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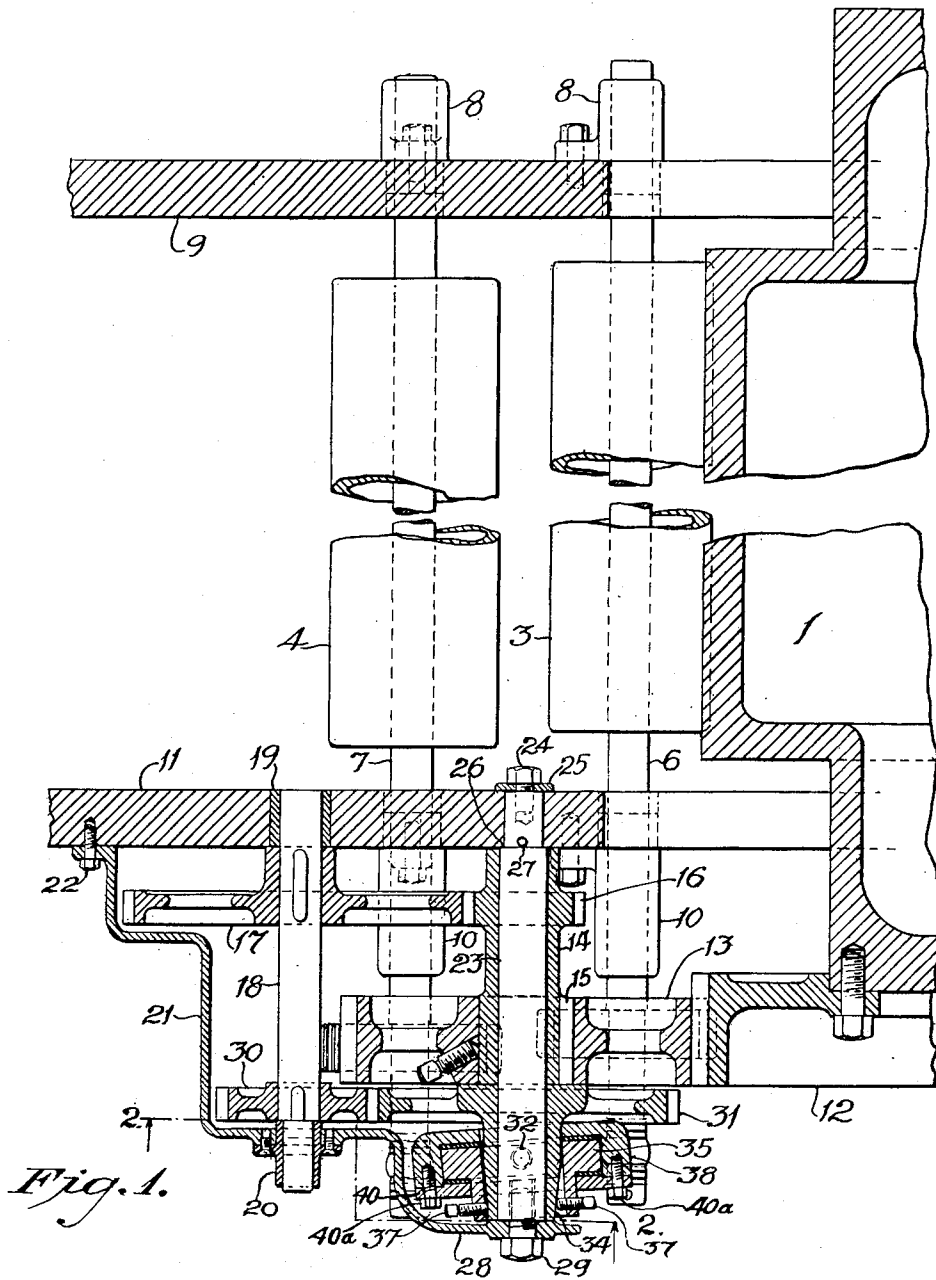
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B. C. WHITE

