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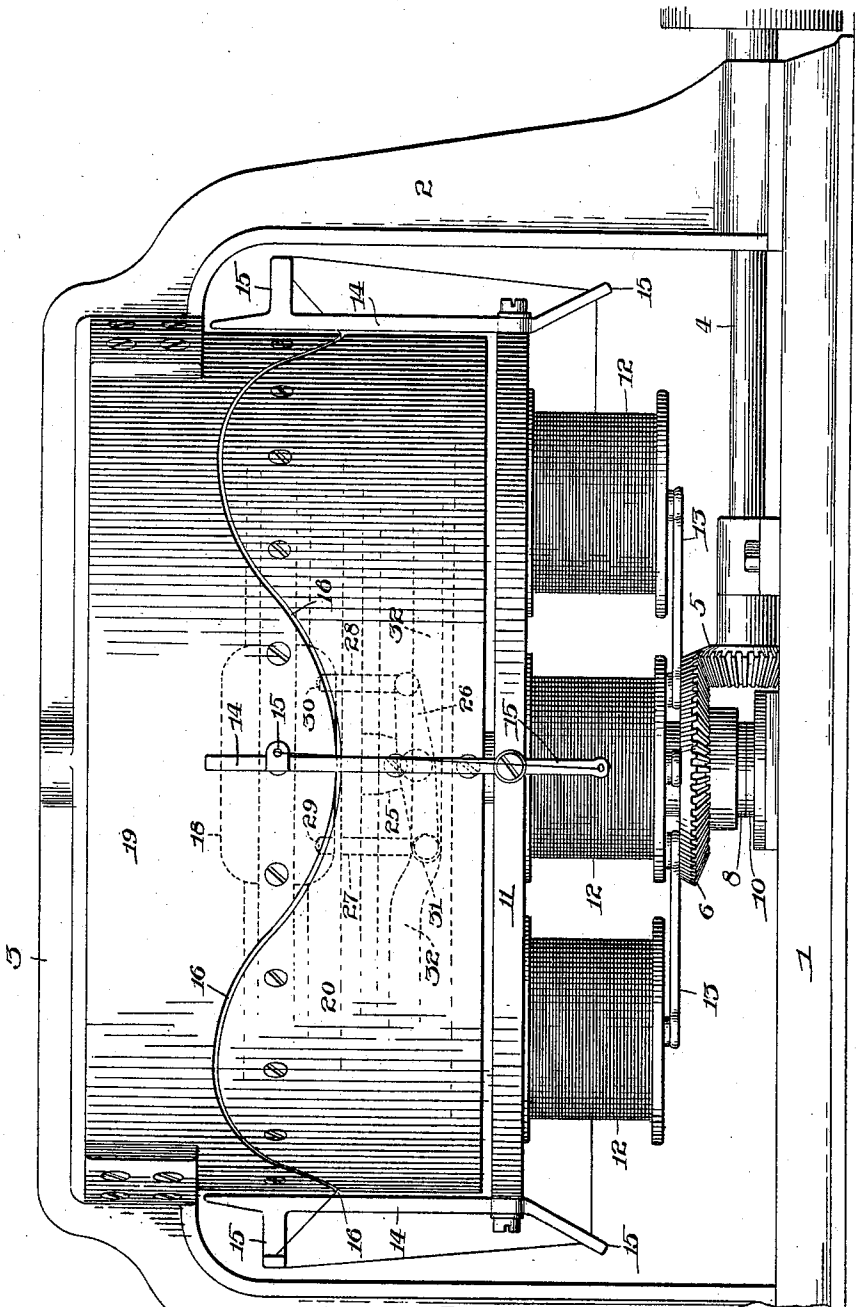
4 Sheets—Sheet 1.

A. V. GROUPE.

BRAIDING MACHINE.

No. 588,421. Patented Aug. 17, 1897.

Fig. 1.



Witnesses.

