

Sept. 29, 1953

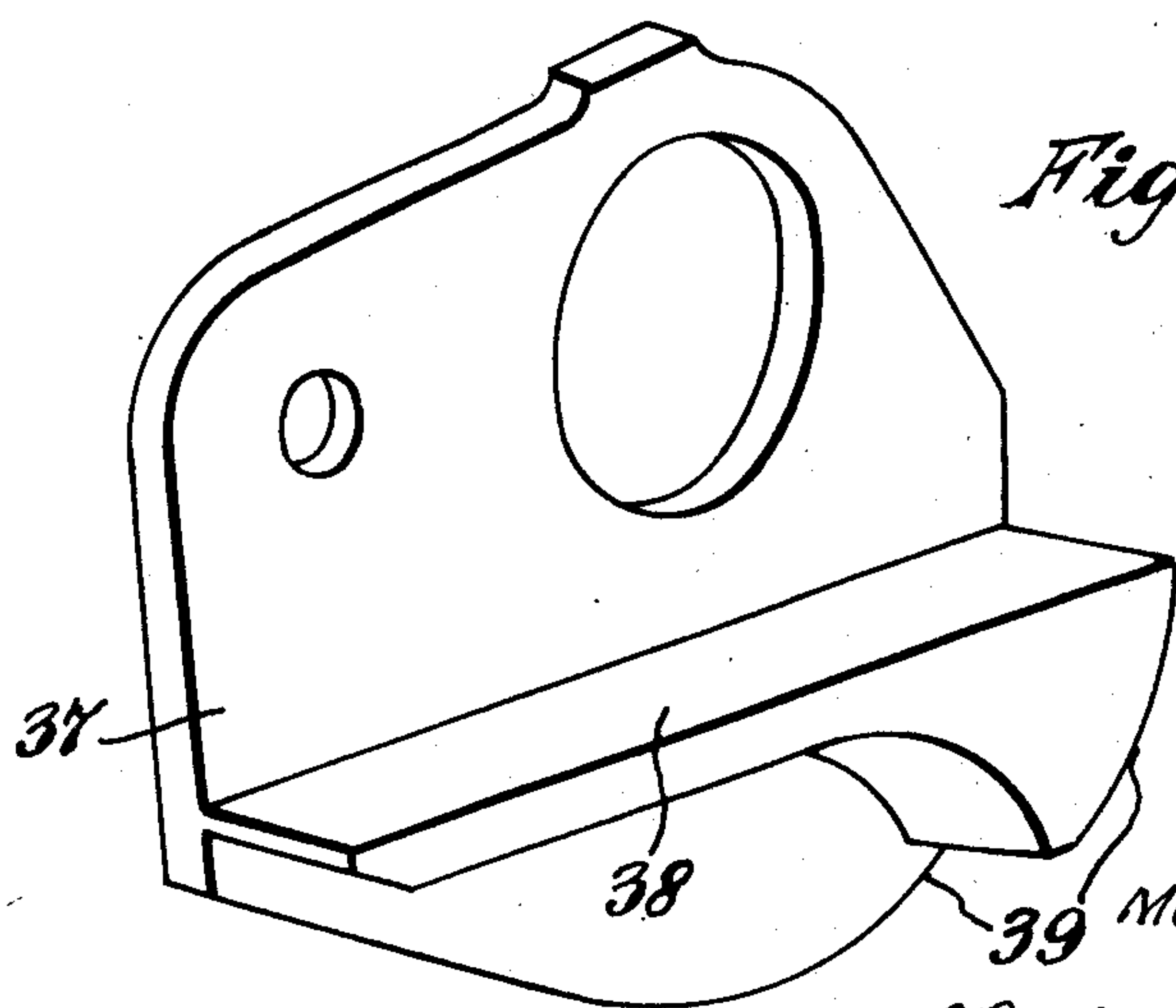
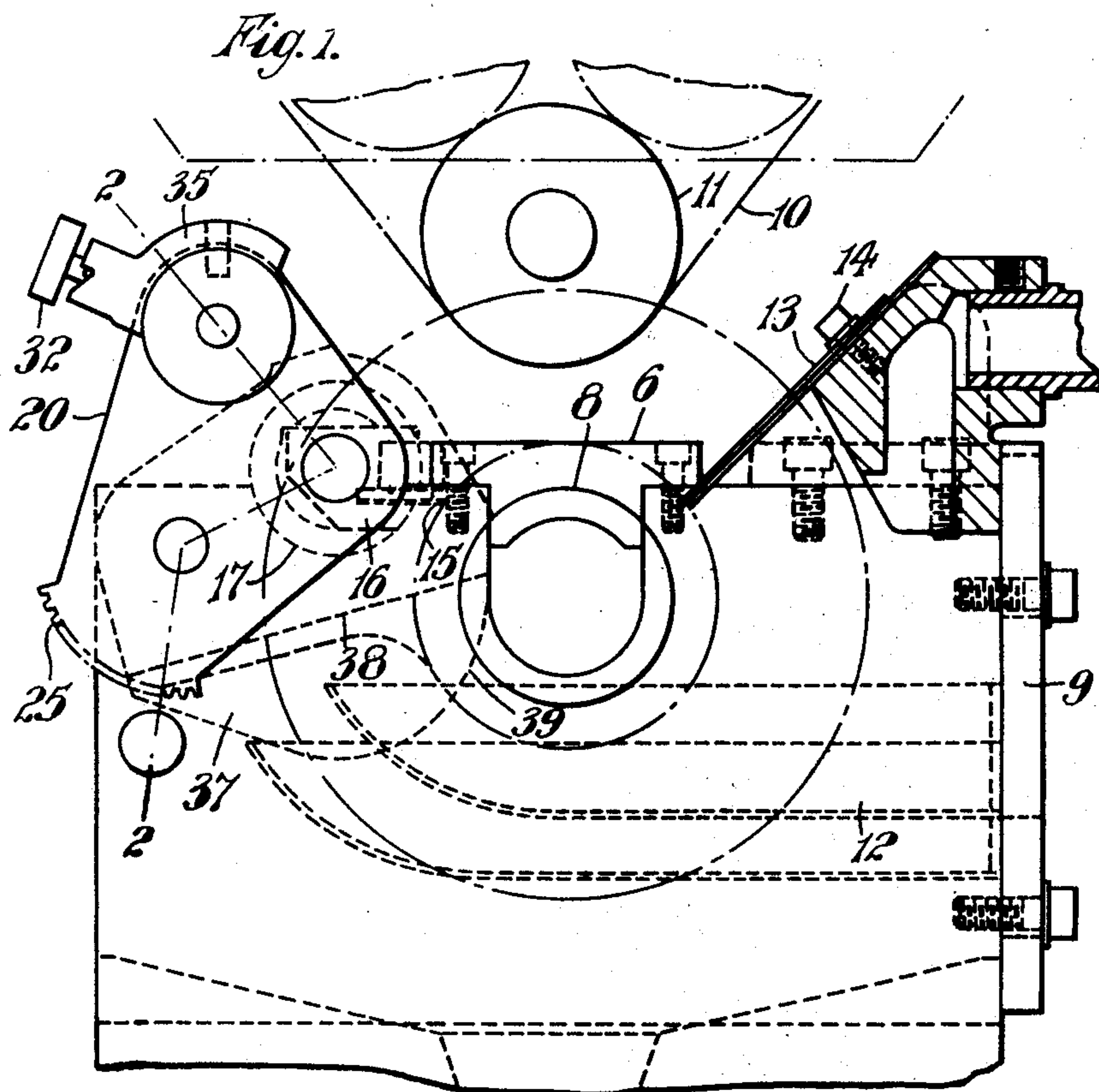
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ROTARY PHOTOGRAVURE PRINTING APPARATUS

