

Feb. 8, 1944.

H. M. BARBER

2,341,202

ROTARY PRINTING PRESS

Filed Feb. 28, 1941

2 Sheets--Sheet 1

Fig. 1.

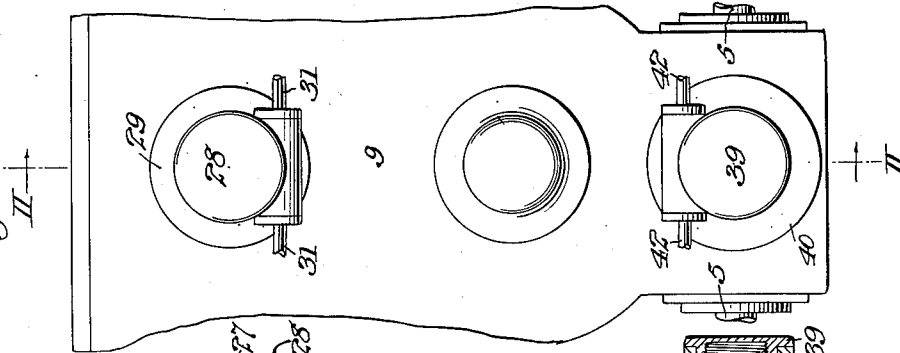
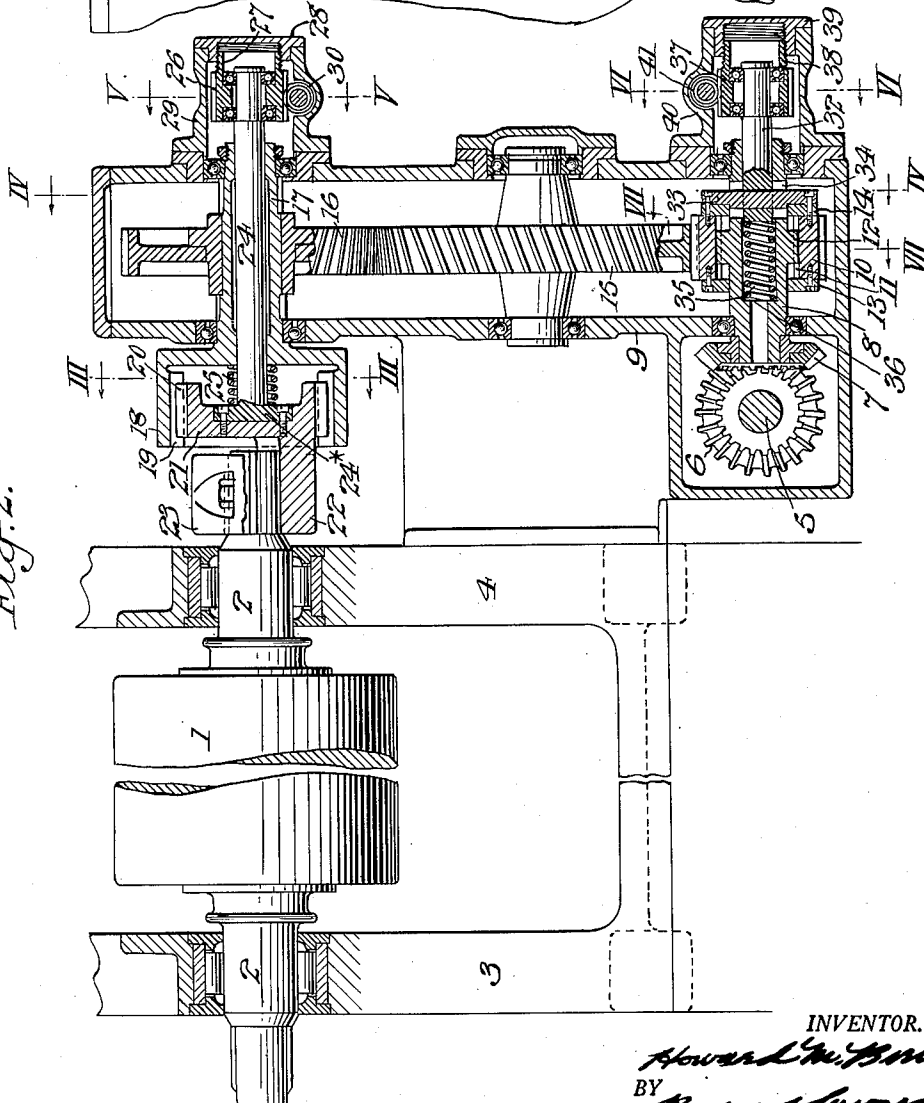


Fig. 2.



INVENTOR.

Howard M. Barber
BY
Brown & Leonard
attys

Feb. 8, 1944.