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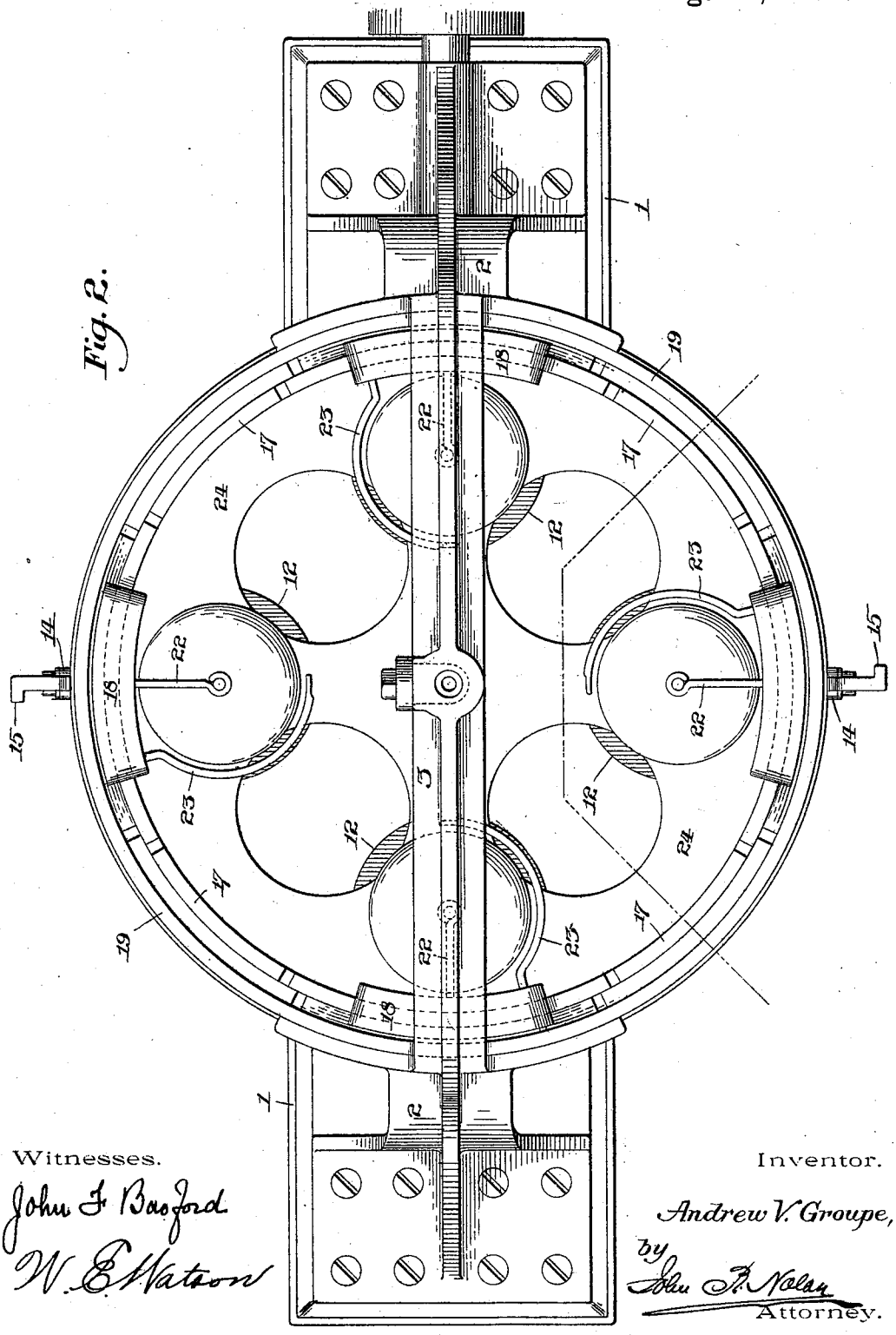
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A. V. GROUPE.

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Fig. 2.



Witnesses.

