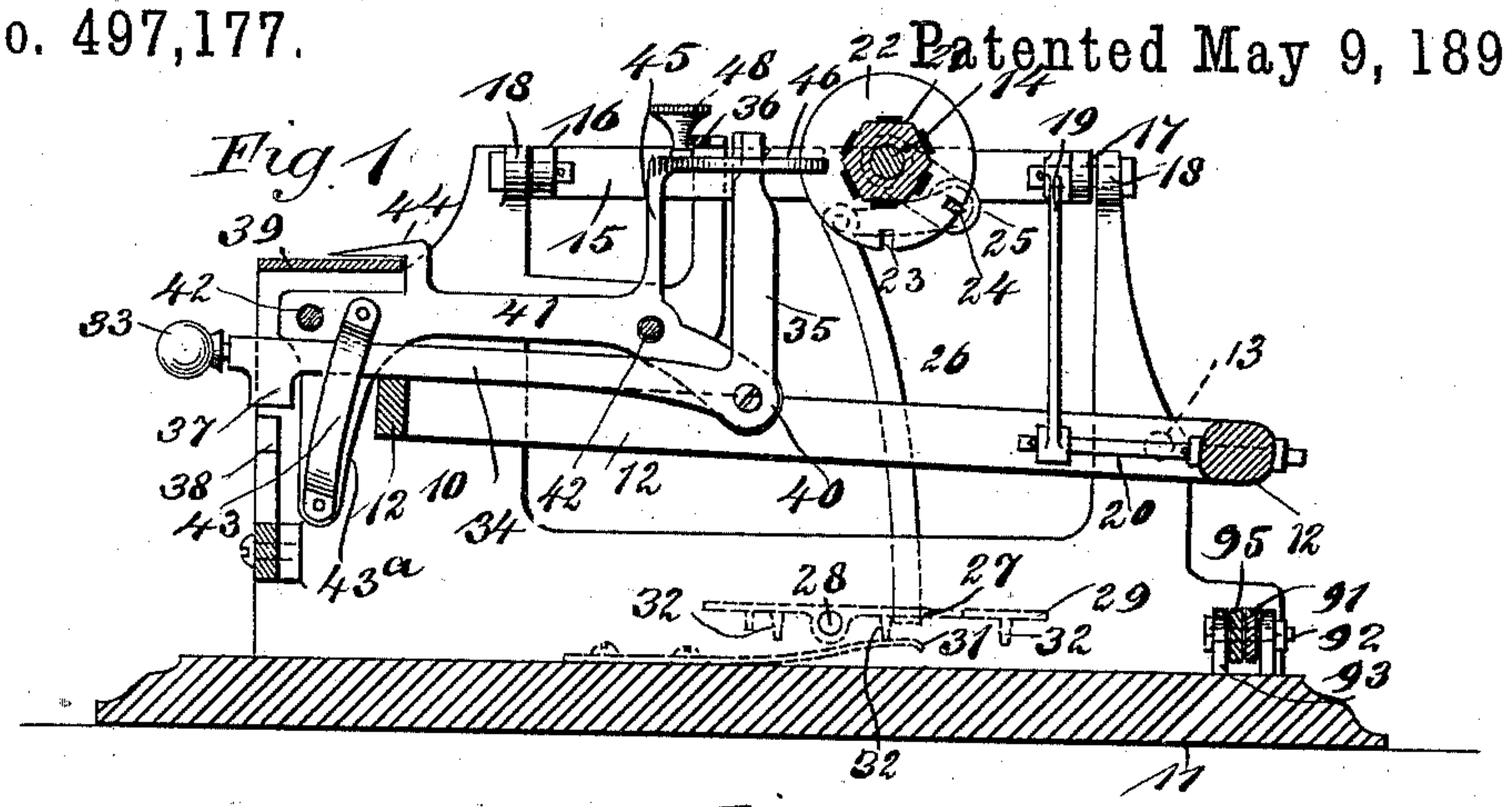

Fig. 2.

