Sept. 30, 1941. E. K. JOHANSEN 2,257,383

PRESS

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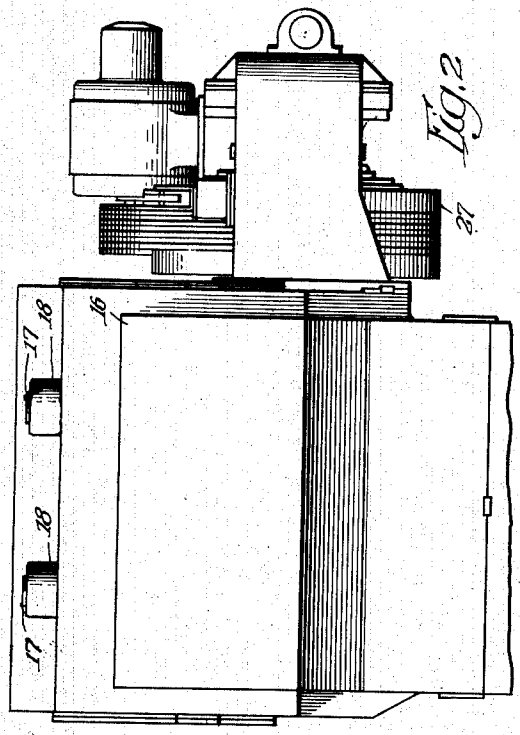


