

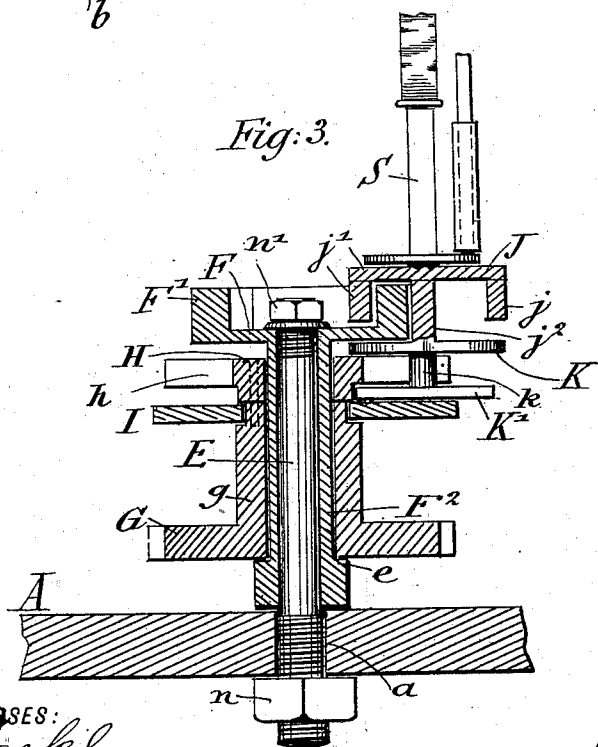
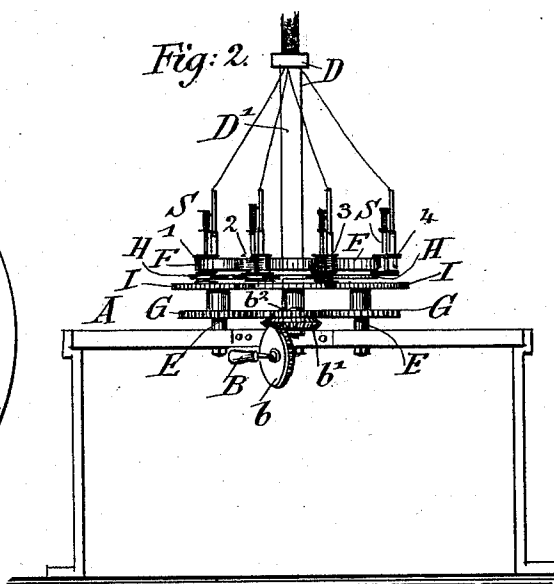
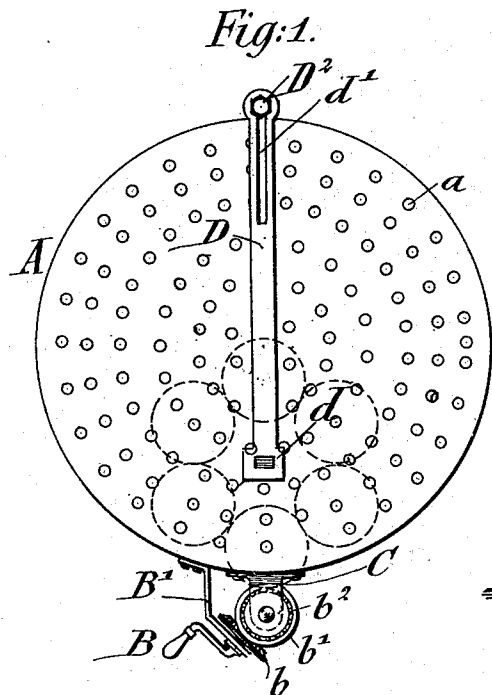
(No Model.)

2 Sheets—Sheet 1.

O. DICKHAUS.
BRAIDING MACHINE.

No. 578,916.

Patented Mar. 16, 1897.



