No. 771,501. PATENTED OCT. 4, 1904.

H. B. ROSS.

FEED ROLL FOR PLANING MACHINES.

APPLICATION FILED JAN. 28, 1904.

NO MODEL. 2 SHEETS—SHEET 1.

Fig. 1.

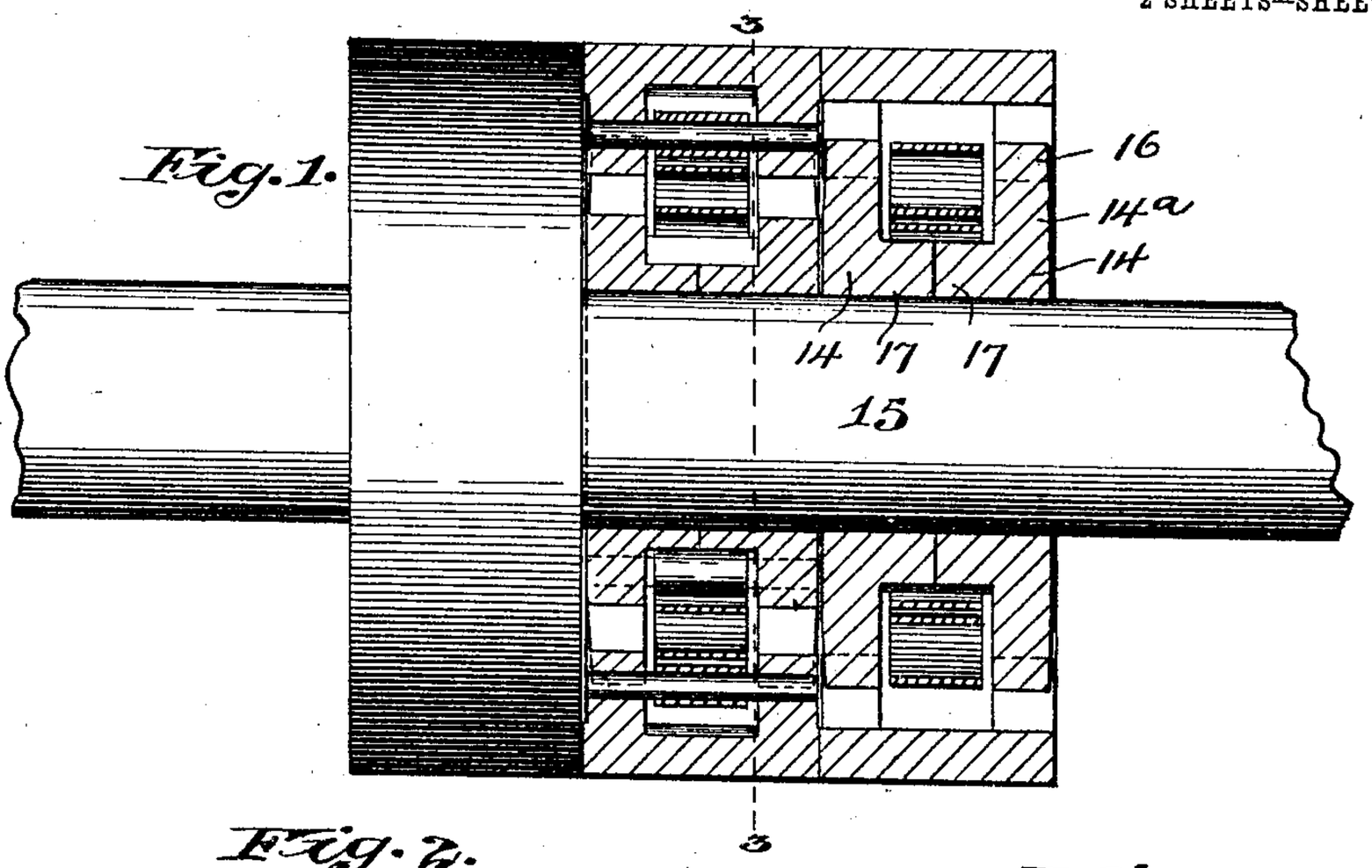


Fig. 2.