Fig. 2

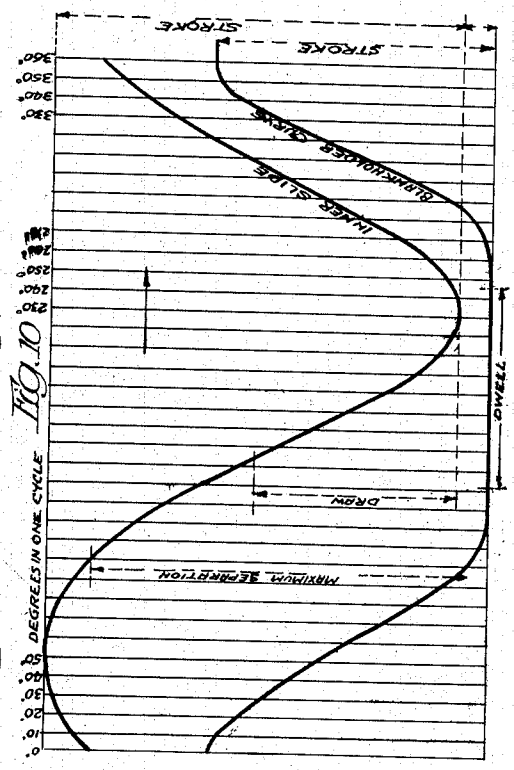


Fig. 10

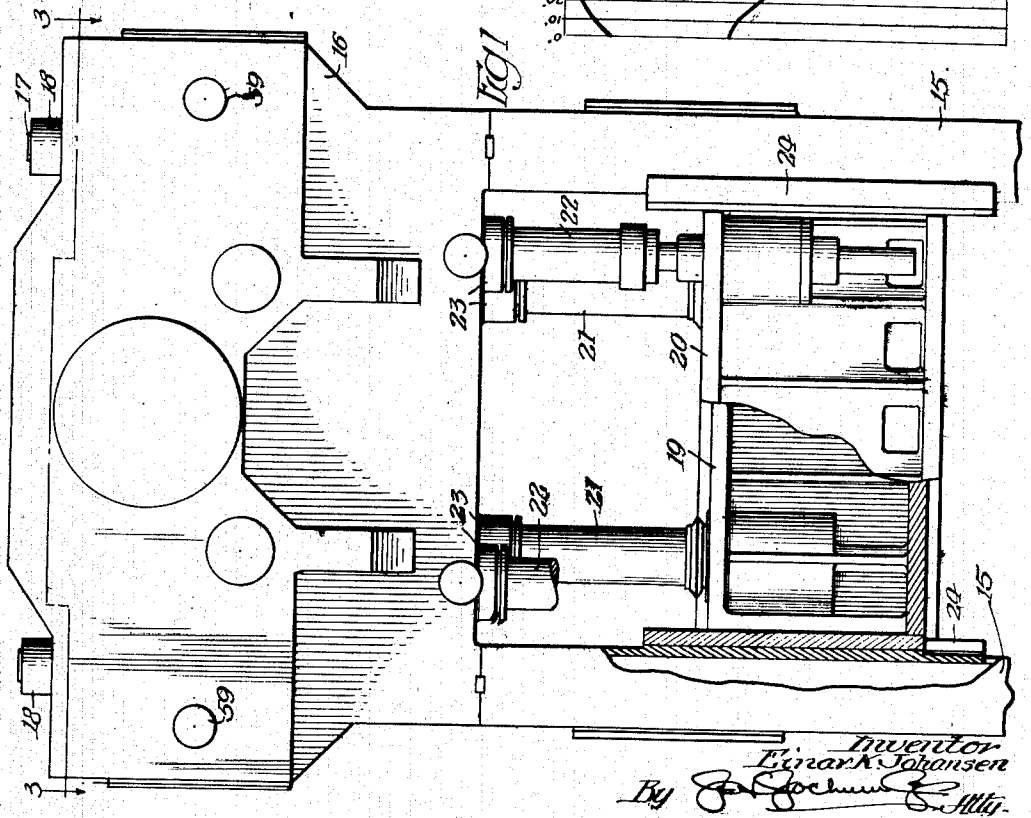


Fig. 1

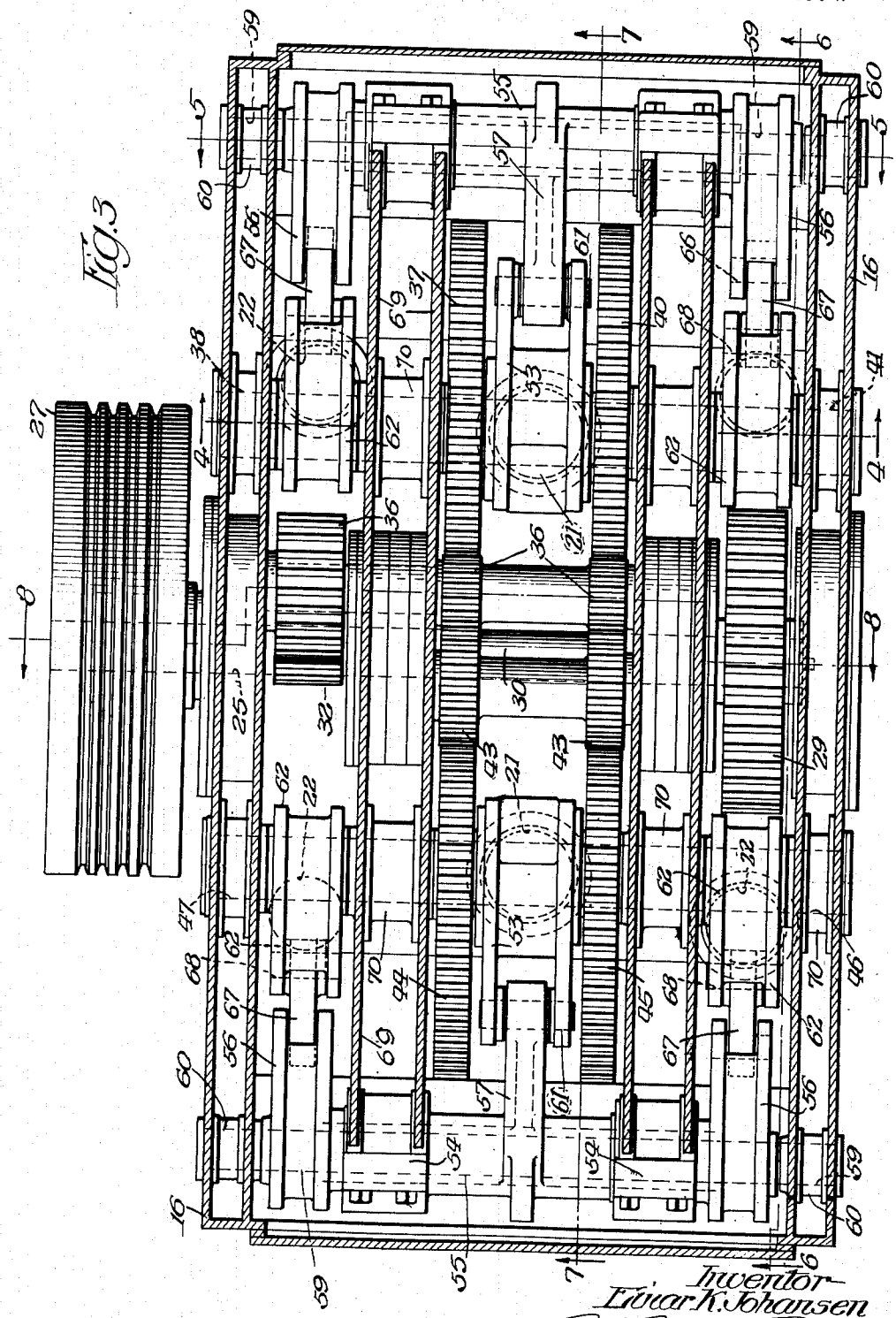
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FIG. 3