WITNESSES:

G. Jackel
R. F. Pelouze

INVENTOR

Otto Dickhaus
BY *Ernest Renger*
ATTORNEYS.

(No Model.)

2 Sheets—Sheet 2.

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Fig: 4.

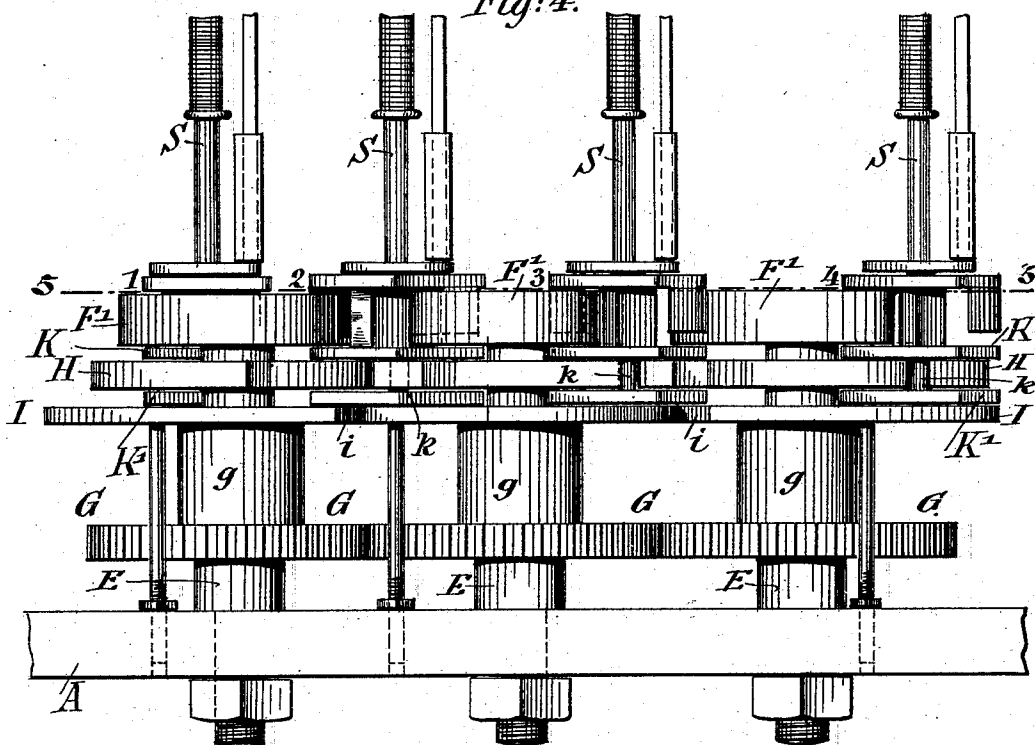
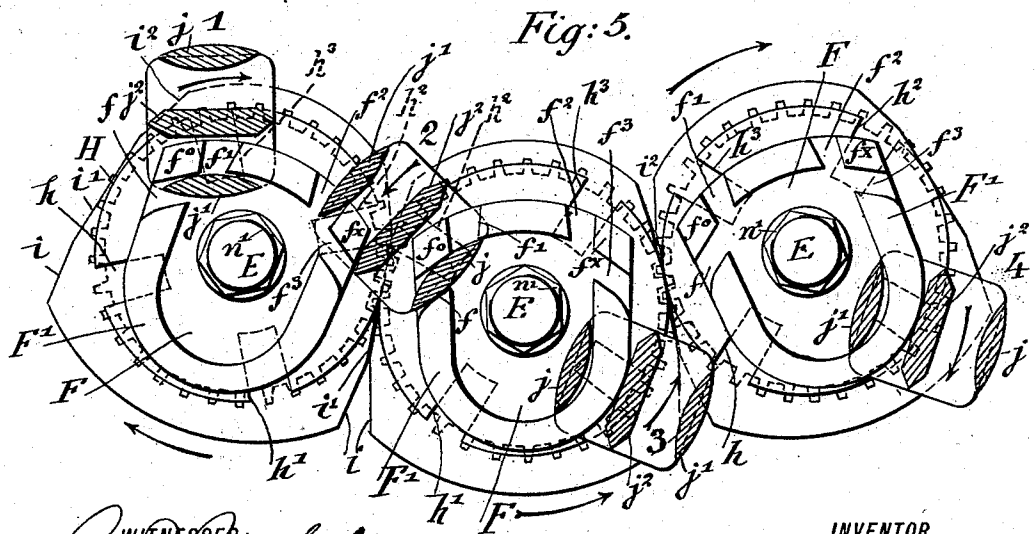


