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PATENTED FEB. 5, 1907.

W. C. PLANK.
TYPE WRITER ATTACHMENT.

APPLICATION FILED SEPT. 5, 1905.

2 SHEETS—SHEET 1.

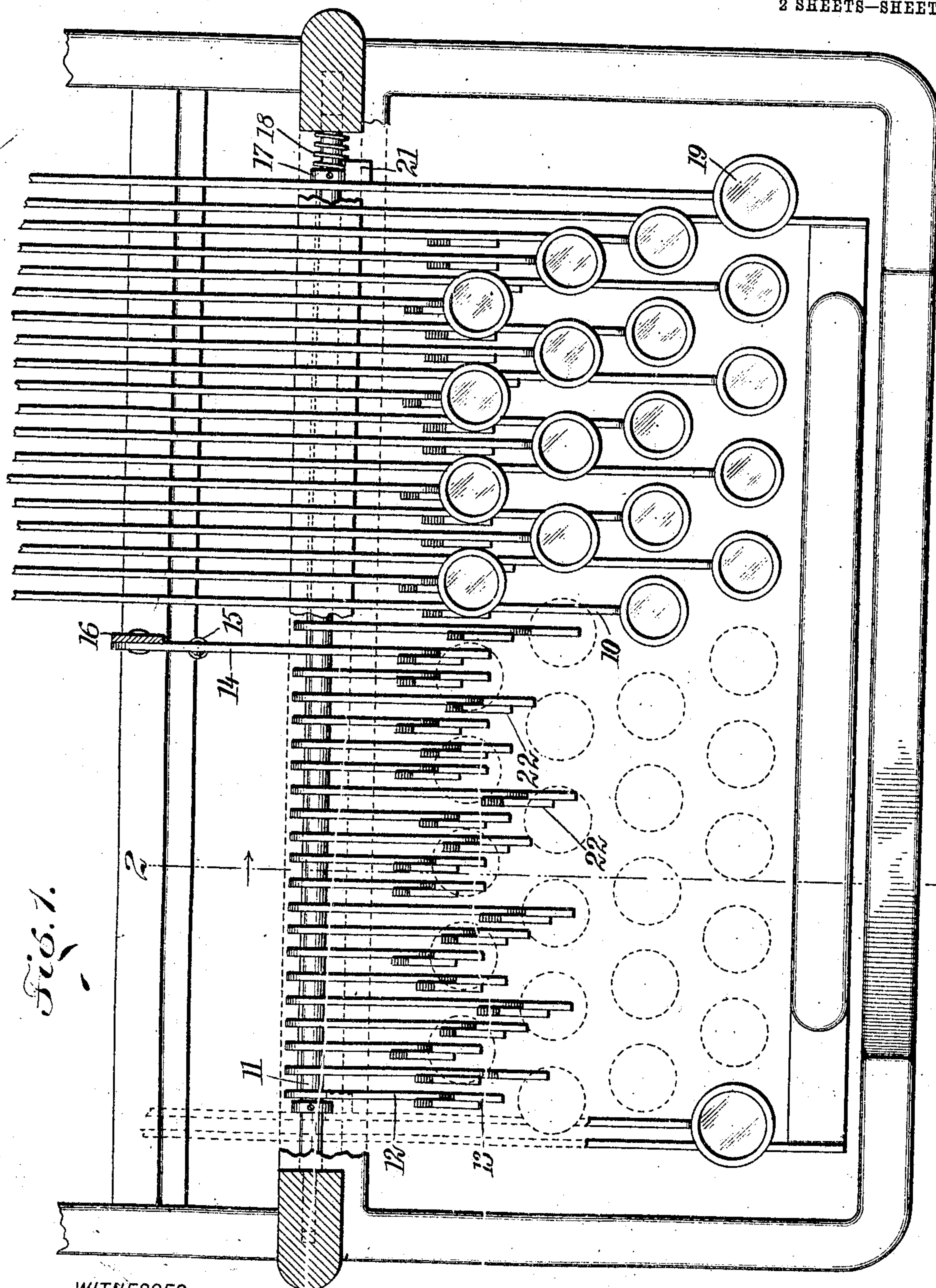


Fig. 1.

