

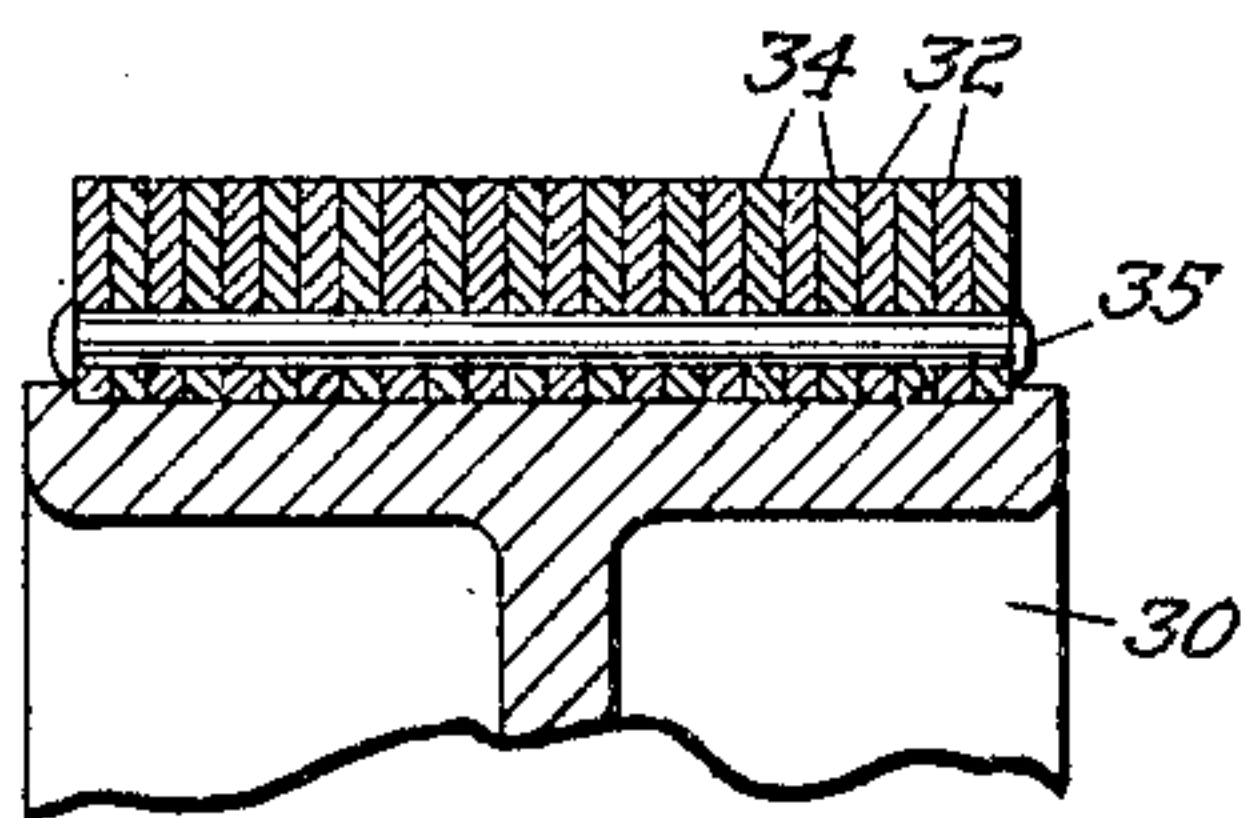