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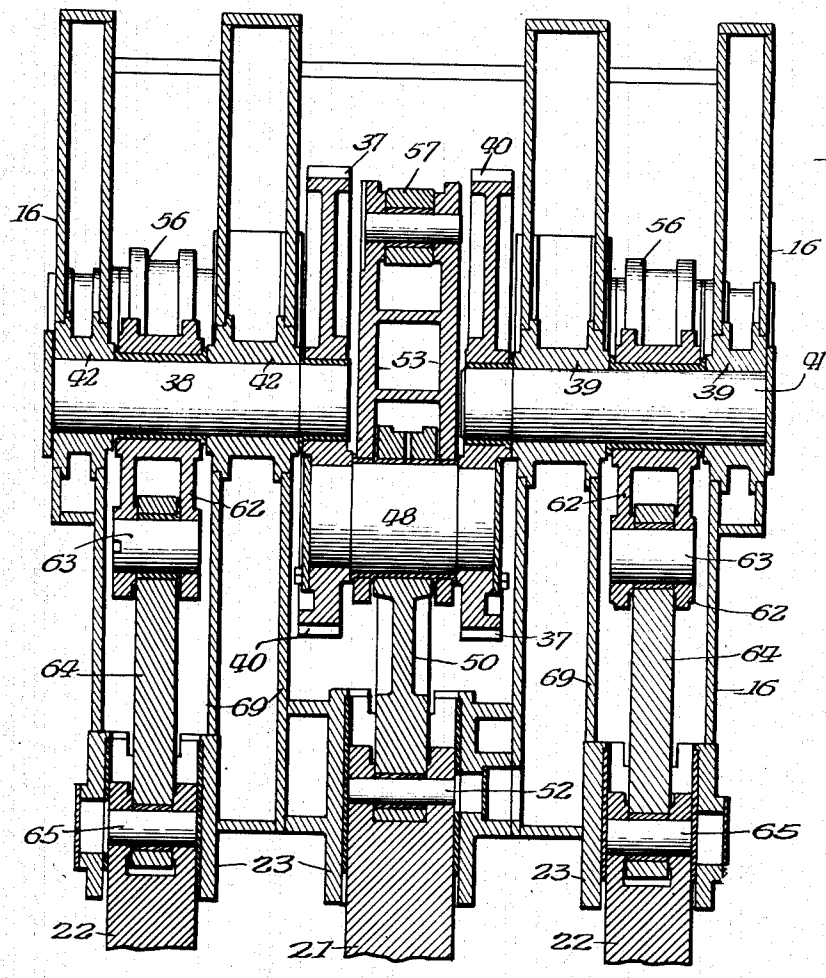
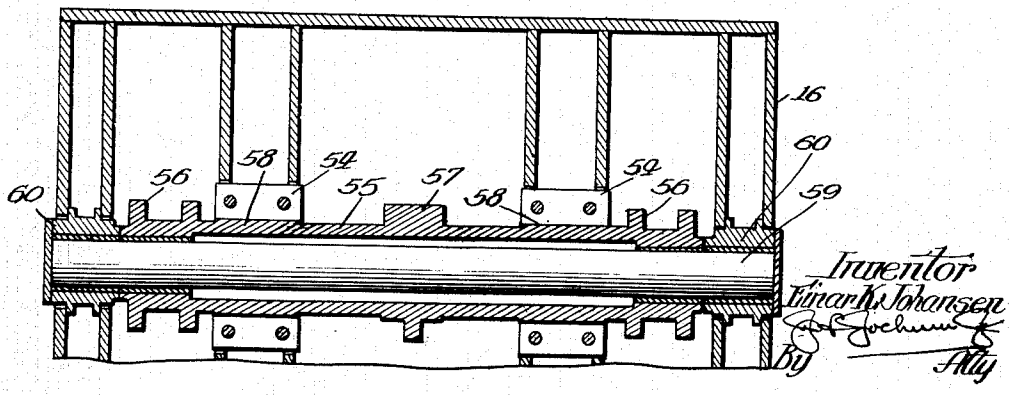


