

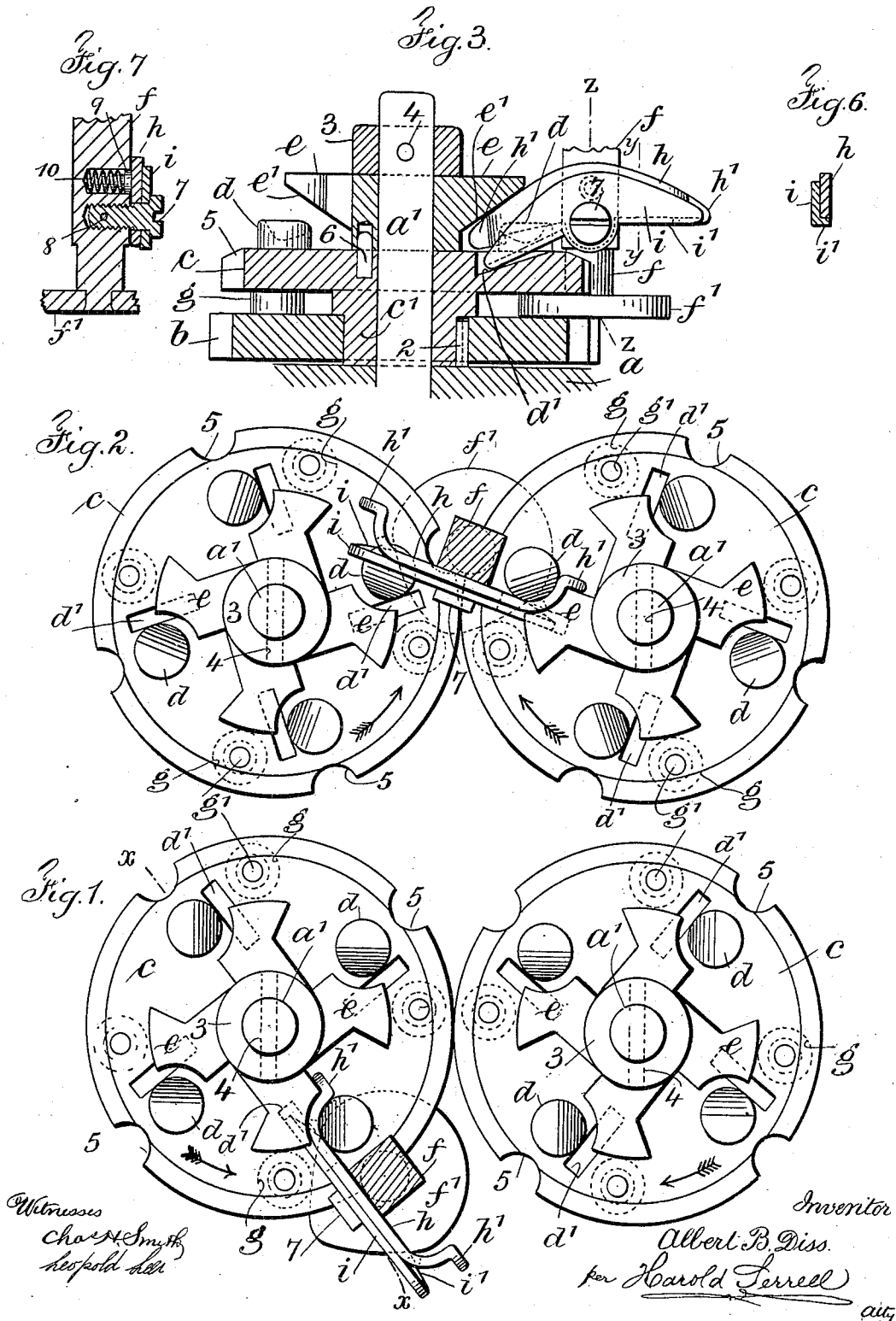
No. 830,137.

