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MOUNTING MEANS FOR TYPE CYLINDERS

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Fig. 1.

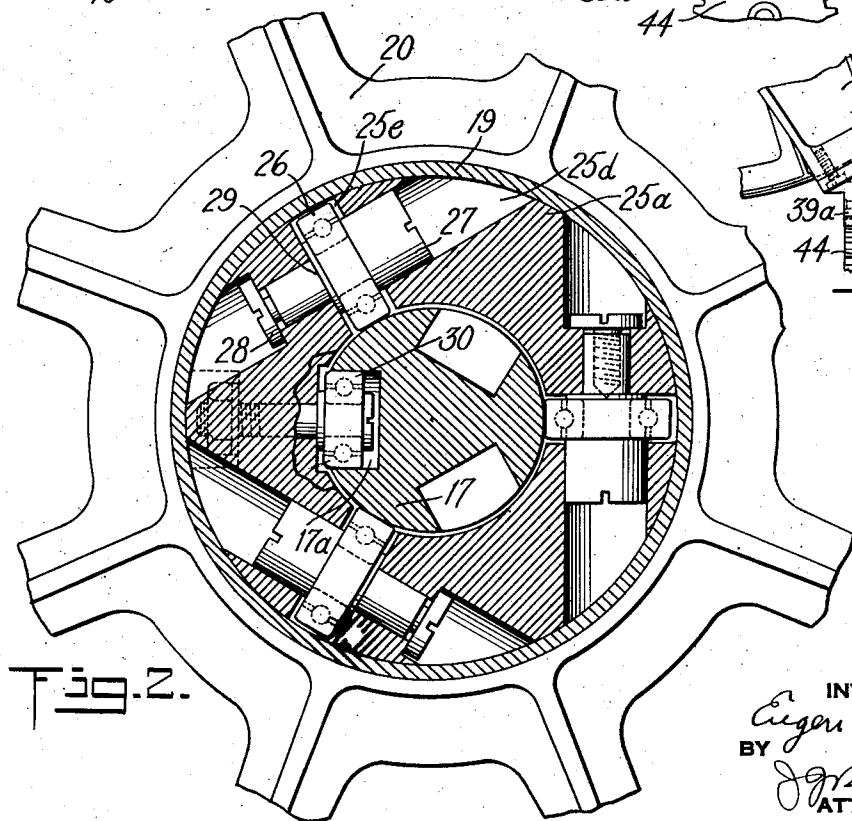
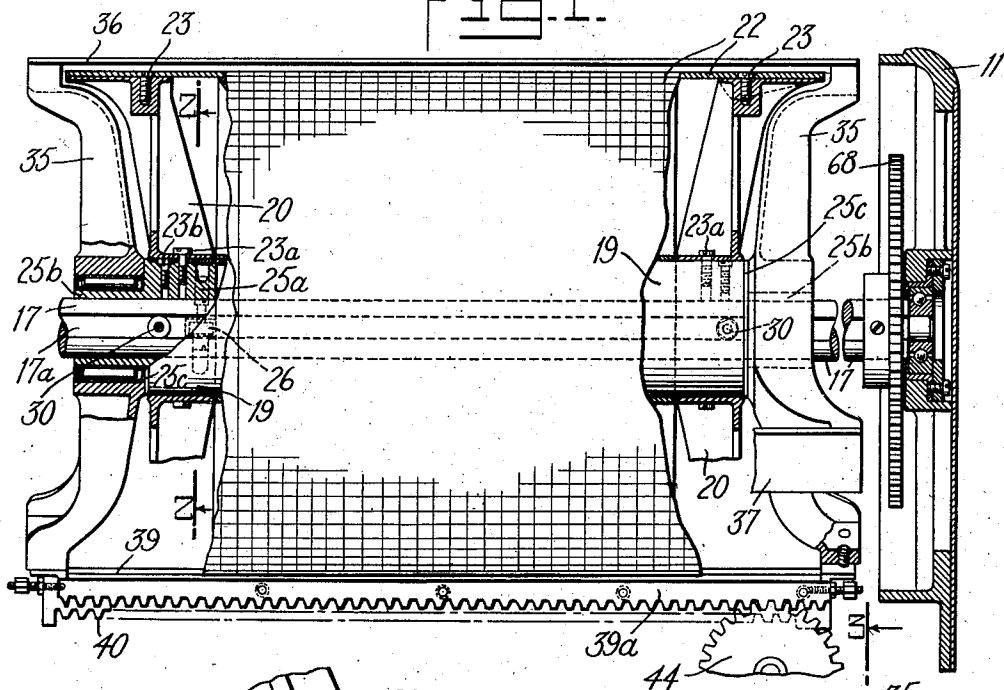


Fig. 2.

