

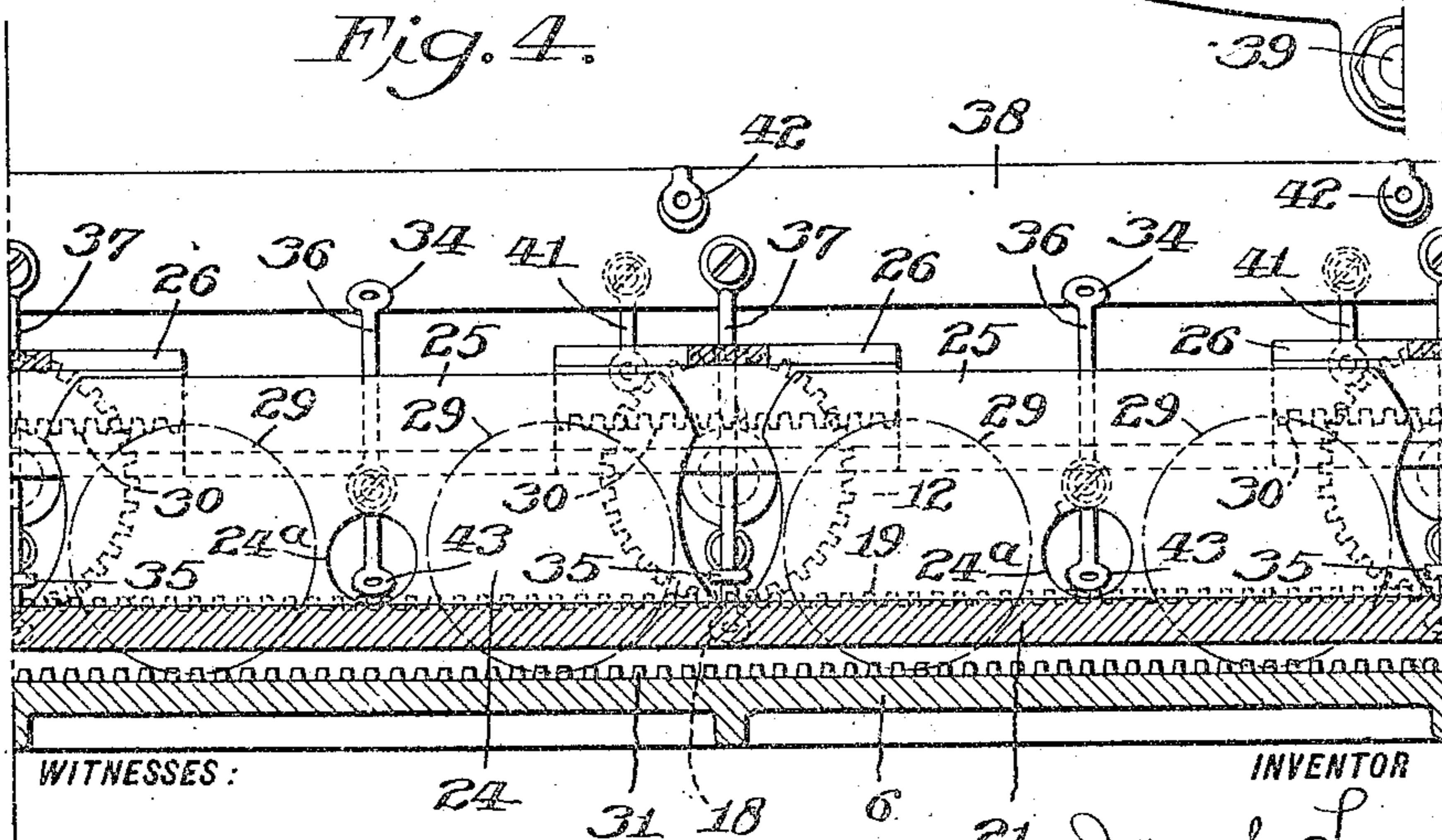
