2 Sheets--Sheet 1.

F. W. HUPPELSBERG.

Braiding-Machine.

No. 160,198. Patented Feb. 23, 1875.

Fig: 1.

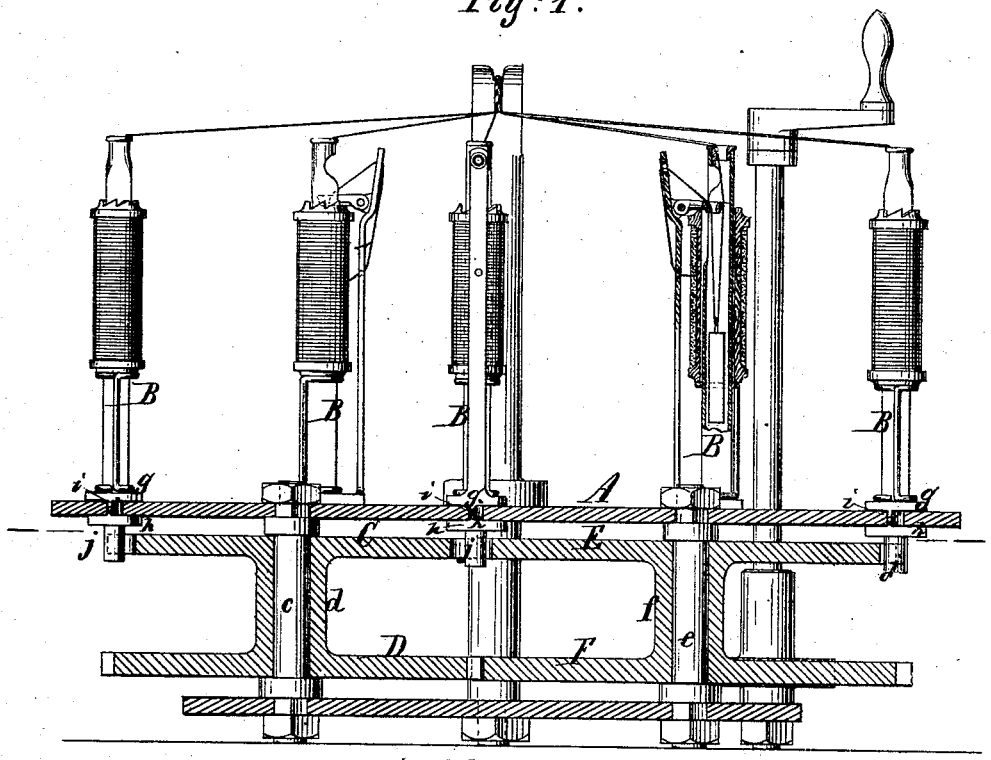
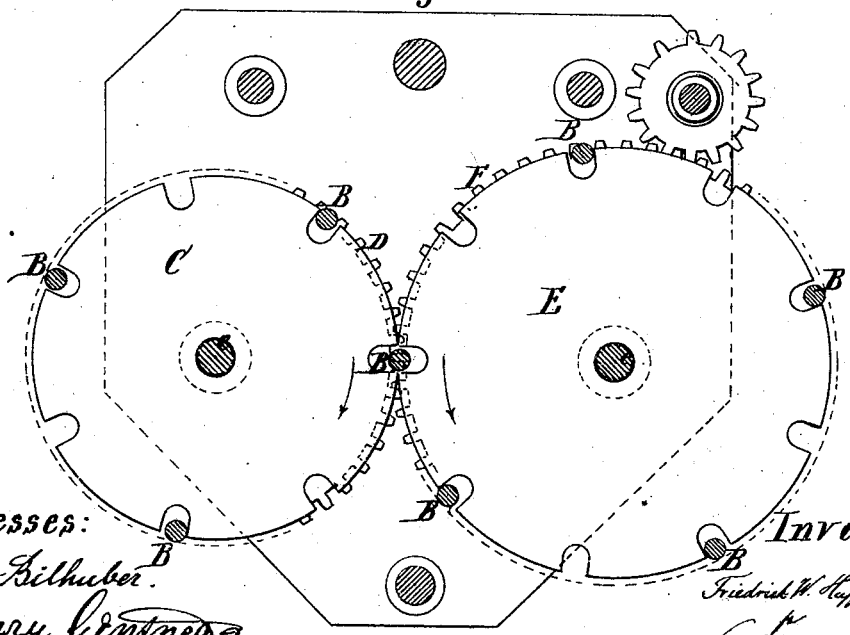


Fig: 2.



Witnesses:

Ernst Bilhuber.