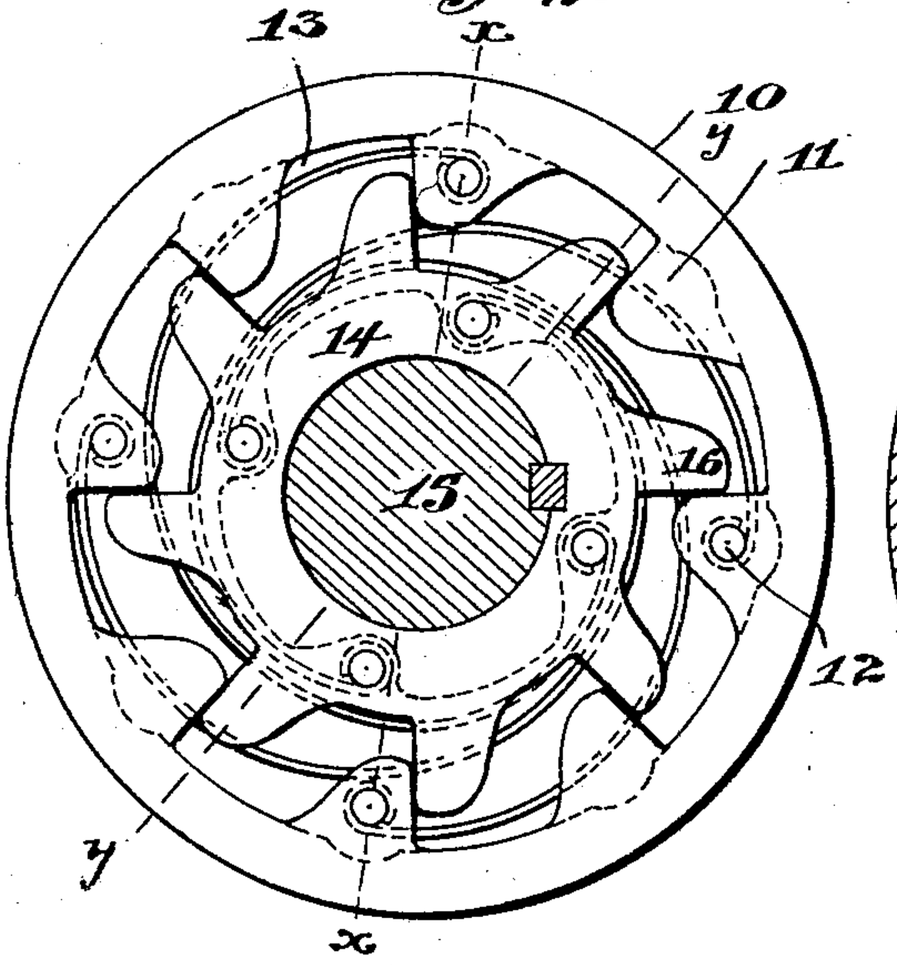


Fig. 3.