VIBRATOR FOR INK DISTRIBUTING ROLLERS

Filed Jan. 22, 1923

3 Sheets-Sheet 1



INVENTOR
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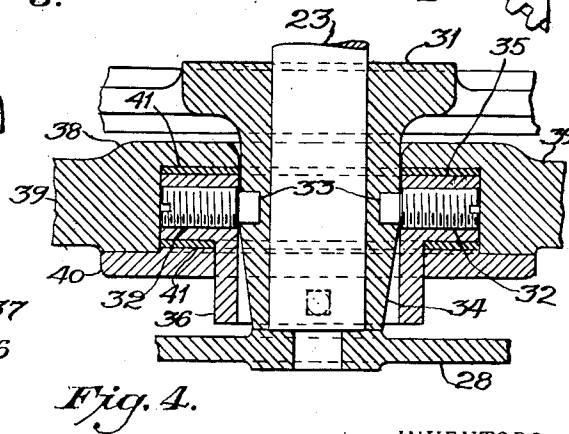
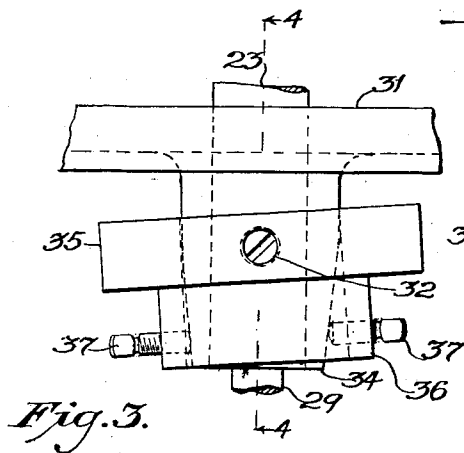
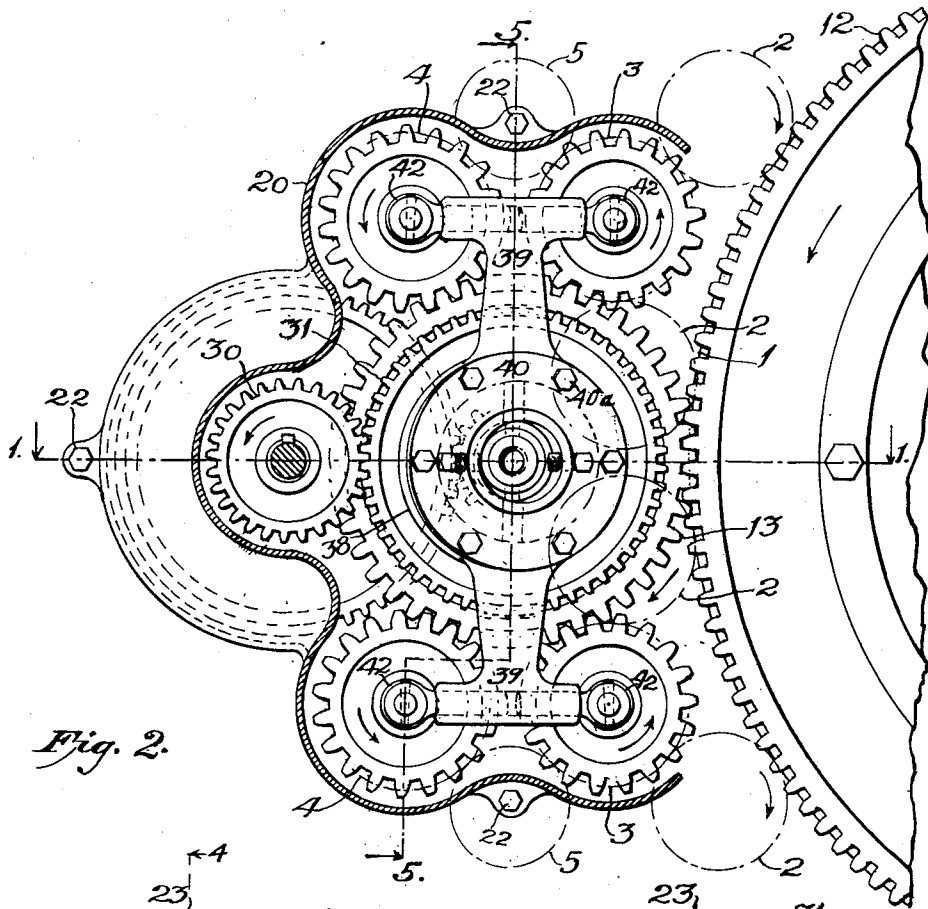
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VIBRATOR FOR INK DISTRIBUTING ROLLERS