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3 Sheets-Sheet 1



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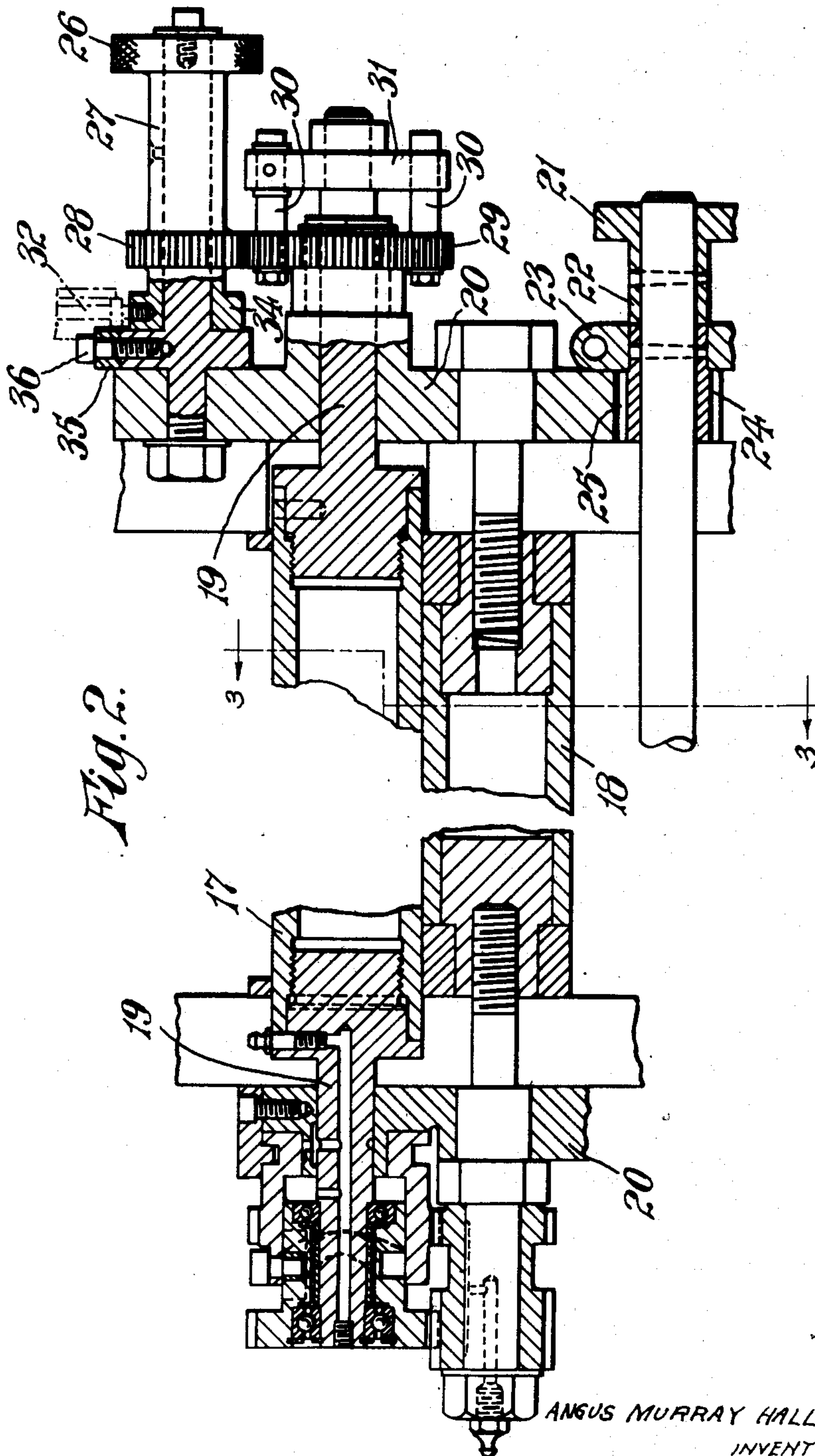