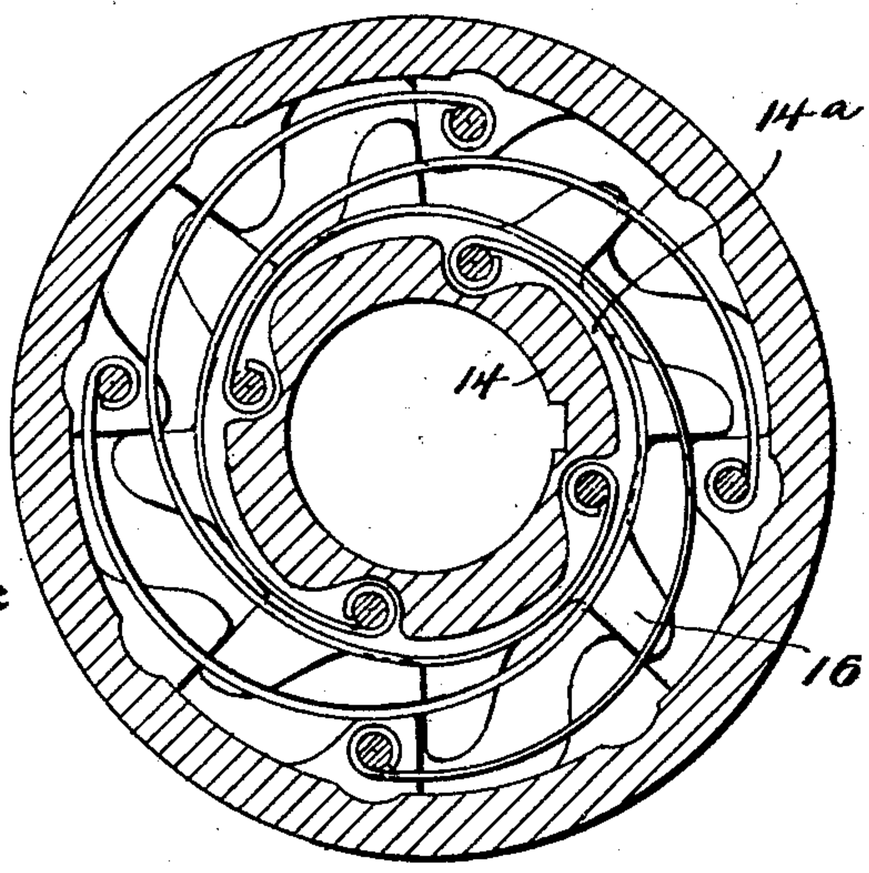
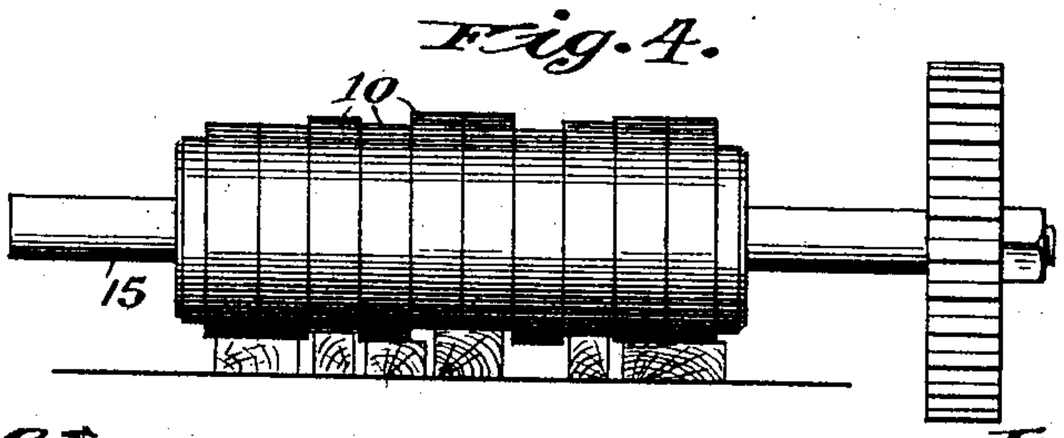


Fig. 4.



