S. ARONSON.

TYPE WRITER.

APPLICATION FILED DEC. 16, 1907.

939,965.

Patented Nov. 16, 1909.

4 SHEETS—SHEET 1.

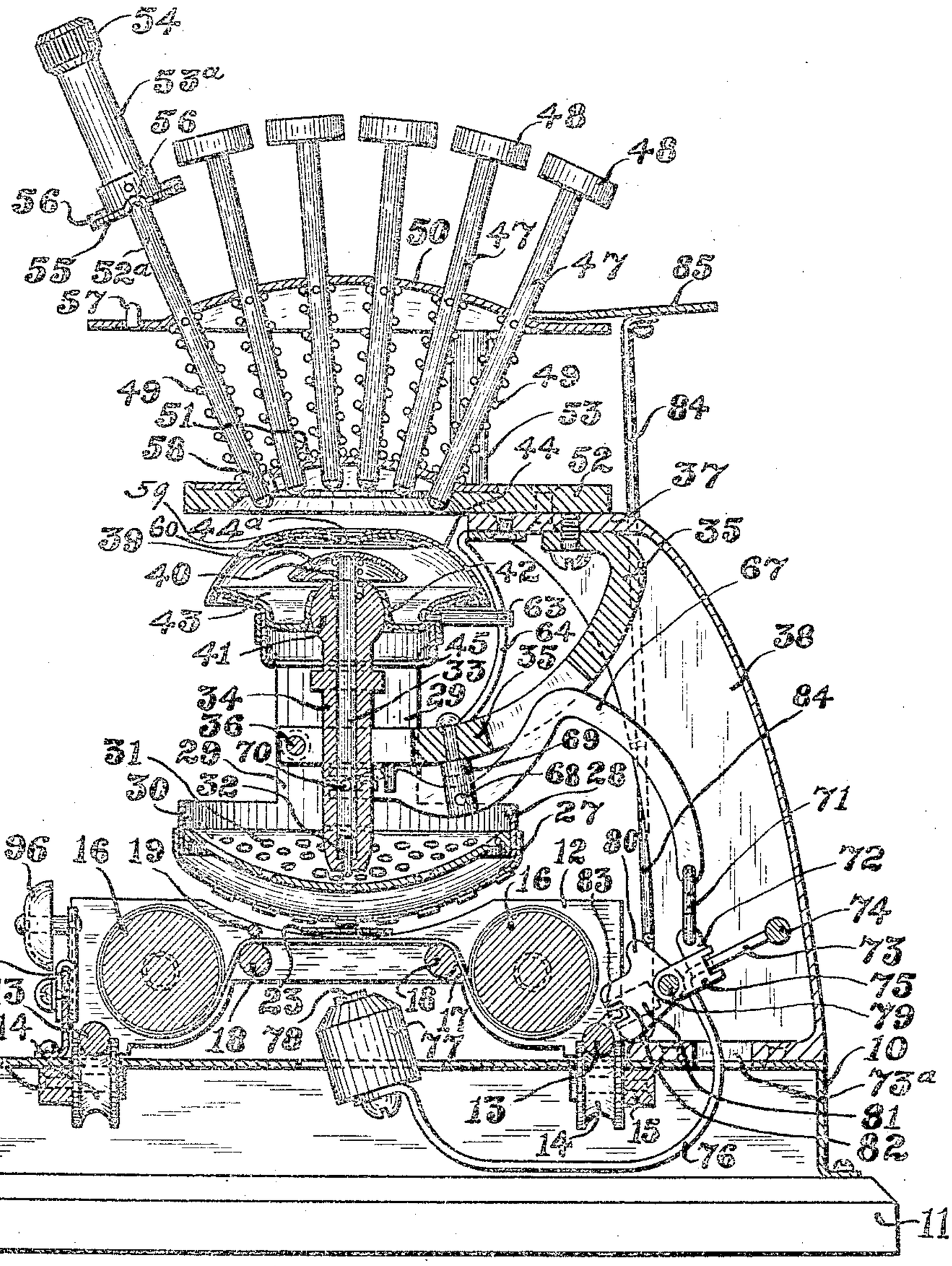

Fig. 1

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4 SHEETS—SHEET 2.