PATENTED SEPT. 4, 1906.

A. B. DISS.
BRAIDING MACHINE.

APPLICATION FILED MAR. 20, 1905. RENEWED MAR. 2, 1906.

2 SHEETS—SHEET 1.



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2 SHEETS—SHEET 2.

Fig. 5.

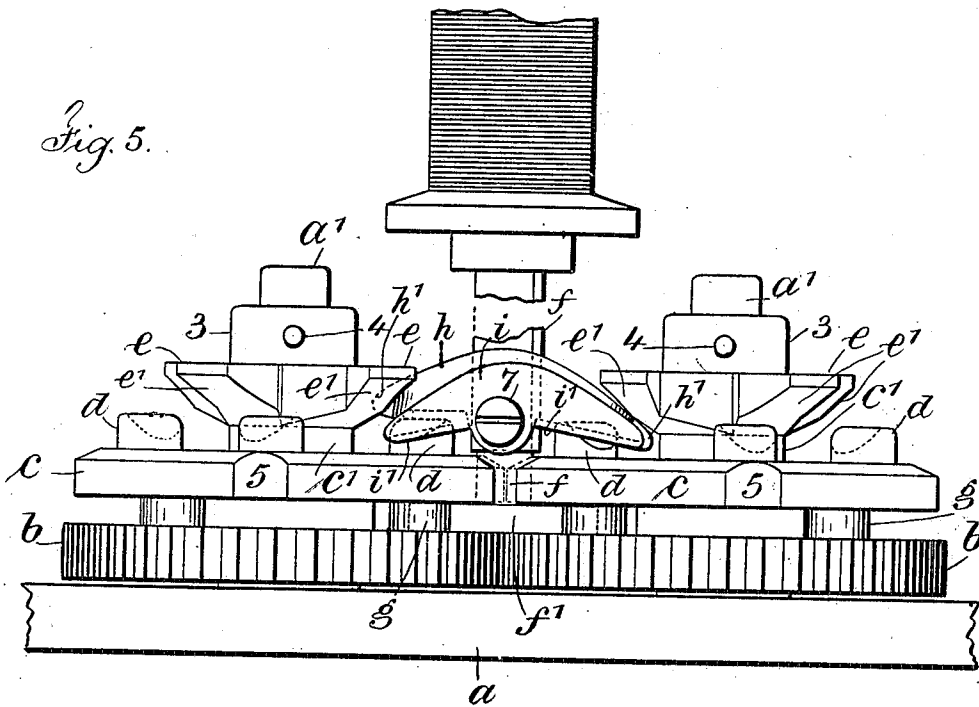
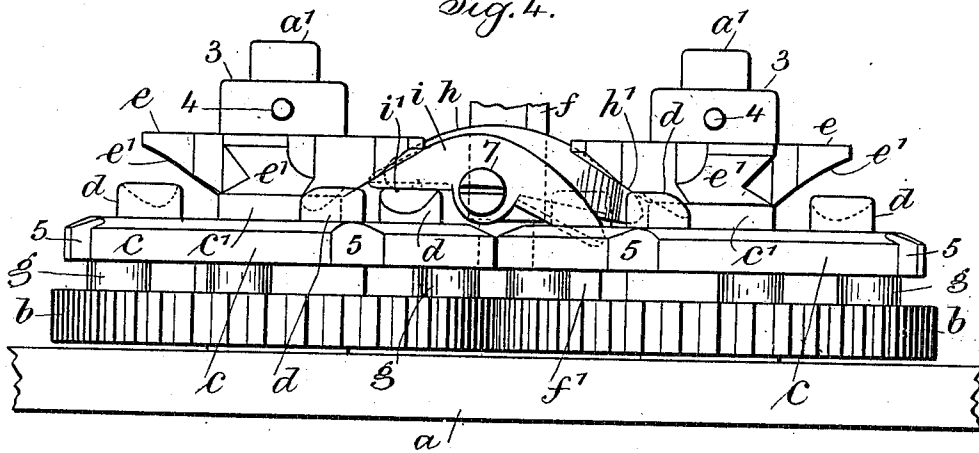


Fig. 4.