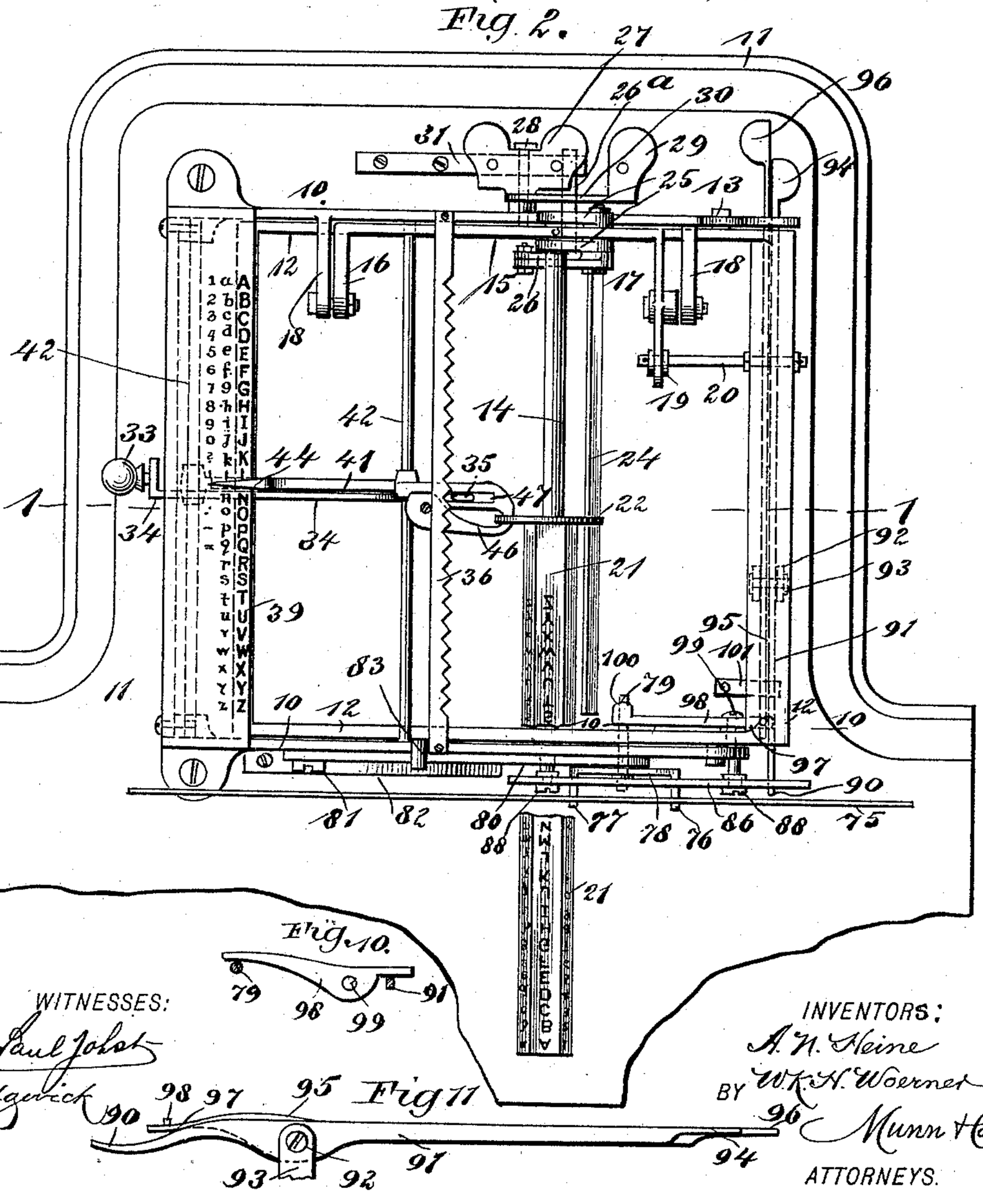

Fig. 10.

Fig. 11.

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(No Model.) 3 Sheets—Sheet 2.

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TYPE WRITING MACHINE.

