March 26, 1940. E. R. SUTCLIFFE 2,195,319

WEB-TURNER BAR FOR PRINTING MACHINES AND FOR LIKE PURPOSES

Filed July 16, 1938

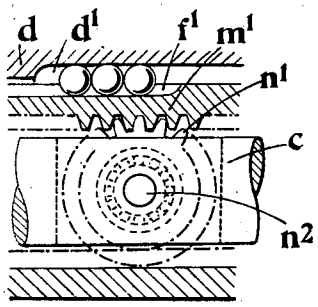


Fig. 3

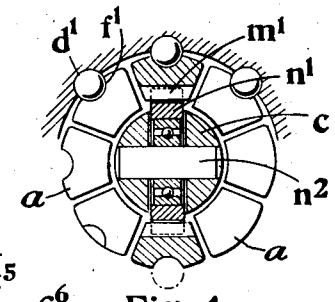


Fig. 4

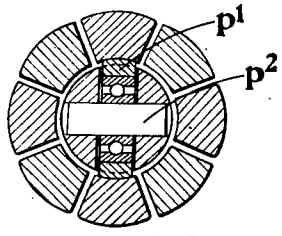


Fig. 5

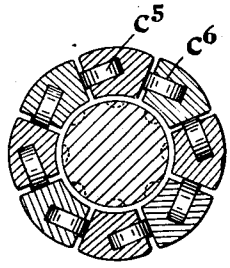


Fig. 6

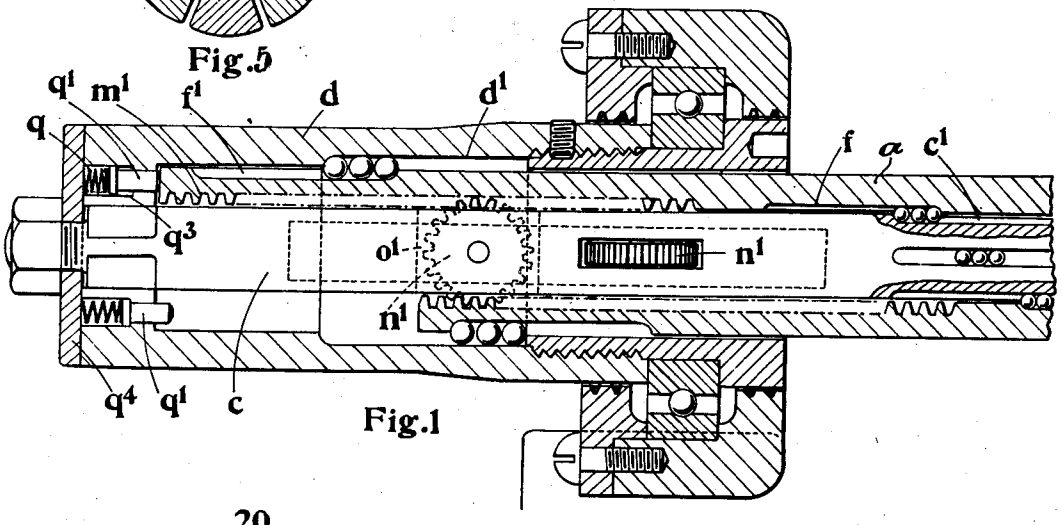


Fig. 1

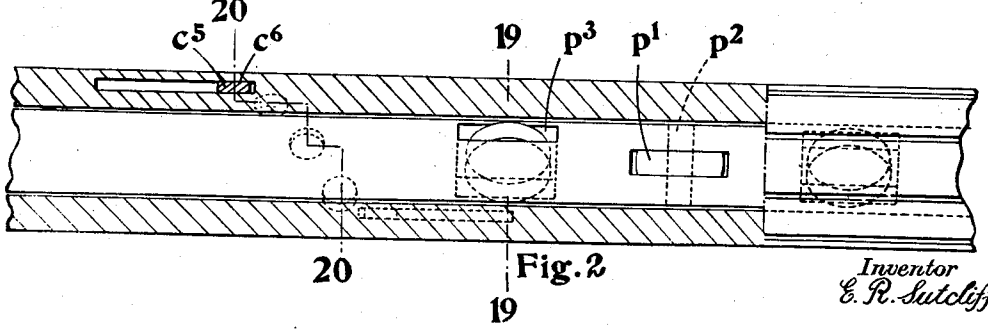


Fig. 2

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WEB-TURNER BAR FOR PRINTING MACHINES AND FOR LIKE PURPOSES

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Application July 16, 1938, Serial No. 219,507
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7 Claims. (Cl. 271—2.1)

This invention relates to turner bars applicable to web printing machines and to other like purposes.

The invention has among its objects to avoid friction in the passage of the webs over the turner bars and to prevent set-off or smearing of the impressed webs.

According to the invention the turner bar comprises a circumferential series of longitudinal bars of substantially sector-shaped section each radially immovable relatively to a central spindle carrying them but capable of axial movement relatively to the said spindle in opposite directions under the influence of the web.

According to the invention furthermore, each diametrically oppositely disposed pair of longitudinal bars is automatically operated under the influence of the web by a pair of racks and co-operating pinions, the racks being secured to or formed integral with the bars and each pair of diametrically oppositely disposed bars engaging at opposite positions with a toothed pinion mounted within a recess or cavity in the central spindle around which the bars are mounted whereby an axial movement of one bar under the influence of the moving web in peripheral contact therewith is effective to move the other diametrically oppositely disposed bar axially in the opposite direction.

The invention is illustrated by way of example in the accompanying diagrammatic drawing, in which

Figure 1 is a sectional side elevation of part of a construction of turner bar according to the invention.

Figure 2 is a part sectional elevation of another part of the construction according to Figure 1.