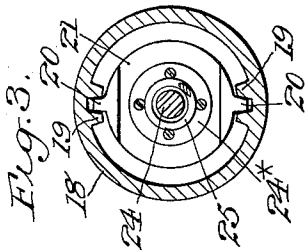
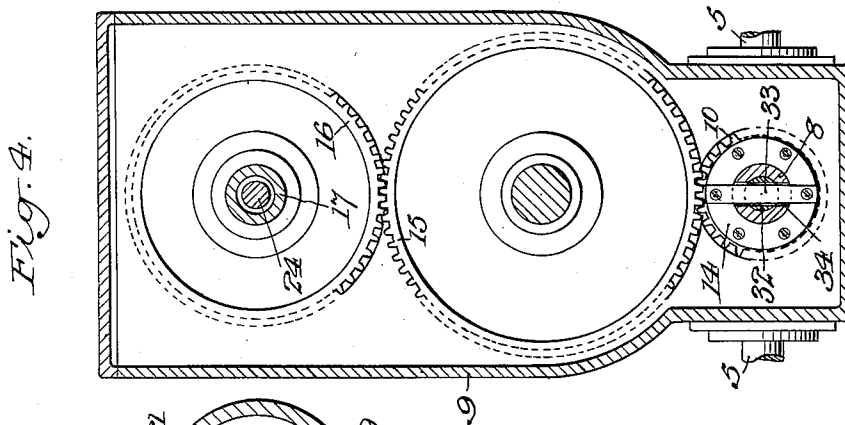
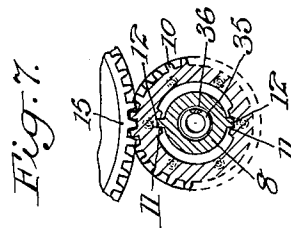
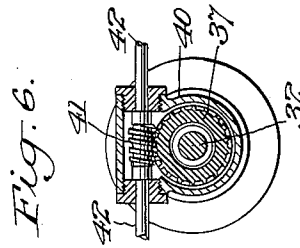
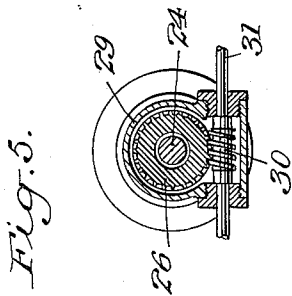
H. M. BARBER

2,341,202

ROTARY PRINTING PRESS

Filed Feb. 28, 1941

2 Sheets-Sheet 2



INVENTOR.
Howard M. Barber
 BY
Howard Edward
attys.

UNITED STATES PATENT OFFICE

2,341,202

ROTARY PRINTING PRESS

Howard M. Barber, Pawcatuck, Conn., assignor to
C. B. Cottrell & Sons Company, Westerly, R. I.,
a corporation of Delaware

Application February 28, 1941, Serial No. 381,031

10 Claims. (Cl. 101-248)

The object of my invention is to provide novel means whereby the form cylinder of a printing unit, particularly the design cylinder of an intaglio printing unit, may be independently adjusted both rotatively with respect to its driving mechanism and in an endwise direction while the press is running or is at rest, so that the form cylinder may be brought into both longitudinal and lateral register easily, accurately, and quickly.

My invention more particularly includes novel manually operated adjusting mechanisms located at the gear side of the press for convenience in manipulation and for simplification in structure.

My invention further includes a flexible connection between the form cylinder and its drive to adjust any misalignment between the form cylinder and its driving shaft.

My invention also includes spring means for eliminating lost motion between the several elements of the drive.

A practical embodiment of my invention is represented in the accompanying drawings, in which

Fig. 1 represents a detail end elevation;

Fig. 2 represents a detail cross section taken in the plane of the line II—II of Fig. 1;

Fig. 3 represents a cross section taken in the plane of the line III—III of Fig. 2;

Fig. 4 represents a cross section taken in the plane of the line IV—IV of Fig. 2;

Fig. 5 represents a cross section taken in the plane of the line V—V of Fig. 2;

Fig. 6 represents a cross section taken in the plane of the line VI—VI of Fig. 2; and

Fig. 7 represents a detail cross section taken in the plane of the line VII—VII of Fig. 2.

The form cylinder is denoted by 1, and it is provided with a shaft 2 mounted for rotary and endwise movement in the sides 3 and 4 of the printing press frame.

The drive for the form cylinder comprises the following elements: The main drive shaft 5 has a bevel gear connection 6, 7 with the lower sleeve 8 which extends through and is mounted for rotary movement in a housing 9. A helical gear 10 is slidably interlocked by an internal and external straight toothed connection 11 and 12 with the rotary sleeve 8, and this gear is centered with respect to said sleeve by end plates 13 and 14 slidable with the gear along the said sleeve.