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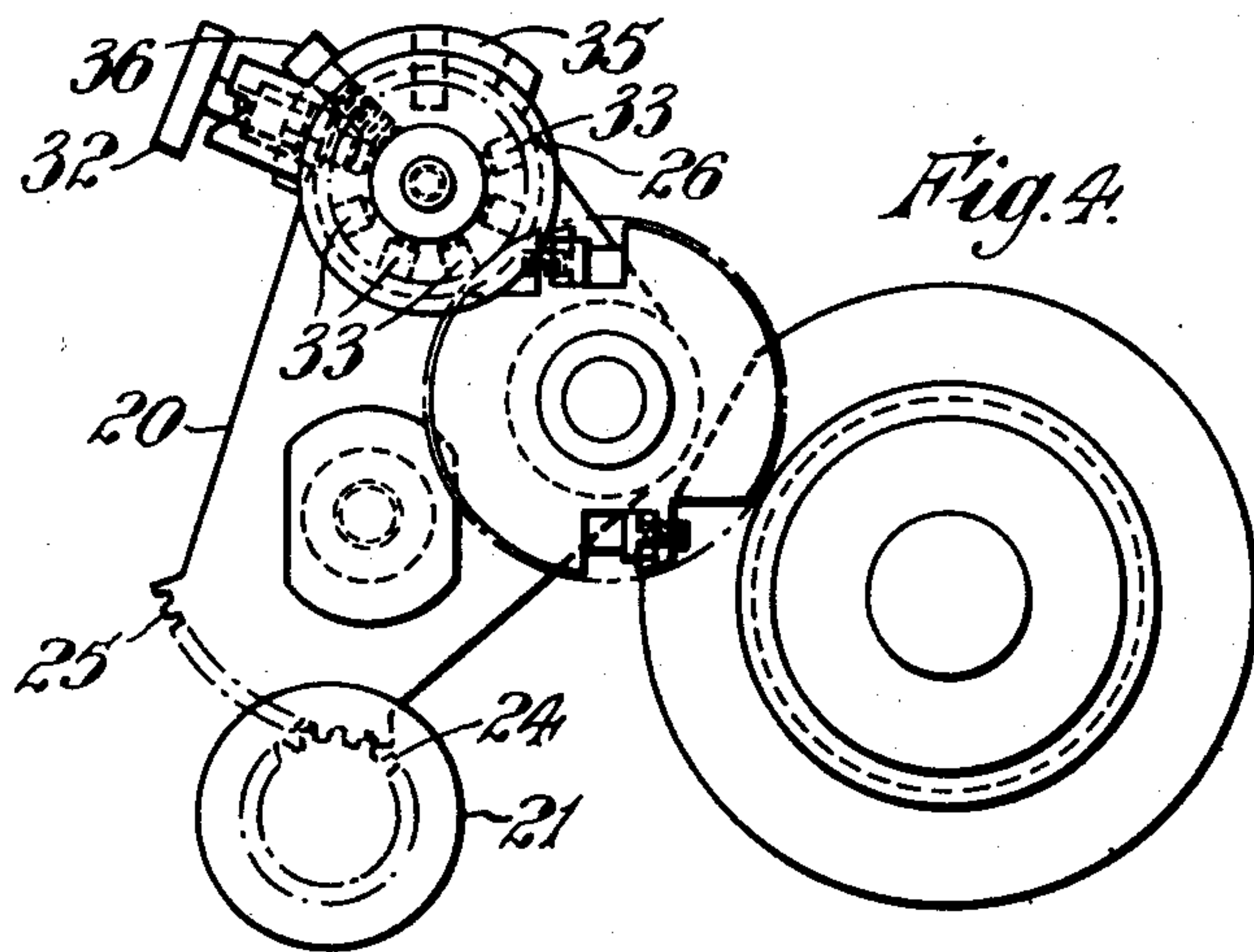
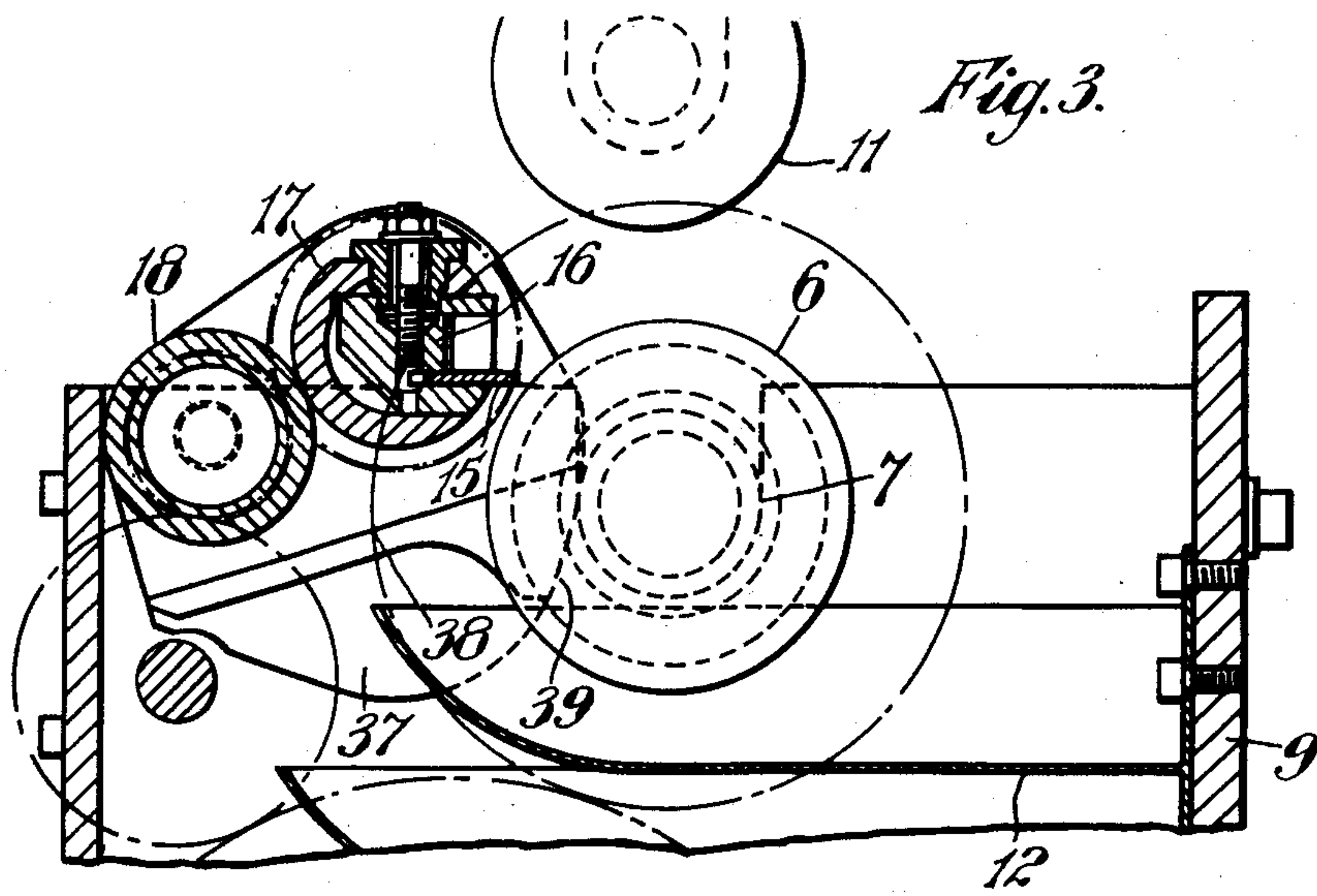
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## UNITED STATES PATENT OFFICE