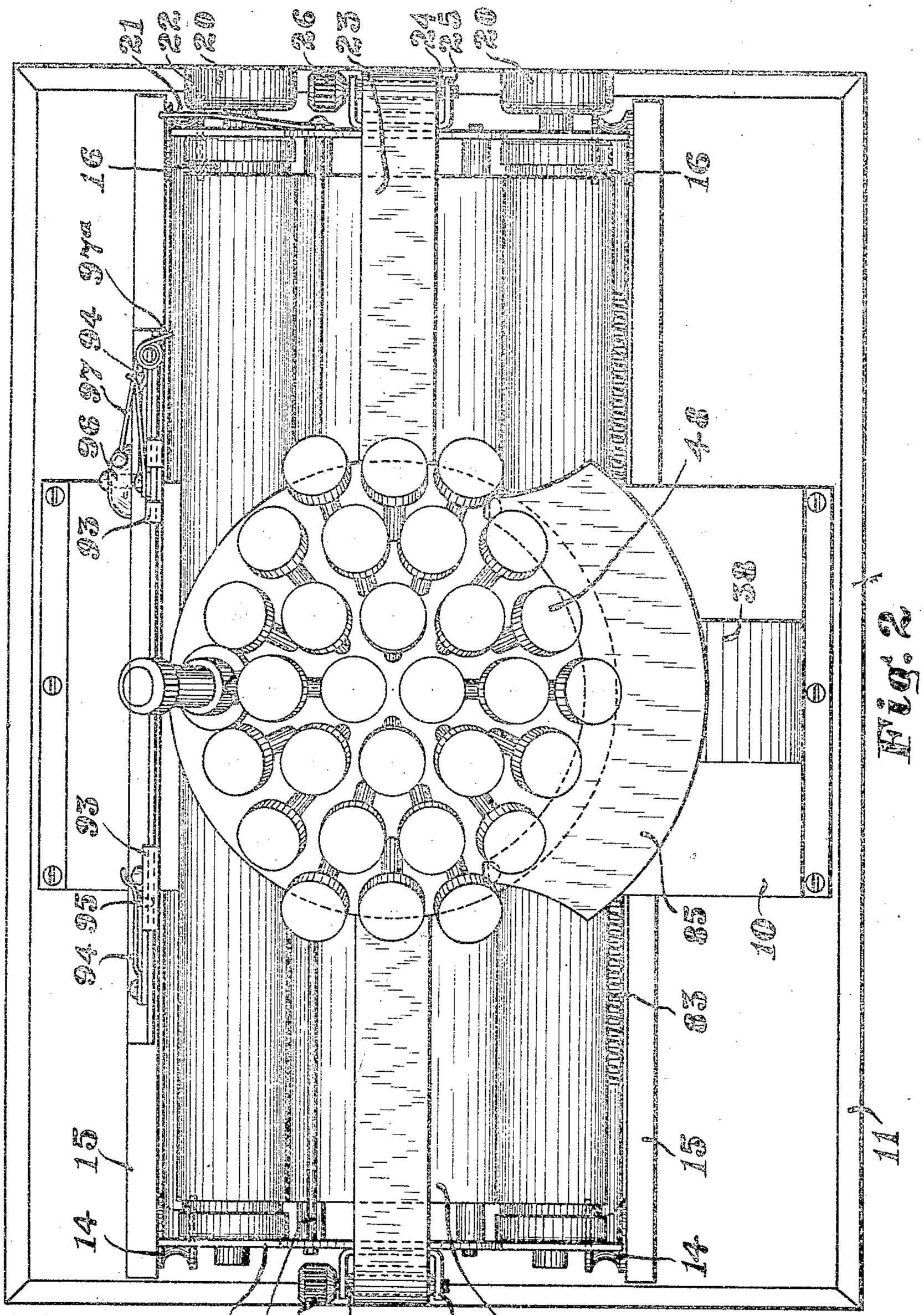

Fig. 2

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4 SHEETS—SHEET 3.