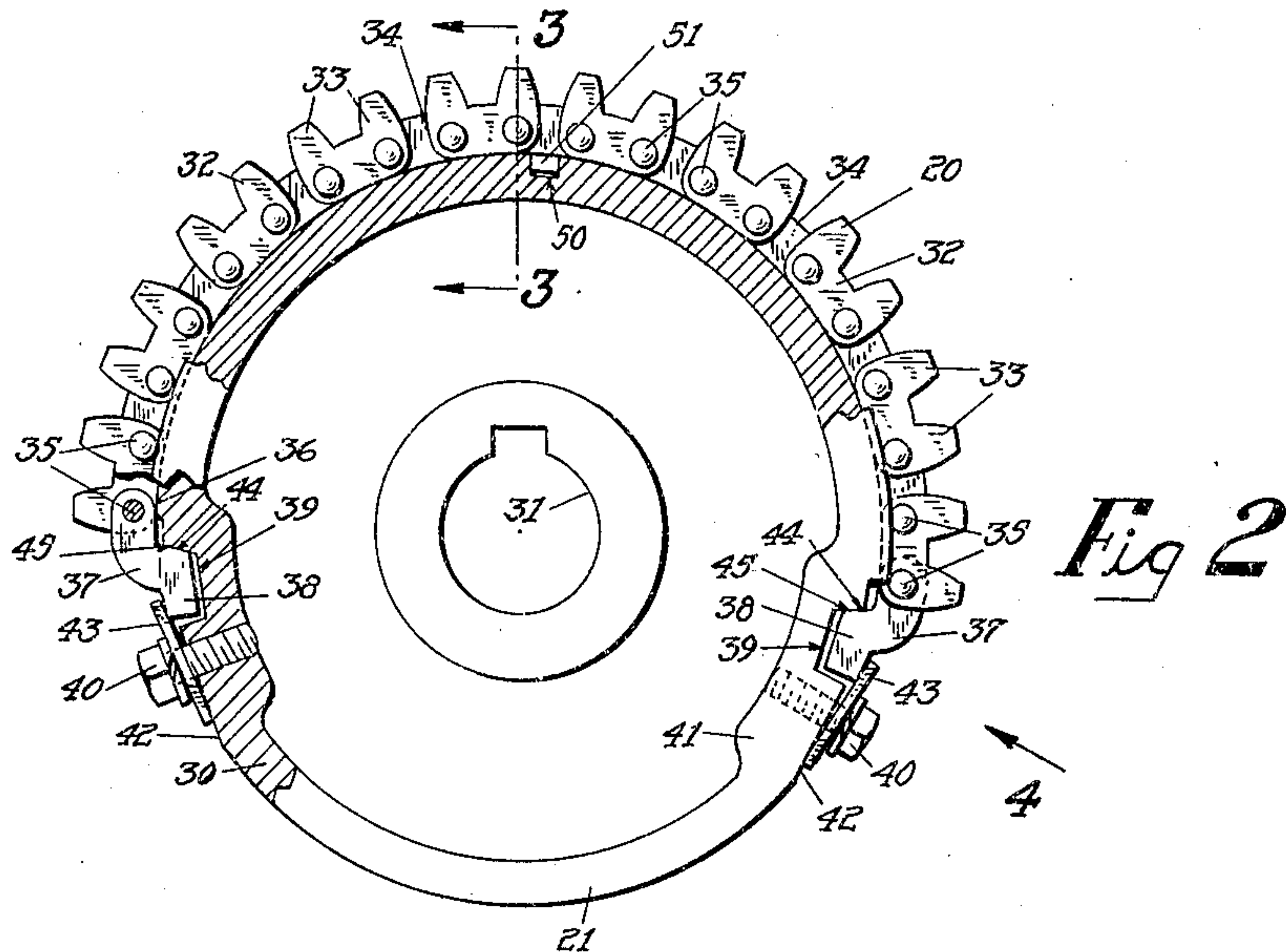
Sept. 4, 1928.

