Sept. 14, 1937. W. F. HUCK 2,092,759

PRINTING MACHINE

Filed Dec. 22, 1934

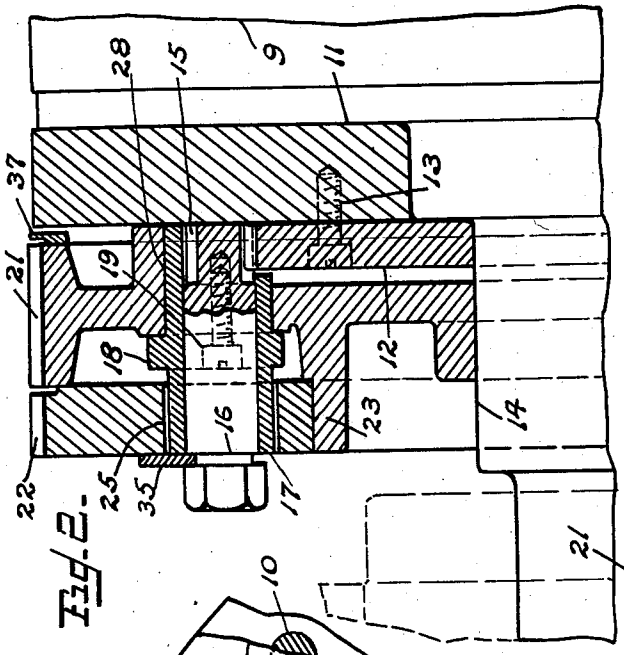


Fig. 2.

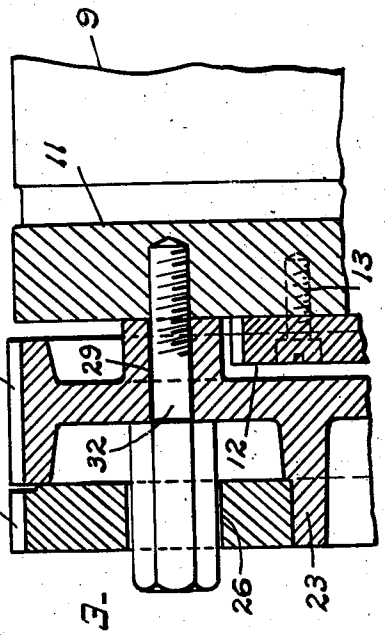


Fig. 3.

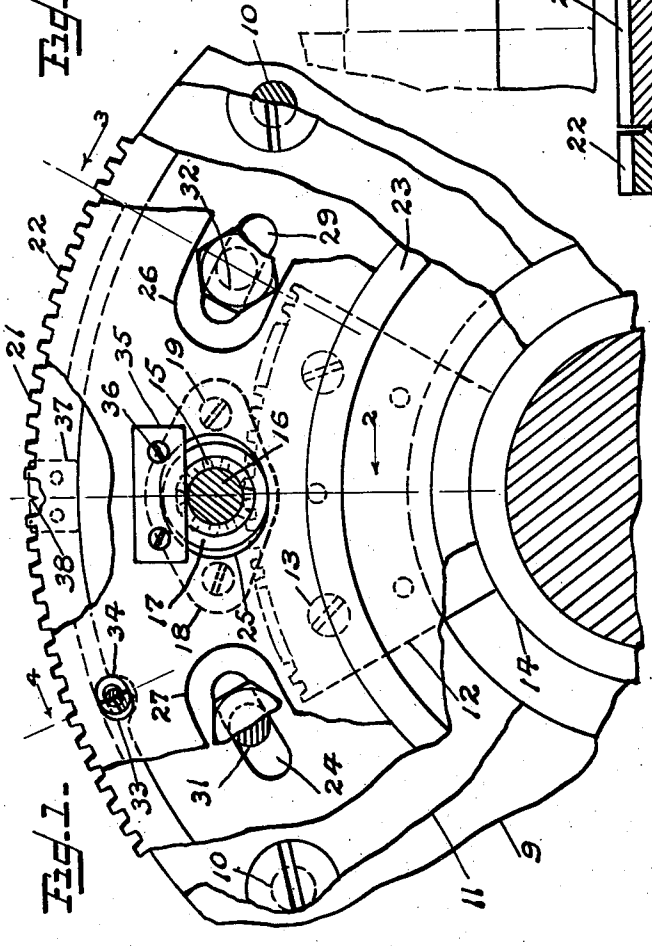


Fig. 1.