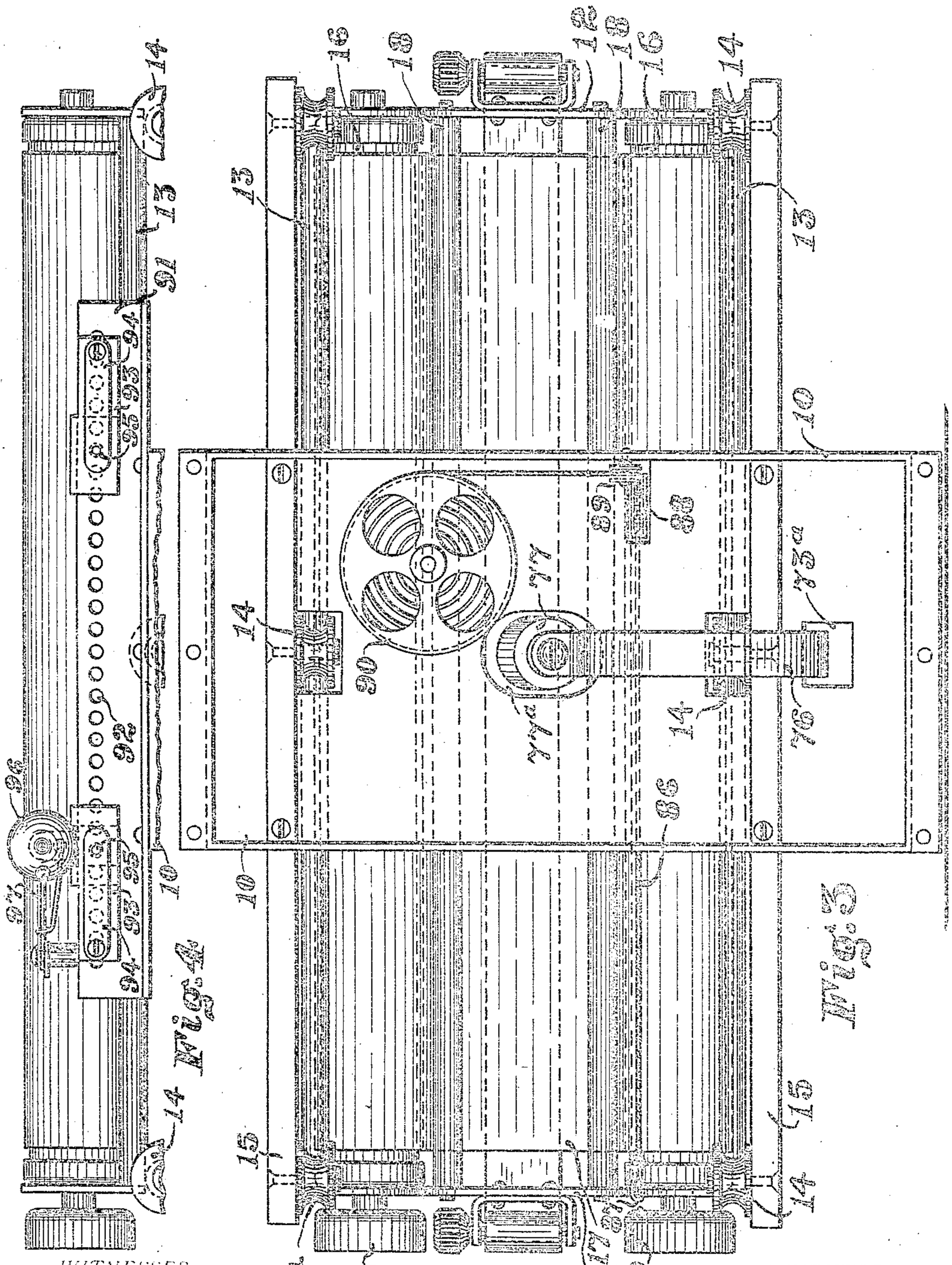

Fig. 4.

Fig. 5.

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4 SHEETS—SHEET 4.