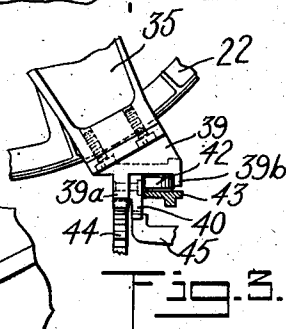


Fig. 3.

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MOUNTING MEANS FOR TYPE CYLINDERS

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Original application May 3, 1946, Serial No.
666,980. Divided and this application April 19,
1947, Serial No. 742,630

3 Claims. (Cl. 197—48)

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This case relates to mounting means for a rotatably and axially movable element and, in respect to this matter, is a division of application Serial No. 666,980, filed May 3, 1946, by Eugen Buhler et al., now Patent No. 2,458,339, dated January 4, 1949.

In said application is disclosed a Chinese type-writer including a drum bearing circles of types and a single printing hammer to strike any selected one of the types. The drum is continuously in rotation and is shiftable axially while in continuous rotation so as to bring a desired circle of types into alignment with the printing position. Then, as a desired type, in this circle of types, is in flight across the printing position, the printing hammer is operated to strike the desired type for printing on a work sheet. Selection of a type thus involves the step of shifting the drum axially to select the proper circle of types and the further step of actuating the printing hammer at the time the desired type in the selected circle is in flight across the printing position. Keys are operated in combination to select the desired types. The axial shift of the drum and the timing of the actuation of the printing hammer is effected by automatic means brought into operation by the selector keys. In order that typing speed be a maximum, the axial shift of the drum must be effected rapidly and smoothly and with minimum inertia and momentum and also without impeding the continuous rotation of the drum.

Accordingly, the present invention is directed to improved means for carrying and mounting an element for rotation and axial travel in such manner that the element may be shifted axially with a minimum of inertia and momentum while the element is in rotation.

More specifically, the invention is directed to anti-friction means for mounting a continuously rotating type cylinder for transverse or axial traction.

The invention further includes anti-friction keying means between the rotatable element and the shaft.

The invention also provides a novel carriage for a rotating drum.

Other objects of the invention will be pointed out in the following description and claims and illustrated in the accompanying drawings, which disclose, by way of example, the principle of the invention and the best mode, which has been contemplated, of applying that principle.

In the drawings:

Fig. 1 is a front view, partly in section and

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partly broken away, of the type drum and associated mounting and actuating means for the drum.

Fig. 2 is a section, on an enlarged scale, of the mounting means for the drum, and is taken along lines 2—2 of Fig. 1.

Fig. 3 is a detail end view looking in the direction of the arrow 3 in Fig. 1.

In detail, 17 is a continuously rotated shaft journaled at opposite ends by ball bearings mounted in end frame castings. Only the ball bearing and the end casting 11 for the right hand end of the shaft are shown here. Continuous rotation of the shaft is effected by drive means including the gear 68 fixed on the shaft. Keyed to shaft 17, by means presently described, is the type drum. The hub of the drum comprises a tube 19, of light-weight material such as magnesium. Circular spiders of similar light-weight material are fastened to tube 19, only the end spiders 20 being shown here. Supported by the spiders and attached by screws 23 to the end spiders 20 is the type cylinder 22, also of light-weight material.

The hub of the type drum includes, besides the tube 19, two end pieces of light-weight material, attached to the tube by screws 23a and 23b, of which screws 23a also serve to fasten the end spiders 20 to the tube. Each end piece is formed with a section 25a fitting into an open end of the tube 19, a collar section 25b extending outside the tube, and a flange 25c between sections 25a and 25b for limiting insertion of the section 25a into the tube and thereby locating the end piece axially with respect to the tube. Each end piece internally carries three ball bearing rollers 26 to engage three equidistant points of the circumference of shaft 17. For this purpose, the end piece has three chordal bores 25d bisected by radially extending slots 25e. The slots 25e accommodate the ball bearing rollers 26 and washers 29 while bores 25d receive studs 27 and coacting screws 28 for mounting the rollers. The rollers 26, three in each end piece, centralize the type drum 18 on shaft 26 and also afford anti-friction traction for the drum upon its adjustment lengthwise of the shaft. Each end piece also mounts an additional ball bearing roller 30 in position to ride inside a keyway 17a in shaft 17. The two rollers 30, one in each end piece, key the drum to the shaft for rotation and afford further anti-friction traction for the drum upon its axial adjustment. The tube 19 and the attached end pieces surround shaft 17 with clearance. Hence, the type drum 18 engages the shaft only through

