

W. A. PRINGLE.  
SPEED CHANGING MECHANISM.  
APPLICATION FILED JAN. 19, 1907.

937,034.

Patented Oct. 12, 1909.

Fig. 1.

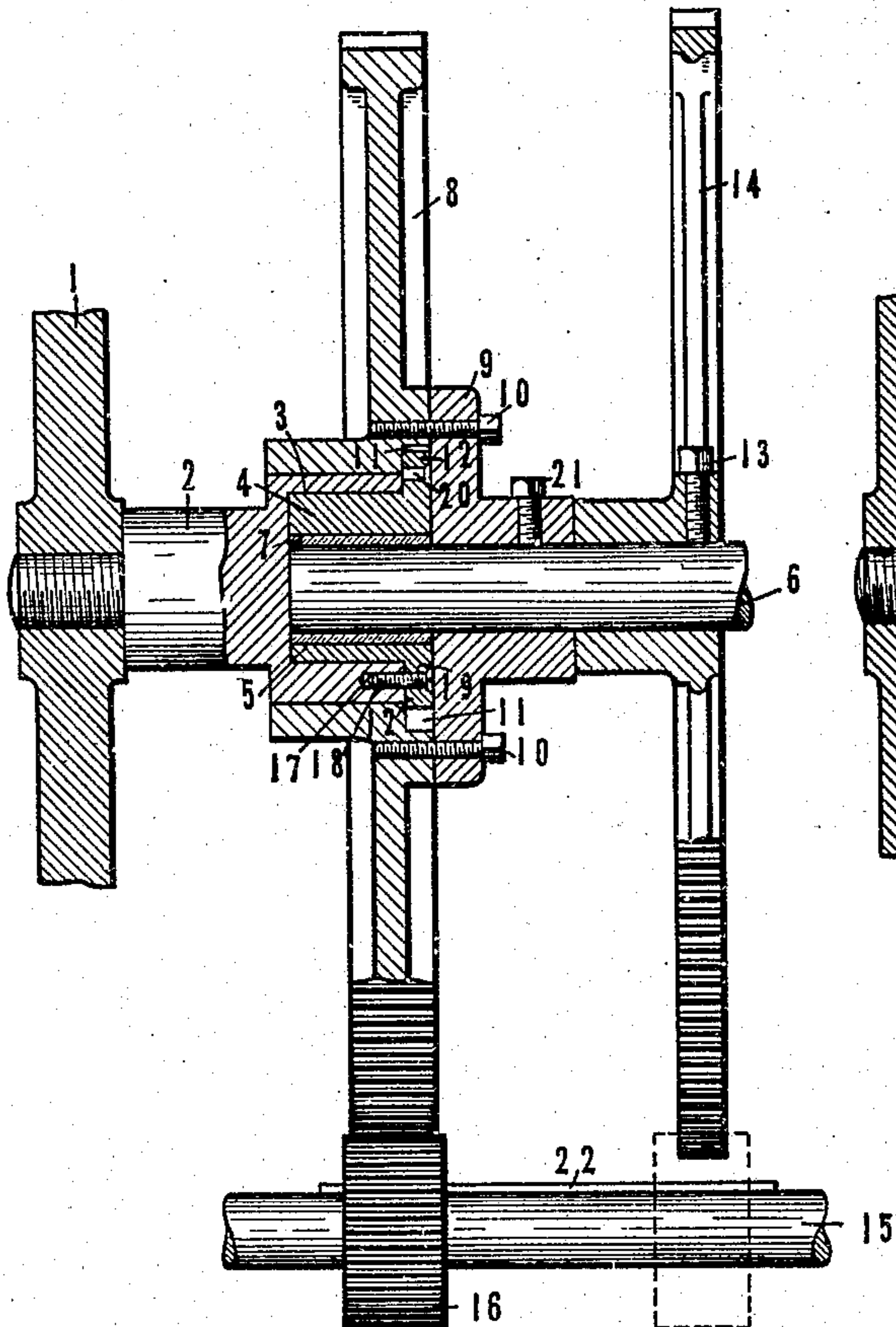


Fig. 2.