Fig: 5.



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UNITED STATES PATENT OFFICE.

OTTO DICKHAUS, OF JERSEY CITY, NEW JERSEY.

BRAIDING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 578,916, dated March 16, 1897.

Application filed July 21, 1896. Serial No. 600,057. (No model.)

To all whom it may concern:

Be it known that I, OTTO DICKHAUS, a citizen of the German Empire, residing at Jersey City, State of New Jersey, have invented certain new and useful Improvements in Braiding-Machines, of which the following is a specification.

This invention relates to a machine for braiding cords, telephone or telegraph wires, cables, &c.; and the object of the same is to provide a machine having great simplicity of construction combined with ease of operation and effectiveness and wherein the serpentine motion of the racers is accomplished without necessitating a serpentine grooved top plate.

The invention consists of a bed-plate provided with a suitable number of holes adapted to receive an interchangeable number of upright shafts or screw-bolts for supporting in fixed position separate flanged race-plates, the flanges of which are notched or recessed, substantially stationary abutting spacing-plates, intermeshing gear-wheels turning upon the upright shafts and provided with hubs passing through the spacing-plates, rotary carriers connected with the hubs of the gear-wheels and arranged above the spacing-plates, and racers which carry the spindles for the bobbins, said racers being provided with depending parallel flanges or ribs adapted to engage with the flanges of the race-plates and with pins which are adapted to engage in the recesses of the rotary carriers as the latter are turned through the medium of the intermeshing gear-wheels, whereby alternating sets of racers are caused to traverse from one race-plate to the other in that serpentine course which is necessary to produce the interlacing and twisting of the threads which are led from the bobbins through one common guide-hole, from which the complete cord or covered telegraph-wire issues, as will be hereinafter fully described and then particularly claimed.

In the accompanying drawings, Figure 1 is a plan view of a braiding-machine, partly in dotted lines; and Fig. 2 is a side view thereof, showing the same equipped with my improvements. Fig. 3 is an enlarged detail vertical section of one of the attachments for operating the racers and causing them to traverse a serpentine path. Fig. 4 is a side elevation

showing a number of geared attachments for operating the racers; and Fig. 5 is a horizontal section on line 5 5, Fig. 4.

Similar letters and numerals of reference indicate corresponding parts.

In the drawings, A indicates the bed-plate, which may be supported in any suitable manner and which is provided with an indefinite number of holes *a*, which may be arranged in any desired manner, so that the base-plate has capacity for various arrangements of the attachments which support and operate the racers, as, for instance, the attachments may be arranged in circular form, as shown in Fig. 1, or in straight or in any other desired form, according to the work to be produced by the machine.

b b indicate a pair of bevel gear-wheels, which intermesh at an angle to each other and which are rotated by means of a hand-crank B, supported in a bearing of a suitable bracket B', extending from the side of the bed-plate A, said beveled wheel *b'* also having affixed thereto a gear-wheel *b*². The short shaft of the bevel-wheel *b'* and the gear-wheel *b*² turns in suitable bearings in ears C, extending from the bed-plate.

D indicates the usual bar, which is provided with a guide-eye *d* at one end and a slot *d'* at the other end, and is supported above the bed-plate by means of a post D', arranged at one side of the bed-plate. A set-screw D² passes through the slot *d'* and connects the bar D adjustably with the post D', so that the guide-eye *d* of the bar can be adjusted symmetrically and centrally with relation to the system of racers which are arranged below the bar and supported and operated by the attachments which are applied to the base-plate A.