Fig. 6

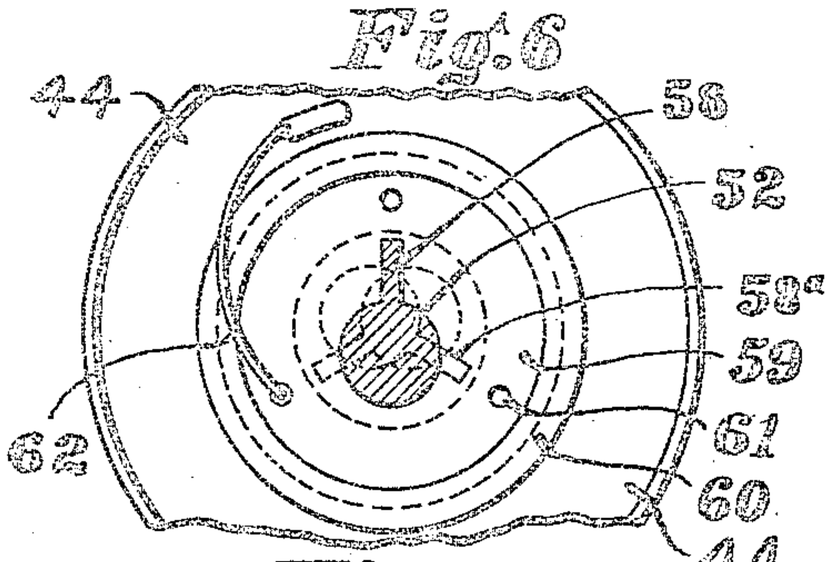


Fig. 5

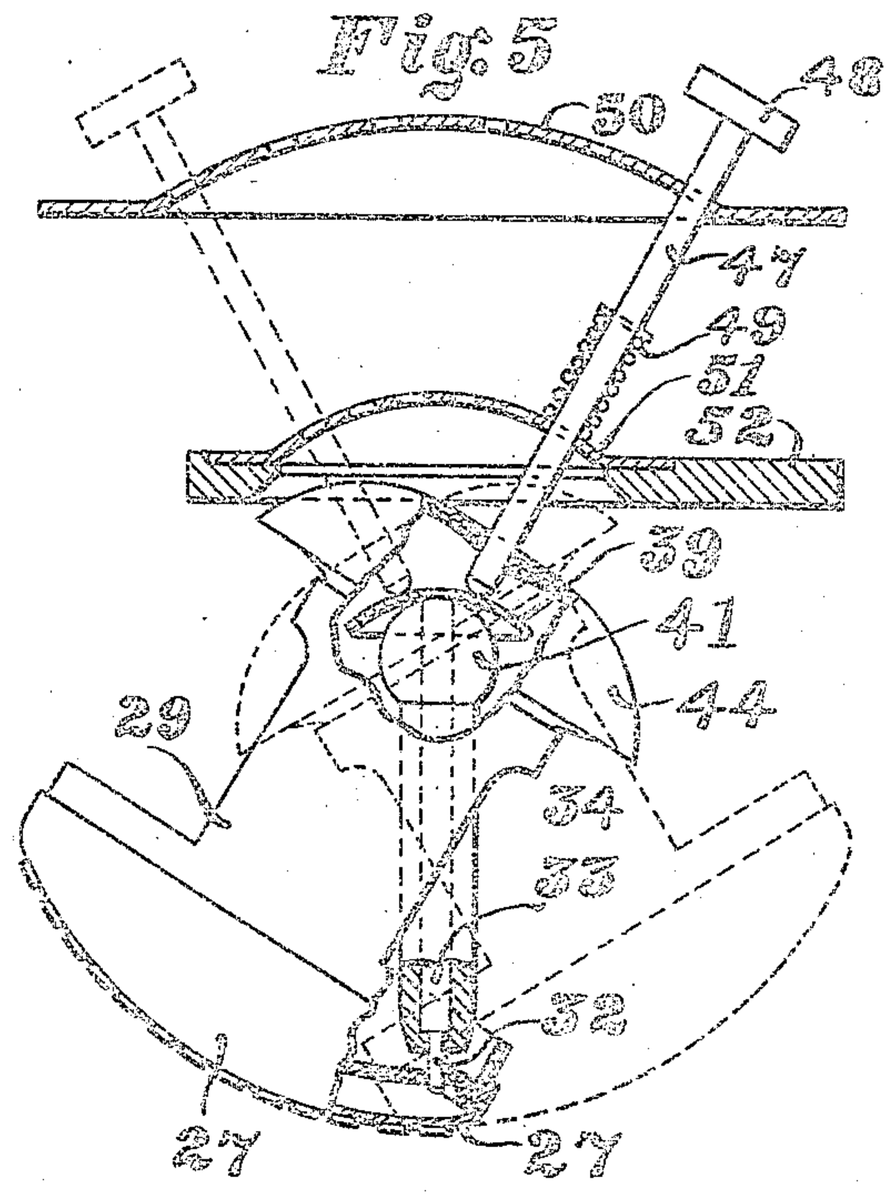


Fig. 7

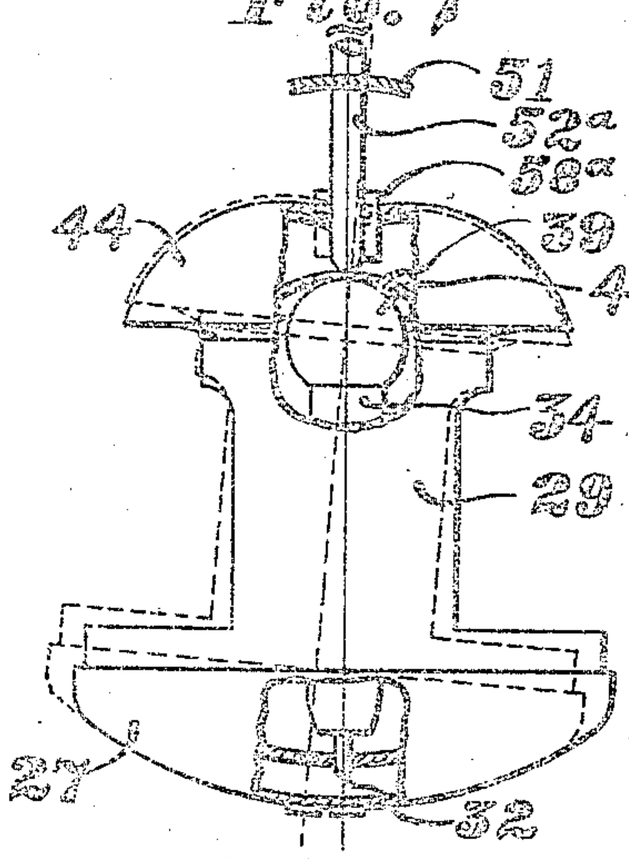
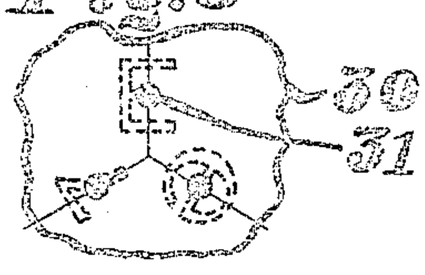


Fig. 8



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UNITED STATES PATENT OFFICE.

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TYPE-WRITER.

939,965. Specification of Letters Patent. Patented Nov. 16, 1909.

Application filed December 16, 1907. Serial No. 406,654.

To all whom it may concern:

Be it known that I, SAUL ARONSON, of the city, county, and State of New York, have invented a new and useful Improvement in Type-Writers, of which the following is a full, clear, and exact description.

My invention relates to improvements in typewriting machines, and the object of my invention is to produce a machine which is comparatively simple and which has the parts constructed and arranged in such a way that the machine can be made at an exceedingly low price, and in fact low enough to enable it to be sold where ordinary typewriters would not be used, and to enable it to be also adapted for use as a toy machine.

My invention is also intended to produce a machine of this character which can stand a good deal of hard usage without getting out of repair, and to obviate the use of type levers and a multiplicity of small parts as much as possible.

My invention is further intended to produce a machine in which the type keys are in the form of straight, sliding plungers, arranged to operate on a cam surface and deflect a convex surface bearing the type, so that the desired type may be brought into printing position, all of which it will be seen, obviates the use of swinging levers or similar parts.

My invention is further intended to arrange the upper and lower case type and numbers and other marks, in groups, preferably groups of three, each group corresponding to one key, and to provide an easy means of swinging the type bearing surface so as to bring a desired type of a group into printing position.

My invention is further intended to arrange the type on a swinging device which is preferably of a bell-like character, and which I term the type block, and to arrange the keys so that they will in the first instance swing the block and type to approximate position, and then center and steady the type while the actual printing is effected.

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