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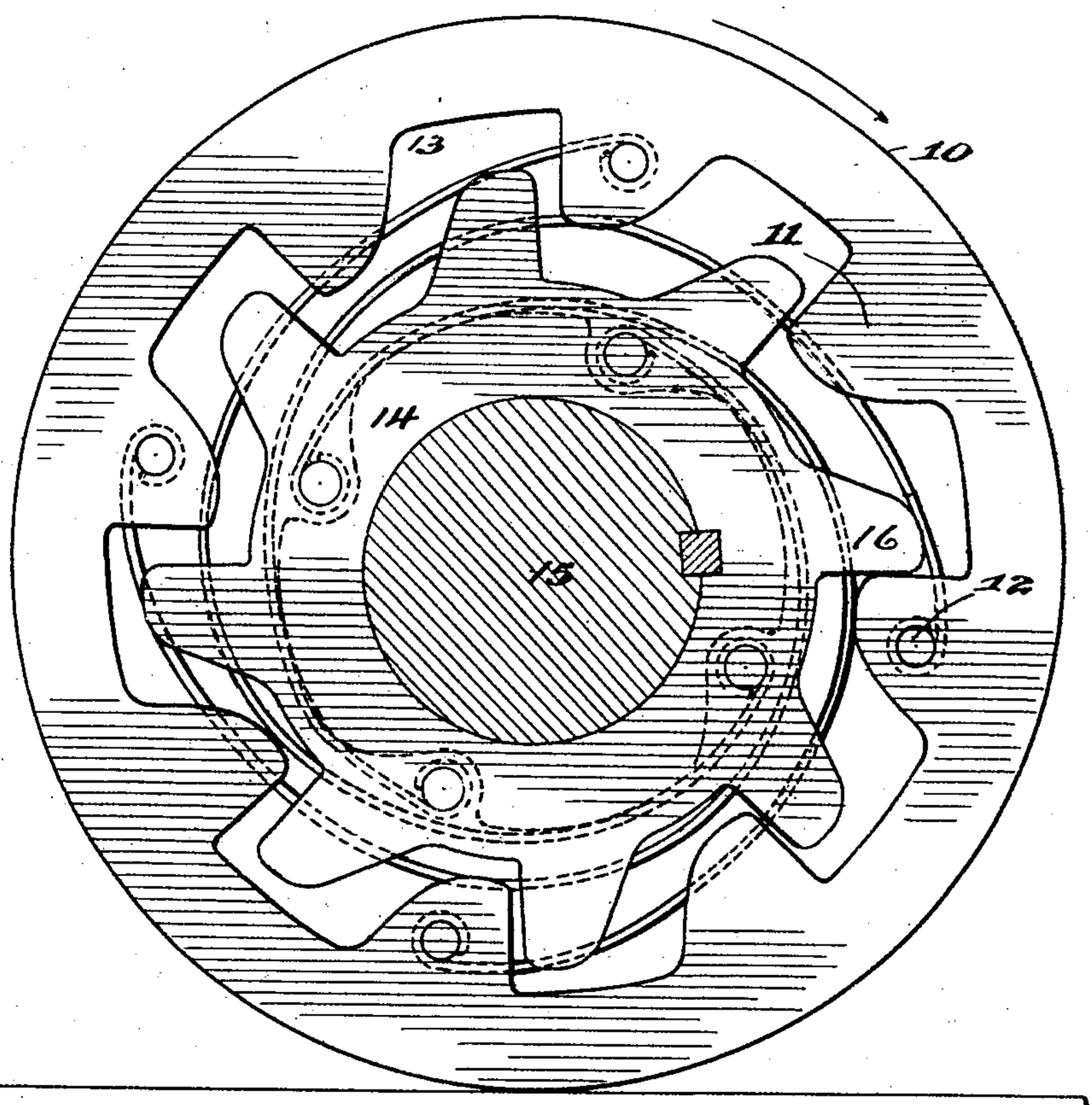
FEED ROLL FOR PLANING MACHINES.

APPLICATION FILED JAN. 28, 1904.

NO MODEL. 2 SHEETS—SHEET 2.

Fig. 5.



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UNITED STATES PATENT OFFICE.

HARRY B. ROSS, OF BELOIT, WISCONSIN, ASSIGNOR TO THE BERLIN MACHINE WORKS, OF BELOIT, WISCONSIN, A CORPORATION OF WISCONSIN.

FEED-ROLL FOR PLANING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 771,501, dated October 4, 1904.

Application filed January 28, 1904. Serial No. 191,008. (No model.)

To all whom it may concern:

Be it known that I, HARRY B. ROSS, a citizen of the United States, residing at Beloit, in the county of Rock and State of Wisconsin, have invented certain new and useful Improvements in Feed-Rolls for Planing-Machines, of which the following is a specification.