Witnesses

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UNITED STATES PATENT OFFICE.

ALBERT B. DISS, OF NEWARK, NEW JERSEY, ASSIGNOR TO UNITED STATES BRAID MACHINE MANUFACTURING CO., OF NEWARK, NEW JERSEY, A CORPORATION OF NEW JERSEY.

BRAIDING-MACHINE.

No. 830,137.

Specification of Letters Patent.

Patented Sept. 4, 1906.

Application filed March 20, 1905. Renewed March 2, 1906. Serial No. 303,797.

To all whom it may concern:

Be it known that I, ALBERT B. DISS, a citizen of the United States, residing at Newark, in the county of Essex and State of New Jersey, have invented an Improvement in Braiding-Machines, of which the following is a specification.

In braiding machines as heretofore constructed a series of revolving heads upon a suitable platform or support have been employed with transfer devices connected to the heads adapted to engage exchange devices carried by the spindles upon which the bobbins of thread are mounted.

My invention relates to improvements in the transfer and exchange devices with the object of simplifying the construction, lessening the number of parts, and increasing the efficiency of the device.

In carrying out my invention and in combination with a series of meshing gears and a platform supporting the same I employ a series of revolving heads having edge notches for the spool-spindles, there being an annular space between each gear and head to receive and hold a plate formed with the spool-spindle. Each revolving head is provided with a series of knobs having cam-faces and adjacent tangentially-disposed grooves and with conical heads having a series of cam-faces above and extending over said grooves. Each spool-spindle has two locking rocker-bars of peculiar form pivotally connected thereto, the major portions of the adjacent surfaces of which are in frictional contact, whereby they are adapted to be moved in unison. The operation of these rocker-bars and their manner of engagement to each revolving head is hereinafter more particularly described.

In the drawings, Figure 1 is a plan showing two of the revolving heads and the transfer and exchange devices in one position. Fig. 2 is a similar view with the parts in the position they occupy at the moment that the transfer of the spool-spindle from one head to the other has taken place. Fig. 3 is a vertical section and partial elevation at about the line xx of Fig. 1. Fig. 4 is an elevation of two of the revolving heads and their gears and the parts associated therewith corresponding in position with the plan Fig. 2. Fig. 5 is a view similar to Fig. 4, but with the

spool-spindle and locking rocker-bars at an intermediate position as if disconnected from either revolving head. Fig. 6 is a section at the dotted line yy of Fig. 3, and Fig. 7 is a vertical section at the dotted line zz of Fig. 3.

a represents part of the platform of a braiding-machine, the general construction of which is well known in this art.

b represents gears of a series of meshing gears arranged usually in circular form around said platform.

c represents the revolving heads, one of which is associated with each gear b and arranged in a superimposed relation therewith. In the present instance each head is raised slightly above the gear b beneath the same by virtue of the formation of the hub c' of the head which has a shouldered portion and passes down through the gear and is connected to the gear by a key 2, the said hub bearing upon the surface of the platform a , preferably raising the gear slightly above the platform and creating between the gear and the head an annular space. A post a' , secured in the platform a , rises above the same and passes through the revolving head and its hub and rises above the same. Around the upper end of the post a' is a collar 3, secured thereto by a pin 4, and between the collar 3 and the upper surface of the head c is a conical head e , through which also the post a' passes. Each head c is provided with semi-circular notches 5 in the periphery thereof. I have shown and prefer to employ four of such notches. Secured in the upper surface of each revolving head c are knobs d , having corner cam-faces, and adjacent to said knobs in the surface of each head are grooves d' , arranged tangentially to the post a' . The conical head e , as will appear from the drawings, is of peculiar formation in plan view, because of being cut into four arms. The under surfaces of these arms are cam-faces e' , the configuration in plan being generally provided to give clearance for the movements of the locking rocker-bars of the spool-spindle.