Figure 1 is a vertical cross section of the machine embodying my invention. Fig. 2 is a plan view thereof. Fig. 3 is an inverted plan view of the machine. Fig. 4 is a broken rear elevation of a part of the machine, showing means for limiting the movement of the carriage in each direction. Fig. 5 is an enlarged detail sectional view with parts broken away, showing especially the means for operating the type block. Fig. 6 is a broken detail of a part of the type block and its adjusting mechanism. Fig. 7 is a sectional elevation with parts broken away, of the type block and connections, and Fig. 8 is a detail showing a group of type and the means for steadying the type block.

The machine is provided with a suitable base 10, preferably of rectangular shape, and this is adapted to be secured to a base board or plate 11. A carriage 12 slides transversely across the base 10, having side bars 13 which run on guide rollers 14, and these are pivoted to supporting bars 15, although the guides may be otherwise arranged without affecting the principle of the invention. The carriage is also provided with oppositely arranged parallel rollers 16 which are placed near the sides of the carriage, and which are connected by an apron 17 so that both turn in unison, and the apron is adapted to roll up at the ends on the rollers and to carry the paper which is being printed upon. To facilitate the guiding of the paper, the apron passes over two guide bars 18 (see Fig. 1) and beneath a guide rod 19. The paper is inserted from the back, that is, from the left hand in Fig. 1, is pushed through beneath the ribbon 23, and rolled up partly on the right hand roller 16 and into the apron, after which the opposite edge of the paper is inserted beneath the guide rod 19 and rolled up on the second roller 16. The rear roller 17 is provided with a wheel 20 at the end to facilitate turning it, and a spring pawl 21 which is secured to the carriage and has a projection 22 to engage corresponding holes in the wheel 20, serves to steady the roller, these holes being spaced the right distance apart to cause the proper spacing when the roller is turned a distance of one space. The ribbon 23 extends transversely of the carriage, and is wound at the ends on rollers 24 which are held in suitable brackets or clips 25, and which are provided with thumb pieces 26 so that the ribbon may be turned backward and forward as desired.