This invention relates to sectional feed-rolls for planing and surfacing machines, and has for its object to provide a sectional feed-roll the sections whereof are capable of independent yielding movement in a direction transversely of the shaft to accommodate themselves to sticks of lumber of different thicknesses and to irregularities of thickness in the same sticks.

My invention will be understod from a description of one of the roll-sections, since all the sections may be of like construction.

Briefly described, each feed-roll section comprises a hollow feed-roll of suitable width to adapt it to act upon a narrow stick of lumber and so connected to its driving-shaft as to permit to the lumber-engaging surface of the feed-roll a vertical movement and such that while a positive driving of the feed-roll is effected it is mounted to yield in a direction transversely of the shaft and while capable of use upon sticks of considerable variation in thickness the roll-section is so firmly held by its yielding connections to the shaft as to make it effective in feeding the thinnest sticks within its range of operation.

Referring to the drawings, which illustrate the preferred mechanical embodiment of my invention, Figure 1 shows the driving-shaft with three roll-sections applied thereto, the left-hand roll being in elevation and the intermediate and right-hand rolls being in mid-section on the lines $x\ x$ and $y\ y$, respectively, of Fig. 2. Fig. 2 is a side elevation of the roll-section, showing the shaft in cross-section. Fig. 3 is a cross-sectional view of the roll and its connections with the driving-shaft on the line 3 3 of Fig. 1. Fig. 4 is a front elevation showing a group of sectional rolls on the shaft and their application to a number of sticks of lumber of different thicknesses; and Fig. 5 is an enlarged view similar to Fig. 3, but illustrating the eccentric position of the roll relatively to the shaft and more particularly illustrating the relative positions and operations of the intermediate driving-lugs.

In the drawings, 10 represents a feed-roll section in the form of a ring or short cylinder, which is provided on its inner periphery with internally-projecting lugs 11 in suitable number, a series of eight being shown on each end of the ring or cylinder disposed in pairs, alternate pairs of said lugs being apertured to provide bearings for the pins 12, which serve as pivots or anchors for the outer ends of a series of springs 13. These springs are of a generally-abbreviated helical form or type, more specifically designable as C-springs. The inner ends of the springs 13 are pinned to a driving-ring, which latter is preferably and as herein shown constructed of two symmetrical members 14, keyed on the driving-shaft 15 and each having an annular radially-extending flange 14^a, provided with driving-lugs 16, said members 14 also having integral inwardly-extending hubs 17 of such length that when abutted against each other there is provided a space between the flange equal to or slightly greater than the width of the springs. The two members of the driving-ring are secured together by the pins or rivets 18, which latter afford means for holding the inner ends of the springs. These flanges afford in conjunction with the driving-lugs a working space for the springs, within which they are coiled or compressed when the outer section is moved with reference to the inner, and the sides of the flanges and lugs afford guides to prevent lateral movement of the outer section or feed-roll with reference to the inner section or driving-ring. The springs 13 are of such length and strength as to support the weight of the outer roll-section and to afford a considerable resistance to pressure upon the feed-roll, which would tend to change its concentric relation to the shaft. It will be observed that these springs are symmetrically arranged about the shaft and that each spring is of such length as to extend

through an arc of more than one hundred and eighty degrees. All of the springs when the parts are assembled are under tension, and consequently any force tending to vary the concentric relation of the feed-roll section to its shaft will be resisted by the combined action of all the springs. The tendency to upward movement of the feed-roll is of course due to its encountering sticks of lumber of greater thickness than the normal distance between the surface of the feed-roll and the bed or roll over which the lumber is being advanced. Under the normal tension of the springs the coöperating pairs of driving-lugs on the inner and outer members are in constant contact when the feed-roll section is concentric with the shaft; but they are of such length relatively to the radial distance between the roll-section and driving-ring as to permit the necessary play of certain coöperating lugs in radial, tangential, and intermediate directions and to permit of a facewise movement of adjacent roll-sections upon each other to adapt the feed-roll as a whole to the varying thicknesses of lumber subjected to its operation.