**1,683,220**

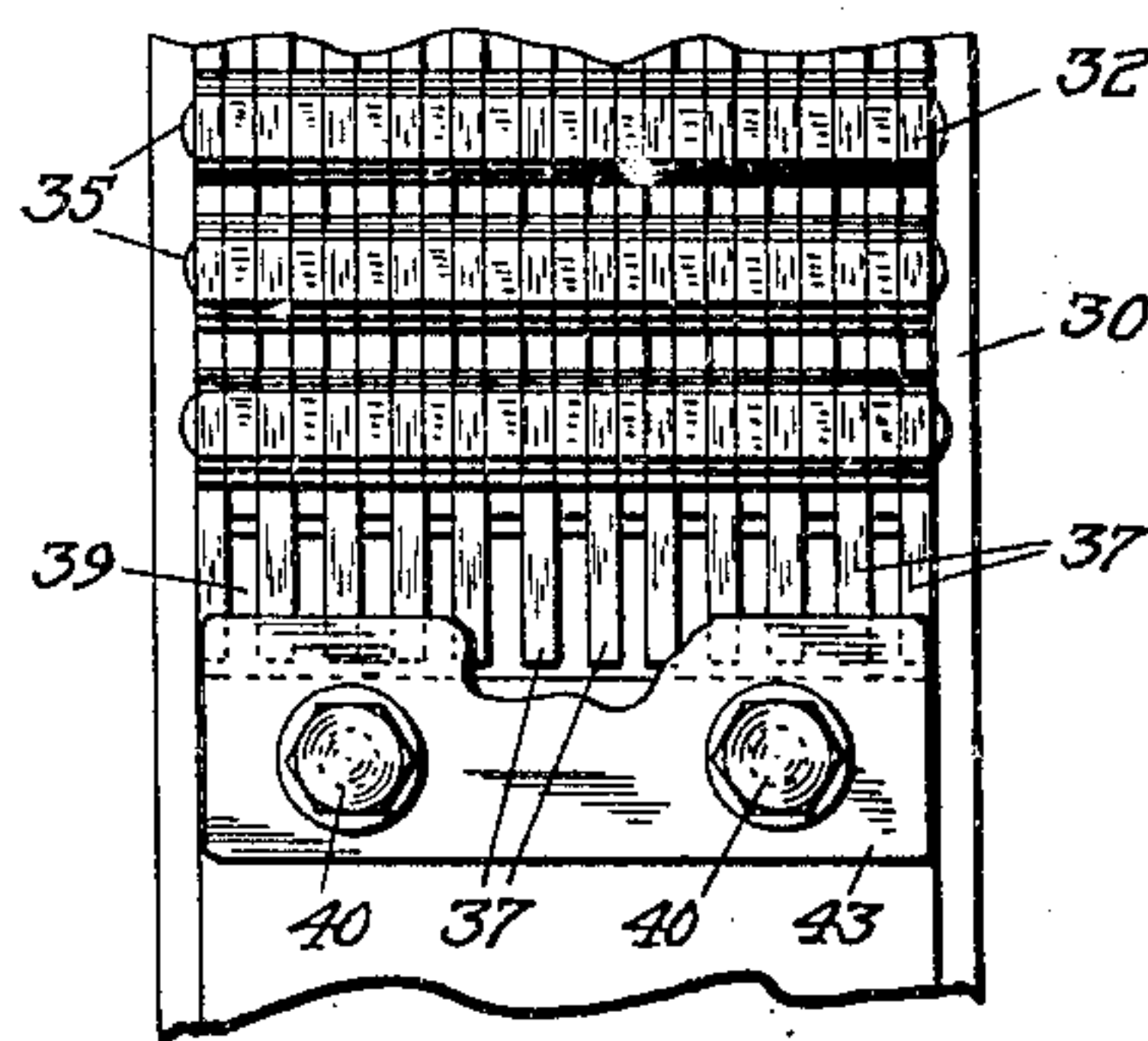
W. M. WATTIE

CYLINDER FOR KNOWLES HEADS

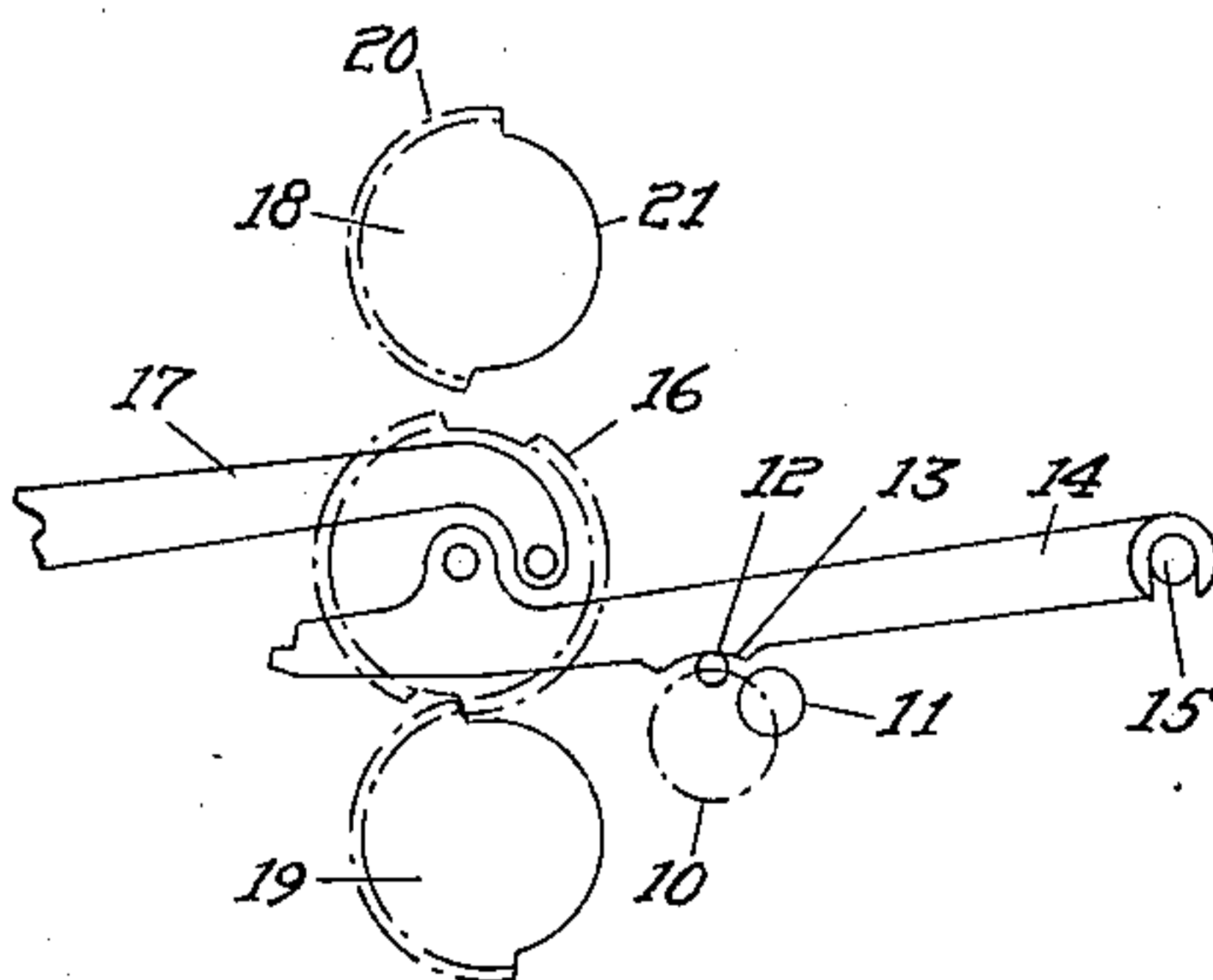
Filed Aug. 25, 1927



*Fig. 3*



*Fig. 4*



*Fig. 1*

*Inventor*

*William M. Wattie*

*Southgate Fay & Haskney*  
*Attorneys*



## UNITED STATES PATENT OFFICE.

WILLIAM M. WATTIE, OF WORCESTER, MASSACHUSETTS, ASSIGNOR TO CROMPTON & KNOWLES LOOM WORKS, OF WORCESTER, MASSACHUSETTS, A CORPORATION OF MASSACHUSETTS.

## CYLINDER FOR KNOWLES HEADS.

Application filed August 25, 1927. Serial No. 215,495.

This invention relates to improvements in cylinders for so-called Knowles heads and it is the general object of the invention to reduce the cost of the cylinder by omitting the step of chilling the teeth and substituting therefor pressed metal teeth which are removable from the body of the cylinder.

The so-called Knowles head set forth in Reissue Patent No. 7,785 to Knowles employs a pattern controlled vibrator lever on which is mounted for oscillation a mutilated thin vibrator gear. This gear lies between and meshes with one or the other of two driving cylinder gears and by means of a connector pivotally attached to the vibrator gear motion is communicated from one or the other of said actuating cylinders to the harnesses or box levers. It has been general practice to chill the teeth of these actuating cylinders, but this method is expensive and unless skillfully carried out the cost of the driving cylinders becomes excessive. It is an important object of my present invention to omit from the core or body of the cylinder the teeth which have heretofore been formed integrally therewith and in their place to substitute a form of chain which is flexible to conform to the shape of the core and to have radially extending teeth to do the work formerly done by the integral teeth.