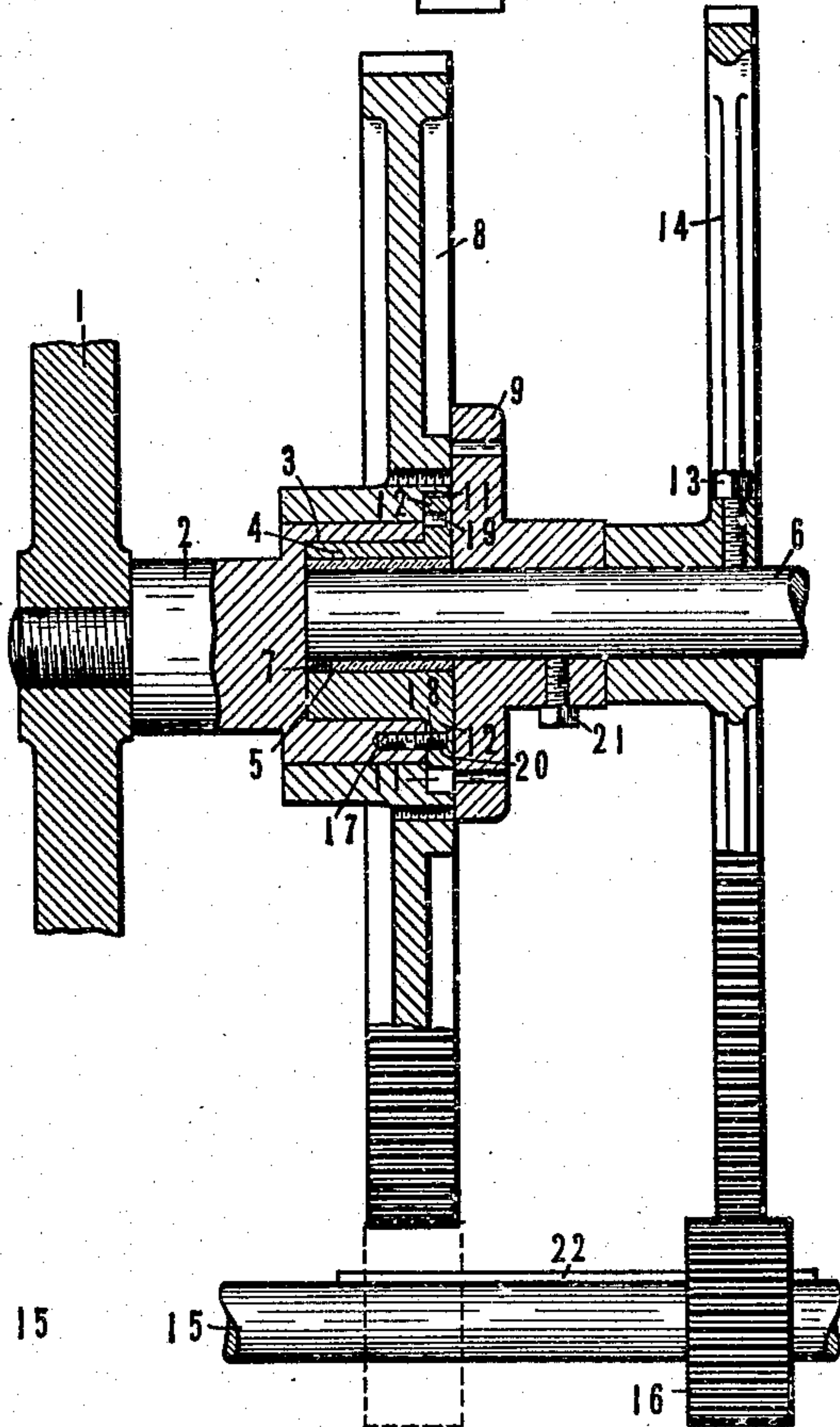


Fig. 3.