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the centralizing ball bearing rollers 26 and the keying ball bearing rollers 30, so that traction of the drum along the shaft may take place with a minimum of friction. This feature, added to the fact that the type drum is extremely light in weight, because its parts are made of light-weight material, provides for a minimum of inertia and momentum of the drum upon its axial adjustment.

Adjustable of the drum along the shaft 17 is effected by adjusting a cradle 35 which straddles the drum. The cradle comprises three-armed sides and tie bars 36, 37, and 39 joining the arms of the two sides. The cradle is mounted through needle bearings on the collar sections 25b of the end pieces of the drum hub and its sides about the flanges 25c. The mounting permits the drum to rotate freely inside the cradle and at the same time compels the drum, upon movement of the cradle lengthwise of the shaft 17, to move with the cradle. The tie bar 39 of the cradle is formed with a rack 39a and a ledge 39b (see Fig. 3), both parallel to shaft 17. A second, parallel rack 40 is fixed to a side of rack 39a and spaced from ledge 39b, whereby the rack 40 and the ledge define a channel running parallel to shaft 17. Extending into the channel is a roller 42 carried by a frame plate 43. Roller 42 prevents rotation of the cradle, restricting it to linear movement parallel to shaft 17. Such linear movement is effected, after release of a latch 45 from rack 40, by the turning of a gear 44 which is in mesh with rack 39a. The transverse movement of the cradle effects similar movement of the type drum. Arrest of the cradle movement, by reengagement of latch 45 with rack 40, also arrests transverse shift of the type drum.

While there have been shown and described and pointed out the fundamental novel features of the invention as applied to a preferred embodiment, it will be understood that various omissions and substitutions and changes in the form and details of the device illustrated and in its operation may be made by those skilled in the art, without departing from the spirit of the invention. It is the intention, therefore, to be limited only as indicated by the scope of the following claims.

What is claimed is:

1. A machine including a rotatable shaft, a type cylinder or the like, and means for mounting the cylinder on the shaft for axial travel, said mounting means including hub pieces for the cylinder surrounding the shaft with clearance, and anti-friction rollers journaled in the hub

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pieces with their axes extending at right angles to the axis of the shaft, said rollers being so spaced as to engage equidistant surfaces of the shaft to afford evenly distributed anti-friction traction for the cylinder along the shaft, said shaft being formed with a keyway, said hub pieces also being provided with ball-bearing rollers riding in said keyway to afford anti-friction keying of the cylinder to the shaft, whereby the cylinder is mounted for rotation with the shaft and, at the same time, may travel along the shaft on solely anti-friction means, including the anti-friction keying rollers.

2. In combination, a rotatable shaft having a keyway therein, a cylinder, and a hub structure for the cylinder constructed to mount the cylinder for rotation with and for travel along the shaft, said hub structure including a tube to which the cylinder is attached, said tube surrounding the shaft with clearance and being open at the opposite ends, said hub structure further including a pair of hub pieces, each fastened into an open end of said tube, and a plurality of anti-friction rollers journaled inside each of the hub pieces with their axes at right angles to the axis of the shaft, the rollers in each hub piece being spaced to ride on spaced longitudinal surfaces of the shaft, said hub pieces also being provided with anti-friction keying devices riding in the keyway in the shaft to key the cylinder to the shaft for rotation therewith, whereby the cylinder is mounted to be capable of anti-friction traction along the shaft while in rotation with the shaft.

3. A combination as defined in claim 2, and a cradle straddling the cylinder and movable parallel to the shaft to effect the cylinder travel along the shaft, said hub pieces including sleeves extending outside the ends of the tube, anti-friction means surrounding said sleeves, said cradle having its sides mounted through said anti-friction means on said sleeves so as to allow the cylinder to rotate freely within the cradle, and means preventing turning of the cradle.

EUGEN BUHLER.

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The following references are of record in the file of this patent:

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