Figure 3 is a sectional elevation of a detail of the construction illustrated in Figures 1 and 2 on an enlarged scale.

Figure 4 is a transverse sectional end elevation corresponding to Figure 3.

Figure 5 is a transverse sectional elevation on the line 19—19 of Figure 1 and

Figure 6 is a transverse sectional elevation on the line 20—20 of Figure 2.

In carrying the invention into effect according to one construction as illustrated in the drawing the turner bar comprises circumferential series—for example ten—of longitudinal bars a of substantially segmental section that are mounted lengthwise in juxtaposition around a central spindle c to present a substantially continuous peripheral surface around which the web is passed, the bars a being immovable radially but movable axially independently one of the other. Thus as the web moves and changes its direction in movement around the turner bar the longitudinal bars in contact with the web at their respective peripheral faces participate in the axial component of the motion of the web during its period of contact with the turner bar. Each pair of diametrically oppositely disposed sector-shaped bars a are mechanically interengaged in such manner that an axial movement of one bar in one direction serves to effect an axial movement in the opposite direction of the other bar. Thus the sector-shaped bars a may be formed for a determined distance along the inner peripheral face as racks m^1 which engage at opposite positions toothed pinions such as n^1 which are mounted on spindles n^2 in recesses o^1 conveniently provided in the central spindle c, the teeth of the pinions n^1 projecting beyond the periphery of the spindle c on either side to engage the racks m^1.

As shown in Figure 1, the oppositely disposed racks m^1 engage the pinions n^1 with the one bar at the limit of its axial movement in one direction and the diametrically oppositely disposed bar at the limit of its movement in the other.

Axial grooves or ball races f, c^1 are provided between the central spindle c and the longitudinal sector-shaped bars a and axial grooves d^1, f^1 between the longitudinal sector-shaped bars and the sockets d at the ends of the spindle for the reception of the balls or rollers for the purpose of securing the minimum friction in the movement of the longitudinal bars.