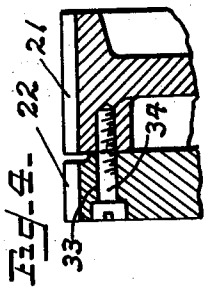


Fig. 4.

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PRINTING MACHINE

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Application December 22, 1934, Serial No. 758,743

17 Claims. (Cl. 101—248)

This invention in general relates to printing machines and more particularly to means for providing a convenient and simplified mechanism for expeditiously effecting relative movement or rotation between a cylinder and its driving gears in order to secure accurate register in printing.

It is also an object of the invention to provide a cylinder gear adjusting mechanism of generally improved construction, whereby the device will be simple, durable and inexpensive in construction, as well as convenient, practical, serviceable and efficient in its use.

With the foregoing and other objects in view, which will appear as the description proceeds, the invention resides in the combination and arrangement of parts, and in the details of construction hereinafter described and claimed, it being understood that various changes in the precise embodiment of the invention herein disclosed may be made within the scope of what is claimed without departing from the spirit of the invention.

The preferred embodiment of the invention is illustrated in the accompanying drawing, wherein:

Figure 1 is a fragmentary end elevational view, partly in section, of a cylinder to which an embodiment of the invention has been applied;

Figure 2 is a transverse sectional view, taken on the line and as seen in the direction of the arrow 2 of Figure 1;

Figure 3 is a fragmentary detail view taken on the line and as seen in the direction of the arrow 3 of Figure 1; and

Figure 4 is a view similar to Figure 3, taken on the line and as seen in the direction of the arrow 4 of Figure 1.

Referring now to the drawing, 9 designates a cylinder on the end of which is fastened in any suitable manner, as by the screws 10, a ring 11. To the fixed ring 11, a gear segment 12 is fastened by screws 13, the said segment 12 being seated on a shouldered portion 14 of the cylinder 9 and coactingly engaged with a pinion gear 15 which is fastened to or formed integrally with an adjusting stud or member 16, rotatably arranged in a bushing or sleeve 17. The sleeve 17 is provided with a flange 18, apertured to receive screws 19, threaded into the face of a gear 21, adjustably mounted on the shouldered portion 14 of the cylinder above mentioned, the teeth of the gear 21 normally being in register or aligned with the teeth of a toothed ring or gear 22, which is mounted on an annular ledge or projection 23 of the gear 21 and which may be considered to be a component part of the gear 21.

As best shown in Figure 1, it will be seen that the toothed ring 22 is provided with a plurality of holes 26, 27 which are in opposed relation to slots 29, 24 respectively in the gear 21. In addition, the ring 22 has another slot 25 through which the bushing 17 is protruded, the said bushing being received in a hole 28 provided in the ring 21. Through the registering holes and slots 26, 29 and 27, 24, screws 31, 32 are passed, the said screws being threaded into fixed ring 11 and having elongated heads (Figure 3) which are freely accommodated in the holes 26, 27 and press against the face of the gear 21 in order to removably and adjustably fasten the latter to the fixed ring 11. The toothed ring 22 is further provided with an additional series of slots, one of which is shown as at 33, through each of which a screw 34 is passed, the said screw being threadedly engaged in the gear 21 and normally serving to lock the gears 21, 22 together as a unit or to free same for relative angular movement, when desired, as will appear hereinafter.

The adjusting stud 16 is normally retained in the operative position shown by a plate 35 which is fastened by screws 36 to the outer gear 22. In order to determine with accuracy the extent of the adjustment of the cylinder and the gear 21, relatively to each other, a small plate or bracket 37 is secured to the rim of the said gear 21, the said plate being provided with a centrally positioned indicating notch 38 which is employed preferably with a line (not shown) which may be made on the periphery of the ring 11. For all practical purposes, it will be understood the gear 21 and its toothed ring 22 may be considered as one gear.