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Fig. 3

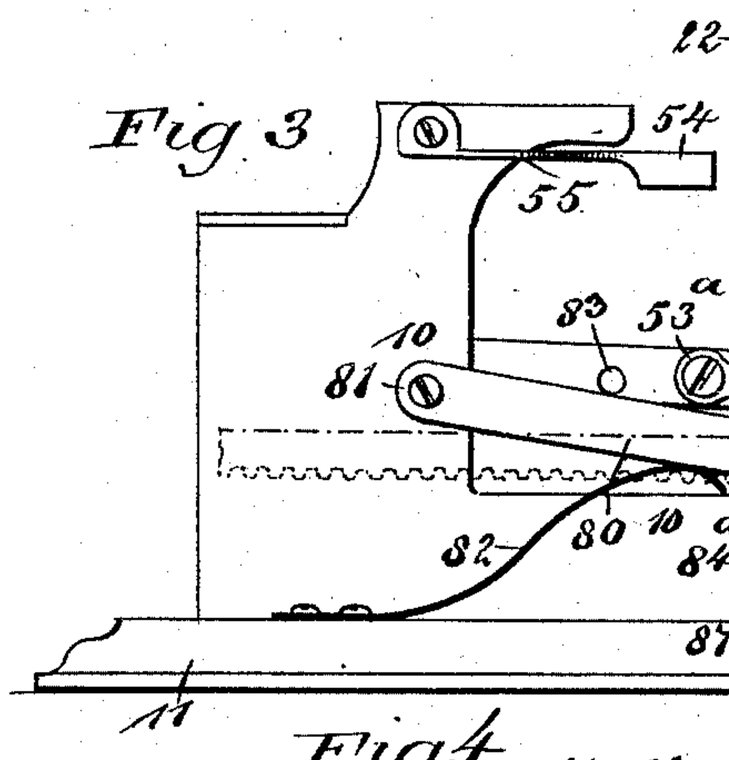


Fig. 6

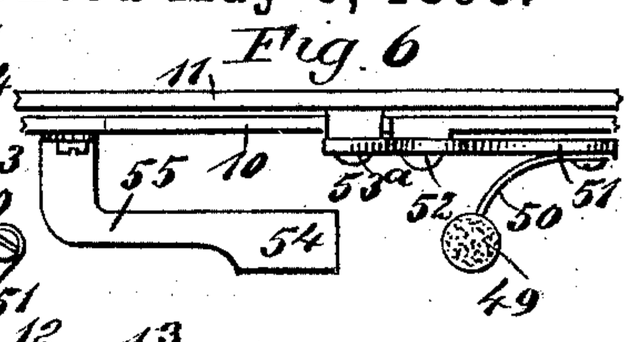


Fig. 4.

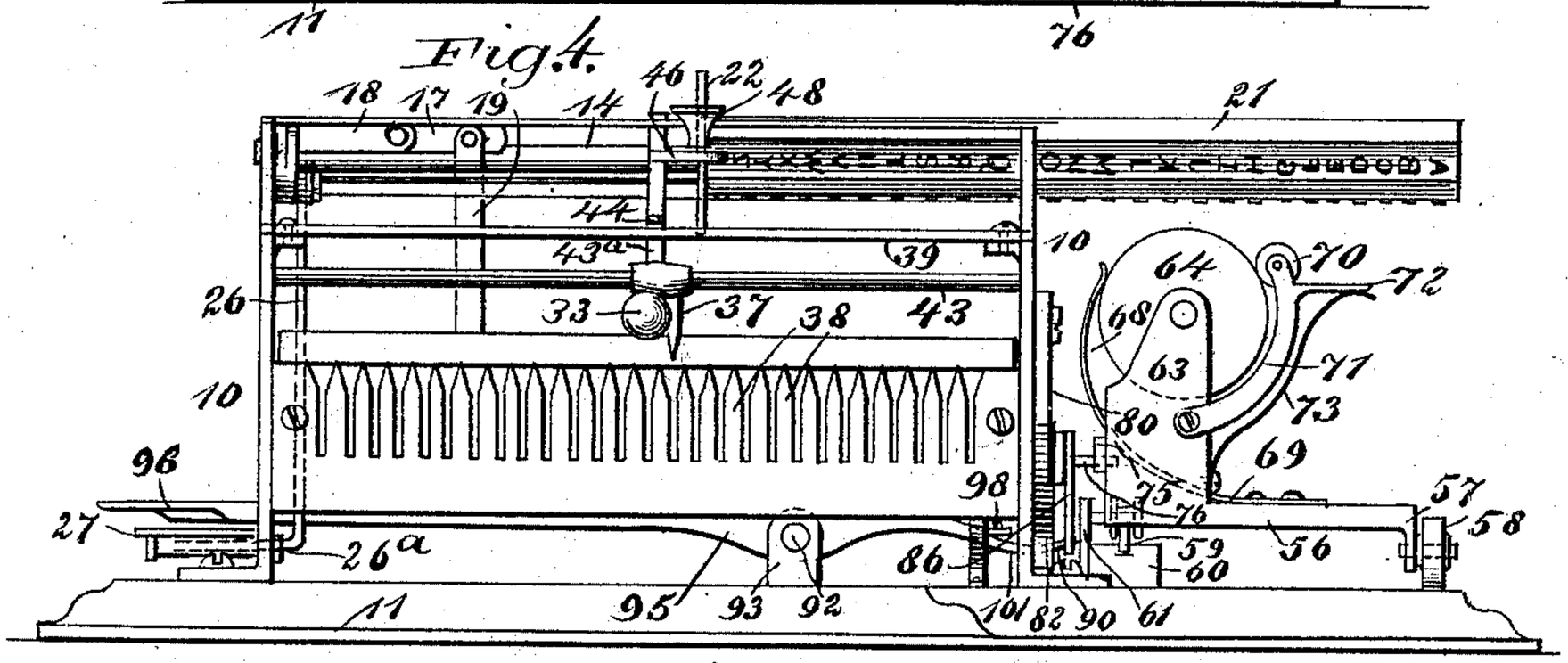


Fig. 5.