The type are arranged on the bottom of the type block 27, which is simply a swinging convex surface, and the type are arranged in groups of three as shown best in Fig. 8, so that by turning the type surface, either an upper or lower case letter or figure or other character can be brought into printing position. The type block has its face plate 27 or the plate which carries the type, secured to a collar 28, and the collar is preferably integral with the hanger 29, this being in the form of two upwardly extending side pieces. A concave plate 30 which is concentric with the face of the block 27, is also secured to the collar, and is provided with a series of holes 31 which receive the center pin 32 formed on the end of the plunger 33, which latter slides in the vertically arranged and rigid guide post 34, the latter extending well downward into the type block.

I have described in detail the construction of the type block 27, but obviously the essential thing is to have the convex printing surface, the centering arrangement on the back, and the freely swinging arrangement which will presently be described, but the detail construction of the parts is of course immaterial.

The guide post 34 is supported on a rigid arm 35 which is split at the lower end to clasp the guide post, and the two ends are held together by a bolt 36 or equivalent fastening. The upper end of the arm 35 is secured to the top part 37 of a bracket 38, which is curved upward and rearward from the front of the base 10 and is preferably of sheet metal.

The centering plunger 33 has its upper end provided with a convex surface 39, the convex side being uppermost, and the plunger is normally raised by a spring 40 which is coiled around it beneath the part 39. This part 39 lies over the ball-like end 41 which is formed on the top of the guide post 34 and is perfectly smooth, so that the cup 42 may swing freely on it as if on a universal joint. This cup 42 is formed on the inner plate 43 of the cam surface 44, which is provided with a depressed center or top having a hole 44 therethrough to permit the type keys to be pushed downward into and through it, as hereinafter described. The striking surface 44 forms a part of the type block which swings on the ball 41, and the structure is further strengthened by the plate 45 which is attached to the plate 43 and connects with the hanger 29. The particular formation of the type block, however, is immaterial, so long as its general shape and its freely swinging characteristics are preserved.

The cam surface 44 of the type block is as stated, in the form of a convex cam having a depressed center, and it is arranged beneath the plunger type keys 47 which converge approximately to the center of the ball 41, and these keys have the usual finger pieces 48 which can be marked in the usual way with characters corresponding to the type on the printing surface of the block 27. The keys 47 are normally raised by springs 49 which are coiled around them, and they slide through the two guide surfaces 50 and 51, these being concentrically arranged, and the latter being secured to the plate 52 which is attached to the top of the bracket 38, while the guide 50 is supported by posts 53 on the aforesaid plate 52. An extra key 52^a is arranged in the key bank to shift the type block so as to arrange for printing upper case characters or a number or other desired character. The key 52^a has a sleeve 53^a attached to the top of it, which can be marked with the type characters if desired, and it has a thumb piece or milled plate 54 at the top to enable it to turn readily. It also is provided with a flange 55 having sockets 56 therein, which engage the boss 57 on the flange of the part 50, so that when the key is turned to twist the type block as presently described, a socket 56 will come into engagement with the boss 57. The lower end of the key 52^a has a bit 58 thereon, and when the key is depressed and pushed through the slot or hole 44^a and turned, the bit will come into engagement with the slot 58^a in the plate 59 (see Fig. 6 and also Fig. 1) which plate turns in a holding rim 60 on the under side of the part 44, and has alining with the slots 58^a, holes 61 which are engaged by the pawl 62, this gripping sufficiently to enable the plate 59 and the type block to be tilted together, but the pawl will yield sufficiently to enable the plate 59 to be turned out of engagement therewith by a little extra pressure on rotating on the key. The hole 44^a is eccentric to the cam surface 44, as shown by dotted lines in Fig. 6. Consequently when the key 52^a is inserted in the hole 44^a and the plate 59 turned, it shifts the position of the hole with relation to the surface 39 and to the cam surface 44, and then when the key 52^a is withdrawn and a regular or type key 47 depressed, it will go through the cam surface and on the plunger top 39 at a little different angle than it would have if the position of the guide hole 44^a had not been changed, and the type groups as shown in Fig. 8 are in such relation that by shifting the position of the plate 59 and the guide hole 44^a therein, the walls of the hole are brought into such a position that the depression of a regular key will tilt the type block so as to bring either one of a desired group of three into printing position. It will be seen therefore, that the hole 44^a in the plate 59, and cam surface 44, is merely a guiding device the position of which can be shifted by the key 52^a, and that the shifting of this eccentrically walled hole shifts the angle at

