June 20, 1967 RENTARO SASAKI 3,326,346

TYPE DRUM PRINTER WITH HAMMER MOUNTED INSIDE OF AND COAXIAL WITH DRUM

Filed Oct. 20, 1965 2 Sheets-Sheet 1

Fig. 1

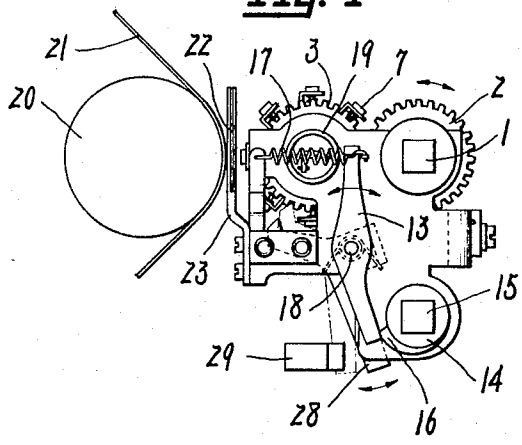
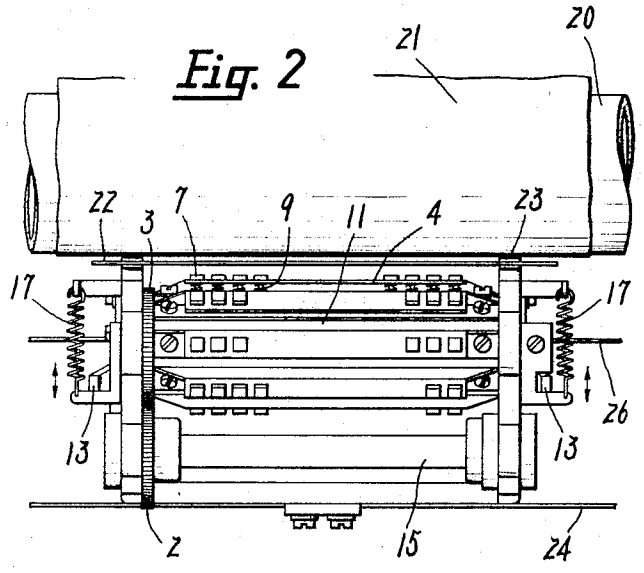


Fig. 2



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Fig. 3

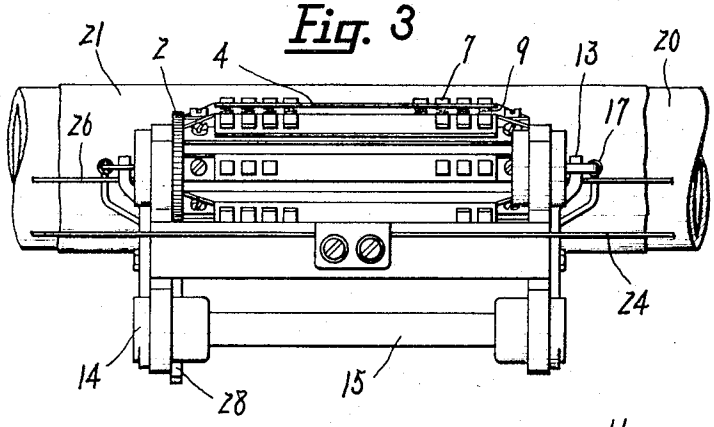


Fig. 4

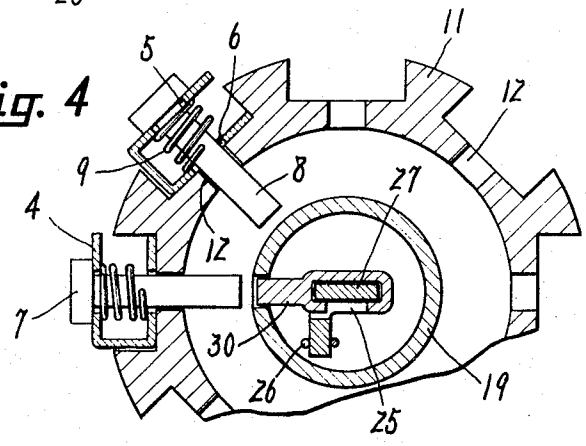
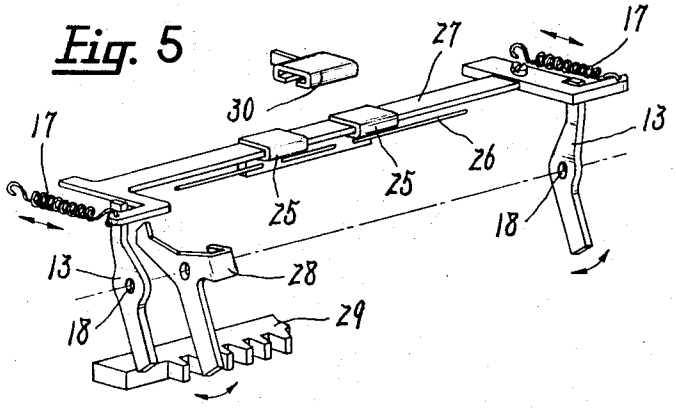


Fig. 5



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United States Patent Office

3,326,346

Patented June 20, 1967

3,326,346

TYPE DRUM PRINTER WITH HAMMER MOUNTED INSIDE OF AND COAXIAL WITH DRUM

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Filed Oct. 20, 1965, Ser. No. 498,658
1 Claim. (Cl. 197—53)

This invention relates to a typewriter of the type drum type.