It is a further object of my invention to provide quickly detachable means for removing the chain sections so that in case of wear or breakage a new section may be applied.

A still further object of my invention is to construct the chain and cylinder so that the major part of the strain placed upon the teeth will be transmitted directly to the cylinder rather than to the attaching means by which the chain is secured to the cylinder.

Still another object of the invention is to provide interconnections for the cylinder and chain intermediate the ends of the latter which will act to hold the chain against improper angular displacement on the cylinder core.

With these and other objects in view which will appear as the description proceeds, my invention resides in the combination and arrangement of parts hereinafter described and set forth in the claims.

In the accompanying drawings, wherein

I have shown a convenient embodiment of my invention,

Fig. 1 is a diagrammatic view of the essential parts of a Knowles head illustrating the location of the cylinders which form the subject matter of my present invention,

Fig. 2 is a front elevation of one of the cylinders, parts being in section to show more clearly certain features of the device,

Fig. 3 is a vertical section on line 3—3 of Fig. 2, and

Fig. 4 is a side elevation of a portion of the cylinders moving in the direction of arrow 4, Fig. 2.

Referring particularly to Fig. 1 it will be seen that I have provided a pattern chain cylinder 10 having high and low pattern surfaces 11 and 12, respectively, which co-act with runs 13 formed on vibrator levers 14. Each of the latter is pivoted on heel pin 15 at one end and at the other end affords pivotal support for a vibrator gear 16. The latter is attached to a connector 17 which may communicate motion either to harness frames or to drop boxes. The vibrator gears 16 are located between upper and lower mutilated actuating cylinder gears 18 and 19, respectively, and each cylinder is provided with a series of teeth indicated at 20 and also a blank portion indicated at 21. The matter thus far described is of common construction and forms no part of my present invention.

My present improvements relate to the construction of the actuating cylinders 18 and 19 and in carrying my invention into effect I provide each cylinder with a core 30 preferably of cast iron having a bore 31 to receive a supporting shaft not shown. The toothed section of each actuating cylinder is provided by a chain, said chain having links 32 formed each with two teeth 33, said links 32 being connected together by intermediate links 34. Pins 35 connect the links 32 and 34 together and permit said links to move angularly with respect to each other so that they may conform to the cylindrical surface 36 formed on the core 30. At each end of the chain there is provided a plurality of holding lugs 37 which are attached to the chain by the pins 35 and lie in the planes of the intermediate links 34. Each lug has a foot 38 which enters a pocket 39 formed in the core.



The device for holding the chain to the core includes bolts 40 extending into the thickened portion of the core 31 through a flat surface 42 and said bolts hold in position retaining plates 43, one for each end of the chain. Each plate extends over that portion of the adjacent lugs 37 which enter the corresponding pocket 39. The proportions are such that the outer ends of the bolts 40 do not extend beyond a circle passing through the bottom of the teeth, the purpose of this construction being to permit the bolts 40 to rotate without disturbing the vibrator gears.

In certain instances I may desire to provide additional driving connection between the chain and cylinder core, in which case I may provide the cylinder with a key slot 50 which receives key projections 51 extending from the chain links, preferably the intermediate links 34. Although I have shown but one keyway in Fig. 2 yet as many of these slots can be employed as are necessary to give the proper driving connection between the chain and the cylinder core.

In operation the teeth 33 co-act with the teeth on the vibrator gears 16 to cause rotations of the latter. Should it be necessary to remove the chain or to reverse the same in order to compensate for wear the screws 40 and retaining plates 43 may be removed after which the retaining lugs 37 can be moved out of the pockets 39 and a new chain substituted, or the old chain reversed, after which the retaining plates may be replaced. The lugs 37 have inclined portions 44 which co-operate with corresponding inclined portions 45 of the pockets 39, said inclined surfaces having the effect of tightening the chain as the retaining plates 43 are drawn into position by the screws 40.