2,653,535

ROTARY PHOTOGRAVURE PRINTING  
APPARATUSAngus Murray Halley, Moseley, Birmingham,  
EnglandApplication June 29, 1950, Serial No. 171,151  
In Great Britain May 8, 1950

5 Claims. (Cl. 101—157)

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This invention has reference to improvements connected with photogravure printing apparatus and has for its object to provide a means whereby image cylinders of varying diameters can be utilised in the apparatus whilst maintaining a sealing of the cylinder within a casing with only a small segmental proportion of the cylinder projecting out of the casing and thereby obviating the use of a cover over the casing. A further more specific object of the invention is to provide means whereby a doctor blade which is mounted within a casing can be swung away from the image cylinder without breaking a line contact between the said housing and the sealing member.

The invention consists of a rotary photogravure printing apparatus characterised in that the doctor blade is mounted in a housing which has line contact with an arcuate face of a sealing member the centre of curvature whereof is coincident with a pivot axis about which the housing may be rocked; the invention further resides in the provision of means whereby the doctor blade housing which is quasi-cylindrical in form, can be rotated about a longitudinal axis after the manual release of a locking device which admits of the ready re-setting of the housing to the initial position. The invention may further reside in the provision of chutes which substantially fill the spaces between the ends of the image cylinder and the casing therefor, said chutes being rockable with the doctor blade housing about the pivot coincident with the axis of the sealing member and having an arcuate underface struck from said pivot whereby the chutes maintain a constant close contact with the protruding spindle or trunnions of the image cylinder for all settings of the doctor blade housing.