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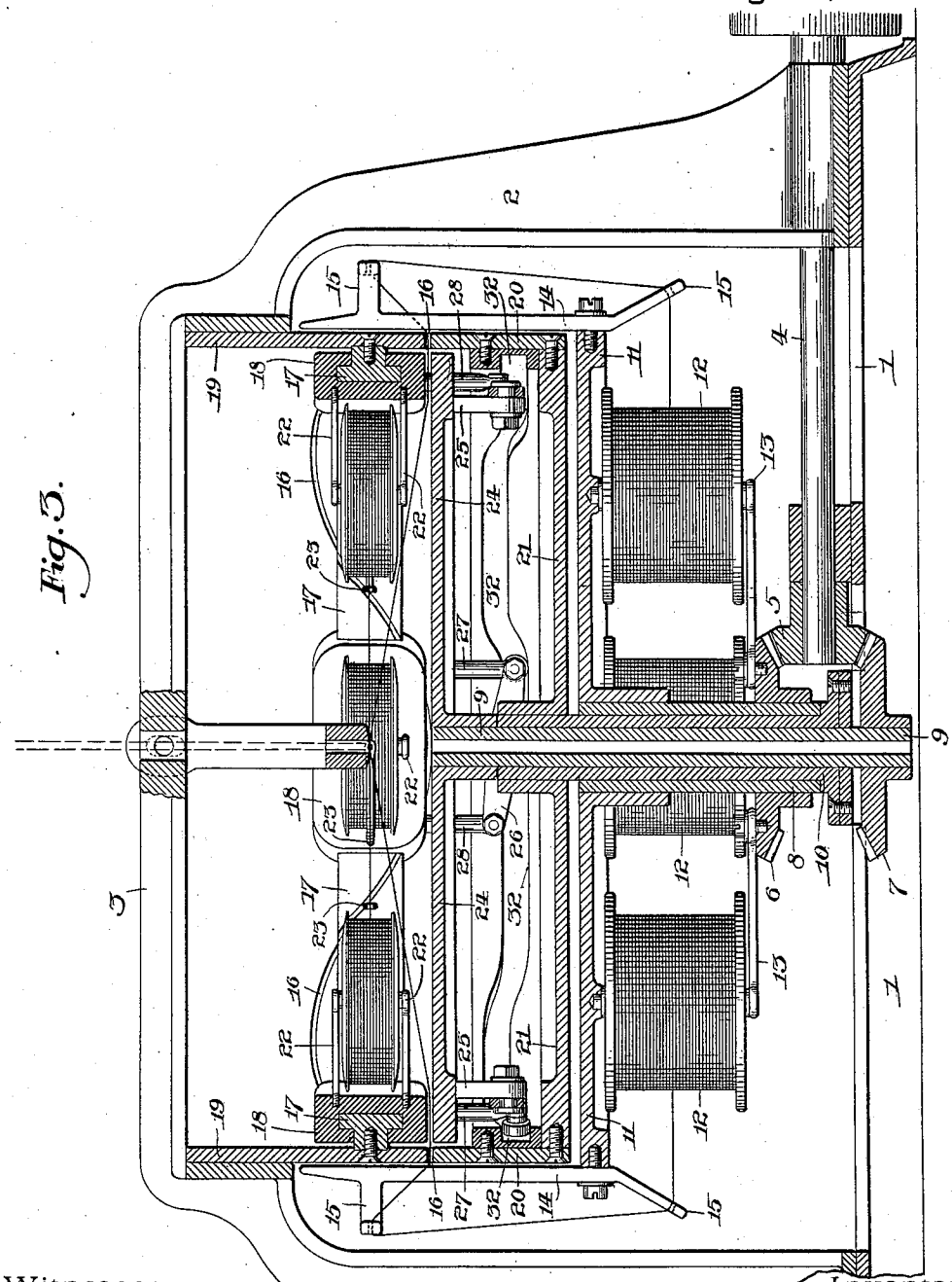
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A. V. GROUPE.

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Fig. 3.



Witnesses.

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(No Model.)

4 Sheets—Sheet 4.

A. V. GROUPE.

BRAIDING MACHINE.

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Fig. 4.

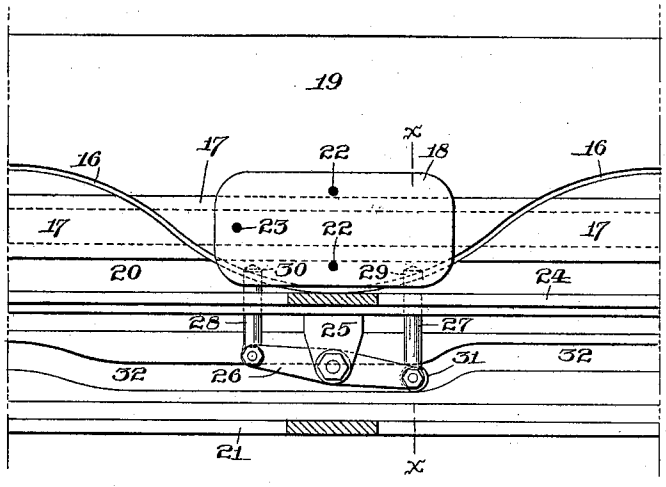


Fig. 8.

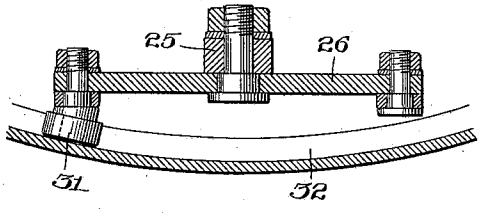


Fig. 9.

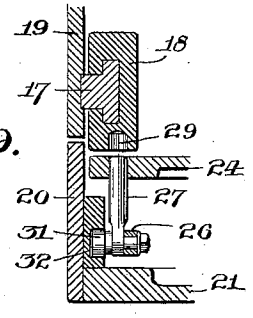


Fig. 5.