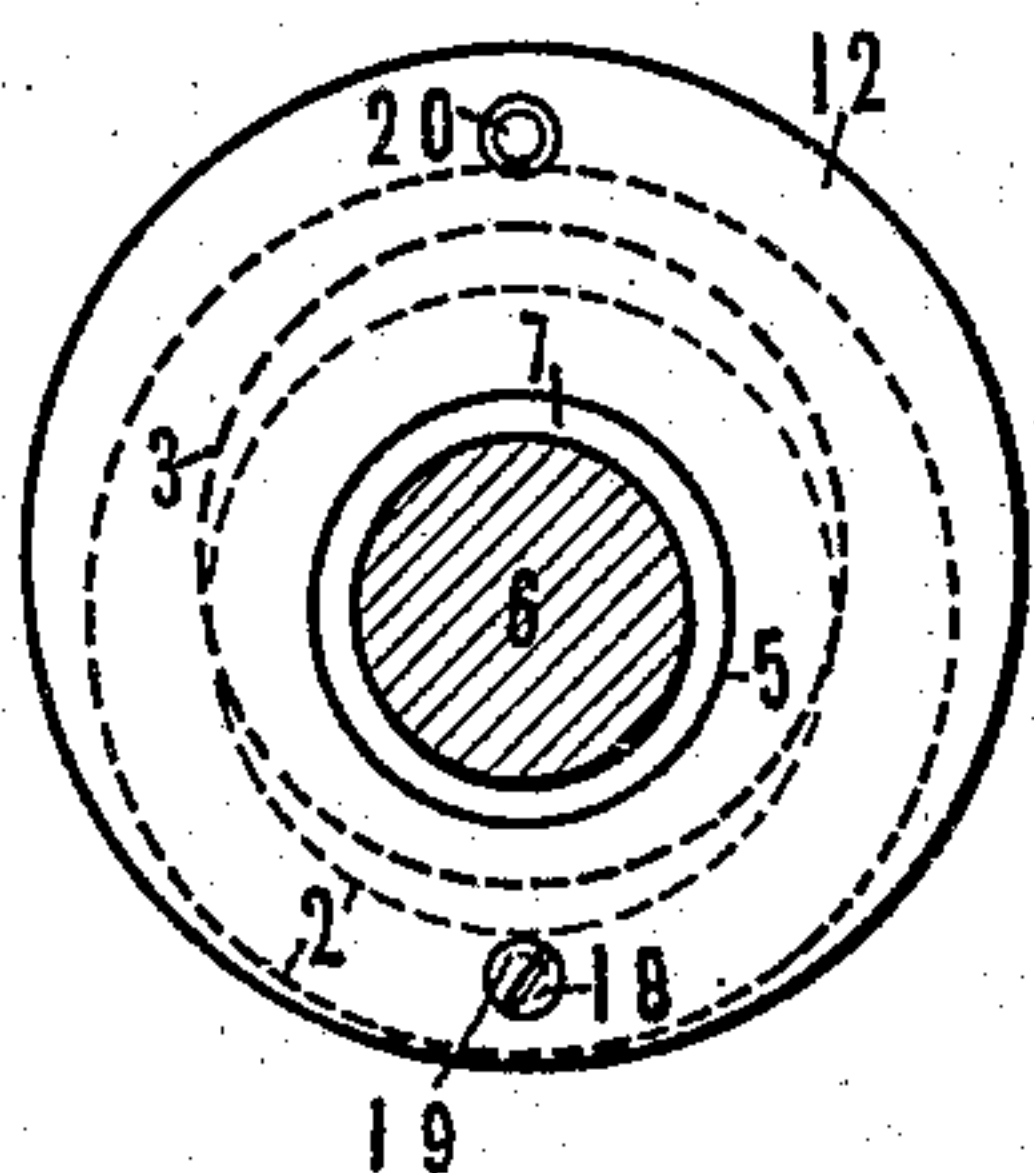