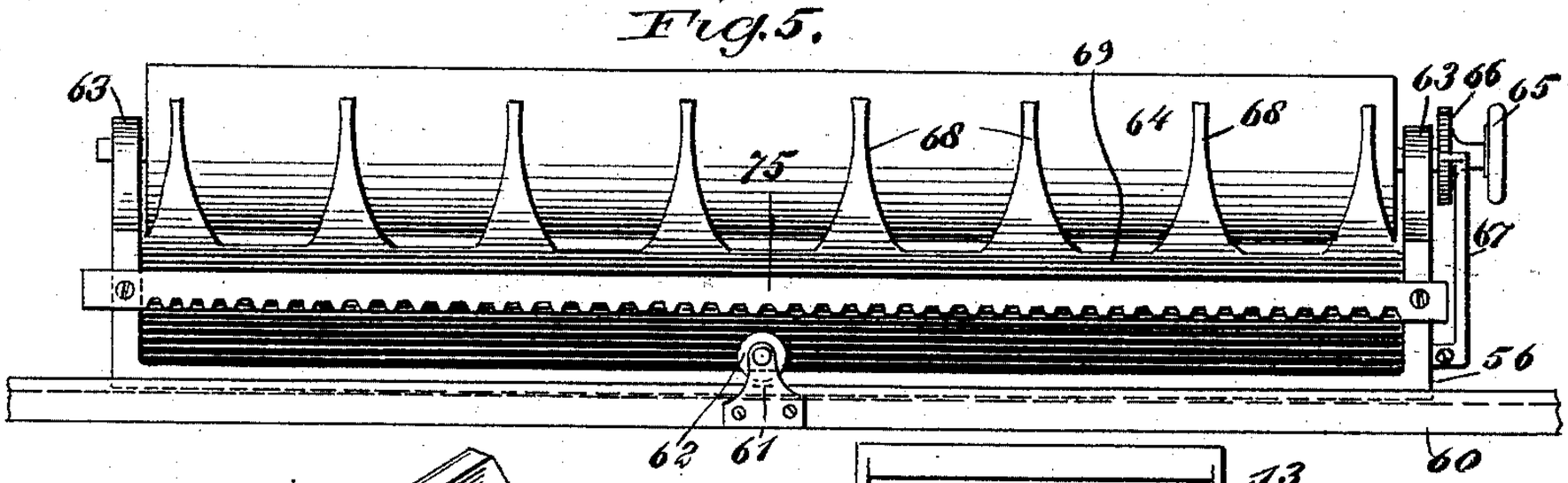


Fig. 7

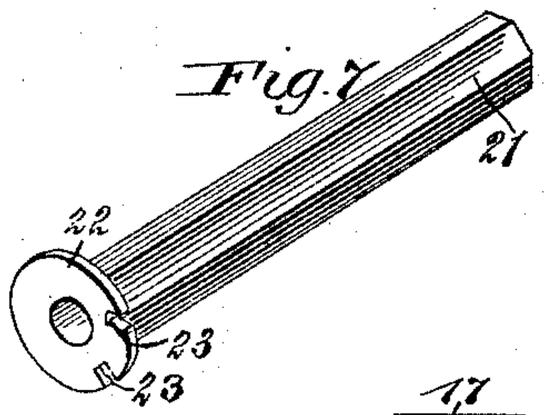


Fig. 8.

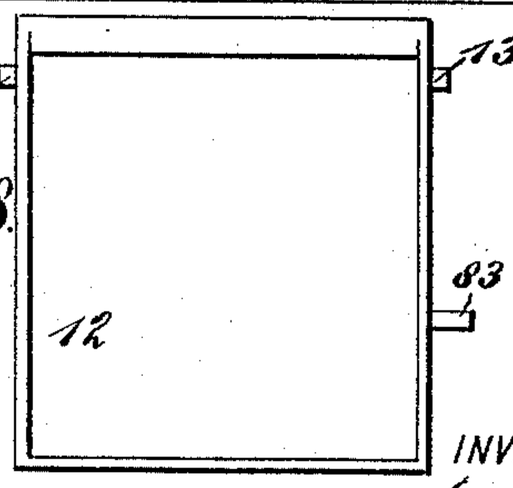
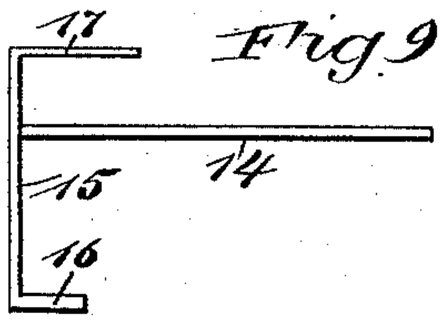


Fig. 9



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A. N. HEINE & W. K. H. WOERNER.