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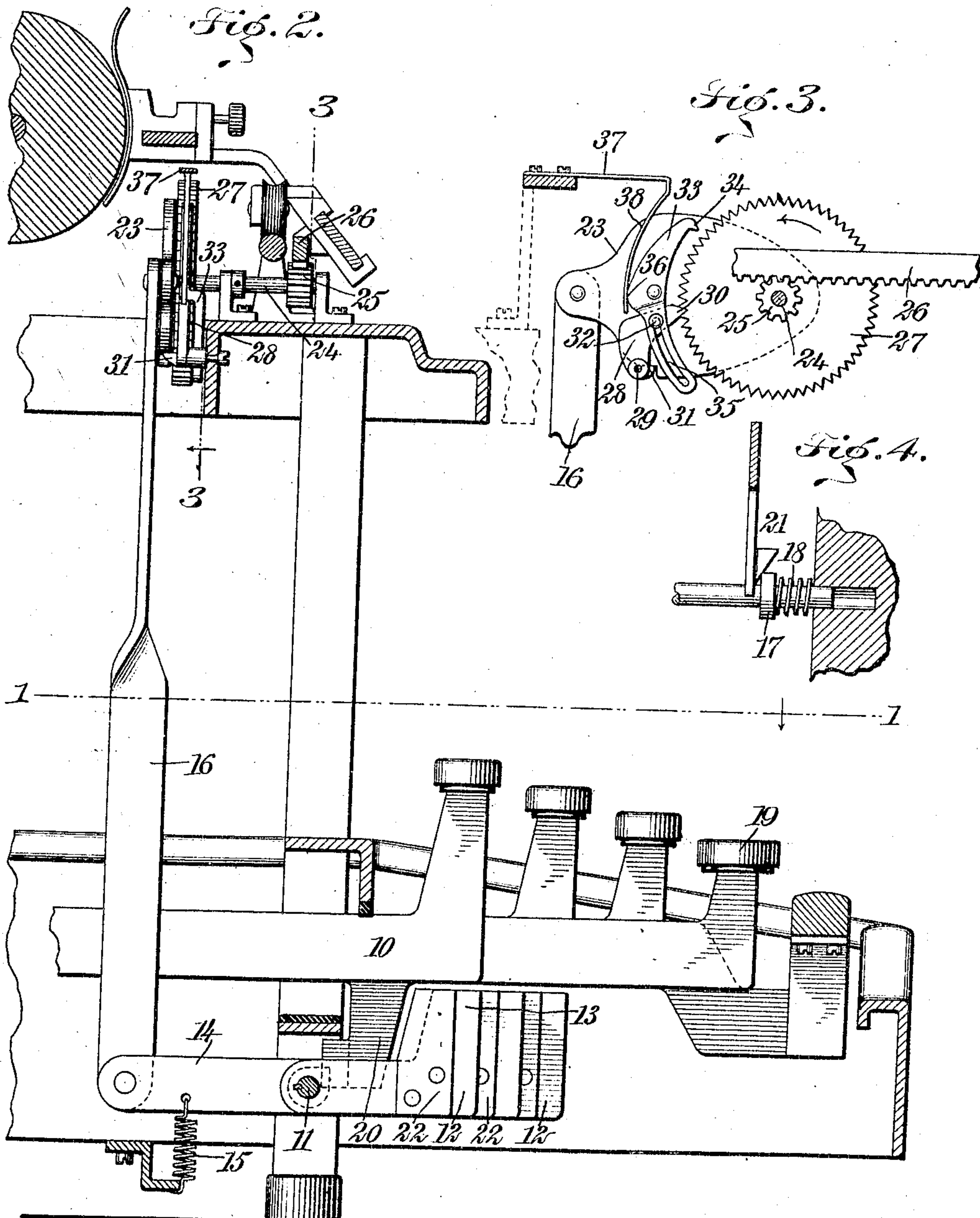
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2 SHEETS—SHEET 2.



WITNESSES:

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UNITED STATES PATENT OFFICE.

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TYPE-WRITER ATTACHMENT.

No. 843,360.

Specification of Letters Patent.

Patented Feb. 5, 1907.

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To all whom it may concern.

