

No. 682,887.

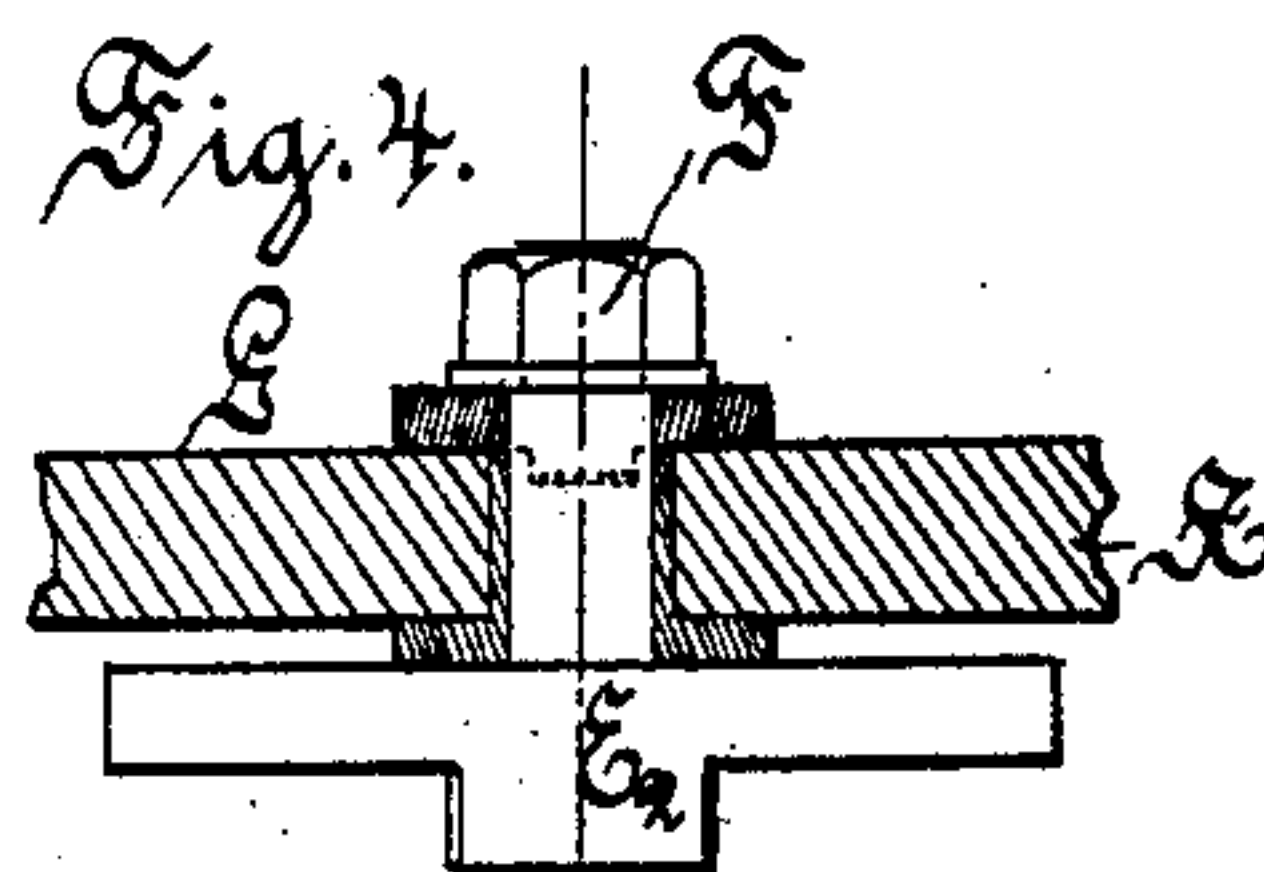