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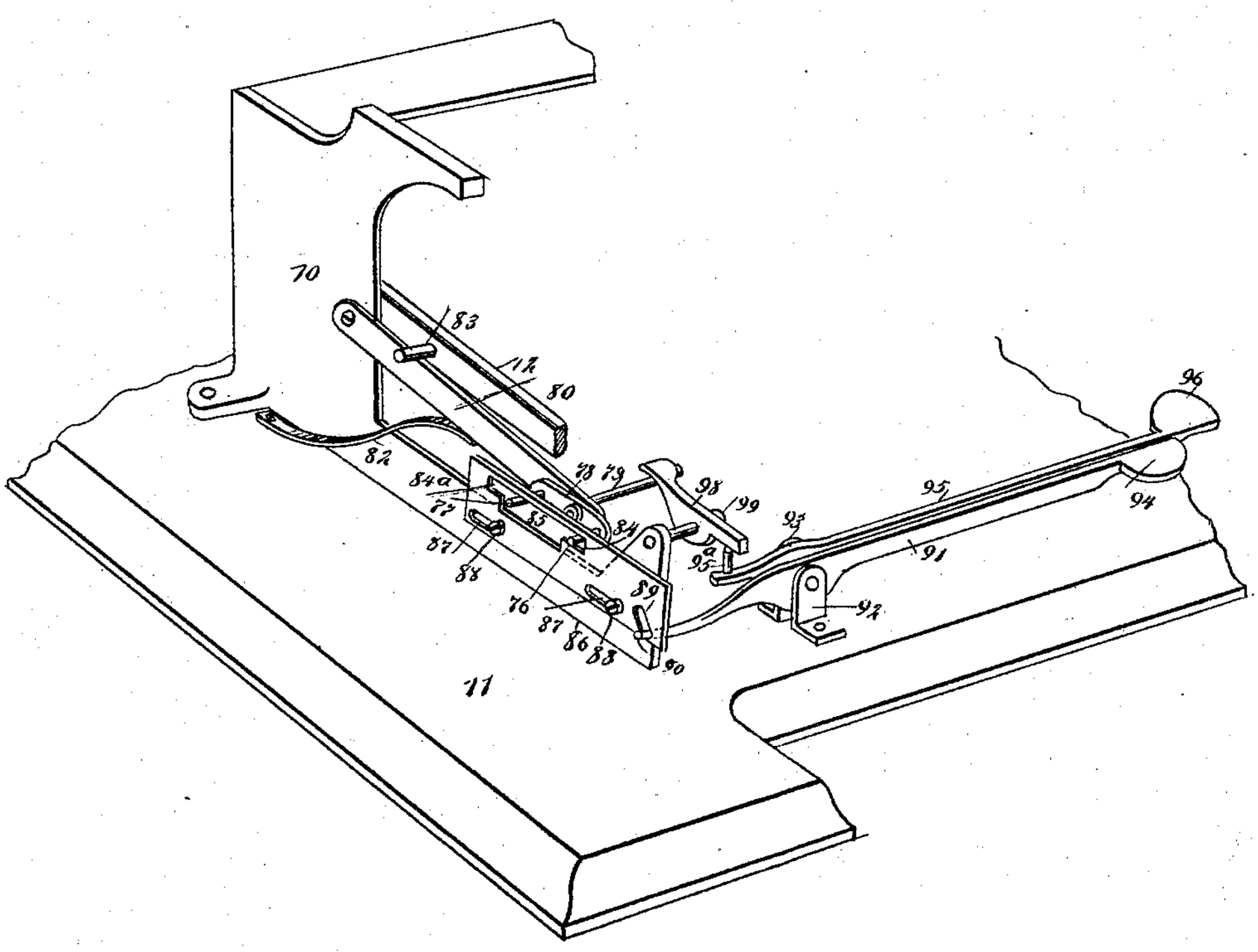
Fig. 12.



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UNITED STATES PATENT OFFICE.

ALFRED N. HEINE AND WILLIAM K. H. WOERNER, OF EVANSVILLE, INDIANA.

TYPE-WRITING MACHINE.

SPECIFICATION forming part of Letters Patent No. 497,177, dated May 9, 1893.

Application filed July 15, 1892. Serial No. 440,136. (No model.)

To all whom it may concern:

Be it known that we, ALFRED N. HEINE and WILLIAM K. H. WOERNER, both of Evansville, in the county of Vanderburg and State of Indiana, have invented a new and Improved Type-Writing Machine, of which the following is a full, clear, and exact description.

Our invention relates to improvements in typewriters, and the object of our invention is to produce a cheap, durable and simple machine which may be easily and rapidly operated, which requires but little skill to successfully operate it, which is provided with a peculiar form of type bar adapted to carry a great number of characters and to be cheaply and nicely made, which also has a convenient arrangement for moving the carriage backward and forward, and on which the printing may be seen as fast as made.

To these ends, our invention consists in certain features of construction and combinations of parts, which will be hereinafter described and claimed.

Reference is to be had to the accompanying drawings forming a part of this specification, in which similar figures of reference indicate corresponding parts in all the views.

