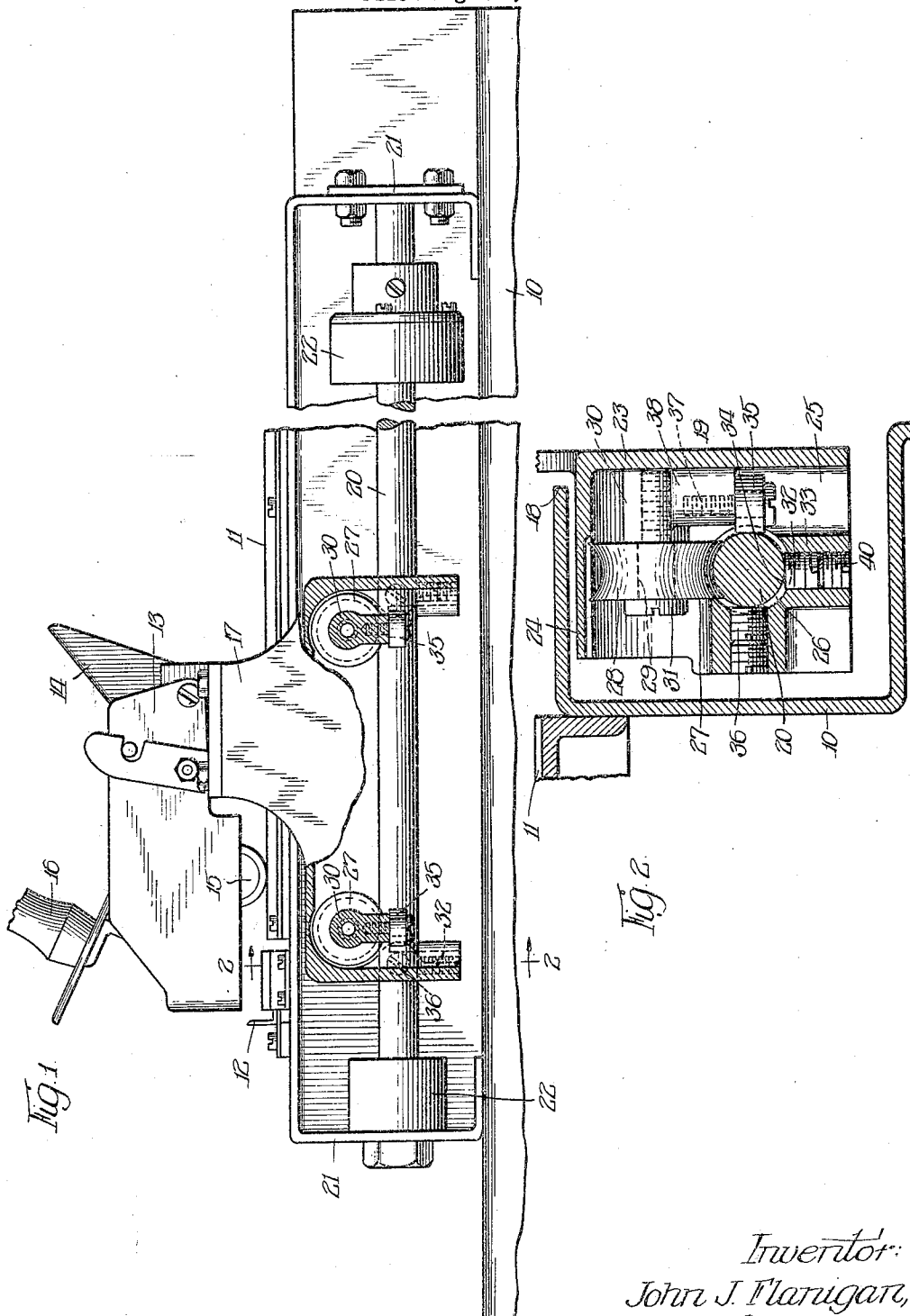


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J. J. FLANIGAN
DUPLICATING MACHINE

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DUPLICATING MACHINE

Application filed August 26, 1929. Serial No. 388,463.

My invention relates to duplicating machines of the type disclosed in my copending application Serial No. 344,203, filed March 5, 1929.

5 My object is to provide a novel and improved movable carriage bearing which will eliminate frictional resistance to the movement of the carriage and at the same time maintain the carriage in definite relation to the printing bed as the carriage moves.