Fig. 4

Fig. 5



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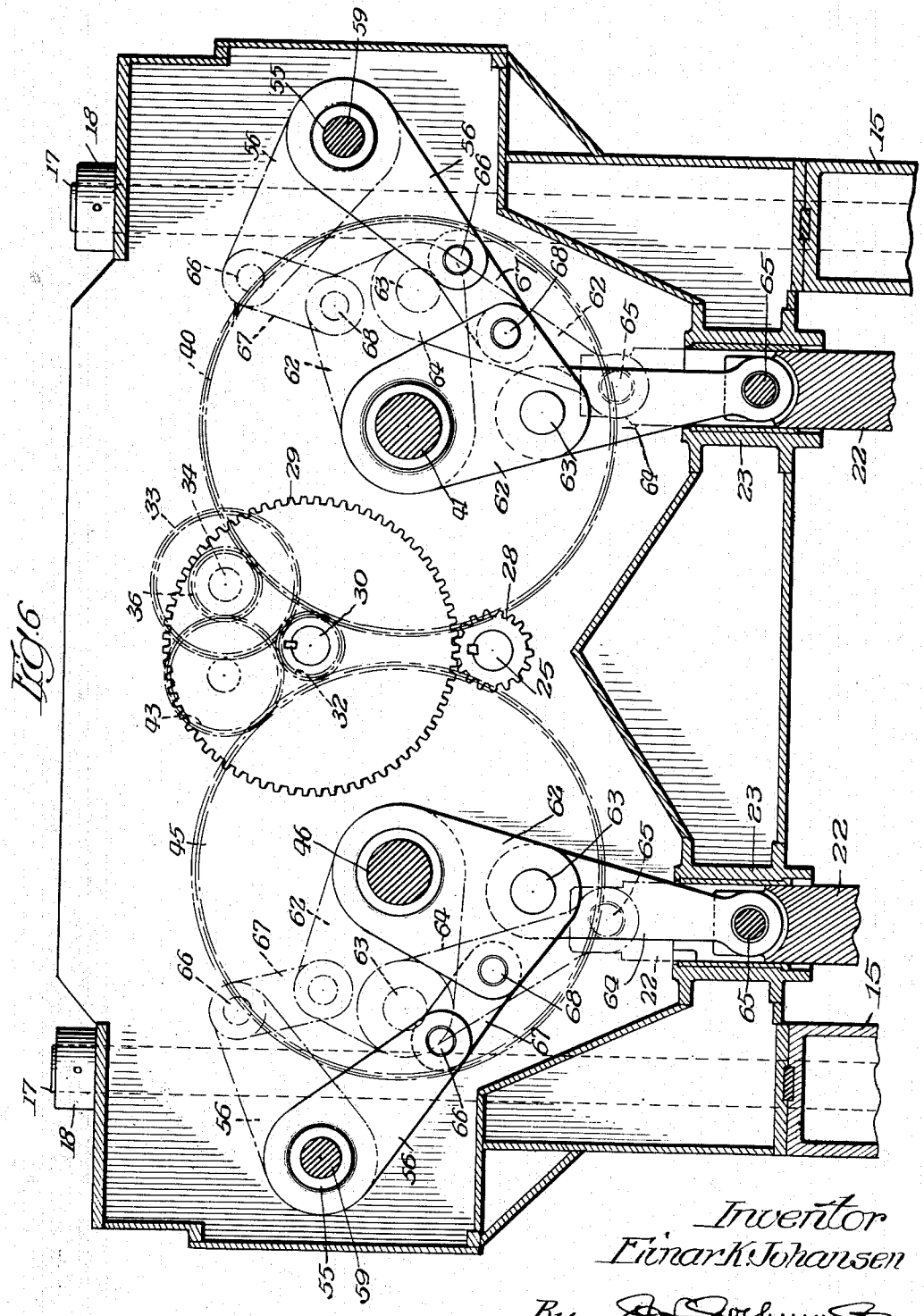


FIG. 6

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PRESS

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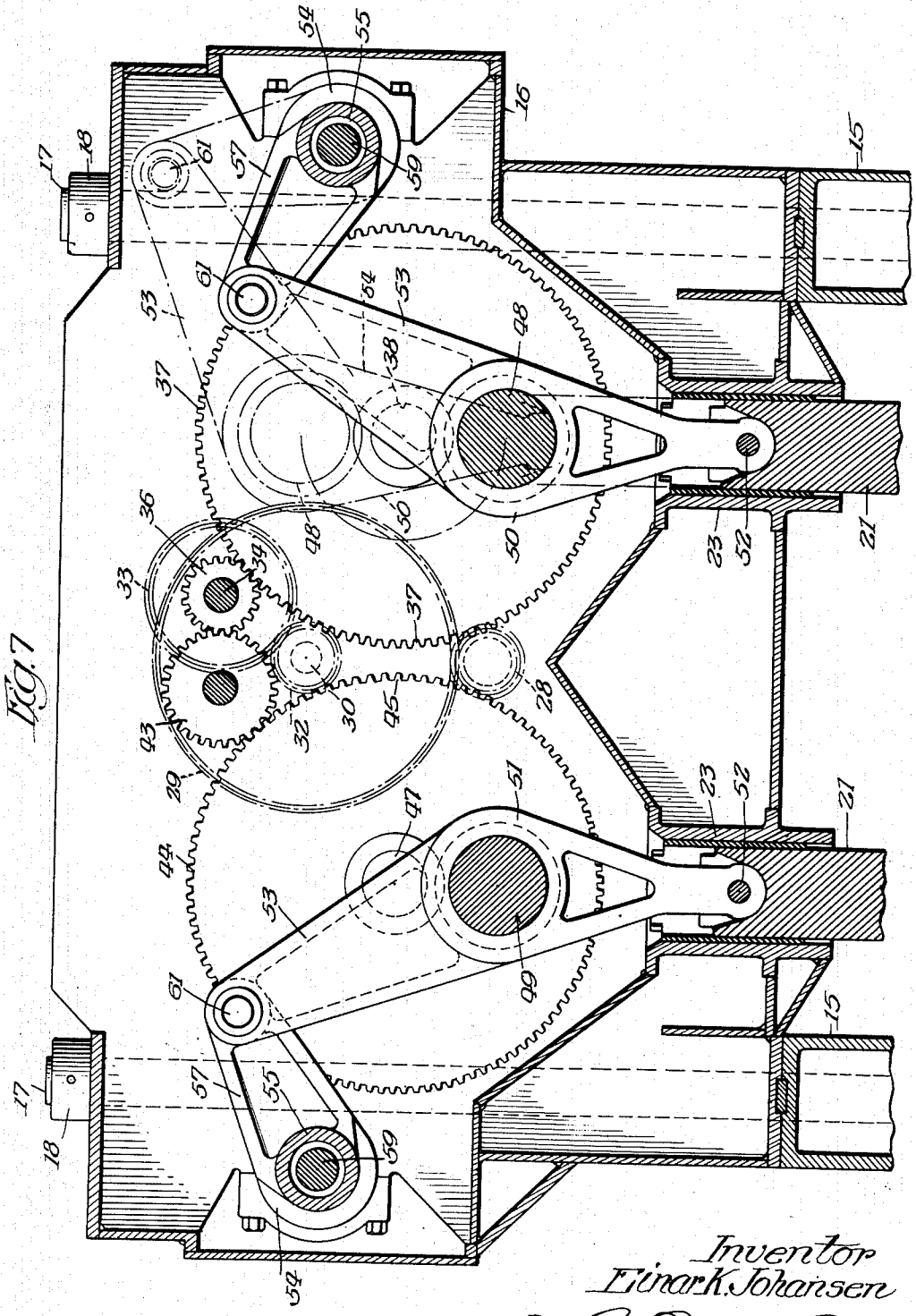