The function and operation of the device may now be summarized as follows:

Assuming it is desired to advance or retard a cylinder relatively to its coacting cylinder in order to obtain the desired register or vary the margin space on the printing sheet, the screws 31, 32 are loosened and then the adjusting member 16 is turned, thereby rotating the pinion 15 and causing same to travel over the teeth of gear 12 and consequently turning the gear 21 with respect to the cylinder 9. After the adjustment desired, and as shown by the indicating means mentioned above, is obtained, the screws 31, 32 are tightened and the cylinder is made ready for further operation.

It will be understood that the gear (not shown) carried by a coacting printing cylinder and which

meshes with gear 21, is provided with a face of sufficient breadth to properly mesh with both gears 21 and 22. When it is desired to take up backlash or lost motion between the gear 21 and the meshing gear referred to, the screws 34 alone are loosened, whereupon the gear 22 may be adjusted relatively to the gear 21 until the backlash is taken up to the desired extent, after which the said screws 34 are tightened. It will be observed that when the gear 21 is to be adjusted relatively to the cylinder, the screws 34 are left tightened, thereby moving the gear 22 with the gear 21. The adjusting mechanism to accomplish this purpose has employed slotted gears and adjusting screws arranged to move the gear within the limits defined by studs or bolts in the slots, the said adjusting screws being each arranged with their axis normal to a radial line of the cylinder. On certain classes of machines where the end of the cylinder is closely adjacent the frame, however, there is insufficient space to manipulate a wrench for making this adjustment. By the present design and construction and by reason of the fact that the manually adjustable member 16 has its axis of rotation parallel to the longitudinal axis of the cylinder, an operating wrench or other suitable tool can be conveniently inserted between the cylinder and the adjacent frame to engage and turn the head of the adjusting member 16 and the other screws 31, 32 alluded to above, which may be loosened and/or tightened during the operation of adjusting the cylinder relatively to its gear.

It will be observed that by the above means accurate register in printing can be obtained and adjustments whenever required, may be conveniently and expeditiously made in the manner indicated. In addition, backlash can be quickly taken up.

It will be understood that the invention may be embodied in other specific forms without departing from the spirit or essential attributes thereof, and it is therefore desired the present embodiment be considered in all respects as illustrative and not restrictive, reference being had to the claims rather than to the foregoing description to indicate the scope of the invention.

What I claim is;

1. In a printing machine, the combination of a cylinder, a gear mounted on said cylinder, a gear segment fastened to the cylinder, and a rotatable pinion mounted with its axis parallel to the axis of said cylinder coactable with said gear segment for turning the gear relatively to the cylinder.

2. In a printing machine, the combination of a cylinder, gear means fastened to the cylinder, a gear rotatably mounted on the cylinder, a toothed ring mounted on the gear, a manually adjustable member coactable with the gear means for turning the gear relatively to the cylinder, and securing means releasable to permit angular movement selectively between the gear, the toothed ring and the cylinder.

3. In a printing machine, the combination of a cylinder, gear means fastened to the cylinder, a gear rotatably mounted on the cylinder, a second gear mounted on the first mentioned gear, a manually operable pinion engaged with said gear means for moving the said gear relatively to the cylinder, and indicating means on the gear and the cylinder for denoting relative angular movement between same.

4. In a printing machine, the combination of a cylinder, a gear turnably mounted on said cylinder, a manually operable member rotatably arranged in said gear, and gear means secured to the cylinder and coactable with the manually operable member for producing relative angular movement between the gear and the cylinder, said manually operable means having its axis of rotation parallel to the axis of rotation of the cylinder.

5. A combination as specified in claim 4 and a toothed ring turnably mounted on said gear but normally fastened in aligned relation therewith.

6. In a printing machine, the combination of a cylinder, gear means fastened to the cylinder, other gear means arranged on the cylinder and rotatably adjustable relatively to each other and the cylinder, and means coactable with said first mentioned gear means for adjusting said last mentioned gear means relatively to the cylinder.