Figure 1 is a vertical cross section on the line 1—1 in Fig. 2. Fig. 2 is a broken plan view of the machine with the inking roller and carriage removed. Fig. 3 is a broken end view of the machine. Fig. 4 is a front elevation of the same. Fig. 5 is an enlarged side elevation of the platen and carriage, looking on the inner side of the same. Fig. 6 is a detail plan view of the inking mechanism. Fig. 7 is a detail perspective view of the prismatic type bar. Fig. 8 is a detail plan view on a reduced scale of the swinging frame used for actuating the type bar. Fig. 9 is a detail plan view on a reduced scale of the rod and yoke which carry the type bar. Fig. 10 is a detail sectional view of the carriage actuating spacing levers, on the line 10—10 in Fig. 2. Fig. 11 is a broken detail side elevation of the spacing keys or levers; and Fig. 12 is a broken perspective view showing in detail the arrangement of the space keys and their connections.

The machine is provided with a suitable frame 10, of a generally rectangular shape, which is secured to a base 11, and fulcrumed in this frame near the back side is a vertically swinging frame 12, having on opposite sides and near its back end, trunnions 13, which are journaled in the frame 10. A type rod 14 extends longitudinally of the machine above the swinging frame 12, and is held to swing at right angles to the swinging frame, this rod being secured to or formed integrally with a yoke 15, (see Figs. 2 and 9) which yoke has side arms 16 and 17 pivoted at their free ends to fixed arms 18, which project inward from the frame 10, as best shown in Fig. 2. The arm 17 is longer than the arm 16, and its free end extends farther inward and serves as a crank, this arm being pivoted to a depending rod 19, shown clearly in Fig. 1, and the latter at its lower end is secured to an inwardly extending arm 20, which is in turn fastened to the back side of the swinging frame 12. It will be seen therefore, that when the swinging frame 12 is depressed, the movement will be communicated to the type rod 14, and the latter will also swing downward, but at right angles to the frame 12.

The type rod 14 carries a hollow prismatic type bar 21, which forms an essential feature of this invention, the bar being provided with any necessary number of faceted sides on which are produced the desired characters, such as letters, figures, punctuation marks, &c., and these characters are preferably electrotypes. The bar is held to slide and turn on the type rod, and it has at one end a flange 22, in which are radial slots 23, adapted to receive the guide bar 24, which extends parallel with the type rod 14, and which at one end is secured to a double crank 25, which is fulcrumed on the yoke 15, so that the guide bar will swing in unison with the type rod 14 and type bar 21.

One arm of the crank 25 connects with a pitman 26, which extends downward, as best shown in Fig. 1, and this pitman at its lower end is bent outward, as shown at 26^a in Fig. 2, and is secured to a double key 27 which swings on the central fulcrum 28, and by pressing the key one way or other, the guide bar 24 is tilted and made to turn the type bar 21, so as to bring it into position for upper or lower case printing as desired. Another key

29, having a greater movement is provided with a shank 30, which is secured to the key 27, and by depressing this key 29, the type bar may be turned farther so as to bring other characters, such as figures, into printing position. The keys are normally pressed by a spring 31, so as to hold the machine in position for lower case printing, and they have studs 32 on their under sides, which limit their movements.

The longitudinal movement of the type bar 21, as well as its downward movement and consequently the printing of the machine, are regulated by a handle 33, which projects from the front side of the machine and is secured to a rearwardly extending elbow lever 34, the upper arm 35 of which extends in a nearly vertical position, and has a knife edge on its front side which engages a rack 36, and the rack and knife edge assist in giving perfect alignment. The lever 34 has near its front end and on the under side another knife edge 37, which is adapted to move downward between the spring fingers 38, shown best in Fig. 4, these fingers having tapering upper ends which assist in guiding the lever to place, and they are arranged beneath an index plate 39 and register with the characters on the plate. This index plate 39 extends longitudinally and horizontally across the front portion of the machine, and on its face are produced all the characters printed by the machine. It will be seen that the two knife edged parts 35 and 37 provide for perfect centering and aligning.

The lever 34 is pivoted at its elbow on a depending arm 40 of the horizontally sliding frame 41, which moves on parallel rods 42, which extend longitudinally through the front portion of the machine, and the lever 34 is held to move accurately on the frame 41 by a keeper plate 43, which is secured to a depending front portion 43ª of the frame, the lever being held to move between the keeper and the frame. The frame 41 and lever 34 move together, and the frame has near its front end a forwardly-extending bent hand or pointer 44, which moves over the index plate 39 and indicates when the printing lever 34 is in the correct position to print a desired character.

Near the rear end of the frame is an outwardly-extending arm 45, which terminates at its upper end in horizontally and rearwardly-extending jaws 46, which project beneath the rack 36, and one of which is provided with a slot 47, on which the upper arm 35 of the lever 34 is held to move. The jaws 46 are pivoted on a screw 48, which also serves to hold them in position. The plate 46 is also slotted on its back edge and made to engage the flange 22 of the type bar 21. It will be seen then, that by grasping the handle 33, the lever 34 and frame 41 may be moved backward and forward, thus carrying the type bar 21 and bringing it into a desired position, and as the lever 34 extends across and rests upon the front edge of the swinging frame 12, when the lever is depressed it carries with it the swinging frame, thus operating also the type bar 21 and swinging it downward upon the platen as hereinafter described, so as to print a character on the paper carried by the platen.