Considering the relation of the parts as disclosed in Figs. 2 and 3, it will be seen that the coöperating driving-lugs are in face engagement, the outer and inner sections of the roll being concentric to the shaft. Now if by reason of passing sticks of lumber of varying thickness beneath the roll, as shown in Fig. 4, some of the roll-sections are displaced with reference to the others, and therefore vertically moved into a position non-centric with the shaft, it will be seen that the driving-lugs will be held in contact at one point—as, for example, at the mid-height on the right hand of Figs. 2, 3, and 5; but this will result in a maximum separation of the lugs upon the opposite side of the roll and a less separation combined with a relative endwise movement of the intermediate pairs of coöperating lugs, as disclosed in Fig. 5. The movement is not, therefore, a free bodily vertical movement of the outer roll-section with relation to the inner or driving ring, but rather a circular movement, the fixed point being that in which the two driving-lugs have a facewise contact. For this reason it is important to provide a long spring which will permit of these varying movements without permanent set or distortion and which shall also afford a maximum yielding resistance to such displacement, whereby is secured the requisite pressure to feed the lumber. The flat C-spring shown and described I find excellently adapted for these results, especially when a plurality of such springs symmetrically disposed are employed.

The invention is susceptible of considerable structural variation as to the number of the springs and the mode of connecting them to the inner and outer sections and also as to the construction of the driving-section. It will be observed that the compression and extension of the springs take place in curved lines substantially concentric to the axis of the shaft, and therefore substantially in the direction of the length of the spring. By reason of this fact the maximum power of the springs is availed of without liability to destruction of the springs by reason of giving them a permanent set.

I claim—

1. A sectional feed-roll comprising a driving-shaft provided with driving connections rigid therewith, an outer roll-section provided with coöperating driving connections, and one or more helical springs disposed between the shaft and the outer roll-section and arranged substantially coaxially with said driving-shaft, substantially as described.

2. A sectional feed-roll comprising a driving-shaft provided with driving connections rigid therewith, an outer roll-section provided with coöperating driving connections, and a series of C-springs disposed between the shaft and the outer roll-section, substantially as described.

3. A sectional feed-roll comprising a driving-shaft provided with driving connections rigid therewith, an outer roll-section provided with coöperating driving connections, and a series of symmetrically-disposed C-springs each extending through an arc of more than one hundred and eighty degrees disposed between the shaft and the outer roll-section, substantially as described.

4. A sectional feed-roll comprising a driving-shaft provided with a driving-ring having outwardly-projecting lugs, an outer roll-section provided with inwardly-projecting lugs coöperating with said lugs of the driving-ring, and a series of C-springs connecting the outer roll-section with said driving-ring, substantially as described.

5. A sectional feed-roll comprising a driving-shaft provided with a driving-ring having outwardly-projecting lugs, an outer roll-section provided with inwardly-projecting lugs coöperating with said lugs of the driving-ring, and a series of symmetrically-disposed C-springs disposed between and at their opposite ends connected to said driving-ring and outer roll-section, respectively, substantially as described.

6. A sectional feed-roll comprising a driving-shaft provided with a driving-ring having outwardly-projecting lugs, an outer roll-section provided with inwardly-projecting lugs coöperating with said lugs of the driving-ring, and a series of symmetrically-disposed C-springs each extending through an arc of more than one hundred and eighty degrees disposed between and at their opposite ends connected to said driving-ring and outer roll-section, respectively, substantially as described.

7. A sectional feed-roll comprising a driving-shaft provided with a driving-ring having two series of outwardly-projecting lugs at the ends thereof, an outer roll-section provided with two corresponding series of inwardly-projecting lugs coöperating with said lugs of the driving-ring, pins mounted in and between laterally-adjacent lugs of the driving-ring and outer roll-section, respectively, and a series of symmetrically-disposed C-springs disposed between said driving-ring and outer roll-section and at their opposite ends mounted on the pins carried by the lugs of said driving-ring and outer roll-section, respectively, substantially as described.

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