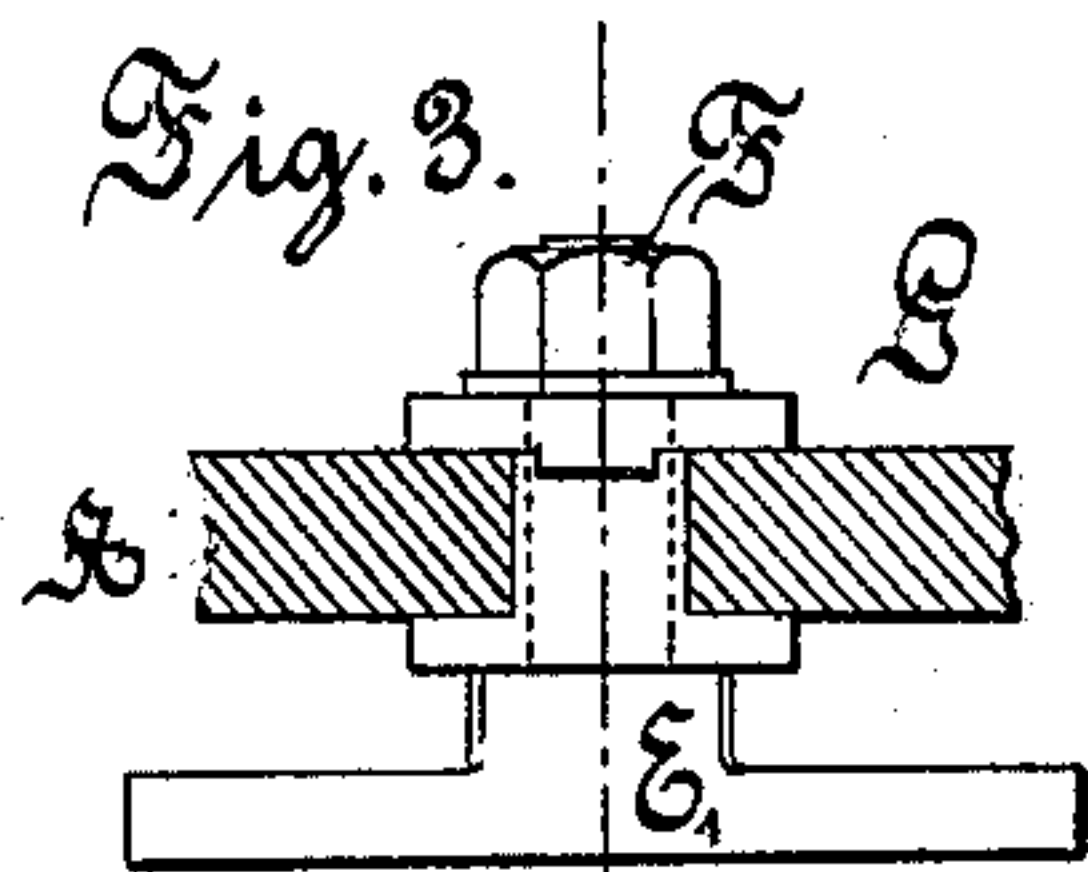