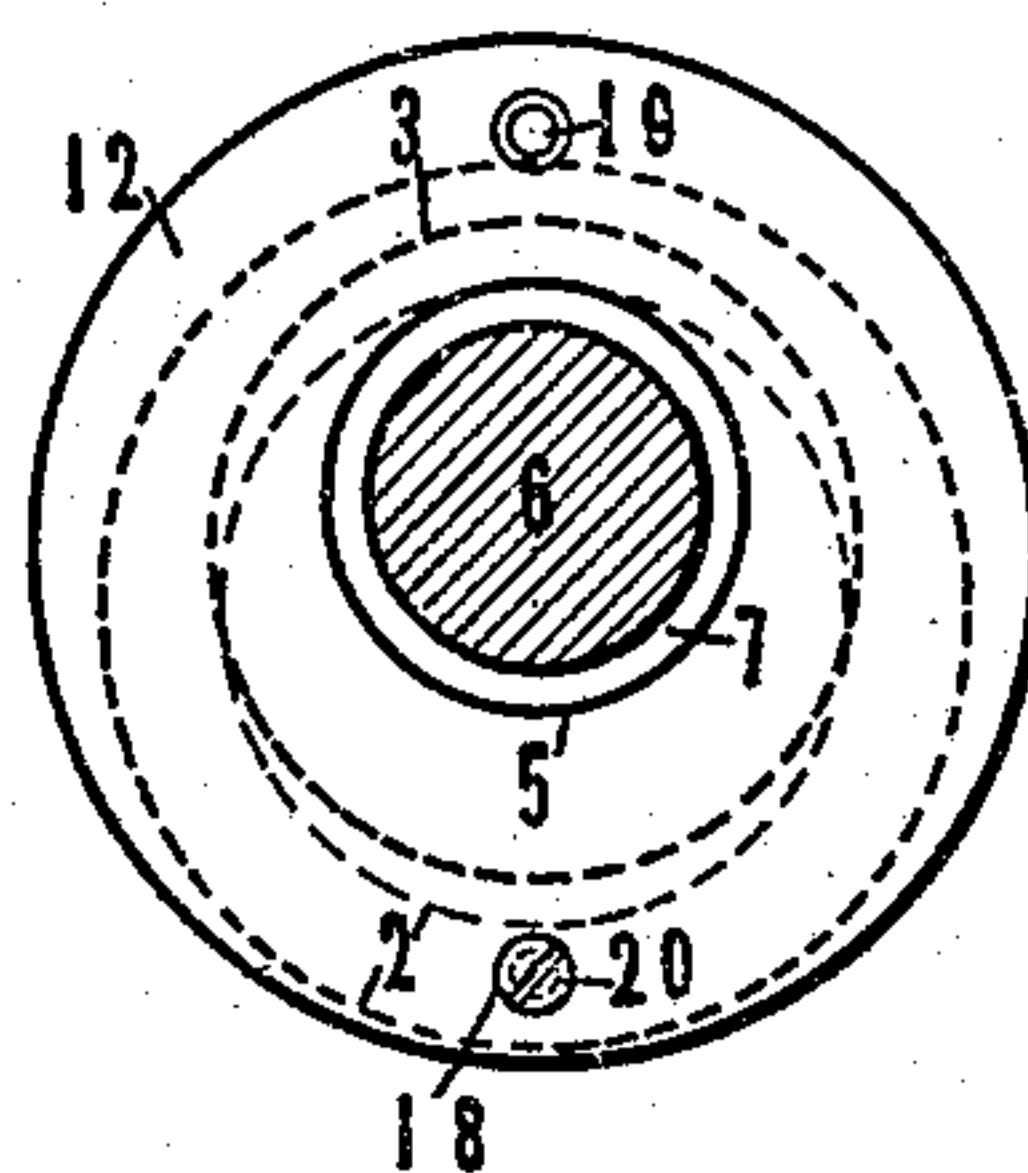