The helical gear 10 meshes with an intermediate helical gear 15 mounted to rotate in the housing 9. This helical gear 15 in turn meshes with a helical gear 16 fast on a sleeve 17 mounted

to rotate in the housing 9 in substantial alignment with the shaft 2 of the form cylinder 1. This rotary sleeve 17 is provided with a head 18 which is slidably interlocked by an internal and external straight toothed connection 19, 20 with the head 21 of one of the members 22 of a coupling which coacts with the other member 23 to lock the coupling to the shaft 2 of the form cylinder 1.

The means for adjusting the form cylinder 1 in an endwise direction while the press is running or at rest is shown as comprising the following elements: A shaft 24 which is mounted for endwise movement in the bore of the rotary sleeve 17 in substantial alignment with the form cylinder shaft is provided with a head 24* secured to the head 21 of the coupling member 22 to rotate therewith and with the sleeve 17. The sliding interlocked connection between the head 18 of the sleeve 17 and the head 21 of the coupling takes care of any slight misalignment between the shaft 24 and form cylinder shaft 2. A spring 25 is interposed between the opposite faces of the heads 18 and 24* of the rotary sleeve 17 and shaft 24 respectively to take up all lost motion between the sleeve and shaft.

A worm gear 26 is rotatably mounted on the shaft 24 and it is locked against endwise movement thereon, which worm gear has an exteriorly screw-threaded hub 27 which engages an interiorly screw-threaded cap 28 carried by an extension 29 of the housing 9. A worm 30 which is rotatably mounted in the extension 29 meshes with the worm gear 26 and a handle or wheel (not shown) may be used for turning the worm shaft 31 to rotate the worm gear to adjust the shaft 24 endwise through the screw-threaded engagement of the hub of the worm gear 26 with the cap 28. This endwise movement of the shaft 24 will act through the coupling to cause an endwise adjustment of the form cylinder shaft 2.

The means for adjusting the form cylinder rotatively while the press is running or at rest is shown as comprising the following elements: A short shaft 32 is mounted for endwise movement in the bore of the sleeve 8 which is driven by the main drive shaft 5. A cross pin 33 which is secured to the helical gear 10 extends through the shaft 32 and through the elongated slots 34 in the sleeve 8 to interlock the gear and shaft. A spring 35 is interposed between the inner end of the shaft 32 and an annular interior shoulder 36 of the sleeve 8 to take up all lost motion between the shaft and sleeve. A worm gear 37 is rotatably mounted on the shaft 32 and it is locked

against endwise movement thereon. This worm gear is also locked against endwise movement with respect to the helical gear 10 through the cross pin 33. This worm gear has an exteriorly screw-threaded hub 38 which engages an interiorly screw-threaded cap 39 carried by an extension 40 of the housing 9.

A worm 41 which is rotatably mounted in the extension 40 meshes with the worm gear 37 and a handle or wheel (not shown) may be used for turning the worm shaft 42 to rotate the worm gear 37 to adjust the shaft 32 and thereby the helical gear 10 endwise. This endwise adjustment of the helical gear 10 across its meshing intermediate helical gear 15 will change the relative relationship between the form cylinder and drive shaft and thereby rotatively adjust the form cylinder 1 with respect to its drive.

It will thus be seen that the devices for adjusting the form cylinder endwise and rotatively are both located on the gear side of the press and that they may be independently used whether the press be running or is at rest. This arrangement and the provision of the coupling between the form cylinder shaft and upper sleeve shaft permits the ready removal and replacement of the form cylinder without in any way disturbing the drive or the adjusting devices.

It is evident that various changes may be resorted to in the construction, form and arrangement of the several parts without departing from the spirit and scope of my invention, and hence I do not intend to be limited to the particular embodiment herein shown and described, but what I claim is:

1. In a rotary printing press, a form cylinder, two rotary sleeves, shafts slidably interlocked to their respective sleeves, means for coupling one of the shafts to the form cylinder, gearing connecting the two sleeves and including a helical gear locked to the other shaft and slidably interlocked with its sleeve, a device for sliding the coupled shaft to adjust the form cylinder endwise and an independent device for sliding the other shaft to adjust the form cylinder rotatively.

2. In a rotary printing press, a form cylinder, two rotary sleeves, shafts slidably interlocked to their respective sleeves, means for coupling one of the shafts to the form cylinder, gearing connecting the two sleeves and including a helical gear locked to the other shaft and slidably interlocked with its sleeve, a device for sliding the coupled shaft to adjust the form cylinder endwise and an independent device for sliding the other shaft to adjust the form cylinder rotatively, and spring means for taking up the lost motion between the sleeves and their respective shafts.