E represents the upright shafts, which are screw-threaded at their lower ends, which pass through the holes of the base-plate and receive suitable nuts *n*. Secured by the nuts *n'* at the upper ends of the upright shafts E are the race-plates F, which are each provided with a flange F', having recesses or notches *f f' f*² *f*³, respectively, and each having a sleeve F², which sleeves are placed upon the upright shafts E and rest upon the base-plate A, so that in connection with the nuts at the upper ends of the upright shafts the

race-plates are held stationary. (See Fig. 5 in particular.) The flange F' of each race-plate F has a peculiar form, its shape being that of a horseshoe in which the ends are connected by a recessed portion, so that corner-posts $f^0 f^x$ are formed between the recesses f^1 and $f^2 f^3$, respectively, this being necessary in order to properly guide the racers, as hereinafter explained.

Gear-wheels G rotate around the sleeves F^2 of the race-plates and rest upon shoulders e at the lower ends of said sleeves, said gear-wheels being provided with hubs g , which extend upwardly and are connected firmly with the rotary carriers or disks H , which are arranged above the spacing-plates I , that are received by reduced portions of the hubs g of the gear-wheels G . The rotary carriers H are each provided with four notches or recesses $h^1 h^2 h^3 h^4$, respectively, which are arranged in succession at distances apart equal to one-fourth of the periphery of the carrier, so that notch h^2 will be diametrically opposite to notch h^1 and notch h^3 diametrically opposite to notch h^4 . The spacing-plates I are of peculiar form. Each side is divided into three abutting edges $i^1 i^2 i^3$, respectively, the opposite edges i^1 being substantially parallel, the edges i^2 being arranged at a slant, and the edges i^3 being arranged at a still greater slant.

The manner of mounting and operating the above-described parts will be described hereinafter.

The serpentine course of the racers is effected by the described mechanism without necessitating a serpentine-grooved top plate. Each racer 1, 2, 3, 4, &c., consists of a plate J , which is provided with depending ribs, lugs, or flanges $j^1 j^2$ at opposite ends and a central web or flange j^3 , which extends lower than the end flanges $j^1 j^2$. Below the central web or flange j^3 are arranged on the racers two spaced guide-plates $K K'$, which are separated and fixed to each other by means of a guide-pin k , which is in line with the axis of the spindle S , on which the bobbin is arranged in the usual manner.

When it is desired to form a certain twist for cords, telephone and telegraph wires, &c., the above attachments are arranged in the desired manner upon the bed-plate A , either in the form of a square, as shown in dotted lines in Fig. 1, or in the form of a circle or in any other form desired, according to the form of braid to be produced. When the proper arrangement has been made, the gear-wheels G will all be in engagement, that is to say, the teeth of the same will all intermesh and, furthermore, be arranged with one of the gear-wheels G in mesh with the power-transmitting gear-wheel b^2 , so that when the hand-crank B is rotated the whole train of mechanism will be set into action. Another point to be noted in the arrangement of the attachments is that the corresponding edges $i^1 i^2 i^3$ of the adjacent spacing-plates be in engagement, depending upon the arrangement of the

attachment. When the attachments are arranged in line, the edges i^1 will abut, while when the attachments are arranged in a curve of considerable radius the edges i^1 will abut, and when arranged in a curve of less radius the edges i^2 will abut. This abutting of the edges $i^1 i^2$ against each other causes the "set" or fixing of the spacing-plates in such a manner that when the gear-wheels are rotated their hubs will rotate within the spacing-plates without moving the same, securing thereby a rigid structure. The racers are now adjusted so that an alternating series, which is required to move in the opposite direction to the intermediate ones forming another series, as well as the latter, will both have the proper movements in intercrossing serpentine paths imparted to them. The guide-pins k of the racers are inserted in the radial recesses in the rotary carriers, so that the guide-plates $K K'$ will be arranged, respectively, above and below the carriers, while the spaces between the ribs or flanges $j^1 j^2$ of the racers will receive the flanges of the race-plates F .