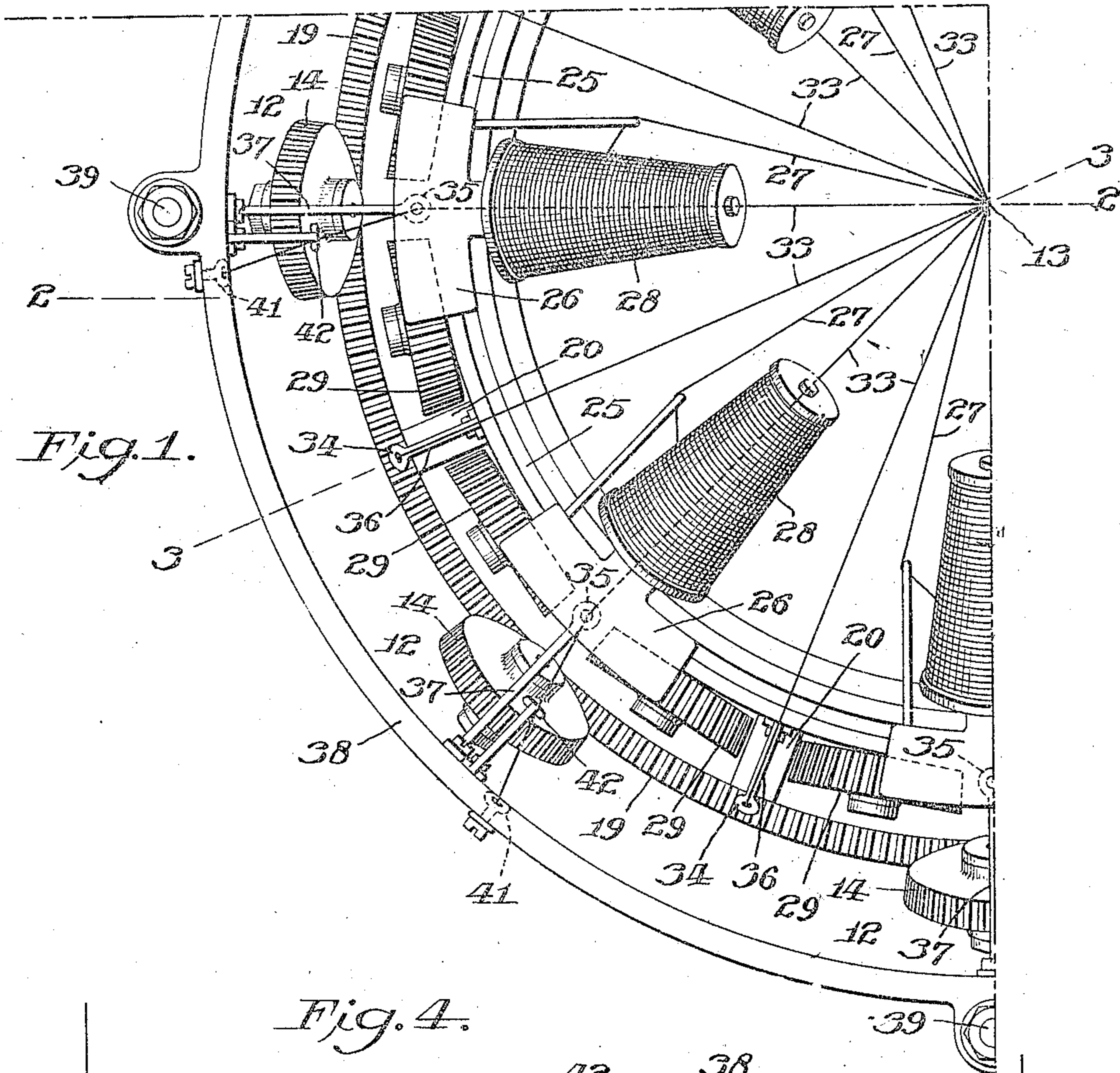
No. 887,259.