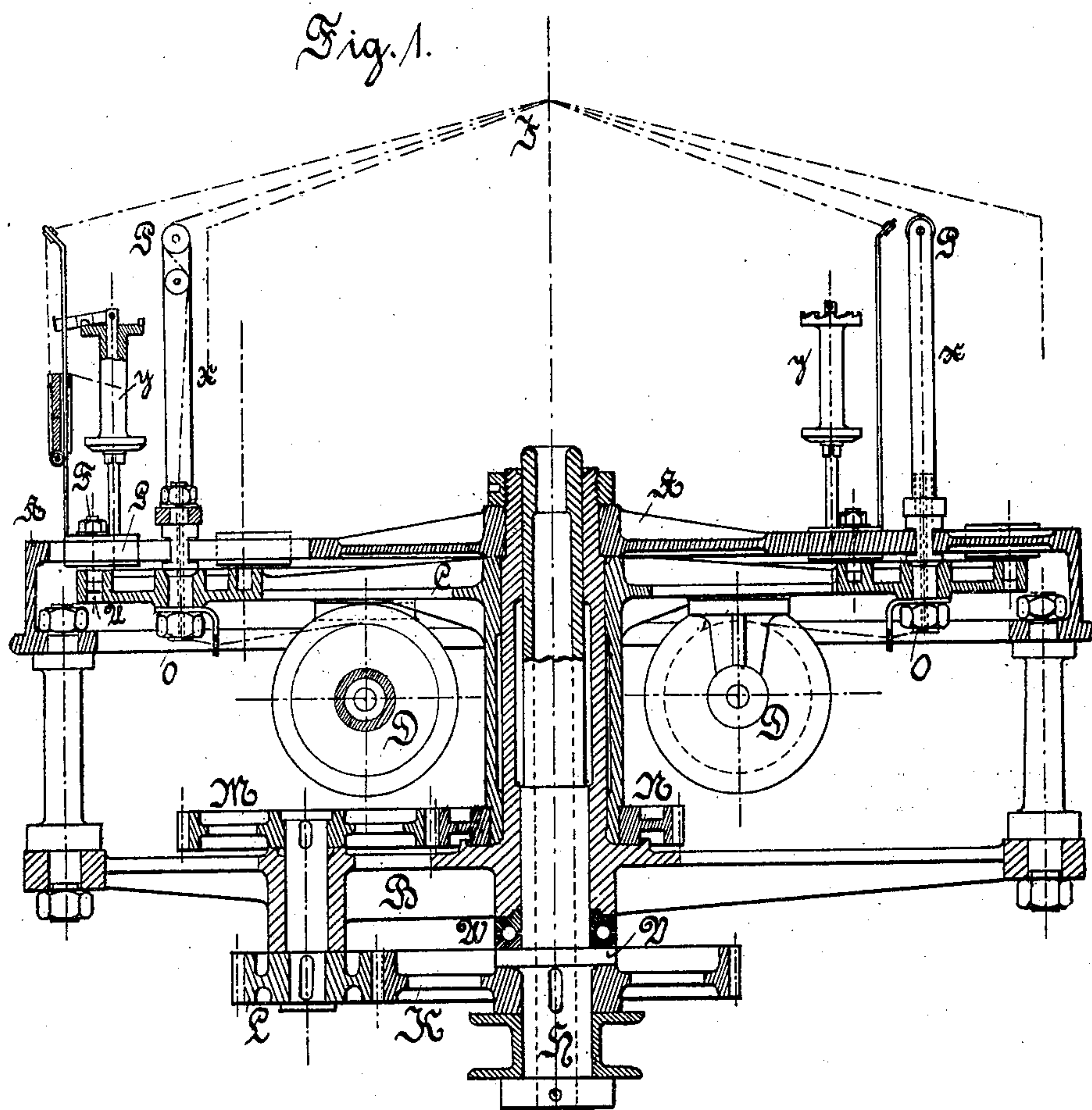
Patented Sept. 17, 1901.