Be it known that I, WILLIAM CHARLES PLANK, a citizen of the United States, and a resident of Las Flores, Lower California, Mexico, have invented a new and Improved Type-Writer Attachment, of which the following is a full, clear, and exact description.

One of the objections which has been made to type-writing machines as they are now constructed is the use of the same spacing for all letters, resulting in the cramping of the m's and w's and injuring the appearance of the type-written papers.

The principal object of the present invention is to provide means for allowing the carriage to move varying distances, according to the letters struck, so as to provide a uniform spacing between the adjacent letters instead of a uniform spacing between the centers of the letters. This will greatly improve the appearance of type-written work, and the result is accomplished without greatly modifying the construction of ordinary type-writing machines and permits the use of regulation printing-type. It also allows the use of capitals without striking the spacing-bar afterward.

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

Figure 1 is a sectional view on the line 1 1 of Fig. 2, showing a portion of a keyboard in plan with one form of my invention applied thereto. Fig. 2 is a sectional view of the same on the line 2 2 of Fig. 1, showing an escapement. Fig. 3 is a sectional view on the line 3 3 of Fig. 2; and Fig. 4 is a sectional view, on an enlarged scale, of a detail.

My invention is designed to be applied to an ordinary keyboard without changing the same, except to provide letters of regulation space instead of the letters which are peculiar to type-writers. The key-levers 10 are operated as usual and are designed to operate means for providing the uniform spacing when they are depressed. I have shown this means in the following form: A shaft 11 is mounted to oscillate in bearings on the frame of the machine. To this shaft are rigidly secured a series of arms 12. These arms have different lengths, according to the space occupied by the regulation letter which is to be printed. Each of the arms is located with a portion (shown in the present

instance in the form of a projection 13) extending into the path traversed by the corresponding key-lever. Consequently when the key is depressed it will result in the depression of the corresponding arm, and the latter will result in the oscillation of the shaft 11 and the elevation of a lever 14 connected therewith. This lever is ordinarily kept in a lowered position and the arms 12 in an elevated position by means of a spring 15 or the like. The lever 14 is connected by a link 16 with a device for controlling the motion of the carriage, this device preferably being in the form of an escapement, which will be described below.

It will be noticed that the arms 12 are of different lengths, or rather that the portions thereof which engage the key-levers are located at different distances from the shaft 11. This is to provide for oscillating the shaft different distances, according to the key which is struck. For example, the levers which control the wide letters, as "m" and "w," are located above the short arms 12, so that by depressing the keys the necessary distance, which is uniform, the lever 14 will be elevated a maximum distance. The longest arms 12, which are located under the keys for the short letters—as "i," for instance—will obviously not elevate the lever 14 as far as the others, and the intermediate arms will be operated to elevate the lever an intermediate distance.

In order to adapt the device for use on those machines which employ a shift-key for printing capitals and other characters, the shaft 11 is made longitudinally slidable in its bearings a short distance and is provided with a fixed collar 17. A spring 18 is provided for normally forcing the shaft in one direction. The shift-key 19 is provided with an extension 20, which has a lug 21, provided with an inclined surface. This lug is adapted to come in contact with the collar 17 upon the downward motion of the key and move the shaft slightly to the right or left, as the case may be. This will move all of the arms 12 out of position to be operated by the key-levers and move a series of corresponding arms 22 into such position. These corresponding arms will be given the necessary lengths in order to provide for the proper shifting of the carriage to accommodate the lower-case characters.

While it will be understood that the portion of the invention which I have so far de-

scribed can be used in many forms of escapement devices, I have designed an escapement that is particularly valuable in this connection, and I will now proceed to describe it.