In order to reduce friction, at an intermediate position or at intermediate positions distant from the socket end of the spindle c may be provided rollers p^1 (Figure 5) mounted on ball bearings on spindles p^2 which are mounted within recesses or cavities p^3 (Figure 2) formed in the central spindle c in such manner that the rollers project at opposite positions from the recesses or cavities so as rotatably to engage the inner peripheral surfaces of the sector-shaped bars a.

A circumferential series of rollers c^5 of disc shape are provided in staggered helical relation between the lateral faces of the sector-shaped bars (Figure 6), each roller being mounted in an axial slot or cavity c^6 in the lateral wall of one bar to project in engagement with the adjacent lateral surface of the sector-shaped bar positioned next to it.

To provide a cushioning or buffer effect for the sector-shaped bars in their axial reciproca-

tion nibs q^1 may be resiliently mounted under the pressure of springs q^2 in recesses or cavities q^3 formed on the inner end faces or end plates q^4 of the sockets d at each end of the turner bar, the sector-shaped bars a bearing against the projecting ends of the nibs q^1 when nearing the end of their axial movement in the direction towards the sockets.

In operation the axial movement in one direction imparted to one bar by the web in contact therewith will cause the oppositely disposed bar to move axially a corresponding distance in the opposite direction without additional or external means being required for restoring the bars to their original positions.

I claim:

1. A turner bar including in combination a central spindle, sockets at each end of said spindle, a turner bar supporting-frame carrying said sockets, friction bearings between said spindle and said sockets, longitudinal bars mounted on said spindle to present outer peripheral surfaces for frictional engagement by the web and movable thereby, and friction bearings between said spindle and said bars.

2. A turner bar including in combination a central spindle, a circumferential series of longitudinal bars mounted on said spindle to present outer peripheral surfaces for frictional engagement by the web, each of said bars being capable of a longitudinal movement relatively to said spindle under the axial component of motion of the web and means causing positive engagement of each of said bars with the diametrically oppositely disposed bar in such manner that the longitudinal movement of one bar in one direction causes longitudinal movement of the diametrically oppositely disposed bar in the opposite direction.

3. A turner bar including in combination a central spindle, a circumferential series of longitudinal bars mounted on said spindle to present outer peripheral surfaces for frictional engagement by the web, each of said bars being radially immovable relatively to the central spindle but capable of a longitudinal movement relatively to said spindle, a rack formed for a determined length on the inner peripheral surface of each bar and toothed pinions mounted in recesses or cavities in said spindle and engaging the racks on diametrically oppositely disposed bars at determined positions in such manner that the longitudinal movement of one bar under the influence of the web serves to impart a longitudinal movement thereto which is effective to return the diametrically oppositely disposed bar into its original position.

4. A turner bar including in combination a central spindle, a circumferential series of longitudinal bars mounted on said spindle to present outer peripheral surfaces for frictional engagement by the web, each of said bars being capable under the influence of the web of a longitudinal movement relatively to said spindle in opposite directions and friction bearings at an intermediate position or positions with respect to the ends of the bar between the spindle and the bars.

5. A turner bar including in combination a central spindle, a circumferential series of longitudinal bars mounted on said spindle to present outer peripheral surfaces for frictional engagement by the web, each of said bars being capable under the influence of the web of a longitudinal movement relatively to said spindle in opposite directions and cushioning or buffer means for said bars mounted at the ends of the turner bar.

6. A turner bar of circular section comprising a central spindle, a series of longitudinal bars surrounding said spindle to present an outer peripheral surface which is adapted to be frictionally engaged by the web, gear teeth on the under surface of each of said longitudinal bars, and gear wheels mounted in said spindle, each gear wheel engaging the teeth on each pair of diametrically oppositely disposed longitudinal bars.

7. A turner bar of circular section comprising a central spindle, a series of longitudinal bars surrounding said spindle to present an outer peripheral surface which is adapted to be frictionally engaged by the web and means connecting each pair of diametrically oppositely disposed bars whereby a longitudinal movement of one bar in one direction under the axial component of motion of the web serves simultaneously to cause a longitudinal movement of the diametrically oppositely disposed bar in the opposite direction.

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