Each conical head e is connected to rotate with each revolving head by a pin 6, secured in the head and passing up into an aperture in the conical head. f represents the spool-spindle, provided at its lower end with a cam-plate f' of suitable surface area and approxi-

mately circular in plan and of a thickness to pass freely but snugly into the annular space between the gear *b* and the revolving head *c* and to bear against one or more rollers *g*, placed in said annular space at predetermined positions and secured in position by the studs *g'*. The rollers *g* perform a two-fold function—first, of compelling the spool-spindle to transfer from one head to the adjacent head and its cam-plate *f'* to pass out from between the gear *b* and head *c* without strain, and, second, to act as a back-stop to maintain the desired relation of the spindle with the head during rotary movement and against the action of centrifugal force. The spool-spindle *f* is round directly above the cam-plate *f'*, so as to be received in the semi-circular notches 5 of the revolving heads, and above this round part, at least for an appreciable distance, the spool-spindle is preferably made square or provided with one flat surface to which the locking rocker-bars *h* and *i* are connected by a screw-stud 7. These bars are alike at both sides of the screw-studs 7, on which they rock. Their upper edges are curved and their lower edges are at an obtuse angle to one another.

The bar *h*, which comes next to the spool-spindle, is curved at its ends to an arc which agrees with the circumference of the knobs *d* and has ends *h'* bent parallel to the main portion. The locking rocker-bar *i* comes outside of the bar *h*, and the major portion of the adjacent surfaces of these bars *h* and *i* are in frictional contact by virtue of the pressure of the screw-stud 7. The bar *i* is straight and flat except for a flanged lower edge *i'*, which is bent toward and underruns the lower edge of the bar *h*. These flanged edges extend from the spool-spindle toward the end of the plate.

In the operation of the structure and referring to Fig. 1 the revolving heads are moved in the direction of the arrow, the spool-spindle on the left-hand head being carried toward the right-hand head. As these parts approach, the right-hand end *h'* of the bar *h* underruns one cam-face *e'*, which forces the same down, and because of the flanged edge *i'* of the bar *i* also forces the bar *i* down with it, raising the opposite end of both bars to the limit of the cam movement, the opposite end of the bar *i* coming out of the groove *d'* and the adjacent bent end of the bar *h* to about the level of the top of the adjacent knob *d*, at the same time bringing the right-hand end of the bar *i* into close proximity to the tangential groove of the right-hand revolving head, and the further movement causes the lower left-hand edge of the bar *i* to ride up the corner cam-face of this adjacent knob, lifting the left-hand end of the bar *i* and by its flanged edge the left-hand end of the bar *h* and forcing the right-hand end of the bar *i* down into the groove

in the right-hand revolving head and the bent right-hand end of the bar *h* behind a knob *d* of the right-hand head, so as to cause the transfer of the spool-spindle from the left-hand revolving head to the right-hand revolving head and its engagement therewith.

The transfer of the spool-spindle and the locking rocker-bars connected therewith from the right-hand revolving head to the left-hand revolving head are performed in like manner, but in the opposite order. The spool-spindles *f* with their plates *f'* and locking rocker-bars *h* and *i* are essentially held in position on each revolving head near the periphery thereof by virtue of the plate *f'* coming beneath the head and the locking rocker-bar above the head, the plate coming in each case forward of a roller *g*, one end of the rocker-bar *i* in the groove *d'* and the adjacent end of the rocker-bar *h* coming back of a knob *d* and substantially below a cam-face *e'*, there being sufficient friction between the locking rocker-bars and their support to the spool-spindle as to hold them with these ends downward in a frictional position until sufficient force has been exerted on their raised ends to swing them on their pivot.