Fig. 4.



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# UNITED STATES PATENT OFFICE.

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## SPEED-CHANGING MECHANISM.

937,034.

Specification of Letters Patent.

Patented Oct. 12, 1909.

Application filed January 19, 1907. Serial No. 353,032.

*To all whom it may concern:*

Be it known that I, WILLIAM A. PRINGLE, residing at Niagara Falls, in the county of Niagara and State of New York, have invented certain new and useful Improvements in Speed-Changing Mechanism for Cylinders of Printing-Presses, of which the following is a full, clear, and exact description, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates broadly to speed changing mechanism and more particularly to mechanism of the above character adapted for employment in printing presses.

One of the objects of the invention is to provide a simple and efficient means whereby the rotative speed of a cylinder or a numbering wheel employed in a printing press may be varied at will.

Other objects will be in part obvious and in part pointed out hereinafter.

The invention accordingly consists in the features of construction combinations of elements and arrangement of parts which will be exemplified in the construction hereinafter set forth, and the scope of the application of which will be indicated in the following claims.

In the accompanying drawings, wherein is illustrated one of the various possible embodiments of my invention, Figure 1 is a sectional view, parts being in elevation, showing one position of the parts. Fig. 2 is a similar view showing the alternate position of the parts. Fig. 3 is an end elevation of the bushing, showing the relation of the eccentric devices when the parts occupy the positions shown in Fig. 1, the gears and the collar being removed. Fig. 4 is a view similar to Fig. 3, showing the relation of the eccentric devices when the parts occupy the positions shown in Fig. 2.

Similar reference characters refer to similar parts throughout the several views of the drawing.

Referring now to the drawings, wherein I have shown an embodiment of my invention adapted for use with mechanism employed for numbering traveling webs, 1 indicates a portion of the frame of a printing press within which is threaded, in the present instance, a stud 2. But one of the side walls of the press is shown herein, but it will be understood that the opposite side of the

press is similarly constructed. Stud 2, as shown, is enlarged at its outer end and internally bored, as at 3, the bore thereof being off centers or eccentrically disposed. Within this eccentrically bored opening is inserted a bushing 4, said bushing being also provided with an eccentric bore 5 which forms a journal for a shaft 6. Interposed between shaft 6 and bushing 4, in the present instance, is a concentric bushing 7. This bushing, while forming a bearing for the shaft, could, if desired, be omitted and the shaft journaled directly in bushing 4.

Journaled upon the periphery of stud 2 is a gear-wheel 8 which is detachably secured to the collar 9 in any suitable manner, as by means of clamping screws 10, said gear-wheel being provided with a recess 11 adapted to receive the flange 12 of the bushing 4. The collar 9 is rigidly secured to the shaft 6 as by a set screw 21 in order that when the clamping screws are in position as shown in Fig. 1 rotation of the gear-wheel 8 will cause a corresponding movement of the shaft.

Fixed upon shaft 6, as by means of a set-screw 13, is a gear wheel 14 which, in the present instance, has a diameter greater than that of gear wheel 8. Shaft 6 is adapted to be driven from a shaft 15 by means of a pinion 16 which is capable of being moved longitudinally thereon and meshed with either of gear wheels 8 or 14 of shaft 6, when the same is moved laterally, in the manner hereinafter described. Upon shaft 6 may be carried a form or impression cylinder or a numbering wheel, the speed of which it is desired to change by the meshing of the different sized gear wheels with the driving pinion. This mechanism is not shown herein since the same constitutes no essential part of the present invention.

The shaft 15 may be provided with a key 22 coacting with a recess formed in the pinion 16, whereby the latter may be slid along said shaft in position to engage either of the gear-wheels 8 or 14 and yet be prevented from rotating relatively to said shaft.

Stud 2 is provided with a threaded opening 17 adapted to receive a screw 18 which extends through an opening 19 in flange 12 of bushing 4, thus holding the bushing against rotative movement within the stud. The flange 12 has also, in the present instance, at its opposite side an opening 20



adapted when the bushing is rotated through half a rotation to register with the opening 17 formed in the stud in order to receive screw 18, which again holds the parts in fixed relation.