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3 Sheets-Sheet 2



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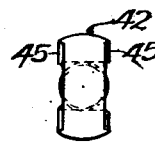
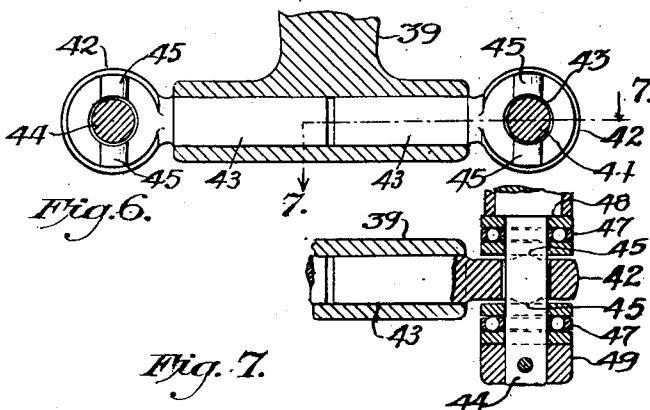
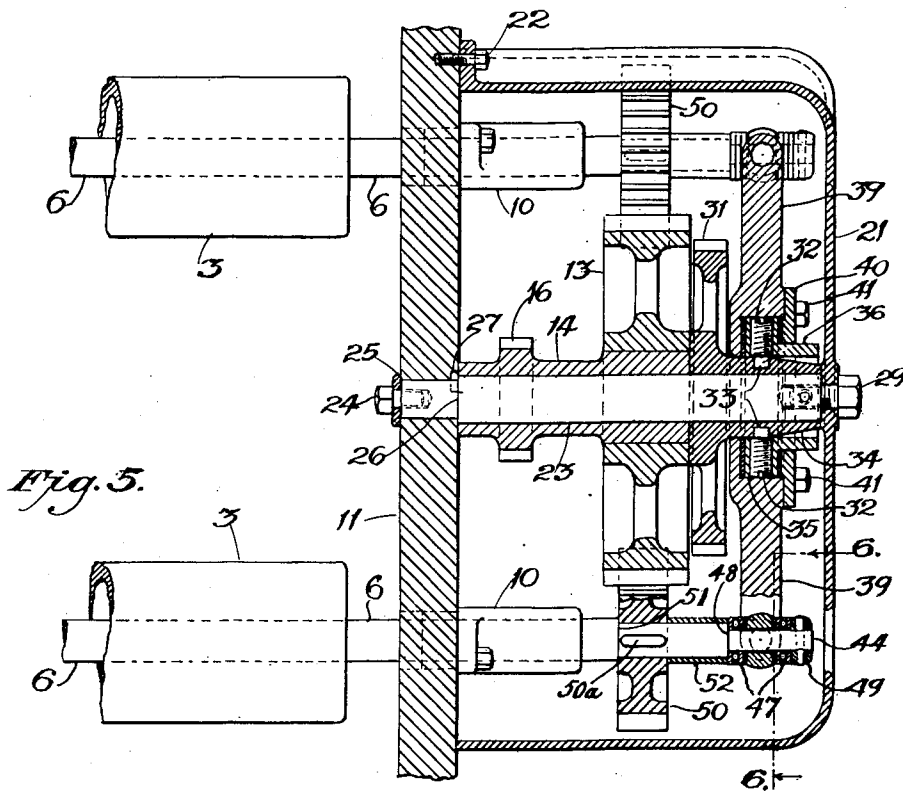
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B. C. WHITE

VIBRATOR FOR INK DISTRIBUTING ROLLERS

Filed Jan. 22, 1923

3 Sheets-Sheet 3



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UNITED STATES PATENT OFFICE.

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VIBRATOR FOR INK-DISTRIBUTING ROLLERS.

Application filed January 22, 1923. Serial No. 814,212.

The present invention relates to improvements in vibrators for ink-distributing rollers of printing presses, wherein a series of rotating rollers are arranged to receive a periodical feed of ink from a fountain, and by vibrating certain of the engaging rollers to uniformly work up and distribute the supply of ink thereon and finally transfer it in an even manner over the printing plates.

One of the objects of the present invention is to provide a common means for longitudinally vibrating one or more rollers forwardly and backwardly at a uniform rate of speed, and for a plurality of rollers to effect for each thereof during such movement a variable lengthwise position with respect to one another.

A further object is to provide a common means for adjusting the extent of movement to effect a common variation thereof among the several rollers vibrated.

Heretofore the vibrating movement of such rollers has been commonly actuated by levers or rods from a crank-pin or eccentric in a manner to effect between the several rollers common periods of action, so that their similar movements, such as reversing and speed variation, will severally occur simultaneously. It has been found in practice that this manner of operation causes impulses which tends to cause an irregularity in the ink distributing action which increases as the number of rolls are added.

In the present invention the movements of the rollers are uniformly constant, resulting in smoothly running action and improved distribution.