FIG. 7

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Fig. 8

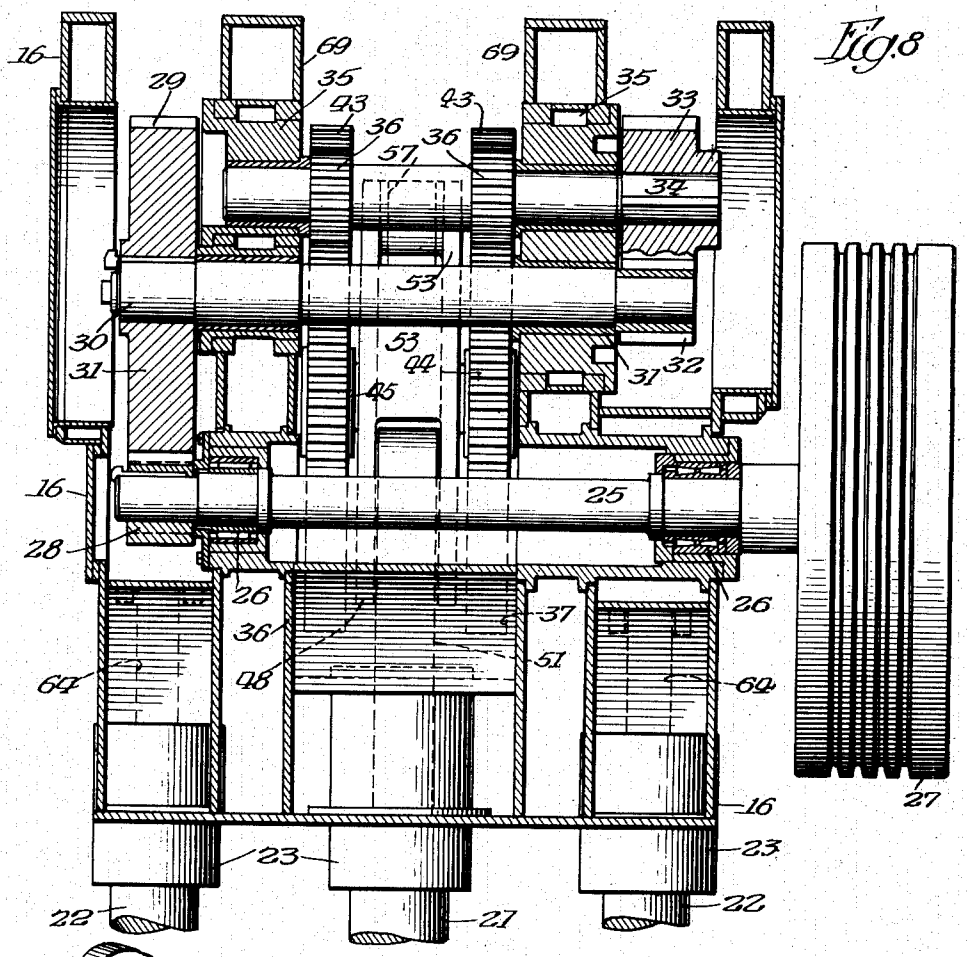
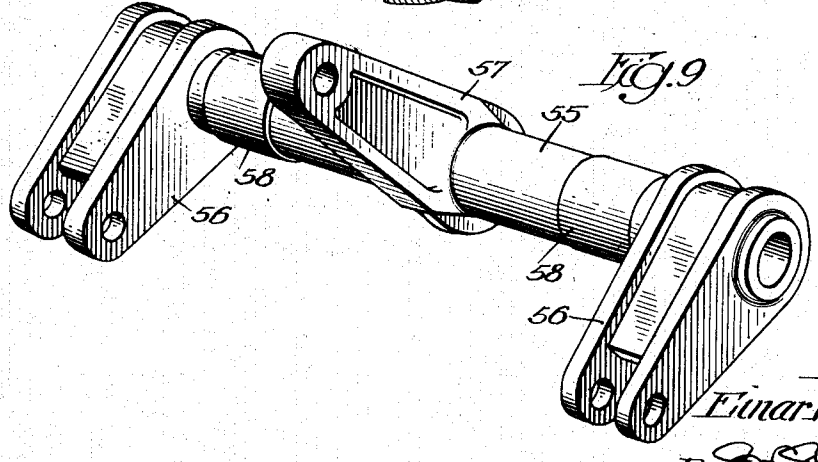