Henry Gentner

Inventor:

Friedrich W. Huppelsberg

by Van Santvoord & Hauff

Attys

THE GRAPHIC CO. PHOTO-LITH. 39 & 41 PARK PLACE, N.Y.

2 Sheets--Sheet 2.

F. W. HUPPELSBERG.

Braiding-Machine.

No. 160,198

Patented Feb. 23, 1875.

Fig: 3.

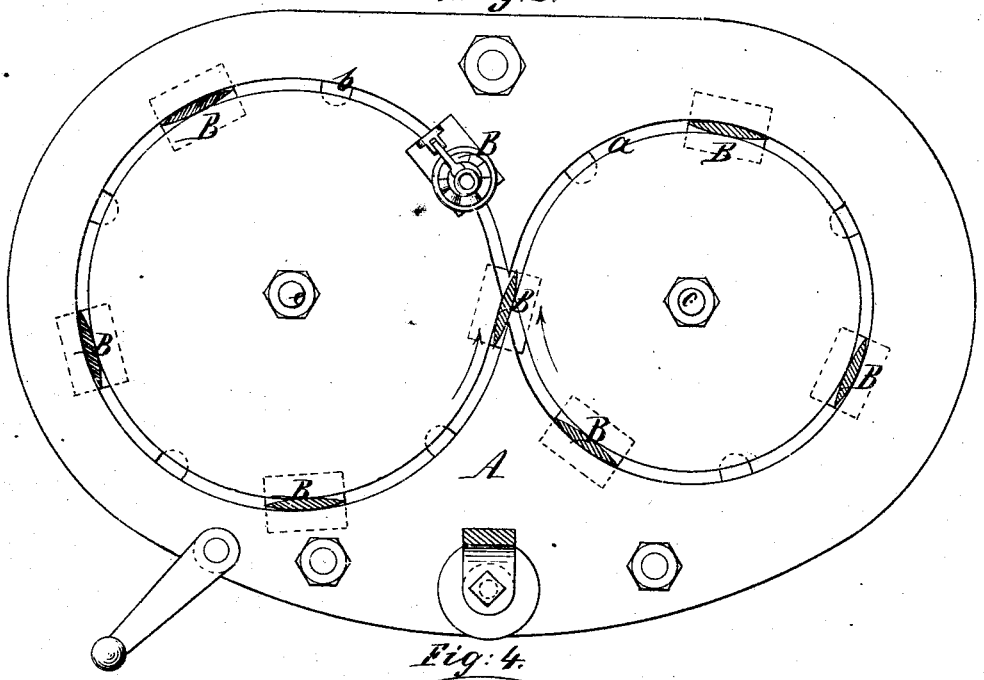


Fig: 4.

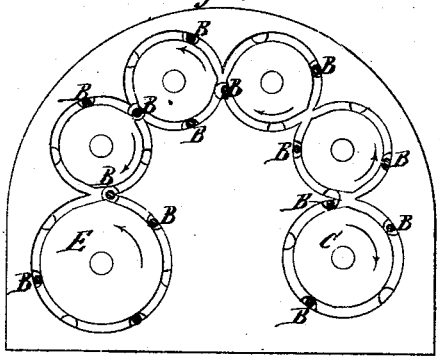


Fig: 5.

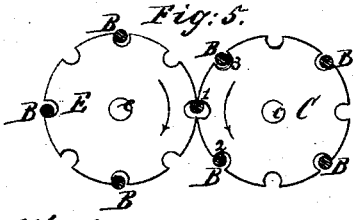
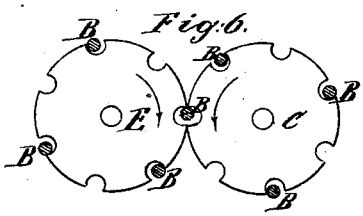


Fig: 6.



Witnesses:
Ernst Bilhuber
Chas. Wahlers.

Inventor:
Friedrich Wilhelm Huppelsberg
per
Van Santvoord & Hauff
attys

UNITED STATES PATENT OFFICE.

FRIEDRICH WILHELM HUPPELSBERG, OF BROOKLYN, E. D., NEW YORK.

IMPROVEMENT IN BRAIDING-MACHINES.

Specification forming part of Letters Patent No. **160,198**, dated February 23, 1875; application filed December 5, 1874.

To all whom it may concern:

Be it known that I, FRIEDRICH WILHELM HUPPELSBERG, of Brooklyn, E. D., in the county of Kings and State of New York, have invented a certain new and Improved Braiding-Machine, of which the following is a specification:

This invention is illustrated in the accompanying drawing, in which—

Figure 1 represents a transverse vertical section. Fig. 2 is a horizontal section in the plane *x x*, Fig. 1. Fig. 3 is a plan or top view, partly in section. Figs. 4, 5, and 6 are diagrams, which will be referred to hereinafter.