For further comprehension of the invention, and of the objects and advantages thereof, reference is had to the following description and accompanying drawings, and to the appended claims in which the various features of the invention are more particularly pointed out.

Figure 1 of the drawings is a horizontal sectional view of a part of an inking mechanism of a printing press showing my invention applied thereto, the section being taken along the line 1—1 of Fig. 2.

Figure 2 is a vertical section taken along the line 2—2 of Fig. 1 and showing the parts in front elevation.

Figure 3 is an enlarged detail view of the vibratory flange in tilted position.

Figure 4 is a sectional view of the latter taken on the line 4—4 of Fig. 3.

Figure 5 is a vertical sectional view on the line 5—5 of Fig. 2.

Figure 6 is an enlarged detail view on line 6—6 of Fig. 5.

Figure 7 is a horizontal sectional view on line 7—7 of Fig. 6.

Figure 8 is an end view of the universal joint between the vibrating connection and the roller shaft.

In the drawings numeral 1 designates a portion of a printing cylinder having plates or forms adapted to be supplied with ink in the usual manner from the form rollers 2, indicated by dotted lines in Fig. 2, the form rollers being in turn supplied from a set of vibrating rolls 3. A second set of vibrating rolls 4 is shown engaging the first set by the transfer rollers 5, also indicated by dotted lines, the vibrating rolls 4 being arranged to receive a supply of ink in the usual manner, not herein shown, from transfer rollers operating in connection with an ink fountain.

The vibrating rolls 3 and 4 are respectively provided with shafts 6 and 7, journaled at one end in bearings 8 secured to the rear frame 9 of an ink carriage, and at their opposite end the shafts are journaled in bearings 10 secured to the front frame 11 of the carriage, the opposite carriage frames being connected together in well-known manner and provided with means for detachably engaging the inking mechanism and the printing cylinder with respect to each other.

The printing cylinder 1 is rotatively mounted in the usual manner and provided at one end with a ring-gear 12, shown in section in Fig. 1, the gear being arranged to operatively engage a gear 13, fixedly secured to the sleeve 14 by the key 15, the sleeve being loosely mounted for rotation on the main vibrator shaft 23, fixed at its opposite ends in the frame 11 and casing section 28 by the cap-screws 24 and 29, a shoulder 26 being formed at one end of the shaft to fixedly engage the frame 11 by the screw 24. The sleeve 14 is further provided with a pinion gear 16, arranged to mesh with the gear 17 fixedly secured to the intermediate shaft 18,

the latter being journaled at opposite ends in the bushings 19 and 20, respectively fixed in the frame 11 and casing 21. Upon the shaft 18 is also fixed a gear 30 arranged to intermesh with a vibratory gear 31, the latter being provided with a projecting hub 34 and arranged to be loosely rotated upon the main vibrator shaft 23.

For effecting the vibration of the inking rolls, the projecting hub 34 of the vibratory gear 31 is provided with diametrically opposite pivot recesses 33, and upon the hub is supported a vibratory flange 35, having an extension boss 36. The annular wall of the flange is provided with threaded perforations adapted to receive the pivot screws 32, having points on the end thereof adapted to engage the pivot recesses 33 of the hub 34, the end of the latter being tapered, as shown more particularly in Fig. 3, to permit the movement of the flange about its pivotal center 32, an adjustable movement thereof being fixed with respect to the hub by means of the set-screws 37, which are threaded through the annular wall of the extension boss 36 and bear at their points against the tapered portion of the projecting hub 34. By means of the set-screws 37 the flange may be moved about its pivotal points on the hub until the axes of the two members coincide with each other, in which position no vibratory action of the flange is produced, and in a similar manner the set-screws may be operated to gradually turn the flange about its pivotal point to obtain any desired vibratory angle within a desired range.

Supported upon the vibratory flange 35 is a double arm 39 having a central hub 38 provided with a recess shaped to slidably engage the flange, one of the side walls of the recess being integral with the arm while the opposite side wall forms a detachable bonnet-plate 40 secured in position by the screws 40*. Anti-friction washers 41 are interposed between the opposite side faces of the flange and the inner faces of the side walls of the recess to receive the thrusts from the vibratory movement of the rotating flange, which movement is transmitted through the arm 39 to the rollers to be vibrated.