which a key 47 will act and so accurately adjust the type block. To guide the type block and prevent it from lateral displacement, it has a projecting arm 63 on one side (see Fig. 1) which enters the slotted guide rod 64 which is attached to the upper part of the bracket 38.

In this construction pressure is applied against the under side of the paper in order to print. To provide for this, a bent lever 67 is used (see Fig. 1,) which is pivoted as shown at 68 to the block 69 supported on the arm 35, though obviously the lever 67 can be supported in any suitable way, and this lever has a slotted end connecting with a pin 70 which works in the slot of the post 34 and is attached to the plunger 33, so that at every descending movement of the plunger to cause a character to be printed, the inner end of the lever 67 is depressed and the outer end raised. This outer end connects by a link 71 and boss 72 with a swinging hammer or platen handle 73, which is secured to the oscillating shaft 74, the latter as shown being supported on the bracket 38. This arm or handle 73 extends inward in a practically straight line so as to engage an off-set on the crank 75 for the purpose of working the escapement, as presently described, and then the arm 73 is bent downward and inward as shown at 76, the arm extending through a slot 73ª (see Fig. 3) in the base 10, and the inner end of the arm is attached to a hammer or platen 77 which works through the slot 77ª in the base, and has a striking surface 78, preferably of rubber, but it can be of any suitable material, which striking surface moves upward forcibly against the paper and causes the latter to be pressed against the ribbon and type. It will be seen that at every movement of the key 47 to print, the platen will be thrown up forcibly beneath the paper so that the character is produced on the latter. Obviously the type block could be carried against a stationary platen to produce the print.

The escapement, except for the means of working it, is not new. The crank 75 is attached to a shaft 79 which turns in its support in the bracket 38, and it carries a pawl 80 having on one side a light spring 81, as shown by dotted lines in Fig. 1, and having a central spring 82 which is adapted to register with the teeth 83 of one of the carriage bars 13. The spring 81 is light so that the carriage can be pushed backward when desired, and the spring will permit the teeth 83 to pass by it, but it holds sufficiently to prevent the carriage from moving in the opposite direction because the spring abuts with the pawl 80. When the pawl is depressed sufficiently to throw the spring 82 below the teeth 83, the return movement of the pawl causes the spring 81 to engage another tooth of the rack and the carriage moves forward the distance of said one tooth, thereby making a letter space. This arrangement is not new in detail. To provide for spacing when a character is not struck, a bail 84 is arranged to contact with the upper side of the pawl 80, and this bail is secured at the top to the spacing bar 85 which is hinged to the outer part of the guide plate 50.

There is no novelty in the way the carriage is impelled. This arrangement is shown, however, clearly in Fig. 3, where the cord 86 is shown attached as at 87 to one end of the carriage, and the cord runs over suitable guide pulleys 88 and 89 and connects with the customary form of spring barrel 90 which is pivoted on the under side of the base 10.

The machine can be easily adjusted to adapt itself to different widths of paper by limiting the travel of the carriage and this arrangement is shown clearly in Figs. 2 and 4. On the back of the machine is a fixed plate 91 which has a row of perforations 92 therein, and abutments 93 are adjustable on the plate 91, each abutment riding on the said plate and having a flat spring 94 thereon, which spring has near its free end, a pin 95 to engage one of the holes 92. The abutment plates can thus be easily adjusted, and it will be seen that as the carriage moves backward and forward, the end plates of the carriage will alternately strike the abutments 93, stopping the carriage.

The machine has the usual bell arrangement to indicate when the end of a line is being approached, and as shown the bell 96 has its tongue 97 coiled around a support, while an extended end 97ª projects into the path of the end plate of the carriage which therefore strikes the tongue end and rings the bell.