10 A further object is to provide a bearing which will require no lubrication, which will be inexpensive to manufacture and durable and long lived in operation, and which can be adjusted to eliminate all play or looseness between the guide rod and bearing.

Other objects of my invention will appear hereinafter.

Referring to the drawing

20 Fig. 1 is a view in elevation of the upper portion of a duplicating machine, showing the carriage and bearing therefor embodying my invention; and

25 Fig. 2 is an enlarged transverse vertical section on the line 2—2 of Fig. 1.

In Fig. 1 the upper portion of the frame 10 of a duplicating machine is shown. At the top of the frame is a flat supporting bed 11 upon which the gelatin band (not shown) is stretched. At the forward end of the supporting bed a margin bar 12 is provided for registering the sheets to be printed with the master impression on the gelatin band. A platen carriage 13 is positioned above and straddles the supporting bed and gelatin band, and is mounted to reciprocate back and forth along the bed for the purpose of impressing the sheets upon the gelatin band during the printing stroke and stripping or removing from the band therefrom during the return stroke. This carriage has a suitable sheet guide 14 and a platen roller 15 by means of which the sheets are pressed upon the gelatin band. The carriage also has a handle 16 by which it is moved back and forth and by which the platen roller is operated to apply the necessary printing pressure on the sheet, all as set forth in my copending application above mentioned.

50 At one side the carriage is provided with

suitable rollers which bear upon the top of the frame for supporting that side of the carriage. On the side of the carriage shown in the drawing, the carriage has an arm 17 which extends downwardly and has the supporting bearing at its end. The frame, along this side and beneath the plane of the supporting bed 11, is U-shaped in section, as shown in Fig. 2 so as to form a channel within which the bearing is positioned. This makes a neat appearing structure and serves as a guard to prevent damage of the parts or contact therewith by the operator.

The arm 17 extends downwardly just outside of the outer edge 18 of the top of this frame channel, and at its lower end carries a box like frame casting which embraces the guide rod or rail 20 extending the length of the frame within the channel. This guide rod is supported at its ends in the frame members 21 and has stop members 22 which are engaged by the ends of the bearing frame 19 to determine the limits of movement of the carriage. The bearing frame 19 has an outer side wall 23, top wall 24 and end walls 25. The end walls 25 have openings 26 for the guide rod 20, these openings being sufficiently large to permit the free movement of the bearing frame along the rod without contacting with the rod. The bearing frame is elongated to occupy a considerable length of the rod. It carries bearing rollers 27 within its ends which are spaced apart lengthwise of the rod thereby providing two widely separated points of support on the rod. These bearing rollers are comparatively wide and their peripheries 28 are grooved to conform to the curvature of the rod. They are rotatably mounted on shaft 29 in the form of threaded bolts which are screwed into threaded bosses 30 formed in the bearing frame. These bolts have heads 31 for holding the rollers in place. The rollers are large and substantial, and since they are positioned on the upper side of the rod, they support the direct weight of the carriage and the pressure incident to the operation of the carriage and the plate roller.

On the under side of the guide rod opposite the bearing rollers I provide contact

plugs 32. These plugs are threaded and are screwed into threaded bosses 33 formed on the end walls of the bearing frame and adjustable radially toward or from the guide rod. These plugs are preferably made of a material such as bakelite which will withstand wear and requires no lubrication. Their inner ends 34 are preferably flat for contact with the under side of the guide rod. They are screwed into their sockets until their flat ends lightly touch the guide rod to prevent any play between the grooved bearing rollers and the guide rod. Their contact with the rod, however, is not sufficient to frictionally interfere with the movement of the carriage along the guide rod. These contact plugs are not subject to the downward weight and operating thrusts of the carriage unless those thrusts tend to rock the carriage or raise it above the supporting bed.

In a similar manner the side thrusts on the carriage are taken care of by another set of bearing rollers 35 and bakelite plugs 36. The bearing rollers 35 are mounted to rotate on shafts 37 in the form of threaded bolts similar to the bolts 29. These bolts are also mounted in bosses 38 formed on the bearing frame. The bearing rollers 35 rotate on axes at right angles to the main bearing rollers 27 and are positioned at right angles to the main rollers so that they will contact with the side of the guide rod. Bearing rollers 35 have flat peripheries to minimize the area of contact with the rod. The plugs 36 are disposed opposite rollers 35 and are similar to the previously described plugs 32. After both plugs 32 and 36 are adjusted in position, metal set screws 40 are screwed into the threaded bosses behind the bearing plugs for locking the plugs in position and sealing the openings in the bosses.