The invention will now be described with particular reference to the accompanying drawings in which:

Fig. 1 is a part sectional end elevation of sufficient of the apparatus for an understanding of the present invention.

Fig. 2 is a longitudinal section taken on the line 2—2 of Fig. 1.

Fig. 3 is a section on the line 3—3 of Fig. 2.

Fig. 4 is an end elevation of a part of the mechanism seen in Fig. 1.

Fig. 5 is a perspective view of the sealing plates and integral ink chutes.

The rotary photogravure printing apparatus illustrated in the drawings is of the kind wherein the image cylinder 6 is provided with trunnions 7 which are mounted in bearings 8 in the end walls of a casing 9 which can be rocked by pneumatic means about a pivot, not shown, so that

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the periphery of the image cylinder 6 contacts the printing medium 10 passing around an impression cylinder 11. The ink, which is of a volatile character, is retained within a tray 12 and into the ink in this tray the lower portion of the periphery of the image cylinder 6 is adapted to dip. It is to be appreciated that in such an apparatus it is a desideratum that a substantial sealing should be maintained around the image cylinder adjacent the upper edge of the casing and the present invention admits of such a sealing whilst also permitting the use of image cylinders of different diameters. To this end mounted at the upper edge of the casing on the one longitudinal side of the image cylinder 6 is a sealing plate 13, preferably of plastic material, which has pin and slot connection at 14 with the casing 9 so as to admit of its setting with its lower longitudinal edge in close contact with the periphery of the image cylinder. The seal on the other longitudinal side of the image cylinder is effected by a doctor blade 15 which is mounted in a carrier 16 in a quasi-cylindrical housing 17, this housing 17 having line contact with a parallel cylindrical sealing member 18 disposed between the housing 17 and the side wall of the casing 9. The ends of the doctor blade housing 17, which are in the form of trunnions 19 and are disposed above the upper edge of the casing 9, are mounted in side plates 20 exterior to the casing 9. These side plates 20 are capable of being rocked about an axis coincident with the longitudinal axis of the cylindrical sealing member 18. Thus it will be seen that if these plates 20 are rocked the doctor blade housing 17 will move around the periphery of the sealing member 18 whilst maintaining line contact therewith for all settings of the doctor blade housing. The rocking of the side plates 20 is effected by means of a knurled hand wheel 21 forming part of a rotatable sleeve 22 surrounded by a clamping ring 23 fixed to the casing 9 and carrying a pinion 24 in mesh with an arcuate toothed rack 25 formed on the lower portion of the side plates 20. This rocking motion admits of the doctor blade housing 17 and contained blade 15 being removed from the image cylinder 6. When the doctor blade housing has been rocked away from the image cylinder 6 and the sealing plate 13 has been removed from contact with the periphery on the opposite side then by removing the upper portions of the bearings 8 the image cylinder can readily be removed from the casing and if desired replaced by an image cylinder of a different diameter. When the image cylinder is replaced by an image cylinder of a different diameter then the angular setting of



the doctor blade 15 relative to the periphery of the image cylinder may be incorrect when again moved into contact therewith, and to admit of a correction the doctor blade housing 17 is rotatable about its own axis and by virtue of its quasi-cylindrical form the line contact with the cylindrical sealing member 18 is not removed. This rotation is effected by means of a knurled hand wheel 26 on a sleeve 27 carrying a pinion 28 in mesh with a pinion 29 rotatable about the trunnions 19 of the doctor blade housing 17. The pinion 29 carries a plurality of pins 30 which engage slots in a disc 31 keyed to the trunnions 19 of the doctor blade housing 17, thus relative movement between the pinion 29 and the disc 31 in an axial direction is permitted to admit of the reciprocation of the doctor blade housing 17 in an axial direction as described in my co-pending application No.171,152 of even date. It will be understood that it is often necessary to remove the doctor blade 15 from the periphery of the image cylinder 6 for cleaning purposes and this can most conveniently be done by rotating the doctor blade housing 17 about its own axis, thus to admit of the ready re-setting of the doctor blade 15 to its initial position there is provided a spring loaded locking plunger 32 which is adapted to co-operate with any one of a series of radial holes 33 formed in an enlargement 34 of the sleeve 27. This plunger is carried by a housing 35 and requires to be withdrawn before the knurled hand wheel 26 can be rotated and by relocating the plunger 32 in the same radial hole 33 the setting of the doctor blade 15 to its initial setting can be ensured. A pin 36 engaging a slot in the housing 35 admits of the housing 35 being set relative to the side plates 28 to provide for settings between adjacent radial holes 33.