For the transmission of the vibrating motion to the rolls 3 and 4, the shafts of the several rolls are extended at one end and provided with a driving gear 50, which in turn is driven by the gear 13, the gear 50 being fixed upon the shaft by a key or feather 50*, as indicated in Fig. 5. The extended shaft ends are reduced in diameter to form a shoulder 51 which engages one of the side faces of the gear 50, the opposite side face thereof being engaged by one end of a sleeve 52, the opposite end of the latter extending to a second shoulder 48 formed by

the terminal reduction of the shaft section 44. The terminal shaft section 44 of the roller is provided with a pair of anti-friction side thrust bearings 47, spaced apart from each other and engaged at their extreme outer side faces on one hand by shoulder 48 and the outer end of the sleeve 52, and on the opposite hand by the inner face of the terminal collar 49, secured to the shaft end by a tapered pin, as shown in Figs. 5 and 7. The section 44 is also provided between the side bearings 47 with a thrust connection 42 having a perforation adapted to loosely receive the shaft end and also provided at its opposite side faces with rounded projections 45 disposed to form a rocking engagement with the adjacent side faces of the bearings 47. The thrust connection 42 is provided with a shank 43, arranged to loosely engage a perforation or bearing formed in the branches of arm 39. In transmitting the vibratory action of the arm 39 through the thrust connections 42, the stem 43 of the latter is free to rotate and to slide lengthwise in its bearing and thereby accommodate itself to the variable direction of movements of the connected parts. As shown in Fig. 5, the roll gears 50 are provided with a face proportionally narrower than that of their common driving gear 13 in order to afford a full lateral driving engagement therebetween when the rollers receive their lengthwise vibration.

For protecting the driving and vibratory mechanisms of the inking rolls, the several operative parts thereof are enclosed within the casing or cover 21, the latter being detachably secured to the front frame 11 by means of the screws 22. Upon the removal of the cover, these operating parts may be readily adjusted or removed, and by the disconnection of the taper pin from the terminal collar 49 of the inking-roll shafts 6 and 7, the connections to the driving and vibratory devices may be readily withdrawn for the convenient removal of the inking rolls.

In adjusting the angle of the vibratory flange 35 for obtaining the required vibration of the inking rolls, the front face 28 of the cover 21 is provided with an opening adjacent the adjusting set-screws 37 of the vibratory flange, and by turning the latter's driving gear 31 about its supporting shaft 23 the two set-screws will become accessible and readily adjustable. In its rotation the operating faces of the vibratory flange travel back and forth in a spiral path and tend to transmit corresponding rotary and vibratory movements to the loosely mounted arm 39, the latter only of which movements being effective, owing to the connections to the shaft ends of the several inking rolls, which act to prevent the rotation of the arm. Thus the vibratory flange transmits to the outer branches of the arm joint vibrating

and tilting movements which act through the connections to the rolls to vibrate the latter in straight-line directions backward and forward, one in advance of the other,

5 owing to the tilting movement of the branches of the arm, the transmitted movements from these latter points being accommodated by the turning and lengthwise sliding movements within the branches of the

10 shank 43 of the thrust connections 42.

It will thus be evident that at each rotation of the gear 31, the inking rolls will be moved forward and backward an extent determined by the inclination of the vibratory flange 35, and each of the rolls 3 and 4 will reach the end of their movement in succession as the point of greatest inclination of the flange 35 reaches the radial lines extending from the center of shaft 23 to the centers of the shafts 6 and 7. Each roll will thus receive its endwise maximum movement at different times and in succession, and if they are equi-distant from shaft 23, their endwise movement will also be equal.

25 While I have shown and described the preferred arrangement and detail construction of the several parts, it will be understood that various detail changes may be made therein to suit variable situations without departing from the essential principle or scope of the invention. Thus, it will be obvious that the vibratory gear 31 may be continuously rotated through a system of gearing from a source of power other

35 than that as shown from the printing cylinder 1, and the relative number of turns of the vibratory gear may be readily proportioned to meet the speed conditions of the press and the necessary vibratory movements for effecting a uniform ink distribution.

40 What I claim as my invention and desire to secure by Letters Patent, is:

1. In a vibrator, a roller to be vibrated, a rotating member spaced apart therefrom, a vibratory flange adjustably fixed to said rotating member to impart a variable vibratory movement, an arm loosely mounted on said flange and adapted to receive a variable vibratory movement therefrom, and a connection between said roller to be vibrated and said arm whereby the latter will serve to vibrate said roller and the roller in turn will hold said arm against rotation.

2. In an inking roll vibrator, a rotating hub spaced apart from said roll, a vibratory flange, means for adjustably fixing said flange on said hub to vary its vibratory action, an arm slidingly supported on said flange, and connections between the inking roll and said arm to effect the vibration of the roll and the non-rotation of the arm.