The inking of the type bar is effected by a roller 49 (see Figs. 3 and 6) which is carried at the front end of a bent spring wire 50, and the latter is secured to the free end of a swinging lever 51, which near its lower end is fulcrumed as shown at 52, on a lug 53 of the frame 10, and which at its extreme lower end is pivoted, as shown at 53ª, to the swinging frame 12. This roller is adapted to enter an ink box 54 which inks it, and the latter is secured by means of an arm 55 to the upper portion of the frame 10. When the frame 12 is depressed, the lever 51 is tilted and the roller 49 pushed into the ink box, and when the lever comes back to place, the roller is brought head against the under surface of the type bar, as shown in Fig. 3, so as to ink the same, and the longitudinal movement of the type bar will cause the roller to move over the type.

The machine has on one side a movable carriage 56, which at one edge is provided with a depending flange 57, on which a roller 58 is journaled, this roller being held to run on the base 11, as shown in Fig. 4, and the opposite edge of the carriage has a slide 59, which moves in a groove in the block 60 carried by the base. A support 61 is secured to the inner side of the block 60, and in this support is journaled a roller 62, which runs upon the inner edge of the carriage, as shown in Fig. 5, and prevents the carriage from lifting. The carriage has at the ends upwardly extending arms 63, in which the platen 64 is journaled, and the platen shaft has at one end a knob 65 by which it may be turned, and also a ratchet wheel 66 which engages a pawl 67 and is used to make the line spaces in the usual way.

Abutting against the inner face of the platen are upwardly-extending spring fingers 68, which are produced on a spring plate 69 secured to the carriage, and these fingers serve to hold the paper in place upon the platen. The paper is also guided and held smooth by a roller 70, which presses upon the outer face of the platen, this roller being journaled in curved arms 71, which are pivoted on the arms 63, and the arms have outwardly extending lugs 72, which are pressed upward by a spring 73 secured to the carriage, and the roller is thus held in close contact with the platen. The platen and carriage are arranged at right angles to the type bar 21, and in a way to bring the platen beneath the type-bar, and consequently when the latter is depressed, it will strike upon the platen.

The carriage 56 has on its inner side a longitudinal rack 75, with teeth on its lower edge, and these teeth engage studs 76 and 77 on a swinging arm 78, and the latter is pivoted at the center on a shaft 79, which extends inward and is journaled in a lever 80, which is ful-

crumed at one end, as shown at 81 on one side of the frame 10, and the lever is normally pressed upward by a spring 82, this spring being sufficiently stiff to raise the frame 12 and hold it normally elevated, the connection between the lever and frame being by a stud 83, which extends laterally from the frame and overlaps the lever. This arrangement enables the spring 82 to hold the frame up, and also enables the depression of the frame to actuate the lever and move the carriage in the proper manner as described below.

The studs 76 and 77 are held to move in side notches 84 and 84ª, which are produced at opposite sides of a recess 85 of a sliding plate 86, which plate is longitudinally slotted, as shown at 87 in Fig. 3, and is held to slide on screws 88 which extend through the slots and into the frame 10. This plate has also near one end an inclined slot 89, which receives the pointed end 90 of a spacing lever 91, which extends along the back side of the machine and projects from one end of the frame, this lever being fulcrumed as shown at 92, between lugs 93 on the frame, and at one end it terminates in a key or finger piece 94. Parallel with this lever is a similar lever 95, which is fulcrumed also at 92, and which terminates at one end in a key 96 arranged near the key 94.

The shorter end 97 of the lever 95 extends beneath one end of the lever 98, which is fulcrumed to the frame 10, as shown at 99 in Fig. 12, and extends at right angles to the levers 91 and 95. The lever 95 has preferably on its upper side and at its free end a stud 95ª which contacts with the lever 98. The lever 98 overlaps both levers 91 and 95, as shown in Fig. 3, so that the movement of these will tilt the lever 98. The inner end of the lever 98 extends above the shaft 79 on which the shifting arm 78 is fulcrumed, and consequently the tilting of this lever 98 will move the shifting arm and carriage as hereinafter described. The lever 98 is widened at a point where it bears on the shaft 79, as shown at 100 in Fig. 2, and the levers 91 and 95 which engage the lever 98 are normally pressed downward by a spring 101.