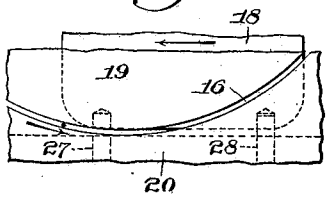


Fig. 6.

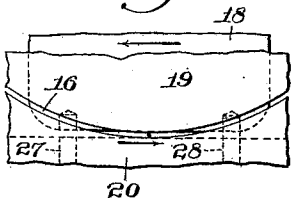
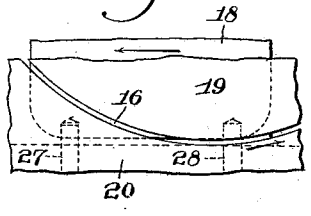


Fig. 7.



Witnesses.

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UNITED STATES PATENT OFFICE.

ANDREW V. GROUPE, OF PHILADELPHIA, PENNSYLVANIA.

BRAIDING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 588,421, dated August 17, 1897.

Application filed December 14, 1896. Serial No. 615,684. (No model.)

To all whom it may concern:

Be it known that I, ANDREW V. GROUPE, a citizen of the United States, residing in the city and county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Braiding-Machines, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part of this specification.

This invention relates to braiding-machines of that general class wherein two oppositely-driven sets of thread-carriers and their complementary parts are constructed and organized to effect the platting together of the threads for the purpose of forming a cord of braid or a braided covering for a central core. It has especial reference to that type of machines wherein two sets of bobbins are rotated in concentric paths and the threads of one set are directed over and under those of the other set successively, so as to attain the braiding of the several threads at a central point.

The essential feature of my invention resides in the construction and arrangement of a sectional trackway for the carriers of one set of bobbins and in the mechanism for actuating said carriers, whereby the threads of the other set of bobbins are directed in an easy course between the adjacent track-sections and over and under the same and the carriers thereon in a manner to minimize the friction of the coöperating parts and to insure a practically uniform tension on the respective threads, thus increasing the speed of the machine and, perforce, the quality and quantity of the material produced thereby.

In the drawings, Figure 1 is a side elevation of a machine embodying my invention in its preferred form. Fig. 2 is a plan thereof. Fig. 3 is a vertical section of the same. Fig. 4 is a quadrantal development of the sectional trackway for the upper bobbin-carriers, the thread-course, and track-support, one of said carriers, and the actuating mechanism therefor, the view being within the broken line indicated in Fig. 2. Figs. 5, 6, and 7 are diagrams of sections of the thread-course, illustrating the passage of one of the bobbin-carriers and the positions of the actuating-pins therefor relative to the thread. Fig. 8 is a section of the rocking lever for said pins and a portion of the camway for actuating said lever. Fig. 9 is a sectional detail as on the line x x of Fig. 4.

The bed-plate 1, lateral uprights 2, and cross-bar 3 constitute the framework of the machine. The main driving-shaft 4 is journaled in bearings on the bed-plate and is provided on its inner end with a bevel gear-wheel 5, which coacts with two similar wheels 6 7 on the lower ends of two concentric tubular shafts 8 9, respectively. Between these tubular shafts is a stationary shaft 10, which rises fixedly from the bed-plate.

To the shaft 8 is fixed a skeleton plate or spider 11, on the under side of which are supported at intervals apart the lower thread-supplying bobbins 12. In the present instance the trunnions or shafts for these bobbins are supported between the plate 11 and outwardly-extending spring tension-fingers 13 on the wheel 6, whereby the threads may be drawn from the bobbins under the requisite tension. On the periphery of the plate 11 at points adjacent to the respective bobbins are vertical arms 14, which are provided at their upper and lower ends, respectively, with perforated extensions 15 for the passage and guidance of the threads on their way to and through a sinuous slot or camway 16, by means of which such threads are raised and lowered in respect to a fixed annular trackway 17 and upper bobbin-carriers 18 thereon, as hereinafter described. This slot or camway is formed by and between the lower and upper edges of two concentric rings 19 and 20, respectively, the upper one of which is fixed to the uprights of the main frame and the lower one to a spider or plate 21 on the upper end of the fixed shaft 10.

The annular trackway just referred to is secured to the inner faces of the rings 19 20 on a horizontal plane midway between the highest and lowest planes intersected by the undulations of the camway and is divided into sections on diagonal lines coinciding with the adjacent inclined portions of the camway. Hence the sections are supported underneath the highest portions of the camway and above the lowest portions thereof, and the

spaces between the adjacent ends of the respective sections constitute in effect a part or continuation of the camway. The trackway is preferably, though not essentially, T-shaped in cross-section for the reception of the correspondingly grooved or recessed bobbin-carriers 18, which travel thereon in a direction reversely of the lower bobbins above described. The upper bobbins are supported between inwardly-extending spring tension-fingers 22 on the carrier, and the threads from these bobbins are drawn through a suitably-disposed guide-arm 23 to the central braiding point.