The eccentric bores 3 and 5 of the stud 2 and bushing 4, respectively, are so proportioned that when the bushing is so positioned as to cause the opening 19 in its flange to register with the opening 17 in the stud, shaft 6 will be positioned concentrically with respect to the bearing surface of the stud 2, and when the bushing has been rotated to bring the opening 20 in its flange into registry with the opening 17, the shaft 6 will have been moved laterally an amount equal to the difference between the radii of the gears 8 and 14.

Having thus described the structural features constituting this embodiment of my invention, the operation thereof may now be understood.

Referring to Fig. 1, it will be seen that when the parts are in the position shown in Fig. 1 with the pinion 16 in mesh with gear wheel 8, shaft 6 will be driven from shaft 15 at a predetermined rotative speed, and that when it is desired to effect a change in the speed of the printing or numbering mechanism carried upon shaft 6, it is merely necessary to remove the clamping screws 10, thereby disengaging gear-wheel 8 from the collar 9, and then to remove the screw 18, thus allowing the bushing 4 to be rotated with respect to stud 2. The screw may be removed after the first loosening the set screws 13 and 21 and moving the gear 14 and collar 9 to the right, whereby access to said screw may be had. This rotative movement of bushing 4 within the eccentric bore of stud 2 operates to carry shaft 6 and the gear-wheel 14 in a lateral direction to allow pinion 16 when slid along shaft 15 to mesh with gear wheel 14, which, as above described, being of greater diameter, causes a different rotative speed of shaft 6. The shafts are again held in fixed relation by means of screw 18 which as above described is adapted to secure the bushing to the stud in either of its positions. It will, of course, be understood that when the position of the shaft 6 has been thus changed, the collar 9 will be disposed eccentrically to the gear-wheel 8 from which it has been detached, the parts assuming the positions shown in Fig. 2.

It will accordingly be seen that I have provided mechanism well adapted to achieve the several objects and ends of my invention in a simple and efficient manner. The distance between the centers of the shafts may be changed at will, thus readily providing for the rotation of the driven shaft from the driving shaft at different speeds of rotation.

While I have shown an embodiment of my

invention adapted particularly for use with a printing press, it is obvious that the same may be used with great facility in a variety of other relations, although the same is peculiarly adapted for use in the relation shown.

As many changes could be made in the above construction and many apparently widely different embodiments of this invention could be made without departing from the scope thereof, it is intended that all matter contained in the above description or shown in the accompanying drawings shall be interpreted as illustrative and not in a limiting sense.

It is also to be understood that the language used in the following claims is intended to cover all of the generic and specific features of the invention herein described and all statements of the scope of the invention, which, as a matter of language, might be said to fall therebetween.

Having described my invention, what I claim as new and desire to secure by Letters Patent is:—

1. In combination, a shaft, a gear-wheel fixedly secured thereto, a second gear-wheel the diameter of which is different than the diameter of said first wheel, a bearing for said second gear-wheel, detachable means for operatively connecting said second gear-wheel to said shaft whereby upon said detachable means being rendered inoperative said shaft may be moved relatively to said second gear-wheel, a second shaft, a gear mounted thereon and adapted to be moved into operative relation with each of the gear-wheels associated with said first shaft, and means for changing the relative positions of said shafts to carry said fixed gear into position to be engaged by the gear on said second shaft upon said detachable means being rendered inoperative.

2. In combination, a shaft, a gear-wheel fixedly secured thereto, a second gear-wheel the diameter of which is different than the diameter of said first wheel, a bearing for said second gear-wheel, a collar fixedly secured to said shaft, detachable means for securing said second gear-wheel to said collar whereby upon said detachable means being rendered inoperative said shaft may be moved relatively to said second gear-wheel, a second shaft, a gear mounted thereon and adapted to be moved into operative relation with each of the gear-wheels associated with said first shaft, and means for changing the relative positions of said shafts to carry said fixed gear-wheel into position to be engaged by the gear on said second shaft upon said detachable means being rendered inoperative.