C. SCHÜRMANN.
BRAIDING MACHINE.

(Application filed June 25, 1900.)

(No Model.)

2 Sheets—Sheet 1.



Witnesses:

Dennie Sundry.
J. B. Keefe.

Inventor
Carl Schürmann

By James L. Norris.
Atty.

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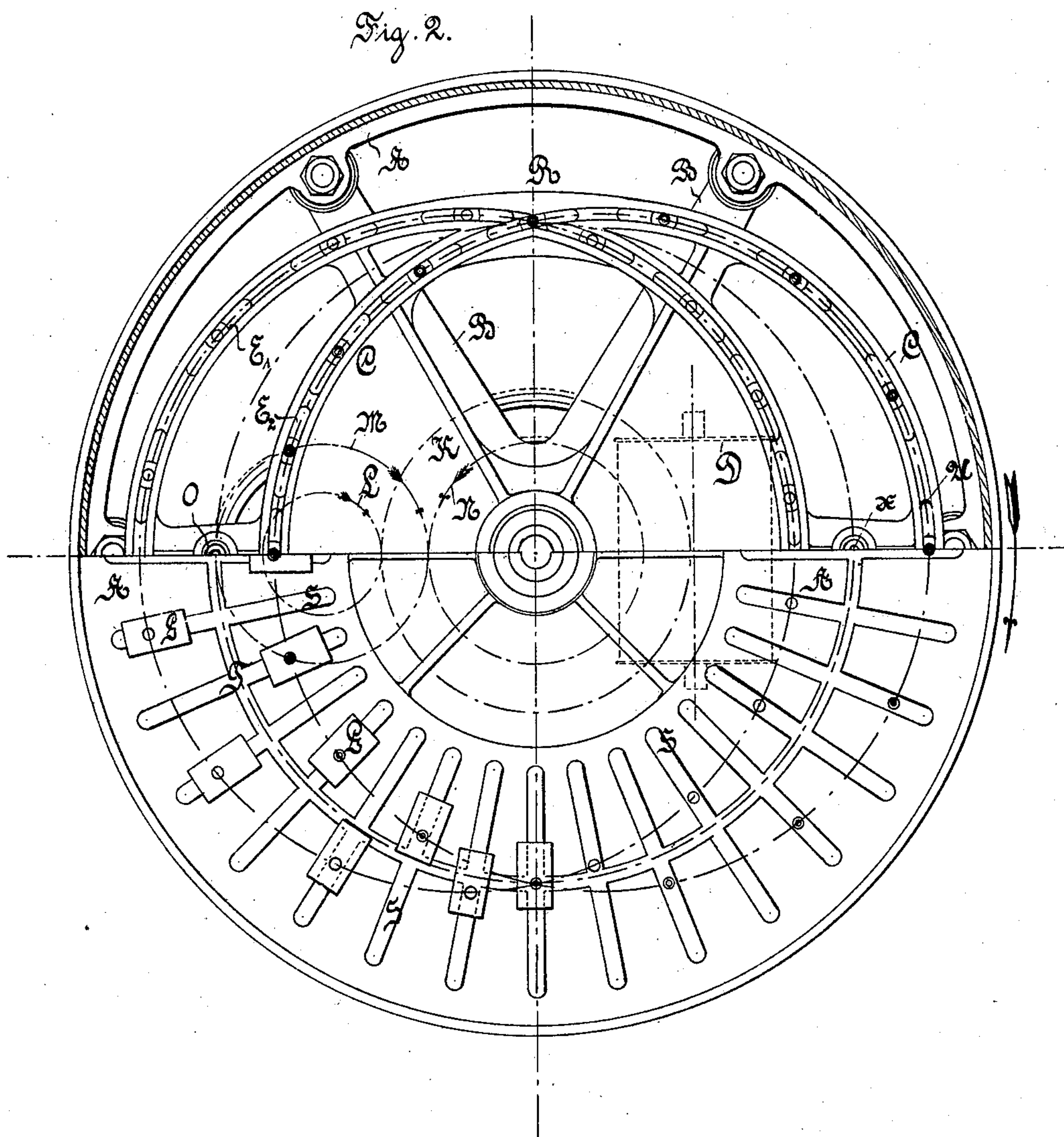
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2 Sheets—Sheet 2.



Witnesses:
Dennis Lumb.
J. B. Keefe

Inventor
Carl Schürmann
By James L. Norris
Atty.

UNITED STATES PATENT OFFICE.

CARL SCHÜRMANN, OF DUSSELDORF, GERMANY.

BRAIDING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 682,887, dated September 17, 1901.

Application filed June 25, 1900. Serial No. 21,567. (No model.)

To all whom it may concern:

Be it known that I, CARL SCHÜRMANN, engineer by diploma, a subject of the German Emperor, residing at Dusseldorf, in the German Empire, have invented certain new and useful Improvements in Braiding-Machines, of which the following is a specification.

This invention relates to braiding-machines with two systems of threads, of which one turns in a circle while the other moves in radial slots. The machines of this kind heretofore constructed have the great disadvantage that the bobbins of the two systems of threads are on the cover of the machine, whereby the number of bobbins is much limited. Attempts have been made to obviate this disadvantage by replacing the bobbins running in the radial slots by thread-guides and arranging the corresponding bobbins underneath the machine. This arrangement, however, presents the great disadvantage that a relative motion of the thread takes place in the thread-guides, and therefore the bobbins arranged beneath the machine must be constructed for a variable tension of the thread. They must be provided with thread-tensioning weights or the like.