The operation of the machine is as follows: The paper to be printed upon is rolled upon the platen 64 so as to be held between the platen and the spring fingers 68 and beneath the roller 70, and then the operator grasps the handle 33, moves it to the character to be printed and then depresses it. The longitudinal movement of the handle moves the type bar 21 into the correct position as already described, and the depression of the handle swings down the frame 12, and carries with it the type bar, thus bringing the latter downward upon the platen 64 so as to print a character on the paper. When the frame is moved downward the stud 83 engages the lever 80, and presses downward upon the lever, and the latter carries down the shaft 79 and the shifting arm 78. The sliding plate 86 will be in the position shown in Fig. 3, and consequently the stud 76 will be held in the notch 84, while the stud 77 will pass downward. This will bring the stud 76 into engagement with the rack 75, and when the frame is released as shown, the movement of the shifting arm will cause the rack and carriage to be advanced one letter space. If a space is to be made when a letter is not printed, the operator presses downward on the key 96, and this tilts the levers 95 and 98, the latter carrying down the shaft 79, and moving the shifting arm 78 in the manner just described. When the carriage is to be moved in the opposite direction however, the key 94 is depressed, thus tilting the levers 91 and 98, but before the lever 98 is pressed sufficiently to actuate the shaft 79 and the shifting arm 78, the short end of the lever 91, acting on the inclined wall of the slot 89, moves the plate 86 so as to bring the stud 77 into the notch 84ª, and the stud 76 and consequently the shifting arm, will be moved in the opposite direction to that above described, and a like reverse movement will be given to the carriage rack and carriage.

Having thus described our invention, we claim as new and desire to secure by Letters Patent—

1. A type-writer, comprising a stationary frame, a swinging frame journaled thereon, a swinging type rod carried by the swinging frame and adapted to swing at right angles thereto, a flanged type bar held to slide on the type rod and having characters produced on its sides and a slot in its flange, a guide rod arranged parallel with the type rod and adapted to enter the slot of the type bar flange, a key mechanism for rotating the guide rod and type bar, a key-operated lever mechanism for moving the type bar longitudinally, and a movable platen arranged beneath and at right angles to the type bar, substantially as described.

2. A typewriter, comprising a stationary frame having an index plate thereon, a swinging yoke held to swing at right angles to the swinging frame and actuated by the movement of the swinging frame, a type rod carried by the yoke, a sliding and revoluble type bar mounted on the type rod, a movable platen held beneath and at right angles to the type bar, a sliding frame held to move parallel with the index plate and having a hand or indicator to move over the index plate, a connection between the sliding frame and the type bar whereby both will slide together, a handled bell crank lever pivoted on the sliding frame and adapted to engage the swinging frame, the lever having knife-edged portions on its upper and lower arms to engage stationary racks, and a key-operated oscillating guide bar connected with the type bar and adapted to turn the same, substantially as described.

3. A typewriter, comprising a stationary frame, a swinging frame journaled thereon, a swinging yoke arranged above the swinging frame and adapted to swing at right angles to

the frame, a connection between the frame and yoke whereby the two will move in unison, a type rod carried by the yoke, a type bar held to slide longitudinally on the rod, the type bar having rows of type thereon, and a slotted flange at one end, a guide rod carried by the yoke and extending through the slot in the flange, the guide rod having a crank at one end by which it is oscillated, a key connected with the crank to turn the same, and a platen arranged in the path of the type bar, all substantially as described.

4. In a typewriter, the combination of the swinging and longitudinally movable type bar, the frame for supporting it and the swinging frame adapted to operate the type bar, of an ink well carried by the stationary frame, an arm fulcrumed on the stationary frame and connected with the swinging frame whereby it is oscillated, and an inking roller flexibly suspended on the arm and adapted by the movements of the frame to be carried between the well and type bar, substantially as described.

5. In a type writing machine, the combination, with the printing mechanism actuated by a swinging frame, of a movable platen-carrying carriage arranged at one side of the frame, a rack secured to the carriage, a swinging lever actuated by the swinging frame, a tilting shifting arm journaled at the free end of the lever and having studs to engage the carriage rack, and key-operated mechanism for throwing either of the studs into engagement with the rack, substantially as described.

6. In a typewriter, the combination of the movable carriage having a rack thereon, printing mechanism adapted to print upon the carriage platen, a swinging frame for actuating the printing mechanism, a swinging lever pivoted on a stationary support and actuated by the swinging frame, a shifting arm pivoted centrally on the free end of the swinging lever and having studs at its ends to engage the carriage rack, a sliding recessed plate having notches to alternately engage the studs, and a lever mechanism for sliding the plate, substantially as described.

7. In a typewriter, the combination of the movable platen-carrying carriage, a rack secured longitudinally to the carriage, a swinging spring-repressed lever held parallel with the carriage rack, a shifting arm pivoted centrally on the free end of the lever and having studs at its ends to engage the rack, a recessed sliding plate having notches at opposite ends of the recess to alternately engage the studs, and swinging key levers arranged to move the swinging lever and adapted to also operate the slide plate so as to bring the notches and studs into engagement, substantially as described.

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