Fig. 9



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Patented Sept. 30, 1941

2,257,383

UNITED STATES PATENT OFFICE

2,257,383

PRESS

Einar K. Johansen, Chicago, Ill., assignor to Clearing Machine Corporation, Clearing, Ill., a corporation of Illinois

Application December 10, 1938, Serial No. 244,949

6 Claims. (Cl. 113—38)

This invention relates to improvements in presses particularly adapted, though not necessarily limited to that type of press in which there is provided several slides, one of which is operable as a blank or work holder.

In presses of this character it is advantageous to provide a degree of dwell in the blank or work holder while it is gripping or holding the work and while another slide is performing its work.

Heretofore the operating mechanism for the slides has been driven from separate cranks usually offset one with respect to the other with the result that a large number of cranks and links have been necessary, in addition to which the crown of the press in which the links and cranks are located has been of a large and wide construction to accommodate all of these parts.

It is one of the objects of the present invention to provide a press of this character in which the dwell of the blank or work holding slide will be produced with a small number of links, and the crank which operates one of the slides will also operate the other slide, thereby not only resulting in a reduction in the size or width of the press but also in a reduction in the cost of manufacture.

A further object is to provide in a press of this character a construction of slide operating mechanism in which the same pin or shaft will act as a pivot about which the gears that operate both the inner and outer slides will rotate, and which pins or shafts serve as pivot points for the rocker members which actuate the outer slide.

Furthermore, with such a construction and arrangement of slide actuating mechanism no connections or crossbars will be required between the side members and the press frame, and the press may be constructed in any desired size or width by moving back the pivot points of the respective parts.

With a press of this construction the number of rocker members or toggles will be reduced and the toggles and rocker members for the inner slide will be disposed between the actuating gears, resulting in a more compact construction and a narrower press.

To the attainment of these ends and the accomplishment of other new and useful objects as will appear, the invention consists in the features of novelty in substantially the construction, combination and arrangement of the several parts hereinafter more fully described and claimed and shown in the accompanying drawings illustrating this invention, and in which

Figure 1 is a front elevation partly broken away and parts omitted of the upper portion of a press of this character constructed in accordance with the principles of this invention.

Figure 2 is a detail end elevation of a portion of the press shown in Figure 1, with parts omitted.

Figure 3 is a horizontal sectional view taken on line 3—3 of Figure 1, on an enlarged scale.

Figure 4 is a vertical sectional view taken on line 4—4 Figure 3.

Figure 5 is a detail sectional view taken on line 5—5 Figure 3.

Figure 6 is a detail vertical sectional view taken on line 6—6 Figure 3.

Figure 7 is a detail vertical sectional view taken on line 7—7 Figure 3.

Figure 8 is a detail vertical sectional view taken on line 8—8 Figure 3.

Figure 9 is a detail perspective view of one of the rocker members.

Figure 10 is a cyclograph of the movement of the two slides showing the extended or long period of dwell obtained in the slides.

In the present exemplification of this invention the press frame consists essentially of a bed (not shown), side members 15 projecting above the bed, and a hollow crown, 16, all of which parts may be secured together in any desired or suitable manner, here shown as being fastened by means of tie rods 17 and nuts or collars 18.

In the crown is arranged the operating mechanisms for the inner slide 19 and the outer slide 20, these slides being connected with their actuating mechanisms respectively by means of the adjustable connecting members 21—22 that move through suitable guides 23 that are preferably supported by the crown and which guides serve as a means to relieve the guideways 24 of the outer slide 20 and the guideways of the inner slide 19 against lateral stress which would be exerted thereupon by the actuating mechanism.