7. In a printing machine, the combination of a cylinder, a gear rotatably arranged on said cylinder, a second gear turnably mounted on the first mentioned gear and having gear teeth in normal aligned relation therewith, and means for angularly moving both of said gears together as a unit relatively to the cylinder, said last mentioned means having its axis of rotation parallel to the longitudinal axis of the cylinder.

8. In a device of the character described, the combination with a cylinder, gear means fastened to said cylinder, of a pair of gears rotatably movable on the cylinder, means having its axis of rotation parallel to the axis of rotation of the cylinder, and coactable with said gear means for adjusting the said pair of gears as a unit relatively to the cylinder, and threaded means for loosening and fastening the plurality of gears.

9. In a printing machine, the combination of a cylinder, a gear segment fastened to said cylinder, a gear turnable on the cylinder, a second gear turnable on said first mentioned gear, means for adjustably securing both of said gears together as a unit and loosening them for relative rotational movement when desired, a manually adjustable member positioned within said gears and having an operating connection with the gear segment, and indicating means connected to one of the gears and coactable with means on the cylinder for denoting the extent of angular movement of the first mentioned gear relatively to the cylinder.

10. In a printing machine, the combination of a cylinder, a segmental gear secured to the cylinder, a pinion engaged with said segmental gear, a manually operable member fastened to said pinion, a gear rotatably mounted on the cylinder, a second gear normally secured to the first mentioned gear but adjustable relatively thereto when desired, means in both of said gears for accommodating the manually operable member, and indicating means fastened to one of the gears and coactable with means arranged on the cylinder for denoting relative angular movement between the first mentioned gear and the cylinder.

11. In a device of the character described, a cylindrical part, a gear part, said parts being mounted for rotative movement relatively to each other, a rotatable member journaled in one of said parts with its axis of rotation parallel to the axis of one of said parts, and a second member secured to the other of said parts, said second member and said rotatable member cooperating to rotate one part relatively to the other.

12. In a device of the character described, a cylindrical part, a gear part, said parts being mounted for rotative movement relatively to each

other, a rotatable member journaled in one of said parts with its axis of rotation parallel to the axis of one of said parts, a second member secured to the other of said parts, said second member and said rotatable member cooperating to rotate one part relatively to the other, and means to indicate the amount of such relative movement.

13. In a device of the character described, a cylindrical part, a gear part, one of said parts being mounted for rotative movement relatively to the other, and means to rotate one of said parts relatively to the other including a member on one part and a member rotatably mounted to the other part, said rotatable member adapted to cooperate with the other member, when rotated in one direction, to rotate the part in which it is mounted in the same rotative direction relatively to the other part.

14. In a printing machine, the combination of a printing cylinder, a driving gear in axial alignment with and variably positionable angularly with respect to the cylinder, adjusting gear means on the cylinder, and other adjusting gear means on the gear, said cylinder, said gear and said adjusting gear means having their axes in a common plane.

15. In a printing machine, a rotatable cylinder part, a gear part for driving said cylinder, a gear segment on one of said parts, a gear pinion having its teeth in mesh with the teeth of said segment and being rotatably mounted in the other of said parts to drivingly connect said parts for rotative adjustment in respect to each other, and means to indicate the amount of rotative adjustment between said parts.

16. In a printing machine, a rotatable cylinder part, a gear part for driving said cylinder, a gear segment on one of said parts, a gear pinion having its teeth in mesh with the teeth of said segment and being rotatably mounted in the other of said parts and having its axis of rotation parallel to the axis of one of said parts to drivingly connect said parts for rotative adjustment in respect to each other.

17. In a printing machine, a rotatable cylinder part, a gear part for driving said cylinder, a gear segment on one of said parts, a gear pinion having its teeth in mesh with the teeth of said segment and being rotatably mounted in the other of said parts and having its axis of rotation parallel to the axis of one of said parts to drivingly connect said parts for rotative adjustment in respect to each other, and means to indicate the amount of rotative adjustment between said parts.

WILLIAM F. HUCK.