I prefer to prevent the screw-stud 7 turning in the spool-spindle *f* so as to obviate looseness incident to wear and vibration, and this I accomplish by the use of a pin 8 passing across through the spindle. The frictional condition desired between the locking rocker-bars *h* *i* and between the bar *i* and the head of the screw-stud 7 is advantageously and preferably established by the employment of a stud 9 and spring 10 in a recess formed in the spool-spindle, as shown in Fig. 7, in which the spring 10 at one end bears on the base of the recess and at its other end against the back of the stud 9, the stem of the said stud being within the convolutions of the spring while the face of the stud bears against the rear face of the rocker-bar *h* to press the bar *i* against the head of the stud 7 and the bars together.

As is well known in the art of braiding-machines, there is a multiplicity of spool-spindles employed constantly traveling from one hand to the other in first one direction and then in the other for laying strands in the braiding operation, and while I have only shown in the drawings one spool-spindle and its coacting devices it is obvious that as many as desired may be employed, as provision is made in each head for two spindles at a time.

I claim as my invention—

1. In a braiding-machine, the combination with a series of revolving heads and their connecting devices, of spool-spindles, two locking rocker-bars upon the same pivot connected to each spool-spindle and independent means connected to each head for respec-

tively engaging and operating the said locking rocker-bars and transferring the spindle from one head to the other.

2. In a braiding-machine, the combination
5 with a series of revolving heads and their connecting devices, of spool-spindles, two locking rocker-bars upon the same pivot connected to each spool-spindle, one end of one rocker-bar at a time received in a groove in
10 one head and a knob engaging the adjacent end of the other rocker-bar at the same time, and a means for disengaging said locking rocker-bars and transferring the spindle from one head to the other.

15 3. In a braiding-machine, the combination with a series of revolving heads and their connecting devices, of spool-spindles, two locking rocker-bars upon the same pivot connected to each spool-spindle, one end of one
20 of said locking rocker-bars received in a groove in one head, and a knob on the same head engaging the adjacent end of the other locking rocker-bar, a cam for pressing down the raised end of one rocker-bar and simultaneously moving both rocker-bars, and a second cam-surface for completing the rising
25 movements of one of the rocker-bars and completing the engagement of the other end of the rocker-bars with the adjacent head in transferring the same.

30 4. In a braiding-machine, a series of revolving heads, a series of gears parallel therewith and separated a predetermined distance therefrom, the heads and gears being connected in pairs so that there is an annular
35 space between each head and gear, a spool-spindle, a cam-plate formed therewith and at the lower end thereof and adapted to enter and closely fit the said annular spaces, said
40 heads being provided with spaced-apart peripheral notches to receive the spool-spindle, devices formed with the respective heads, and locking rocker-bars connected by common pivots to each spool-spindle and acted
45 upon by the devices connected to the head for respectively engaging the spool-spindles with one head and then transferring the same to the adjacent head.

50 5. In a braiding-machine, a series of revolving heads, a series of gears parallel therewith and separated a predetermined distance therefrom, the heads and gears being connected in pairs, so that there is an annular
55 space between each head and gear, a spool-spindle, a plate formed therewith and at the lower end thereof and adapted to enter and closely fit the said annular spaces, said heads being provided with spaced-apart peripheral
60 notches to receive the spool-spindle, a series of knobs connected to the upper surface of each revolving head and each knob having a corner cam-face, and said heads having a series of grooves arranged in the surface thereof
65 adjacent to said knobs, a conical head secured above each revolving head and moving

therewith and having a series of cam-faces on the under side, and devices substantially as shown and described connected to each spool-spindle and engaging the grooves and knobs
70 in their connection with each revolving head and adapted to be actuated by the cam-faces to not only effect this engagement, but to transfer the spool-spindles from one head to the other.