Motion is imparted to the slide driving mechanism from a shaft 25 journaled in suitable bearings 26 in the crown and this shaft is in turn driven from any suitable source of power through the medium of a drive pulley 27 connected to the shaft.

The shaft 25 extends across the crown and provided on one end thereof to rotate therewith is a gear 28 which meshes with a gear 29 that is connected to a shaft 30 for rotation therewith. The shaft 30 is journaled in suitable bearings 31

and also extends across the crown. On the end of the shaft 30 opposite the end to which the gear 29 is secured, is a pinion gear 32 which in turn meshes with a gear 33 carried by a shaft 34 for rotation therewith. This shaft 34 is journaled in suitable bearings 35 and extends transversely of the crown and parallel to the shaft 30.

Carried by the shaft 34 for rotation therewith are spaced but connected gears 36 one of which meshes with a large gear 37 that is mounted for rotation upon a shaft 38. This shaft 38 is suitably supported by bearings 39 and extends only partially across the crown and is parallel with the drive shaft 25.

The other of the spaced gears 36 meshes with another gear 40 that is mounted to rotate upon a shaft 41 suitably supported by bearings 42. The shafts 38 and 41 are arranged in alinement but are spaced from each other, and the axes of the gears 37—40 are also in alinement, the gears themselves being laterally spaced.

The gears 36 also mesh respectively with idle gears 43 and these idle gears in turn respectively mesh with large gears 44—45, the latter being mounted upon shafts 46—47. The shafts 46—47 are supported by suitable bearings, are arranged in alinement and terminate short of each other similar to the shafts 38—41 so that the gears 44—45 supported thereby will also be laterally spaced and will be in alinement respectively with the gears 37—40.

Thus it will be seen that when the shaft 25 is rotated the gears 37—40—44 and 45 will also be rotated.

The gears 37—40 are connected together to rotate in unison by means of a shaft 48 (see particularly Figure 4) which extends across the space between the gears and the connecting shaft 48 is arranged eccentric to the shafts 38—41 while the gears 44—45 are connected for rotation in unison by a similar shaft 49 extending across the space between the gears and being arranged eccentric to the shafts 46—47.

Mounted upon the shafts 48—49 and for oscillatory movement with respect thereto is a member 50 and a similar member 51 is mounted upon the shaft 49 and these members 50—51 are pivotally connected as at 52 with the respective members 21 that are in turn connected with the inner slide 19 so that upon rotation of the gears 37—45 the eccentric shafts 48—49 will be rotated respectively about the shafts 38—47 to cause a reciprocation of the inner slide 19.

Mounted also upon each of the shafts 48—49 are arms 53 and the arms 53 together with the members 50—51 are disposed respectively in the spaces between the gears 37—40 and 44—45.

Mounted in suitable bearings in the crown, as at 54, one on each side of the press, are rock shafts 55 (see particularly Figures 7 and 9) each of which is provided at its ends with crank arms 56 and also at a point intermediate its length with a crank arm 57. The rock shaft 55 is preferably provided with portions 58 which are of a diameter slightly larger than the remaining portion of the shaft to form portions which are journaled in the bearings 54. These rock shafts 55 are each mounted upon a shaft 59 about which they rock and which shaft 59 is secured in bearings 60. The arm 57 of the rock shaft 55 is pivotally connected, as at 61, with the arm 53 on the respective side of the press so that as the shafts 47—38 are rotated causing the eccentric shafts 48—49 to rotate about the respective shafts 38—47, the arm 53 will rock the shaft 55 through the medium of the arm 57.

Pivotally mounted upon each of the shafts 46—38 at the opposite sides of the frame and adjacent each of the members 22 that are connected with the slide 20, is another rocker member 62, in the present exemplification of this invention four of such members being employed.

Pivotally connected, as at 63, to each of these rocker members 62 is a link or connecting member 64 which in turn is pivotally connected, as at 65, to one of the members 22 that is connected to the outer slide 20.

To the free end of each of the arms 56 of each of the rock shafts 55 is pivotally connected, as at 66, a link 67, the other end of the link being pivotally connected, as at 68, to the respective rocker member 62.

With this construction and when the shaft 55 is rocked, the rocker member 62 will also be rocked about the respective supporting shaft and the parts will be moved from the full line position shown in Figure 6 to the dotted line position in said figure and then back to the full line position again, thus imparting a reciprocatory movement to the outer slide 20.

Thus it will be seen that the driving means for operating the inner slide are driven by a pair of gears between which the actuating mechanism is arranged, and the actuating mechanisms for the outer slides are connected with the same members which operate the inner slide, thereby not only producing the necessary or desired period of dwell in the outer slide, but resulting in a construction of machine in which the number of parts have been materially reduced and which machine will be of a much more compact arrangement.

Furthermore, with the present construction it is not necessary to provide separate cranks offset with respect to each other as in the present invention the same pivots about which the larger driving gears rotate serve as pivots about which the rocking members which actuate the outer slides operate.