3. In an inking roll vibrator, a plurality of inking rolls, a rotating hub spaced apart therefrom, a vibratory flange, means for

vary its vibratory action, an arm slidingly supported on said flange, and connections between said inking rolls and arm to effect the vibration of the rolls and the non-rotation of said arm.

4. In a vibrator, a rotating hub, a vibratory flange pivotally supported on said hub, means for locking said flange in variable position about its pivotal support and in fixed relation with said hub, an arm slidingly mounted on said flange and adapted to receive a vibrating action therefrom, and means for holding said arm against rotation.

5. In a vibrator, a rotating hub, a vibratory flange pivotally supported on said hub, means for fixedly adjusting said flange about its pivotal support to said hub, and an arm loosely mounted on said flange and held against rotation.

6. In a vibrator, a rotatable hub provided with diametrically opposite pivot recesses, a vibratory flange surrounding said hub and provided with an extension boss, radial pivot screws threaded through said flange and having their pivotal points extending into the opposite pivot-recesses of said hub, and set-screws threaded through the extension boss of said flange and arranged to fix the pivotal position of said flange with respect to said hub.

7. In a vibrator, a rotatable hub, a vibratory flange pivotally supported on said hub, an arm provided with a recessed hub arranged to receive said vibratory flange, one of the side walls of the recessed hub being detachably secured in position, and anti-friction washers disposed between the opposite side faces of said flange and the adjacent side walls of the recessed hub of said arm.

8. In an inking roll vibrator, an inking roll mounted for rotating and lengthwise sliding movements, a rotating vibratory flange, an arm carried by said flange and arranged to vibrate therewith, a thrust member having at one end an eye, and at the opposite end a stem arranged for rotating and lengthwise movements in said arm, the eye of said thrust member being disposed to engage the shaft of said inking roll, and anti-friction thrust-receiving members secured to said roll-shaft at opposite sides of the eye of said thrust member.

9. In an inking roll vibrator, a plurality of inking rolls mounted for rotating and lengthwise sliding movements, a rotating vibratory flange, an arm carried by said flange and arranged to vibrate therewith, said arm having a plurality of branches, thrust members loosely mounted in the branches of said arm and provided at their outer end with eyes disposed to engage the shafts of said rolls, and thrust receiving members on said shafts at opposite sides of said thrust members.

10. In a vibrator, a fixed main shaft, a sleeve loosely mounted thereon and provided in fixed relation with a driving gear and a driving pinion, a loosely mounted vibratory gear supported by said main shaft and having a projecting hub, a secondary shaft provided in fixed relation with a pair of gears meshing respectively with the pinion gear and vibratory gear, a vibratory flange fixed to the projecting hub of said vibratory gear, a vibratory arm loosely mounted on said vibratory flange, and means for rotating the driving gear of said sleeve.
11. In a vibrator, a frame, a casing secured to said frame and provided with a front wall, a main shaft fixed to said frame and the front wall of said casing, an intermediate shaft journaled in said frame and in the front wall of said casing, a vibratory gear provided with a projecting hub and loosely supported for rotation within said casing by said main shaft, a sleeve loosely mounted within said casing upon said main shaft and provided in fixed relation with a driving gear and a driving pinion, a pair of gears fixed upon said intermediate shaft within said casing, one of said pair of gears meshing with the driving pinion of said sleeve and the other of said pair of gears meshing with said vibratory gear, a vibratory flange adjustably fixed within said casing to the projecting hub of said vibratory gear, a vibratory arm loosely mounted within said casing upon said vibratory flange, a series of vibrating rolls having an end of their shafts extending into said casing and provided with driving gears engaging the driving gear of said sleeve, means for rotating said latter gear, and means within said casing for connecting the driving ends of said rolls with said vibratory arm.
12. In a vibrating mechanism, a rotatable hub having diametrically opposed pivot recesses, a vibratory flange mounted on said hub and provided with pivot points engaging the pivot recesses thereof, and means for pivotally adjusting said flange in fixed relation upon said hub.
13. In a vibrating mechanism, a rotatable vibratory flange, means for adjusting the vibratory movement of said flange, an arm loosely mounted on said flange and arranged to receive an adjustable vibrating movement therefrom, and an element variably vibrated by said arm, the said element in turn serving to hold said arm against rotation.
- Signed at New York, in the county of New York and State of New York this 18 day of January A. D. 1923.
- BRUCE CLARK WHITE.