3. In combination, a shaft, a gear-wheel fixedly secured thereto, a second gear-wheel the diameter of which is different than the



diameter of said fixed gear-wheel, a bearing for said second gear-wheel, detachable means for operatively connecting said second gear-wheel to said shaft, a second shaft, a gear mounted thereon and adapted to be moved into operative relation with each of the gear-wheels associated with said first shaft, said second gear-wheel associated with said first shaft being normally in position to mesh with said gear on said second shaft, and means for changing the relative positions of said shafts to carry said fixed gear-wheel into position to be engaged by the gear on said second shaft upon said detachable means being rendered inoperative.

4. In combination, a shaft, a gear movably mounted thereon, a second shaft, a gear-wheel detachably secured thereto and adapted to mesh with the gear on said first shaft, a second gear-wheel fixedly mounted upon said second shaft and having a diameter different than the diameter of said detachable gear-wheel, means for changing the distances between the centers of said shafts whereby said fixed gear-wheel may be meshed with said movably mounted gear, said means comprising a bushing eccentrically mounted on said second shaft, and a support provided with an internal bore for rotatively supporting said bushing.

5. In combination, a shaft, a gear movably mounted thereon, a second shaft, a gear-wheel detachably secured to said second shaft and adapted to mesh with the gear on said first shaft, a second gear-wheel fixedly mounted upon said second shaft and having a diameter different than that of said detachable gear wheel, means for changing the distances between the centers of said shafts whereby said fixed gear-wheel may be meshed with said movably mounted gear, said means comprising a bushing eccentrically mounted on said shaft, and a support provided with an eccentrically disposed bore for rotatively supporting said bushing.

6. In combination, a shaft, a gear-wheel detachably secured thereto, a second gear-wheel fixedly secured to said shaft and having a diameter different than the diameter of said first gear-wheel, a second shaft, a gear mounted thereon and adapted to be moved into operative relation with each of the gear-wheels associated with said first shaft, a bushing eccentrically positioned upon said first shaft, and a member provided with a bore to receive said bushing and adapted to form a bearing for said detachable gear-wheel, said bushing when rotated in said member being adapted to carry said first shaft toward or away from said second shaft whereby the gear-wheel fixedly secured to

said first shaft may be moved into or out of position to be engaged by the gear associated with said second shaft upon said first-mentioned gear-wheel being detached from its associated shaft.

7. In combination, a shaft, a gear-wheel detachably secured thereto, a second gear-wheel fixedly secured to said shaft and having a diameter different from the diameter of said first gear-wheel, a second shaft, a gear mounted thereon and adapted to be moved into operative relation with each of the gear-wheels associated with said first shaft, a bushing eccentrically positioned upon said first shaft, and a member provided with an eccentrically disposed bore to receive said bushing and adapted to form a bearing for said detachable gear, said bushing when rotated in said member being adapted to carry said first shaft toward or away from said second shaft whereby the gear-wheel fixedly secured to said first shaft may be moved into or out of position to be engaged by the gear associated with said second shaft upon said first-mentioned gear-wheel being detached from its associated shaft.

8. In combination, a gear-wheel, a stud provided with a bearing surface therefor and having an eccentrically disposed bore, a bushing within said bore and provided with an eccentrically disposed bearing, a shaft journaled in said bearing, a collar fixedly secured to said shaft, detachable means for connecting said collar to said gear-wheel whereby said means being rendered inoperative said shaft may be moved relatively to said gear-wheel, a second gear-wheel fixedly secured to said shaft the diameter of said second gear-wheel being different than the diameter of said first gear-wheel, a second shaft, and a gear mounted thereon and adapted to be moved into operative relation with each of the gear-wheels on said first shaft, said first-mentioned gear-wheel being normally positioned to be engaged by the gear on said second shaft, said bushing being rotatable with respect to said stud whereby it may be rotated to move said first shaft relatively to said second shaft to carry said fixed gear-wheel into position to be engaged by the gear associated with said second shaft upon said detachable means being rendered inoperative.

In testimony whereof I affix my signature, in the presence of two witnesses.

WILLIAM A. PRINGLE.

Witnesses:

WILLIAM ZINTER,  
V. J. STAFFORD.