All of the operating mechanism for the slides is housed within the crown of the press which latter is preferably constructed in the form of a receptacle for containing a lubricant in which this mechanism is immersed.

Partitions 69 are provided in the crown to form supports for the shafts and through which the shafts pass, spacing member 70 being also provided, where necessary or desirable, between the partitions and the walls of the crown of the press. These partitions may be hollow or of any other desirable formation.

While the preferred form of the invention has been herein shown and described, it is to be understood that various changes may be made in the details of construction and in the combination and arrangement of the several parts, within the scope of the claims, without departing from the spirit of this invention.

What is claimed as new is:

1. In a drawing press, two slides, a pair of longitudinally spaced and alined shafts, a gear of comparatively large diameter rotatably supported by each of the adjacent ends of said shafts, said gears being laterally spaced, a shaft secured to said gears and extending across the space therebetween, the last said shaft being eccentric to the axes of the gears, a link connection between the last said shaft and one of said slides, a rocker shaft spaced from and parallel

with all of the aforesaid shafts, a rocker member oscillatably mounted upon the gear supporting shaft, a link connection between said rocker member and the other of said slides, a link connection between said rocker member and said rocker shaft, and a link connected to said rocker shaft and also directly with the said connecting shaft between the gears whereby both the inner slide and the outer slide will be directly operated by the said connecting shaft between said gears.

2. In a drawing press, two slides, a pair of longitudinally spaced and alined shafts, a gear of comparatively large diameter rotatably supported by each of the adjacent ends of said shafts, said gears being laterally spaced, a shaft secured to said gears and extending across the space therebetween, the last said shaft being eccentric to the axes of the gears, a link connection between the last said shaft and one of said slides, a rocker shaft spaced from and parallel with all of the aforesaid shafts, a rocker member oscillatably mounted upon the gear supporting shaft, a link connection between said rocker member and the other of said slides, a link connection between said rocker member and said rocker shaft, and a link connected to said rocker shaft and also directly with the said connecting shaft between the gears whereby both the inner slide and the outer slide will be directly operated by the said connecting shaft between said gears, the link connections between the said connecting shaft between the gears and the said rocker shaft and rocker members operating in the space between the said gears.

3. In a drawing press, a hollow crown, two slides, a pair of longitudinally spaced and alined shafts supported by the crown, a gear of comparatively large diameter rotatably supported by each of the adjacent ends of said shafts, said gears being laterally spaced, a shaft secured to the said gears and extending across the space therebetween, the last said shaft being eccentric to the axes of the gears, a link connection between the last said shaft and one of said slides, a rocker shaft spaced from and parallel with all of the aforesaid shafts, a rocker member oscillatably mounted upon the gear supporting shaft, a link connection between said rocker member and the other of said slides, a link connection between said rocker member and said rocker shaft, a link connected to said rocker shaft and also directly with the said connecting shaft between the gears whereby both the inner slide and the outer slide will be directly operated by the said connecting shaft between said gears, said gears, shafts, rocker members, and connections being housed within said crown, and means for rotating said gears.

4. In a drawing press, a supporting frame, two slides, a crank journaled upon the frame, a rocker member for one of the slides, connections between the last said slide and the said rocker member, connections between said rocker member and between the other of said slides and the said crank, whereby both of the slides will be operated by the same crank, said crank comprising two laterally spaced and alined gears and a connecting member carried by the gears eccentric to the axes thereof and extending across the space between the gears, and means for rotating said gears.

5. In a drawing press, a supporting frame, a hollow crown, two slides, a crank journaled upon the frame, said crank comprising two laterally spaced alined gears of a substantial diameter and a connecting shaft between the gears eccentric to the axes thereof and extending across the space therebetween, a rocker member for one of the slides, connections between said rocker member and the last said slide whereby the latter will be reciprocated upon operation of the said rocker member, connections between said rocker member and the said connection between the said gears, a connection between the last said connection and the other of the slides whereby both of the slides will be operated by the same crank, the said rocker member, gears, connecting shaft between the gears, and the connections between the said connection shaft between the gears and the slides and said connecting shaft being housed within the said crown, and means for rotating said gears.

6. In a drawing press, two slides, a pair of longitudinally spaced and alined shafts, a gear of comparatively large diameter rotatably supported on each of the adjacent ends of said shafts, said gears being in close proximity but spaced from each other whereby they will be disposed substantially centrally of the press, a shaft secured to the gears eccentric to the axes thereof and extending across the space therebetween, a link connection between the last said shaft and one of the slides and operating in the said space, a rocker shaft spaced from and parallel with all of the aforesaid shafts, a rocker member oscillatably mounted upon the gear supporting shaft, a link connection between the rocker member and the other of the slides, a link connection between said rocker member and also directly with the said connecting shaft between said gears and operable in the space between the gears, whereby both the inner and outer slides will be directly operated by the said connecting shaft between the said gears and from points substantially centrally of the machine, and means for rotating the said gear.

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