The bearing structure is exceptionally effective for reciprocating carriages of duplicating machines because it positively holds the carriage in exact angular and printing relation to the printing bed and at the same time permits the free and unrestricted movement of the carriage. No lubrication is required on the guide rail, hence the guide rail can be kept clean and free from gumminess which would otherwise prevent free movement of the carriage. The bearing is inexpensive to manufacture and its parts can be readily removed and replaced when desired. I am aware that changes can be made in the construction, operation and arrangement of parts without departing from the spirit of the invention and I reserve the right to make such changes as fairly fall within the scope of the appended claims.

I claim:

1. In a duplicating machine which has a printing bed, a platen carriage movable along said bed, and a guide rail for the carriage, the combination of a bearing supporting the car-

riage on the guide rail and comprising a frame, bearing rollers in said frame bearing on said guide rail, and adjustable plugs in said frame opposite said bearing rollers to engage the guide rail.

2. In a duplicating machine which has a printing bed, a carriage movable along said bed and a track member for the carriage, the combination of a bearing supporting the carriage on said track and comprising a frame embracing the track and through which the track extends, bearing rollers in said frame bearing upon said track, and plugs in said frame opposite said bearing rollers and adjustable with respect to said track to take up any play between the bearing rollers and the track.

3. In a duplicating machine which has a printing bed, a platen carriage movable along said bed, and a track member for the carriage, the combination of a bearing supporting the carriage on the track member in definite relation to the printing bed and comprising a frame having bearing rollers bearing on the track member and spaced apart lengthwise of said track member, and adjustable take up members in said frame for contact with the track member opposite each of said bearing rollers.

4. In a duplicating machine which has a printing bed, a guide rod disposed below the plane of the bed and at one side thereof, and a carriage disposed transversely above the bed movable along said bed, the combination of a bearing member supporting the carriage on the rod in definite relation to the bed and embracing said rod, said bearing having bearing rollers bearing on the rod, and adjustable phenolic condensate product antifriction members disposed opposite to each of said bearing rollers and adapted for taking up the play between the bearing rollers and the guide rod.

5. In a duplicating machine which has a printing bed, a transversely disposed carriage movable along said bed, and a guide rail disposed below the plane of the bed and at one side thereof, the combination of a bearing connected to the carriage at one side thereof for supporting the carriage in definite relation to the bed, said bearing comprising a frame embracing the guide rail and elongated lengthwise of the rail and having grooved bearing rollers above the rail at points separated lengthwise of the rail, and adjustable take up plugs in said frame beneath the rail and in vertical alignment with the bearing rollers.

6. In a duplicating machine which has a printing bed, a transversely disposed carriage movable along said bed, and a guide rail disposed below the plane of the bed and at one side thereof, the combination of a bearing connected to the carriage at one side thereof for supporting the carriage in definite rela-

tion to the bed, said bearing comprising a frame embracing the guide rail and elongated lengthwise of the rail and having grooved bearing rollers above the rail at points separated lengthwise of the rail, adjustable take up plugs in said frame beneath the rail and in vertical alignment with each of the bearing rollers, and other bearing rollers and take up plugs on opposite sides of the rail in alignment at right angles to the alignment of said first mentioned rollers and take up plugs.

7. A bearing support movable along a track comprising a supporting housing having a roller rotatably mounted therein and engageable with the upper side of said track, another roller rotatably mounted in said supporting housing engageable with one side of said track, a plug in said housing opposite one of said rollers, and another plug in said housing opposite the other of said rollers, said plugs being tensioned against said track to hold said rollers thereon to prevent movement thereof radially of said track.

8. A bearing support movable along a track and comprising a supporting housing having a roller rotatably mounted therein and engageable with the upper side of said track, another roller rotatably mounted in said housing and engageable with one side of said track, a screw plug mounted in said housing opposite the one of said rollers, another screw plug mounted in said housing opposite the other of said rollers, said screw plugs being adjustable to neatly engage said track to hold the rollers on the track and against radial movement relative to the track, and means holding said screw plugs in adjusted position.

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