Connected with the link 16 is a rocking member 23. This is pivoted on a shaft 24, which carries the usual pinion 25, meshing with the rack 26 of the carriage. On this shaft also is an escapement-wheel 27 of the usual or any desired character. These parts can be replaced by any other arrangement which is connected with the carriage of a type-writer for moving it. It will be understood that the carriage-spring (not shown) operates to move the shaft 24 and the two wheels thereon in the direction indicated by the arrow. A pawl 28 is pivoted on a stud 29 on the frame of the machine and is provided with a tooth 30 for engaging the teeth of the escapement-wheel 27. It is also provided with a shoulder 31, upon which the weight of the rocking member 23 rests. It will be observed that when the rocking member is in depressed position and resting on the shoulder 31 it tends to keep the tooth 30 in engagement with the teeth of the escapement-wheel. The pawl 28 is provided with a stud 32, which is adapted to control the motion of a second pawl 33, which is pivoted upon the rocking member 23. This pawl is provided with a tooth 34 for engaging the teeth of the escapement-wheel and with a curved slot 35, through which the stud 32 projects and by which its motion is in part controlled. The peculiar form of the upper part of the pawl 33 is such that it has a projection at the point 36, which is normally engaged by a spring 37, attached to the frame of the machine. This spring is provided with a curved portion 38.

The operation of the escapement is as follows: When a key is pressed, the key-lever bears upon one of the arms 12 or 22, as the case may be, giving an upward movement to the link 16, as has been described. This movement is transmitted to the rocking member 23 to raise it. As this member moves upwardly the pressure on the shoulder 31 is removed, but at the same time the upward movement of the pawl 33, which is pressed against by the spring 37, tends to keep the lower end of this pawl to the right, as shown in Fig. 3, and consequently, through the action of the stud 32, keeps the tooth 30 in engagement with the escapement-wheel. Therefore the escapement-wheel is held in fixed position and the pawl 33 moves upwardly, while the pawl 28 is left in stationary position. When the rocking member reaches the limit of its upward motion, the curved portion 38 of the spring 37 acts upon the projection 36 to force the tooth 34 into engagement with the escapement-wheel. This turning of the pawl 33 moves the stud

32 and disengages the tooth 30 from the escapement-wheel. This operation will permit the carriage-spring to act on the shaft 24 and turn the escapement-wheel a distance determined by the travel of the pawl 33, which is equal to that of the rocking member and is determined by the arms 12 and 22, as described above. Upon the completion of the downward stroke the rocking member strikes the shoulder 31 and forces the pawl 28 to move inwardly, so that the tooth 30 will engage the teeth of the escapement-wheel, and this motion is transmitted through the stud 32 to the pawl 33 to disengage the tooth 34. By adjusting the size of the teeth and the relation of the wheel 27 to the pinion a range of spacing may be obtained that will suffice for all practical purposes.

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

1. In a machine having a keyboard, the combination of a shaft mounted to oscillate, a series of arms of different lengths on said shaft, and extending in one direction from the shaft, the said arms being each located in position to be operated by one of said keys, a lever connected with said shaft and extending therefrom in a direction opposite the said arms, a link connected with said lever, and extending upward therefrom, and means for transmitting motion from said link to a movable part of the machine.
2. In a machine having a keyboard, the combination of a shaft mounted to oscillate, a series of arms on said shaft, each having an upwardly-projecting portion extending into a position to be moved by the keys when the latter are operated, said arms extending in one direction from the shaft and to different distances according to the space occupied by the corresponding key, a lever connected with said shaft and extending therefrom in a direction opposite the said arms, and an operating member connected with said lever.
3. In a machine having a keyboard, the combination of a shaft mounted to oscillate, a series of arms rigidly secured to said shaft, each having a projecting portion extending into a position to be moved by the keys when the latter are operated, said arms extending from the shaft to different distances according to the space occupied by the corresponding key, a lever connected with said shaft, resilient means for normally keeping said lever in lowered position, and the said arms in extreme elevated position for being engaged by the key-levers, and a feeding device controlled from the said lever.
4. In a machine having a keyboard, the combination of a shaft mounted to oscillate, a series of arms rigidly secured on said shaft and extending in one direction therefrom, each arm having a projection at its free end extending upward into the path of motion of

the levers of the keyboard, said arms engaging the levers of the keyboard at different distances from the shaft, according to the width of the character represented by the keys, a lever connected with the shaft and extending therefrom in a direction opposite the said arms, a spring connected with the lever for normally keeping the same in a lowered position and the arms in an elevated position, a feeding device, and means connected with said lever for controlling the operation of said feeding device.