3. In a rotary printing press, a form cylinder, two rotary sleeves, shafts slidably interlocked to their respective sleeves, means for coupling one of the shafts to the form cylinder, gearing connecting the two sleeves and including a helical gear locked to the other shaft and slidably interlocked with its sleeve, a device for sliding the coupled shaft to adjust the form cylinder endwise and an independent device for sliding the other shaft to adjust the form cylinder rotatively, and means for centering the helical gear with respect to its sleeve.

4. In a rotary printing press, a form cylinder, two rotary sleeves, shafts slidably interlocked to their respective sleeves, means for coupling one of the shafts to the form cylinder, gearing connecting the two sleeves and including a helical gear locked to the other shaft and slidably in-

terlocked with its sleeve, a device for sliding the coupled shaft to adjust the form cylinder endwise and an independent device for sliding the other shaft to adjust the form cylinder rotatively, spring means for taking up lost motion between the sleeves and their respective shafts and means for centering the helical gear with respect to its sleeve.

5. In a rotary printing press, a form cylinder, two rotary sleeves, shafts slidably interlocked to their respective sleeves, means for coupling one of the shafts to the form cylinder, gearing connecting the two sleeves and including a helical gear locked to the other shaft and slidably interlocked with its sleeve, a fixed support, worm gears rotatably mounted on the shafts for endwise movement therewith and having screw-threaded engagements with said fixed support, a worm for turning the worm gear on the coupled shaft to slide said shaft for adjusting the form cylinder endwise and a worm for turning the worm gear on the other shaft for adjusting the form cylinder rotatively.

6. In a rotary printing press, a form cylinder, its shaft, an upper rotary sleeve, a shaft slidable endwise therein, a coupling locking the sleeve shaft to the form cylinder shaft and slidably interlocked with said sleeve, a lower rotary sleeve, a shaft slidably interlocked therein, gearing connecting the two sleeves and including a helical gear locked to the last named shaft and slidably interlocked with its sleeve, a device for sliding the first named sleeve shaft to adjust the form cylinder endwise and an independent device for sliding the last named sleeve shaft to adjust the form cylinder rotatively.

7. In a rotary printing press, a form cylinder, its shaft, an upper rotary sleeve, a shaft slidable endwise therein, a coupling locking the sleeve shaft to the form cylinder shaft and slidably interlocked with said sleeve, a lower rotary sleeve, a shaft slidably interlocked therein, gearing connecting the two sleeves and including a helical gear locked to the last named shaft and slidably interlocked with its sleeve, a device for sliding the first named sleeve shaft to adjust the form cylinder endwise and an independent device for sliding the last named sleeve shaft to adjust the form cylinder rotatively, and means for centering the helical gear with respect to its sleeve.

8. In a rotary printing press, a form cylinder, its shaft, an upper rotary sleeve, a shaft slidable endwise therein, a coupling locking the sleeve shaft to the form cylinder shaft and slidably interlocked with said sleeve, a lower rotary sleeve, a shaft slidably interlocked therein, gearing connecting the two sleeves and including a helical gear locked to the last named shaft and slidably interlocked with its sleeve, a device for sliding the first named sleeve shaft to adjust the form cylinder endwise and an independent device for sliding the last named sleeve shaft to adjust the form cylinder rotatively, and means for centering the helical gear with respect to its sleeve, said centering means including end plates carried by the helical gear and slidable on the sleeve.

9. In a rotary printing press, a form cylinder, its shaft, a housing, an upper sleeve mounted to rotate therein, a shaft slidable endwise in the sleeve, a coupling for locking the upper sleeve shaft to the form cylinder shaft and slidably interlocked with said upper sleeve, a lower sleeve rotatably mounted in the housing, means for

driving said lower sleeve, a shaft slidably interlocked with the lower sleeve, gearing connecting the upper and lower sleeves and including a helical gear locked to said lower shaft and slidably interlocked with the lower sleeve, a device for sliding said upper sleeve shaft to adjust the form cylinder endwise, and an independent device for sliding said lower sleeve shaft to adjust the form cylinder rotatively.

10. In a rotary printing press, a form cylinder, its shaft, a housing, an upper sleeve mounted to rotate therein, a shaft slidable endwise in the sleeve, a coupling for locking the upper sleeve shaft to the form cylinder shaft and slidably interlocked with said upper sleeve, a lower sleeve rotatably mounted in the housing, means for driving said lower sleeve, a shaft slidably inter-

locked with the lower sleeve, gearing connecting the upper and lower sleeves and including a helical gear locked to said lower shaft and slidably interlocked with the lower sleeve, a device for sliding said upper sleeve shaft to adjust the form cylinder endwise, and an independent device for sliding said lower sleeve shaft to adjust the form cylinder rotatively, said adjusting devices including housing extensions, worm gears rotatably mounted on their respective sleeve shafts for endwise movement therewith and having screw-threaded engagements with their respective extensions, and worms carried by said extensions for independently turning their worm gears.

HOWARD M. BARBER.