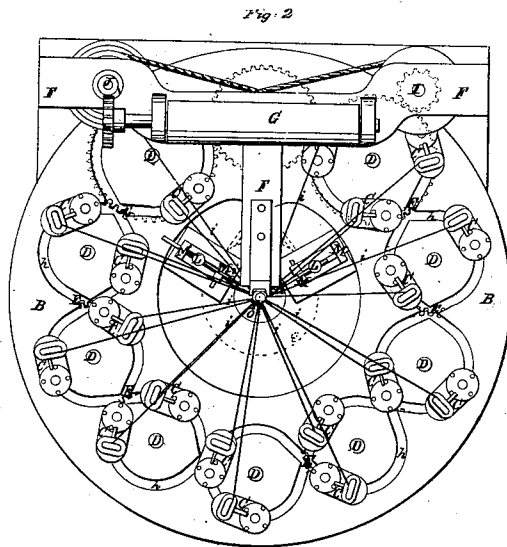
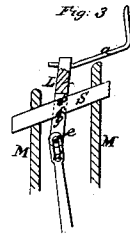
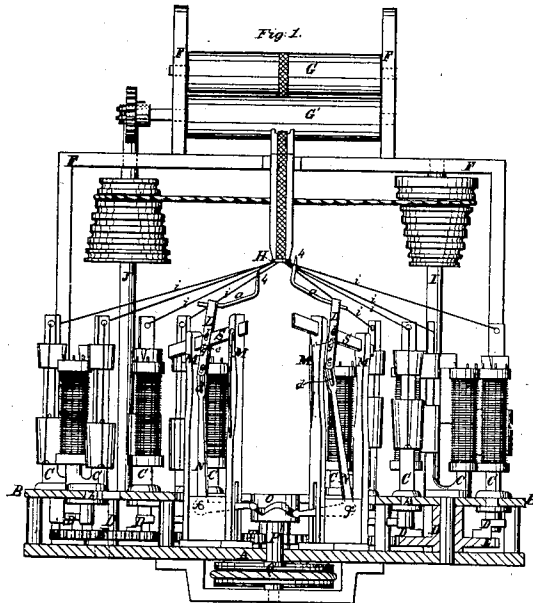


H. W. CADY, J. M. CARPENTER & G. K. WINCHESTER.
BRAIDING MACHINE.

No. 33,569.

Patented Oct. 29, 1861.



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UNITED STATES PATENT OFFICE.

HENRY W. CADY AND JAMES M. CARPENTER, OF PAWTUCKET, AND GILMAN K. WINCHESTER, OF PROVIDENCE, RHODE ISLAND.

IMPROVEMENT IN BRAIDING-MACHINES.

Specification forming part of Letters Patent No. 33,569, dated October 29, 1861.

To all whom it may concern:

Be it known that we, HENRY W. CADY and JAMES M. CARPENTER, both of Pawtucket, and GILMAN K. WINCHESTER, of the city of Providence, in the county of Providence and State of Rhode Island, have invented a new and useful Improvement in Braiding-Machines; and we do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a vertical section of a braiding-machine with our improvement applied; Fig. 2, a plan of the same, and Fig. 3 an elevation of one of the beaters and its appendages detached from the machine.

Similar letters of reference indicate corresponding parts in the several figures.

The manufacture of wide braid by the braiding-machines in common use in this country has been so difficult and imperfect that nearly all the braid of above one-quarter of an inch wide which has been used has been imported. The difficulty has resulted from the great friction produced between the necessarily large number of threads crossing each other, such friction preventing the threads from being drawn up close together in the braid, more especially at the edges thereof, by the mere tension of the threads themselves.

The object of this invention is to overcome this difficulty above mentioned; and to this end it consists in the application to braiding-machines of what we call "beaters" operating between the crossing threads to beat or press them up into the braid.

To enable others skilled in the art to make and use our invention, we will proceed to describe its construction and operation.

A is the bed-plate, and B the slotted plate, in which the puppets C C work.

D D are the carriers, and E E the carrier-gears.

F is the frame which supports the take-up rolls G G' and the tube or eye H, at the lower edge of which the braid is produced, said frame also containing the upper bearings of the upright shafts I and J, the former for

driving the carriers and the latter for driving the take-up rolls.

The above-specified parts are or may be constructed, arranged, and operated substantially as in the braiding-machines in common use.

a a are the beaters, which constitute our invention, consisting each of a stiff piece of steel or other material, terminating, as shown at 4 4 in Fig. 1, in a flattened and pointed finger. Of these beaters there may be one, two, or more; but in making flat braid we prefer to use two, as shown—viz., one to operate at each edge of the braid. Each of these beaters is attached rigidly to a separate lever L, which is pivoted by a fulcrum-pin *b* to one of a corresponding number of inclined slides S S, each of which is fitted to slide longitudinally in guides in a separate pair of fixed posts M M, but allowed no other movement. These slides are arranged radial to the axis around which the carriers D D are arranged concentrically, as shown in Fig. 2, and have an upward inclination toward the said axis, as shown in Fig. 1. Each of the levers L has secured in it, below its fulcrum-pin *b*, a pin *g*, which is allowed some play in a notch *c* in its respective slide, (shown best in Fig. 3,) and each of said levers is connected by a slot-and-pin connection *d e* with the upper and longer arm of one of a corresponding number of elbow-levers N N, which work on fixed fulcra *f f* in the bases of the posts M M, and whose lower and shorter arms enter a groove in a cam O on an upright shaft P, which is arranged in the center of the machine, the said shaft carrying a pulley Q, through which it receives motion from a belt R, running on and driven by a pulley carried by a gear T, which derives a constant rotary motion from one of the carrier-gears E E when the machine is in operation. The position of each beater and its appendages is opposite to one of the crossings of the slots *h* in which the puppets work, and consequently opposite to where crossings of the threads occur in the braiding operation.

The rotary motion of the cam O produces an oscillating movement of the longer arms of the levers N N toward and from the center of the machine. As each of such arms

approaches the center of the machine, it moves its respective lever L upon its fulcrum *b* until its pin *g* has moved across the notch *c*, when the said pin, coming in contact with the upper side of the notch, causes the slide S to move with the lever L toward the center of the machine, and as the lever N moves back from the center of the machine it moves back the lever L upon the fulcrum *b* until the pin *g* strikes the lower side of the notch *c*, after which the slide S is caused to move with the lever away from the center of the machine. The first-mentioned movement of the lever L on the fulcrum *g* causes the finger 4 of the beater to rise between two of the crossing threads *i i* which are being formed into braid, and the subsequent forward and upward movement of the said lever along with its slide S toward the center of the machine causes the finger to open the crossing-threads and press them up toward the braid-making point. The return movement of the lever L on its fulcrum *g* causes the finger to be depressed and entirely removed from between the threads before the beater is moved back in a direction from the center of the machine by the subsequent backward and downward movement of the lever along with the slide S.

The movement allowed to the lever L independent of the slide S is for the purpose of preventing the beaters from interfering with the proper and requisite crossings of the threads.

We do not confine ourselves to the particular construction of the beaters, or to the use of the means of operating them, which we have herein described; but

What we claim as our invention, and desire to secure by Letters Patent, is—

1. The employment in braiding-machines of devices such as we have termed "beaters," applied to operate between the threads, substantially as and for the purpose herein described.

2. Giving the said beaters a distinct and separate rising and falling movement, as well as a movement toward and from the center of the machine or point where the braid is produced, substantially as and for the purpose herein set forth.

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