It will be seen that I have described a machine which is simple for a typewriting machine, and which has the parts constructed and arranged so that they can be easily and cheaply built and readily assembled. The machine is not intended for an especially swift machine, but is intended to be a cheaply built machine which will serve the purpose of a typewriter in very many places, and which can also be made cheap enough to be sold for a toy machine. Obviously the particular manner of hanging and connecting the operating parts is not material, but it is essential to have the parts arranged in the combination expressed, and I lay particular stress on the means for operating the type block and printing characters, and especially the means for bringing the block to its approximate printing position and then centering and holding it while a character is being printed.

It will be seen that the impact of a key 47

on the surface 44 approximately positions the type-block, and that the further movement of the key causes the plunger end 32 to enter one of the holes 31 in the back of the type-block, and thus definitely centers and locks the type-block.

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

1. A typewriter comprising a freely swinging type block, a cam surface connected with the type block, plunger keys operating against the cam surface to approximately position the type block, and means for definitely and accurately positioning the type block by a further movement of the keys.

2. A typewriter having a freely swinging type block, a cam connected with the block, plunger keys operating on the cam to approximately position the block, a locking device to accurately fix the final position of the block, and means for actuating the locking device by a further movement of the plunger keys.

3. A typewriter comprising a freely swinging type block, a cam surface connected with the type block, plunger keys operating on the said cam surface to approximately position the type block, and a centering device actuated by the said keys to definitely fix the position of the type block.

4. A typewriter comprising an oscillating type block having groups of type on its face, a cam surface connected with the type block, plunger keys operating against the cam surface to approximately position the type block, a centering device actuated by the keys to definitely fix the position of the type block, and means for displacing the type block independently of the regular type keys to bring the desired character of a type group into use.

5. A typewriter comprising a freely suspended type block having type on its face and perforations on its back, the perforated part of the type block having the perforations arranged to accord with the type, a plunger to enter the perforations and fix the position of the type block, cam mechanism to first tilt the type block and then actuate the plunger, and independent means for displacing the type block.

6. A typewriter comprising a freely swinging type block, a cam surface connected with the type block, plunger keys operating against the cam surface to approximately position the type block, and a registering point in proximity to the type acting to finally register and lock the type block in position.

7. A typewriter comprising a freely swinging type block, a platen moving to position opposite the type block, a cam surface, plunger keys acting on the cam surface to approximately position the type block over the platen, and locking mechanism operated by the continued movement of the keys and engaging the type block behind and in close proximity to the type, thereby locking the type accurately opposite the platen.

8. A typewriter comprising a freely swinging type block, a plunger arranged to connect with the block to lock it, a cam surface extending over the plunger and having a hole therethrough above the plunger, keys adapted to impinge on the cam surface, extend through the hole, and actuate the plunger, and a platen opposite the type block.

9. A typewriter comprising a tilting freely suspended type block having a cam surface at its upper end, a series of plunger keys impinging on the said cam surface to tilt the block, a lock operated by the keys, and a platen opposite the type block.

10. A typewriter comprising a freely suspended type block, a platen opposite the block, a cam surface connected with the type block, said cam surface having a depressed center with a hole therethrough, keys impinging on the cam surface to tilt the type block and to enter the hole thereof, a plunger held beneath the cam surface and actuated by the keys, and means for locking the type block by movement of the plunger.

11. A typewriter comprising a freely suspended swinging type block, having at its upper end a cam surface with a depressed center and a hole through the center, keys arranged to impinge on the cam surface and enter the hole, a plunger movable beneath the cam surface, a lock operated by the plunger to fix the position of the type block, a tilting lever operated by the plunger, and a swinging platen operated by the tilting lever and movable opposite the type block.

12. A typewriter comprising a rigid post having a bearing ball thereon, a type block suspended on the side bearing ball and having a convex lower face with type thereon, a convex cam arranged above the bearing ball and connected with the type block, said cam having a depressed center with a hole therethrough, keys impinging on the cam and entering the hole, a plunger arranged beneath the hole and actuated by the keys, a lock operated by the plunger to fix the position of the type block, and a platen beneath the type block.

13. A typewriter comprising a tilting type block, having a cam surface at the top, a swinging platen below the type block, a bank of plunger keys directly above the cam surface, and mechanism operated in unison with the keys to swing the platen.

14. A typewriter comprising a movable carriage having an escapement control, a tilting type block above the carriage, a swinging platen below the carriage, a bank of keys above the type block to tilt it, mechanism operated by the keys to swing the platen,

and means for actuating the escapement with the swinging of the platen.

15. A typewriter comprising a tilting type block suspended from a universal joint, a bank of plunger keys movable approximately to the center of said universal joint, and a cam surface interposed between said keys and the type block in such a manner as to cause each of said keys to tilt the type block to a definite angle.

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