PATENTED MAY 12, 1908.

J. LUNDGREN.  
BRAIDING MACHINE.

APPLICATION FILED MAY 11, 1903. RENEWED SEPT. 25, 1907.

3 SHEETS—SHEET 1.



WITNESSES:  
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W. W. Canby

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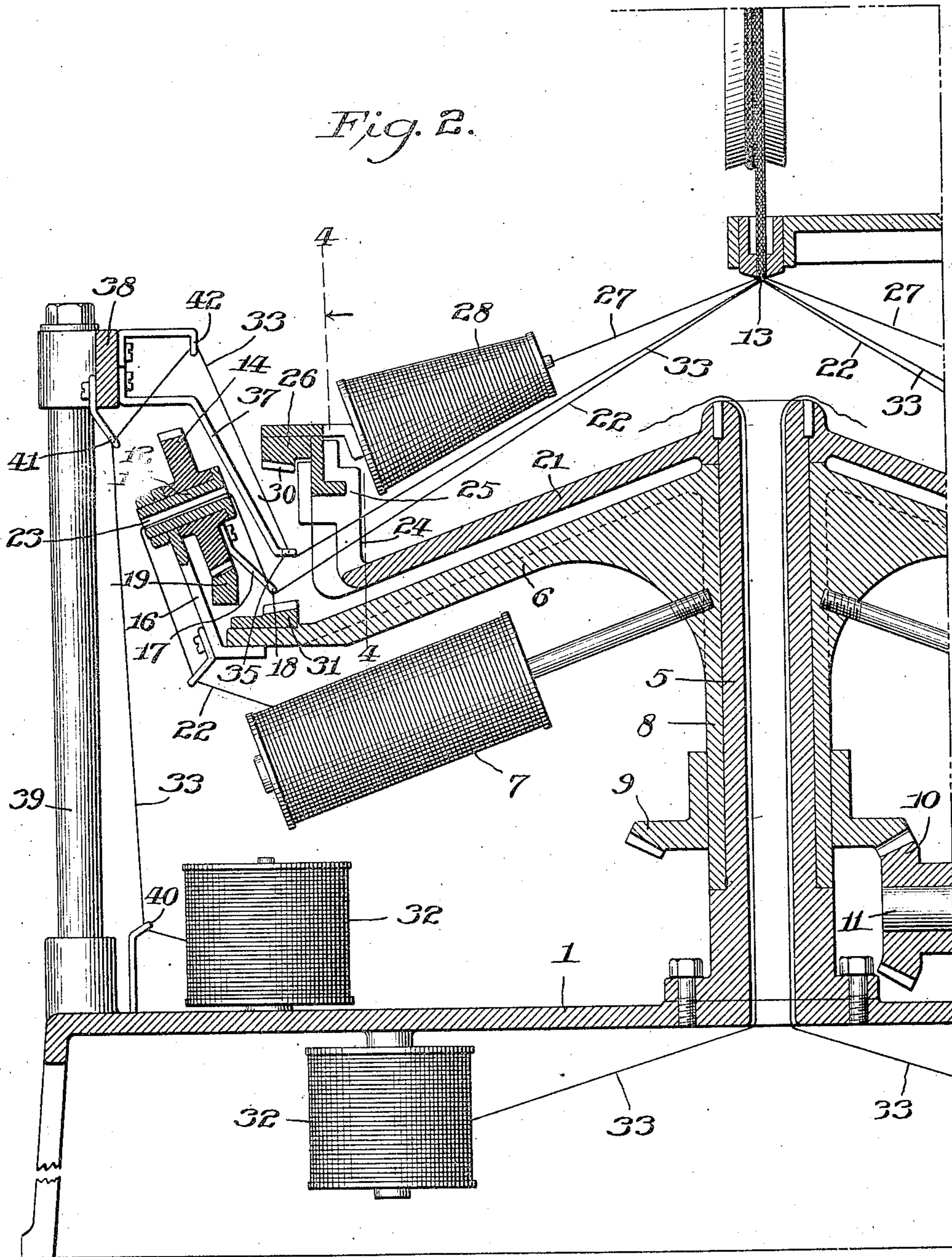
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3 SHEETS—SHEET 2.



WITNESSES:

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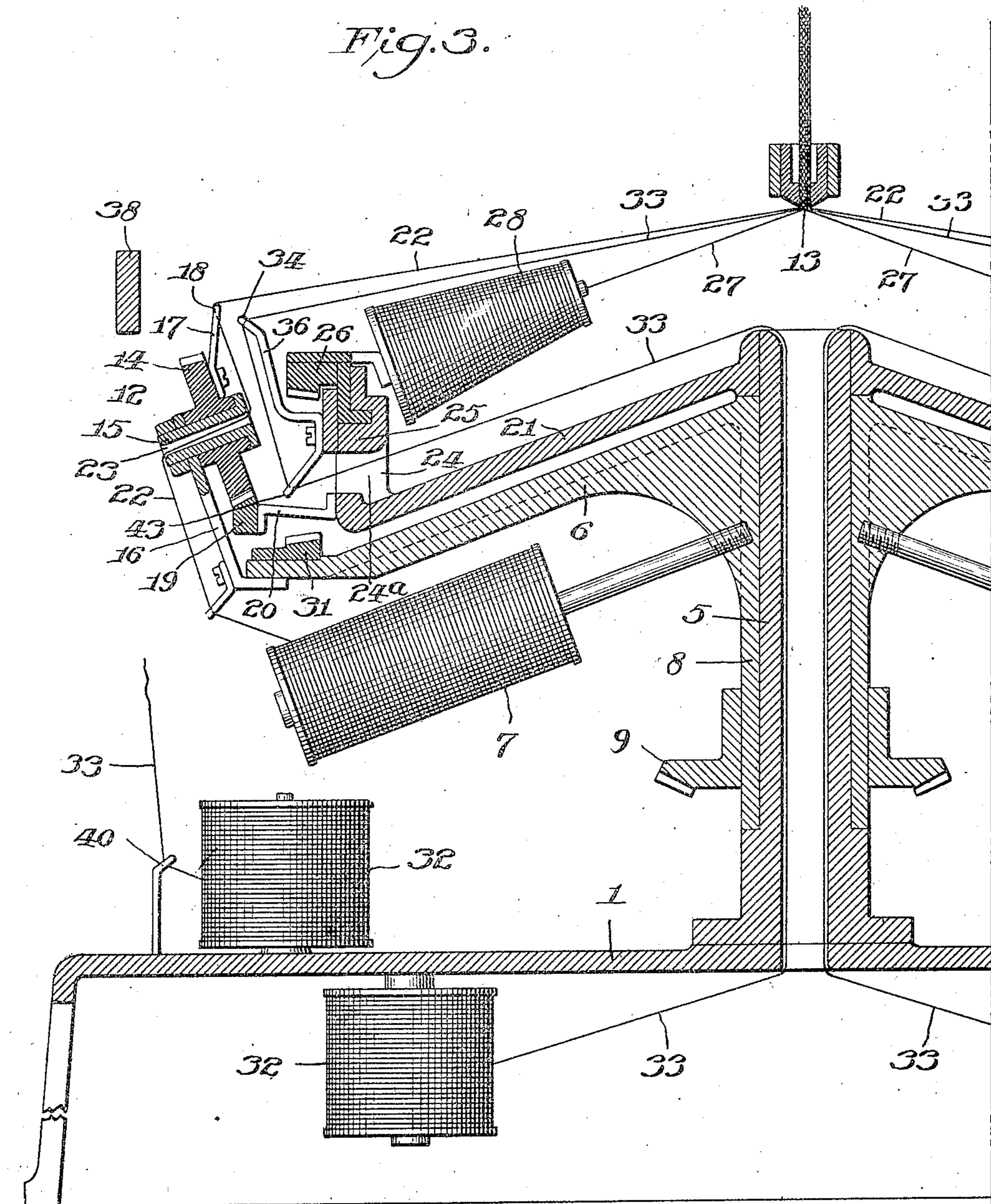
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3 SHEETS—SHEET 3.

*Fig. 3.*



WITNESSES:

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# UNITED STATES PATENT OFFICE.

JACOB LUNDGREN, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO HENRY M. HARLEY,  
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## BRAIDING-MACHINE.

No. 887,259.

Specification of Letters Patent.

Patented May 12, 1908.

Application filed May 11, 1903, Serial No. 156,529. Renewed September 25, 1907. Serial No. 394,577.

*To all whom it may concern:*

Be it known that I, JACOB LUNDGREN, a citizen of the United States, residing at Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Braiding-Machines, of which the following is a specification.

This invention relates to that class of braiding machines wherein two sets of thread-supplying devices are rotated in concentric annular paths and in opposite directions to each other, and wherein the threads of one set are directed over and under the threads of the other set in a manner to effect the braiding operation, such for example as that shown and described in Letters Patent of the United States No. 695,746 dated March 18, 1902 to which reference may be had.

The object of this invention is to provide machines of this character with means for introducing an additional thread or threads and directing the latter, by fixed guides, toward the braiding point, between the paths traversed by the threads delivered from the two sets of rotating thread-supplying devices, whereby a braid having straight longitudinal threads interwoven with the braided threads may be produced, as will be herein-after fully described and claimed.