6. In a braiding-machine, a series of re-
75 volving heads, a series of gears parallel therewith and separated a predetermined distance therefrom, the heads and gears being connected in pairs so that there is an annular space between each head and gear, a spool-
80 spindle, a cam-plate formed therewith and at the lower end thereof and adapted to enter and closely fit the said annular spaces, said heads being provided with spaced-apart peripheral notches to receive the spool-spindle,
85 a series of knobs connected to the upper surface of each revolving head and each knob having a corner cam-face and said heads having a series of grooves arranged in the surface thereof adjacent to said knobs, a conical head
90 secured above each revolving head and moving therewith and having a series of cam-faces on the under side, and two locking rocker-bars connected to each spool-spindle by a
95 common pivot, the respective ends of one adapted to engage the grooves of the heads and the respective ends of the other adapted to engage the knobs of the head, substantially as set forth.

7. In a braiding-machine, the combination
100 with a series of revolving heads and a series of spool-spindles, of locking rocker-bars *h* and *i*, a common screw-stud 7 connecting both of said bars to the spool-spindle, each bar having similar ends, the bar *h* having
105 ends that are curved and at the ends bent parallel with the major portion and the bar *i* having lower edges that are extended and broadened to pass under the lower edges of the bar *h*, and which edges are at an obtuse
110 angle to one another, both bars having curved upper edges, and the major portions of their adjacent faces being in frictional contact, substantially as set forth.

8. In a braiding-machine, the combination
115 with a series of revolving heads and a series of spool-spindles, of locking rocker-bars *h* and *i*, a common screw-stud 7 connecting both of said bars to the spool-spindle, each of
120 said bars having similar ends, the bar *h* having ends that are curved and at the ends bent parallel with the major portion and the bar *i* having lower edges that are flanged to pass under the lower edges of the bar *h*, and which
125 edges are at an obtuse angle to one another, both bars having curved upper edges and the major portions of their adjacent faces being in frictional contact, and knobs on each head around and behind which the curved ends of
130 the bar *h* are brought into locking position,

there being grooves formed in the upper surface of each head and into which one end at a time of the bar *i* is forced to effect the locking engagement of the spool-spindle with the

5 head.

9. In a braiding-machine, the combination with a spool-spindle, locking rocker-bars *h* and *i*, a common screw-stud 7 connecting both of said bars to the spool-spindle, and a
10 plate *f'* at the lower end of the spool-spindle, of a revolving head, a roller secured to the under surface of said head and adapted to come behind the plate *f'*, a knob *d* on the upper surface of said head adapted to come forward of the rocker-bar *h*, said revolving head
15 being provided with a groove adapted to receive one end of the rocker-bar *i* and one wall of which groove comes behind said rocker-bar so as to connect the spool-spindle to the
20 revolving head.

10. In a braiding-machine, the combination with a revolving head, a roller secured to the under surface of said head, a knob secured to the upper surface forward of the
25 vertical position of said roller, said head having a tangential groove in a plane between the planes of the roller and knob, of a spool-spindle, a cam-plate *f'* of appreciable area at the lower end of the spool-spindle and adapted to come against the under surface of said
30 head forward of said roller, locking rocker-

bars *h* and *i*, a common screw-stud 7 connecting both of said bars to the spool-spindle, each of said bars having similar ends, the bar *h* having ends that are curved and at the ends bent parallel to the major portion and the bar *i* having lower edges that are flanged to pass under the lower edges of the bar *h*, and which edges are at an obtuse angle to one another and both bars having curved upper
35 edges, the curved end of the bar *h* being adapted to engage the knob on the upper surface of the head and the adjacent end of the bar *i* the groove adjacent to the knob.

11. In a braiding-machine, the combination with a spool-spindle, of two locking-bars, a single pivot securing the same to the spool-spindle, and means for establishing a friction between said bars, substantially as specified.
45

12. In a braiding-machine, the combination with a spool-spindle, of two locking-bars, a single pivot securing the same to the spool-spindle, a spring and stud in a recess of the spool-spindle and the stud bearing upon one locking-bar to establish a friction between
50 said bars and with their pivot.

Signed by me this 14th day of March, 1905.

ALBERT B. DISS.

Witnesses:

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