In accordance with the present invention, the typewriter includes a plurality of relatively elongated type cases which are positioned at uniform angular spacings around the axis of a type drum and which extend parallel to the axis. Each type case has a pularity of types mounted therein and arranged to be struck and projected radially of the drum axis, biasing means being provided to bias the types to the retracted position. A guide extends longitudinally of the drum and coaxially therewithin, and this guide slidably supports a type hammer which is arranged to strike the stem or shaft rod of a selected type to project the latter.

The type hammer is arranged to perform a spacing action, to either the right or the left, and the type drum is arranged to perform not only a spacing action in coordination with the spacing action of the type hammer but also a rotary selecting action to select a particular type. The type hammer guide includes an elongated guide member on which the type hammer is slidably mounted, and a pair of hammer guides, spaced apart a fixed distance to restrain the type hammer therebetween, are slidably mounted on this elongated guide member and are displaceable by a spacing wire secured thereto to properly position the type hammer.

An object of the present invention is to provide a typewriter having movable parts lighter than those of any conventional typewriter, in which the entire type wheel moves integrally in typing and which is adapted to high speed typing.

Another object of the present invention is to provide a typewriter in which, as only the types are projected, many copies can be made and typing is clear.

A further object of the present invention is to provide a typewriter in which the pitch of types can be reduced and, with a type wheel of the same dimensions, the number of letters to be contained can be remarkable increased.

In the accompany drawings;

FIGURE 1 is a side view illustrating a typewriter embodying the present invention.

FIGURE 2 is a plan view of the same.

FIGURE 3 is an elevation of the same.

FIGURE 4 is an enlarged vertical sectional view of a part of the same.

FIGURE 5 is a perspective view of a part of the same.

Referring to the drawings, a type drum type typewriter embodying the invention includes a rotary selecting shaft **1** which, in response to a given signal, is rotated through a selected angular distance. When shaft **1** is thus rotated, it rotates a type drum **11** so that a selected type case **4** is brought into operative position with respect to the typewriter ribbon. This rotation is effected by a gear **2** rotatable with shaft **1** and meshing with a gear **3** rotatable with type drum **11**. Each type case **4** has a plurality of types **7** mounted thereon, each type **7** including a shaft rod or stem **8**. The types **7** are mounted on the respective type case **4** by virtue of their stems extending through aligned apertures **5** and **6** in the legs of the channel-shaped type case. Stems **8** further extend through apertures **12** into the interior of type drum **11**. A type resetting spring **9** embraces each stem **8** in a type case **4** so that, after a

selected type is projected by a hammer **30** striking its stem **8**, the type is immediately biased back to the position shown in FIG. 4.

A plurality of type cases **4** is arranged at uniform angular spacings around the supporting ring **11**.

13 is a printing cam lever. When a printing cam **14** rotates with a printing shaft **15** and the tip of printing cam lever **13** drops from the lobe **16** of the cam **14**, the printing cam lever **13** will rotate anticlockwise, in the direction indicated by the arrow in FIGURE 1 around a shaft **18** as a center due to the force of a spring **17**. A hammer **30** fitted in a guide **19** will be pushed out and will strike with its tip the end of a stem **8** of type **7**. Therefore the type **7** will be struck or projected out and a letter will be typed, through a ribbon **22**, on typing paper **21** fitted on a platen **20** set opposite the type **7** as in any known typewriter. **23** is a ribbon guide.

24 is a horizontal selecting wire. The types are selected in the horizontal direction by moving the entire body, except the hammer **30** and hammer guide **25**, rightward or leftward with the amount of movement varied in response to a signal, and by any known driving mechanism. Thus the position of the type is selected by the amount of movement in the direction of rotation and amount of movement in the rightward and leftward direction given to the type drum.

In typing, the typing position is displaced by a spacing wire **26** by one letter space for each typing stroke. Therefore, the typing position of the hammer **30** is determined by moving the hammer **30** by one letter space and the spacing wire **26** is moved by an amount of the movement of the hammer **30**, with the addition of the movement for selecting the type with the horizontal selecting wire **24** to determine the typing position.

FIGURE 5 is a perspective view showing holding part for the hammer **30**. The hammer **30** is held between the hammer guides **25**, **35** which are moved with the spacing wire **26** as each letter is typed. Hammer **30** and hammer guides **25** can slide on a guide **27** but are restricted in the direction of striking movement of the hammer.

A locking lever **28** is borne on the shaft **18** and is engageable at one end with a locking rack **29** and at the other end with the gear **3** of the type drum. Locking lever **28** is operated by a cam (not illustrated) rotated by the printing shaft **15**, will engage with the gear **3** and will index the type drum just before typing, so as to prevent fluctuation in typing.

In accordance with the present invention, predetermined amounts of angular and axial displacements, in predetermined directions, are initially given to the type drum. These movements are determined by signals representing letters, and, in turn, determine the type position. The spacing wire is moved once for each typing stroke to effect a predetermined spacing of the letters along the line. Hammer **30** is projected radially of the type drum, by the action of cam **16**, to strike the stem of the selected type in order to make an impression on the typing paper.

What is claimed is:

A type drum type printer comprising, in combination, a type case supporting ring; a plurality of relatively elongated type cases arranged at uniform angular spacings around said supporting ring and extending parallel to the axis thereof, said type cases constituting a type drum; a plurality of types mounted in each type case for displacement radially of the type drum; respective means biasing each type to a retracted position in the associated type case; a platen positioned in operative relation to the type drum; a relatively elongated guide extending coaxially of the type drum; means mounting said guide for swinging toward said platen; a type hammer slidable longitudinally of said guide and restrained against movement laterally of said guide; said type hammer, upon swinging

of said guide, striking a stem of a selected type to project the selected type toward said platen; and a pair of hammer guides slidably mounted on said elongated guide and positioned one on either side of said type hammer, said hammer guides being rigidly interconnected for conjoint movement; and means connected to said hammer guides to displace said type hammer longitudinally of said elongated guide.

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