In the drawings—Figure 1 is a plan view of a portion of a braiding machine provided with my invention. Fig. 2 is a vertical section thereof, as on the line 2—2 of Fig. 1. Fig. 3 is a similar section, as on the line 3—3 of Fig. 1, showing the parts moved to bring one of the thread guiding devices to this line. Fig. 4 is a sectional development of a portion of the trackway on which the upper bobbin carriers run, and adjuncts, as seen from the line 4—4 of Fig. 2.

1 is the bed plate of the machine from which projects a centrally-arranged hollow tubular post 5. Fitted to this post 5 is a freely rotatable wheel 6 which carries a set of thread-supplying bobbins 7. The hub 8 of the wheel 6 is provided with a bevel gear wheel 9 which coacts with a similar wheel 10 on the driving shaft 11, by means of which the wheel 6 is positively rotated. The wheel 6 carries a series of suitably-arranged guide devices 12, which direct the threads from the

bobbins 7 toward the braiding point 13, and, at the same time, raise and lower the said threads during their rotary travel.

In the present instance, the guide devices 12 comprise gear wheels 14 which are rotatably mounted on studs 15 projecting from brackets 16 on the wheel 6. The wheels 14 are provided with arms 17 carrying thread guiding eyes 18, and they mesh with and are rotated by a fixed gear ring 19 supported by brackets 20 projecting from a stationary frame 21 which is supported by the post 5 above the wheel 6. The threads 22 pass from the bobbins 7 through central perforations 23 in the studs 15, and then through the eyes 18 to the braiding point 13; to the end that, as the wheel 6 is actuated, the gear wheels 14 will be rotated, and their rotating arms 17 will raise and lower the threads 22 during their onward travel, thereby causing the threads 22 to pass between and over and under the bobbins 28 and thus effect the braiding operation, as is well known in this art.

The stationary frame 21 is provided with a flange 24 which supports an annular trackway 25 on which the upper bobbin or thread carriers 26 run in a direction reversely to the bobbins 7. The threads 27 from bobbins 28 carried by the carriers 26 are fed direct to the braiding point 13. The carriers 26 are driven by a series of pinions 29 which are rotatably mounted on the flange 24 of the stationary frame 21 and which mesh with teeth 30 on the carriers 26, the pinions 29 being actuated by a gear ring 31 carried by the wheel 6.

By the foregoing description it will be seen that the two sets of bobbins 7 and 28 are supported and rotated in annular paths and in opposite directions to each other; and that the threads 22 from the bobbins 7 are directed, by the guide devices 12, over and under the threads 27 from the upper bobbins 28, thereby producing braid in the usual manner.

Thus far the machine is of well known construction and needs no detailed description herein.

I desire it to be understood that I do not limit myself to the mechanism above described which is substantially the same as that shown and described in the patent hereinbefore referred to, as any suitable means

may be employed to support and rotate the two sets of bobbins in annular paths and in opposite directions to each other, and any suitable means may be employed to direct the threads delivered from one set of bobbins under and over the threads delivered from the other set of bobbins.

I shall now proceed to describe my invention which, in its preferred embodiment, is as follows: In addition to the two sets of bobbins 7 and 28 above referred to, I employ another bobbin or bobbins 32 and support the latter by the main frame or bed plate 1, as shown. Each thread 33 delivered from the bobbin or bobbins 32 is guided and directed to the braiding point 13 between the path traversed by the threads delivered from one set of rotating bobbins and the path traversed by the threads delivered from the other set of rotating bobbins. To accomplish this end it is necessary that the eye which delivers each thread 33 to the braiding point be located outside of the path traversed by the set of rotating bobbins which deliver their threads direct to the braiding point, and within the up and down movement of the threads delivered from the other set of rotating bobbins. I, therefore, provide either the eyes 34 or the eyes 35 or both, depending upon the number of additional threads 33 it is desired to employ. The eyes 34 are arranged to direct the threads 33 to the braiding point 13 above the path traversed by the bobbins 28 and below portions of the path traversed by the threads 22; and the eyes 35 are arranged to direct the threads 33 to the braiding point 13 below the path traversed by the bobbins 28 and above portions of the path traversed by the threads 22. By employing the eyes 35 I am enabled to feed in a thread 33 at each point where the threads 22 pass under the bobbins 28; and by employing the eyes 34 I am enabled to feed in a thread 33 at each point where the threads 22 pass over the bobbins 28. Thus it will be seen that by employing both sets of eyes 34 and 35 I am enabled to feed in double the number of threads 33 than if only one of the sets were employed, for the reason that the threads 33 can only be fed to the braiding point 13 above and below the path traversed by the bobbins 28 and at points where the threads 22 pass under and at points where the threads 22 pass over the bobbins 28. The eyes 34 are supported on the upper ends of arms 36 which are mounted on the trackway 25 supported by the stationary frame 21; and the eyes 35 are supported on the lower ends of arms 37 which project from a fixed ring 38 mounted on standards 39 rising from the bed plate 1. The threads 33 in passing from the bobbins 32 to the eyes 35 are guided by suitably located eyes 40, 41 and 42, and, in passing to the eyes 34, pass up through the tubular post 5 and through an opening 24<sup>a</sup> in the