All the faults of the braiding-machines with two systems of threads heretofore in use are obviated according to the present invention by replacing the circulating bobbins, which keep at a constant distance from the axis of rotation of the machine, by thread-guides and arranging the corresponding bobbins within the machine. By this means it is possible to give any desired diameter to the bobbins within the machine without being obliged to enlarge the machine itself. Moreover, by reason of the thread-guides being always at the same distance from the axis of rotation of the machine there is no variation of the tension in the system of threads. By reason of the arrangement within the machine of the bobbins belonging to the circulating thread-guides it is possible to reduce the eccentricity of the cam-tracks from which the cover-bobbins are driven, these cover-bobbins having to clear the thread-guides, and thus the machine is reduced in size. If, however, the eccentricity of the cam-tracks is reduced, the angle of intersection of the cam-tracks will be more acute, and

this circumstance necessitates a lengthening of the carriages in order that the latter can be safely conducted through the crossing of the cam-tracks. In the lengthening of the carriages, however, the relative distance apart of the cover-bobbins from each other is increased and therefore their number must be reduced. In order to obviate this—that is to say, in order to enable the distance apart of the bobbins to be smaller than the length of the carriages—the said carriages are allowed to engage one over the other at their ends stepwise.

The new braiding-machine is shown in the accompanying drawings, in which—

Figure 1 shows the machine in vertical section. Fig. 2 shows the same in plan. Figs. 3 and 4 show the carriages to be employed in the machine.

x and y are the two systems of bobbins, of which one, x , turns in a circle, while the other, y , moves in radial slots. The motion of the bobbins y is effected by means of cam-tracks (circles, ellipses, or the like) in which run carriages E' E^2 , which are connected to the bobbins in such a manner that the bobbins must follow the prescribed path, while the necessary radial movement is permitted by slots S in the cover A , for which purpose slide-blocks G run in these slots S , the parts of the bobbins y being secured on the said blocks.

The bobbin system x consists of thread-guides P , which are secured on the cam-plate C and turn therewith in a circular track T . The bobbins D of the system of bobbins x are secured within the machine on the cam-plate C .

The systems of bobbins x and y run in opposite directions of rotation, and the magnitude of the difference of speed is dependent on the magnitude of the speed ratio of the toothed wheels K L M N . The gear-wheel K is rigidly connected to the inner hollow sleeve H , and around this gear-wheel K run the gear-wheels L and M planet fashion, whereby rotation of the gear-wheel N is produced in the opposite direction to the cam-plate C .

Since the distance apart of the bobbins y from each other, and therefore also the maximum number of bobbins, is determined by the length of the carriages E' E^2 , the car-

riages must be made fairly long on account of the flat cam-crossing R. Thus the number of bobbins would be small if it were not possible to keep the distance apart of the bobbins smaller than the length of the carriages. 5 This is rendered possible according to the present invention by forming the carriages E' substantially in the shape of an inverted T and the carriages E² substantially T-shaped, as shown in Figs. 3 and 4, so that 10 they overlap each other in the cam-crossings.

The slide-blocks G of the bobbins y are preferably made in two parts to enable them to be more easily changed, and the cam-tracks C are provided in their bottoms at one 15 or more places with openings U, which permit the convenient removal of the carriages E from beneath after the screws F have been slackened. Since the whole weight of the 20 machine is taken by the ring V, a ball-bearing W is introduced at this place to reduce the consumption of power.

Having fully described my invention, what

I claim as new, and desire to secure by Letters Patent, is—

In a braiding-machine, a radially-operating system of bobbins, a concentrically-operating system of thread-guides, corresponding bobbins for the said thread-guides mounted within the machine, so as to render the bobbins of the radial system independent of the bobbins of the concentric system and thus to diminish the dimensions of the machine while keeping the number of bobbins the same, and carriages for the radially-operating system of bobbins for guiding them, 30 formed to overlap each other in the cam-crossings, so as to lead the carriages securely through the flat crossings without requiring a larger distance between the bobbins. 40

In witness whereof I have hereunto set my hand in presence of two witnesses.

CARL SCHÜRMANN.

Witnesses:

WILLIAM ESSENWEIN,
ERNEST ANDRÉ.