The arrows show the directions of movement of the respective parts. When the gear-wheels G are rotated, the carriers H are correspondingly rotated each oppositely to its neighbor, so that by the engagement of the guide-pins of the racers in the recesses of said carriers the racers are also turned in a direction corresponding to the direction of rotation of the carriers. Racer 1, for instance, is shown as traveling in a serpentine path from the left toward the right, it being guided by the recessed end portion of the flange F' of the race-plate along the same, the travel of the next racer to the right being in a direction from the right to the left.

The racer 2 is shown as just leaving one race-plate and being guided onto the next race-plate to the left, this being accomplished by the passing of the end flange j^1 through the recess f^2 in the flange of the race-plate and the entering of the post f^0 into the interval between the flanges or ribs j^1 and j^2 . A further rotation of the carriers moving the racer 2 brings the notches or recesses $h^2 h^3$ of the adjacent carriers in registry, so that by the still further rotation of the carriers the carrier to the left of racer 2 will pull the racer away from that to the right, which previously moved it. The next racer 3 to the right of racer 2 is moving in the same direction as racer 1, while the next racer 4 is moving in the same direction as racer 2, but in the opposite direction to racers 1 and 3. As will be seen more clearly in connection with racer 2, the flange of the race-plate to the extreme left will enter into the space between the webs or flanges $j^1 j^2$ of said racer 2, while the flange of the adjacent race-plate to the right will be released from the space between the webs or flanges $j^1 j^2$. In passing from the middle race-plate the flange or depending web j of racer 2 will pass through the notch or recess f in said race-plate, the central web j^3 of the racer

2 will pass between the flanges of the adjacent race-plates, while the other flange or web j' will pass through the end notch or recess f^2 in the flange of the race-plate at the
 5 extreme left. The intercrossing of the notches $f f' f^2 f^3$ of the flanges of the race-plates is necessitated by reason of the required serpentine path of the racers and from the fact that the alternate racers 1 3, &c., travel in
 10 one direction, while the others, 2 4, &c., travel in the other direction.

By the above-described machine the same may be adapted to meet any requirement, depending upon the nature of the cord or braid
 15 to be made, and the adjustment and setting up of the parts can be accomplished in a very effectual and ready manner.

Having thus described my invention, what I claim, and wish to secure by Letters Patent,
 20 is—

1. In a braiding-machine, the combination with a bed-plate, upright shafts extending from the bed-plate, and race-plates arranged upon said upright shafts, said race-plates being
 25 provided with recessed flanges, of gear-wheels arranged on the upright shafts, rotary carriers connected with the gear-wheels, stationary spacing-plates arranged between the gear-wheels and the rotary carriers, and

racers for carrying the bobbins, said racers 30 being provided with parallel webs or flanges for engaging the flanges of the race-plates, and being operated by the carriers, substantially as set forth.

2. In a braiding-machine, the combination 35 with a bed-plate, upright shafts extending from said bed-plate and race-plates fixed to the upright shafts and provided with recessed or notched flanges, of intermeshing gear-wheels provided with hubs turning on the
 40 upright shafts, radially-notched carriers connected with the hubs of the gear-wheels, abutting spacing-plates received on contracted portions of the hubs of the gear-wheels, and
 45 racers for the bobbins, said racers consisting of plates provided with depending webs or flanges adapted to engage the flanges of the race-plates and a guide-pin adapted to engage in the recesses of the rotary carriers,
 50 substantially as set forth.

In testimony that I claim the foregoing as my invention I have signed my name in presence of two subscribing witnesses.

OTTO DICKHAUS.

Witnesses:

PAUL GOEPPEL,
 GEO. L. WHEELLOCK.