The means for rotating the upper bobbin-carriers is of such construction as to permit the passage of the threads from the lower bobbins over and under the upper carriers, as dictated by the camway. Therefore driving mechanism of the following description is provided, although it may be remarked other means to the same end may be used without departing from the essential feature of the invention.

On the upper end of the central tubular shaft 9 is a plate or spider 24, on the under side of which, adjacent to the respective bobbin-carriers 18, are depending brackets 25. Fulcrumed on each of the brackets is a rocking lever 26, which carries on its respective arms vertically-reciprocable pins 27 28. These pins are fitted to and guided in appropriate perforations in the spider and are adapted, by actuation of the lever, to register alternately with sockets 29 30, respectively, in the under side of the carrier, one pin remaining in engagement with its socket before the retraction of the other pin, and thereby insuring the continuous rotation of the carrier by and with the underlying plate or spider.

On one arm of the lever is a roller 31, which travels in a camway 32, formed on or secured to the lower fixed ring 20, such way being of appropriate contour to effect the actuation of the lever at proper intervals in respect to the upper thread-course 16, to the end that while the threads are being guided to the under sides of the respective carriers 18 the advance pins 27 are retracted and disengaged from the latter to permit the threads to pass freely between said carriers and pins, and before said threads meet the succeeding rearward pins 28, which are engaged with the carriers, the latter pins are retracted and disengaged therefrom simultaneously with the reëngagement of the advance pins with the respective carriers.

From the above-described construction it will be seen that the two sets of bobbins are rotated in contrary directions to each other and that the threads delivered therefrom are directed to the central or braiding point, and, furthermore, that the threads delivered from the lower bobbins are guided in a sinuous course during their rotation, so as to pass through and between the adjacent sections of the trackway for the upper bobbin-carriers and over and under said sections and carriers to effect the braiding operation with rapidity and efficiency.

I claim—

1. In a braiding-machine, the combination, with a stationary sectional trackway provided with threadways between the adjacent sections, carriers on said trackway, bobbins on said carriers, and means for actuating said carriers, of a second set of bobbins, supporting and actuating means therefor, and means whereby the threads from the last-named bobbins are directed between, under and over sections of the trackway in prescribed order, substantially as described.

2. In a braiding-machine, the combination of a sectional trackway provided with threadways between adjacent sections, carriers on said trackway, bobbins on said carriers, means for actuating said carriers, a second set of bobbins, actuating means therefor, and means for supporting the trackway on each side of the path traversed by the threads delivered from the second set of bobbins, whereby said threads may be directed between, under and over sections of the trackway in prescribed order, substantially as described.

3. In a braiding-machine, the combination of two stationary rings between which is formed a sinuous course, a sectional trackway, a set of bobbin-carriers on said trackway, means for rotating said carriers, a second set of bobbins, and means for supporting and rotating the same, whereby the threads from the last-named bobbins are directed between, under and over sections of the trackway in prescribed order, substantially as described.

4. In a braiding-machine, the combination, with a stationary sectional trackway provided with threadways between the adjacent sections, bobbin-carriers on said trackway, and carrier-actuating mechanism provided with devices for alternately engaging and disengaging each of the carriers at two different points, of a second set of bobbins, supporting and actuating means therefor, and means whereby the threads from the last-named bobbins are directed between, under and over sections of the trackway in prescribed order, substantially as described.

5. In a braiding-machine, the combination of two stationary rings between which is formed a sinuous course, a sectional trackway, a set of bobbin-carriers thereon, a fixed camway, rocking levers engaged therewith and provided with means for engaging and disengaging said carriers at predetermined intervals, means for supporting and actuating said levers, lower thread-supplying devices, and means for rotating the same, substantially as described.

6. In a braiding-machine, the combination of two rings between which is formed a sinuous course, an annular trackway interme-

diate the highest and lowest planes of, and intersected by, the course, thread-supplying devices on said trackway, lower thread-supplying devices, and mechanism for rotating said upper and lower thread-supplying devices in opposite directions to each other, substantially as described.

In testimony whereof I have hereunto affixed my signature in the presence of two subscribing witnesses.

ANDREW V. GROUPE.

Witnesses:
JOHN R. NOLAN,
JOHN F. BASFORD.