flange 24, and are guided by eyes 43 supported by downward extensions of the arms 36.

By the above described construction it will be seen that while the threads 22 and 27 are being plaited together in the usual manner to form braid, the threads 33 are fed from fixed points and between the paths traversed by the threads 22 and 27, thereby producing a braid having straight longitudinal threads interwoven with the braided threads.

I claim—

1. In a braiding machine, the combination with two sets of thread-supplying devices, means for supporting said devices and rotating the same in annular paths and in opposite directions to each other, and means for directing the threads delivered from one set of devices over and under the other set of devices, of means for supporting and directing a thread to the braiding point and between the path traversed by one set of thread-supplying devices and the path traversed by the threads delivered from the other set of thread-supplying devices.

2. In a braiding machine, the combination with two sets of thread-supplying devices, means for supporting said devices and rotating the same in annular paths and in opposite directions to each other, and means for directing the threads delivered from one set of devices over and under the other set of devices, of a fixed thread guide located between the path traversed by the last named means and the path traversed by one of the sets of thread-supplying devices, whereby a thread may be introduced to the braiding point between the paths traversed by the threads delivered by the two sets of thread-supplying devices.

3. In a braiding machine, the combination with two sets of thread-supplying devices, means for supporting said devices and rotating the same in annular paths and in opposite directions to each other, and means for directing the threads delivered from one set of devices over and under the other set of devices, of a fixed thread guide located outside of the path traversed by one set of thread-supplying devices and within the limit of the up and down movements of the threads delivered from the other set of thread-supplying devices, whereby a thread may be delivered to the braiding point between the paths traversed by the threads delivered by the two sets of thread-supplying devices.

4. In a braiding machine, the combination with two sets of thread-supplying devices, means for supporting said devices and rotating the same in annular paths and in opposite directions to each other, and means for directing the threads delivered from one set of devices over and under the other set of devices, of a fixed thread guide located to

direct a thread to the braiding point above the path traversed by one set of thread-supplying devices and below the path traversed by the threads delivered from the other set of thread-supplying devices, and means for supplying thread to said fixed guide.

5 5. In a braiding machine, the combination with two sets of thread-supplying devices, means for supporting said devices and rotating the same in annular paths and in opposite directions to each other, and means for directing the threads delivered from one set of devices over and under the other set of devices, of a fixed thread guide located to direct a thread to the braiding point below the path traversed by one set of thread-supplying devices and above the path traversed by the threads delivered from the other set of thread-supplying devices, and means for supplying thread to said fixed guide.

20 6. In a braiding machine, the combination with two sets of thread supplying devices, means for supporting said device and rotating

ing the same in annular paths and in opposite directions to each other, and means for directing the threads delivered from one set of devices over and under the other set of devices, of a series of fixed guides located to direct threads to the braiding point above the path traversed by one set of thread-supplying devices and below the path traversed by the threads delivered from the other set of thread supplying devices, a series of fixed guides located to direct threads to the braiding below the path traversed by one set of thread-supplying devices and above the path traversed by the threads delivered from the other set of devices, and means for supplying threads to said fixed guides.

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

JACOB LUNDGREN.

Witnesses:

RALPH H. GAMBLE,  
ANDREW V. GROUPE.