Similar letters indicate corresponding parts.

This invention relates to a braiding-machine in which a number of jacks or spindles containing the bobbins are used, which receive their motion by notched disks or carriers, and which move in an **8**-shaped race-course.

My invention consists in combining with an even number of jacks two notched disks of unequal diameters and an uneven number of notches, the number of notches in the large disk being two more than that in the small disk, with or without intermediate notched disks, in such a manner that flat braids can be produced from an even number of strands, and the product obtained be materially improved.

In the drawing, the letter A designates the top plate of my braiding-machine, which is provided with an **8**-shaped guide-slot or race-course, *a b*, for the jacks B. The circles *a b*, which form the **8**-shaped race-course, are of unequal diameter, and in the center of the circle *a* is secured a fixed axle, *c*, on which is fitted a tube, *d*, which carries at its upper end a disk, C, and at its lower end a cog-wheel, D. In the center of the circle *b* is a fixed axle, *e*, on which is fitted a tube, *f*, that carries at its upper end a disk, E, and at its lower end a cog-wheel, F. The pitch circle of the cog-wheel D is equal to the mean diameter of the circle *a*, and the pitch circle of the cog-wheel F equal to the mean diameter of the circle *b*, while the diameter of the disks C and E are such that they revolve in close contact with each other with the same circumferential velocity. The number of jacks to be used in my machine is an even number—for instance, eight, or twelve, or thirty, or more—and if the number of the jacks is eight the disk C is provided with seven, and the disk E with nine, notches in its circumference, or, if only two disks are used, and the number of jacks is equal to *n*, the large disk E has $n+1$, and the small disk C n—1 notches, the number of notches in the large disk being two more than that in the small disk; but if the disks C E are used, together with a series of intermediate disks, as shown in Fig. 4, the number of notches in the large disk E may be seven, that in the small disk five, and that in the four intermediate disks four in each, and a machine is obtained capable of carrying $\frac{7+5+4+4+4+4}{2}=14$ jacks.

The jacks B are provided with flanges *g h*, which are connected by narrow strips *i*, the flanges *g* being situated close above, and the flanges *h* close below, the plate A, while the strips *i* extend through and move in the **8**-shaped guide-slot *a b*. From the lower flanges *h* of the jacks extend feet *j* into the notches of the disks C E. When the machine is set in motion the jacks move in the direction of the arrows marked on the **8**-shaped guide-groove in Fig. 3, and each jack, when it reaches the junction of the eight, passes from one circle to the other.

I am aware that braiding-machines of a similar construction to mine have been known for a long time, but in all such braiding-machines intended for flat braiding which I have ever seen the disks E and C are made of equal diameter, and with the same but with an uneven number of notches, for if the disks E and C are made of the same diameter, and an even number of notches is used, (intended to work with an even number of jacks,) the work produced becomes thinner on one edge than on the other.

In order to illustrate the impossibility of using, in a braiding-machine for making flat braids, two disks, C and E, of equal diameter, and of an even number of jacks, I have shown, in Fig. 5, two such disks, each with eight notches and capable of carrying eight jacks. If these jacks are arranged as shown in said figure the jacks 1 and 2 follow each other in the same disk C, and, consequently, the threads carried by these jacks are not braided—they lie flat against each other. If the disks are

turned in the opposite direction the jacks 1 and 3 will follow each other in the same manner, and if an attempt is made to arrange the jacks differently in the disks those of the disks E will either run against those of the disk C or the threads will not be properly braided. If the disks C and E are constructed with equal diameters, and with an uneven number of jacks, (see Fig. 6,) as usually practiced in machines for making flat braids, the disk on the side where the threads are untwisted in braiding contains a smaller number of jacks than that on the other side, and one edge of the braid becomes thinner than the other.

For braids of one color the old style of machines work perfectly well, but if a flat braid is to be produced of two different colors—for instance, white and black—it is desirable to use the same number of white and black strands, and consequently an even number of jacks must be employed. For such work my improvement is of great advantage.

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

In a braiding-machine, the combination, with an even number of jacks or bobbins, of two disks, E C, of unequal diameter, each disk being provided with an uneven number of notches, the number of notches in the large disk being two more than that in the small disk, said disks being made to revolve at the same circumferential velocity with or without intermediate disks, substantially as and for the purpose shown and described.

In testimony that I claim the foregoing I have hereunto set my hand and seal this 30th day of November, 1874.

FR. WILH. HUPPELSBERG. [L. S.]

Witnesses:

W. HAUFF,

E. F. KASTENHUBER.