Within the casing 9 and moveable with the plates 20 are sealing plates 37 which are formed integral with ink chutes 38 the upper surfaces of which are inclined and extend from a position in close contact with the periphery of the trunnions 7 of the image cylinder 6 downwardly towards a position adjacent a side wall of the casing 9 beneath the cylindrical sealing member 18. These sealing plates and ink chutes fill substantially the spaces between the ends of the image cylinder 6 and the end walls of the casing 9 on that longitudinal side of the image cylinder on which the doctor blade housing 17 is disposed and the excess ink wiped from the periphery of the image cylinder 6 by the doctor blade 15 flows down the inclined chutes 38 to the interior of the casing 9. The sealing plates 37 are rockable with the end plates 20 about the longitudinal axis of the sealing member 18 and to admit of the close contact of the ink chutes 38 with the periphery of the trunnions 7 for all settings of the end plates 20 the ink chutes 38 has an arcuate underface 39 the arc of which is struck from the longitudinal axis of sealing member 18.

I claim:

1. In a rotary photogravure printing apparatus, in combination, a casing, an image cylinder rotatable in bearings in said casing, a sealing member having convex cylindrical face and a portion in sealing engagement with the casing, a quasi-cylindrical doctor blade housing the cylindrical surface of which is in line contact with said cylindrical face, means for rocking said doctor blade housing about an axis coincident with the centre of curvature of the cylindrical face of the sealing member and means for ro-

tating the doctor blade housing about its own longitudinal axis.

2. In a rotary photogravure printing apparatus, in combination, a casing, an image cylinder rotatably mounted in bearings in said casing, a cylindrical sealing member in sealing engagement with the casing, a parallel quasi-cylindrical doctor blade housing the cylindrical surface of which is parallel to and in contact with the sealing member, means for rocking the doctor blade housing about the longitudinal axis of said sealing member so as to maintain line contact therewith and means for rotating the doctor blade housing about its longitudinal axis.

3. In a rotary photogravure printing apparatus, in combination, a casing, an image cylinder rotatably mounted by means of trunnions in bearings in said casing, a sealing member having a convex cylindrical face in sealing engagement with said casing, a doctor blade for contacting the periphery of the image cylinder, a doctor blade housing having a cylindrical surface in line contact with said cylindrical face, ink chutes between the ends of the image cylinder and the casing, said chutes having arcuate under faces in close contact with the trunnions of the image cylinder and struck from an axis coincident with the centre of curvature of the cylindrical face of the sealing member and means for rocking the doctor blade housing together with the ink chutes about an axis coincident with the centre of curvature of the cylindrical face of the sealing member.

4. In a rotary photogravure printing apparatus, in combination, a casing, an image cylinder rotatably mounted by means of trunnions in bearings in said casing, a sealing plate extending across the top of said casing and in close contact with the periphery of the image cylinder on one side of its longitudinal axis, a quasi-cylindrical doctor blade housing carrying a doctor blade in contact with the periphery of the image cylinder on the opposite side of its longitudinal axis, a cylindrical sealing member disposed between a side wall of the casing and said doctor blade housing with which it is in line contact, end plates rockable about the axis of the sealing member and carrying the doctor blade housing, ink chutes between the ends of the image cylinder and the casing rockable with said end plates and having arcuate under faces struck from the axis of the sealing member and in close contact with trunnions of the image cylinder and means for rotating the doctor blade housing about its longitudinal axis.

5. In a rotary photogravure printing apparatus according to claim 4 a locking plunger co-operating with any one of a plurality of holes in a rotatable part of the means for rotating the doctor blade housing about a longitudinal axis.

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