5. In a machine having a keyboard, the combination of an oscillatable and longitudinally-movable shaft, two series of arms mounted thereon and adapted to be engaged by the levers of the keyboard, a fixed collar on said shaft, a spring engaging said collar for moving the shaft in one direction, and a shift-key for moving the shaft in the other direction, in order to present a different set of arms in position to be operated by the key-levers, the said shift-key having an extension and provided with a lug on said extension having an inclined surface adapted to engage the collar on said shaft.

6. In a machine having a keyboard, the combination of an oscillatable and longitudinally-movable shaft, two series of arms alternately mounted on said shaft; said arms being adapted to be engaged by the key-levers, and means for shifting said shaft to present a different set of arms to the key-levers; said means comprising a projection on the shaft, and a shift-key provided with a projection having an inclined surface adapted to engage said first-mentioned projection.

7. In a machine having a keyboard, the combination of a feeding device including an escapement-wheel and a pawl having a tooth for engaging the escapement-wheel, a rocking member, a pawl carried by said rocking member and having a tooth for engaging the escapement-wheel, a connection between the said pawls, whereby when one of the pawls is moved into engagement with the escapement-wheel the other pawl is disengaged from said wheel, an oscillatable shaft, a series of arms rigidly secured to said shaft and located in position to be operated by the keys of the keyboard, the said arms being constructed and adapted to oscillate the shaft different distances, a lever connected with the shaft, and a link connecting said lever with the rocking member.

8. In a machine having a keyboard, the combination of a feeding device, comprising an escapement-wheel, a pawl having a tooth for engaging the escapement-wheel, a movable member, a pawl carried by said movable member and having a tooth for engaging the escapement-wheel, a connection between the said pawls, whereby when one of the pawls is moved into engagement with the escapement-wheel, the other pawl is disengaged

from said wheel, and a series of elements located in position to be operated by the keys of the keyboard, said elements being connected with said member and being constructed and adapted to operate the member different distances in accordance with the spaces occupied by the keys with which they are associated.

9. In a machine having a keyboard, the combination of a feeding device and means for controlling the operation thereof, the feeding device comprising an oscillatable member, a pawl thereon having a tooth and provided with a slot, an escapement member with which said tooth is adapted to engage, a second pawl pivotally mounted upon a stationary part of the machine and having a tooth for engaging said escapement member and having a stud for engaging the slot in the first pawl, said second pawl also being provided with a shoulder upon which the oscillatable member is adapted to rest and by which it is forced into engagement with said teeth.

10. An escapement device comprising an oscillatable member, a pawl thereon having a tooth, an escapement member with which said tooth is adapted to engage, a second pawl pivoted to a stationary element, said second pawl having a tooth for engaging the escapement member and a shoulder upon which said oscillatable member is adapted to rest, means for forcing the tooth on the first pawl into engagement with the escapement member when the oscillatable member is moved in one direction, and a connection between the said pawls, whereby when the first pawl is carried into engagement with the escapement member the said second pawl is disengaged from said member.

11. An escapement device, comprising a shaft, an escapement-wheel having teeth and mounted on said shaft, an oscillatable member pivoted upon said shaft, means for oscillating said member, a pawl pivoted to a stationary element and having a tooth for engaging said wheel and a shoulder which the oscillatable member is adapted to engage for forcing said tooth into engagement with the teeth of the escapement-wheel, said pawl also having a stud, a second pawl pivotally mounted upon the oscillatable member and having a tooth for engaging the escapement-wheel, the said second pawl being also provided with means for engaging and moving said stud, and means for controlling the motion of said last-named pawl.

12. An escapement comprising a shaft, an escapement-wheel thereon, an oscillatable member pivotally mounted on the shaft, a pivoted pawl having a tooth for engaging the escapement-wheel, a shoulder for engagement with the oscillatable member and also having a stud, a second pawl pivotally mounted on said oscillatable member and

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having a tooth for engaging the escapement-wheel and a curved slot for receiving said stud, and a spring adapted to engage the second pawl and hold the tooth thereon
5 away from the escapement-wheel, said spring also having a curved portion for forcing the tooth on the second pawl into engagement with the escapement-wheel.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

WILLIAM CHARLES PLANK.

Witnesses:

C. C. COOLIDGE,
JAMES P. SEX.