From the foregoing it will be seen that I have provided a cylinder for a Knowles head wherein the teeth are formed by a chain which readily conforms to the outer surface of the core of the cylinder, said chain having links provided with teeth to cooperate with the vibrator gear. Furthermore, the teeth are on the same type of links and therefore lie in the same planes to be in proper position to engage the teeth of the vibrator gear, the intermediate links 34 being opposite the spaces between the said vibrator gears. It will further be seen that the core is provided with pockets which receive the lugs extending from each end of the chain and that the lugs are held in their respective slots by easily detached holding means. Again it will be seen that the lugs and one wall of each of the pockets have contacting inclined surfaces so that as the retaining plates are drawn into position the chain will be tightened. Also, the lugs 51 and key slot 50 cooperate to position the intermediate portions of the chain.

Having thus described my invention it will

be apparent that changes and modifications may be made therein by those skilled in the art without departing from the spirit and scope of the invention and I do not wish to be limited to the details herein disclosed, but what I claim is:

1. In a pattern mechanism for a loom having a toothed element to be rotated, a rotatable driving member, and a chain secured to said member and rotating therewith and covering a portion of said member, said chain having links provided with teeth to be operatively related to the element to rotate the same.

2. In a pattern mechanism for a loom having a toothed element to be rotated, a rotatable member, and a removable chain secured to the member and having links provided with teeth to be operatively related to the element.

3. In a pattern mechanism for a loom having a toothed element to be rotated, a rotatable member, and a removable chain secured to the member and having links provided with teeth to be operatively related to the element, each alternate link having two teeth.

4. In a pattern mechanism for a loom having a toothed element to be rotated, a rotatable member, a removable chain having links provided with teeth to be operatively related to the element, and means to hold said chain to the member.

5. In a pattern mechanism for a loom having a toothed element to be rotated, a rotatable member, a removable chain having links provided with teeth to be operatively related to the element, and means to hold said chain to the member, said means including lugs to be received by recesses formed in the member.

6. In a pattern mechanism for a loom having a toothed element to be rotated, a rotatable cylindrical member, a chain secured to a portion of said member, said chain having links provided with teeth to engage the element and said chain having other links intermediate the links provided with the teeth, and said chain having lugs in alignment with said intermediate links to enter and be held in recesses formed in the member.

7. In a pattern mechanism for a loom having a toothed element to be rotated, a rotatable cylindrical member, a chain secured to a portion of said member, said chain having links provided with teeth to engage the element and said chain having other links intermediate the links provided with the teeth, and said chain having lugs in alignment with said intermediate links to enter and be held in recesses formed in the member, and detachable means for holding the lugs in the recesses.

8. In a pattern mechanism for a loom having a toothed element to be rotated, a rotatable cylindrical member, a chain se-



cured to a portion of said member, said chain having links provided with teeth to engage the element and said chain having other links intermediate the links provided with the teeth, and said chain having lugs in alignment with said intermediate links to enter and be held in recesses formed in the member, and detachable means for holding the lugs in the recesses, the lugs and recesses having inclined surfaces which co-operate with the holding means to draw the chain tightly around the member.

9. In a pattern mechanism for a loom having a toothed element to be rotated, a substantially cylindrical rotatable member, a chain held thereto and having links provided with teeth to engage the element, and certain of the links having inwardly extending projections to lie in a recess formed in the member to assist in preventing angular movement of the chain around the surface of the member.

10. In a pattern mechanism for a loom having a toothed element to be rotated, a

substantially cylindrical rotatable member, a chain having teeth to engage the element, and means to secure the ends of said chain to the cylinder.

11. In a pattern mechanism for a loom having a toothed element to be rotated, a substantially cylindrical rotatable member, a chain having teeth to engage the element, means to secure the ends of said chain to the cylinder, and means intermediate the ends of the chain defining inter-engaging connection between the chain and the member to prevent relative movement of the intermediate portion of the chain with respect to the member.

12. In loom mechanism, a pair of toothed rotatable coacting members, one to be driven by the other, the teeth of one member being provided by a chain secured to said member and having links with teeth to engage the teeth of the other member.

In testimony whereof I have hereunto affixed my signature.

WILLIAM M. WATTIE.