(Model.)

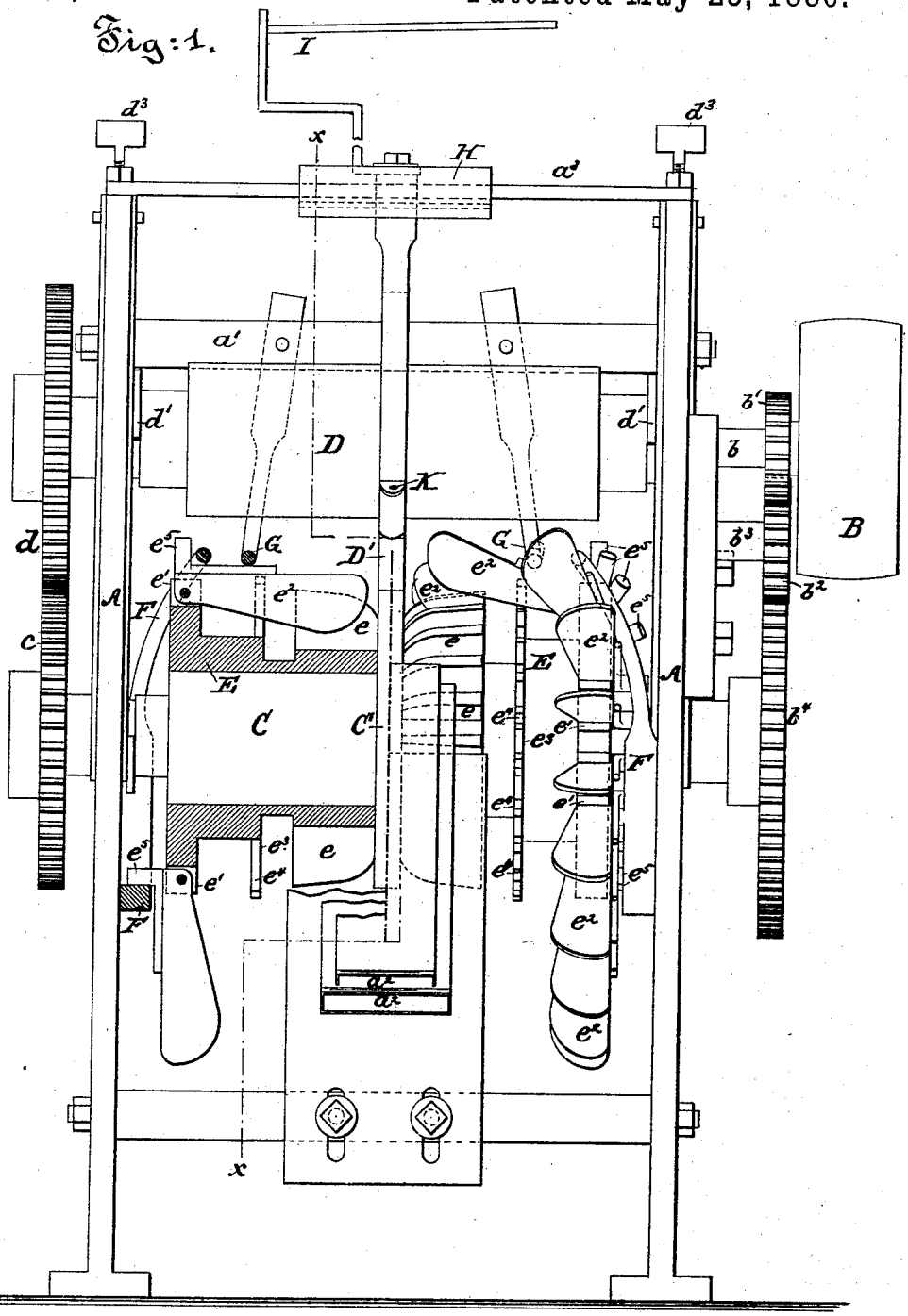
4 Sheets—Sheet 1.

G. & J. H. TAYLOR.

MACHINE FOR WAVING STRIPS OF FABRICS.

No. 342,479. Patented May 25, 1886.

Fig: 1.



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(Model.)

4 Sheets—Sheet 2.

G. & J. H. TAYLOR.

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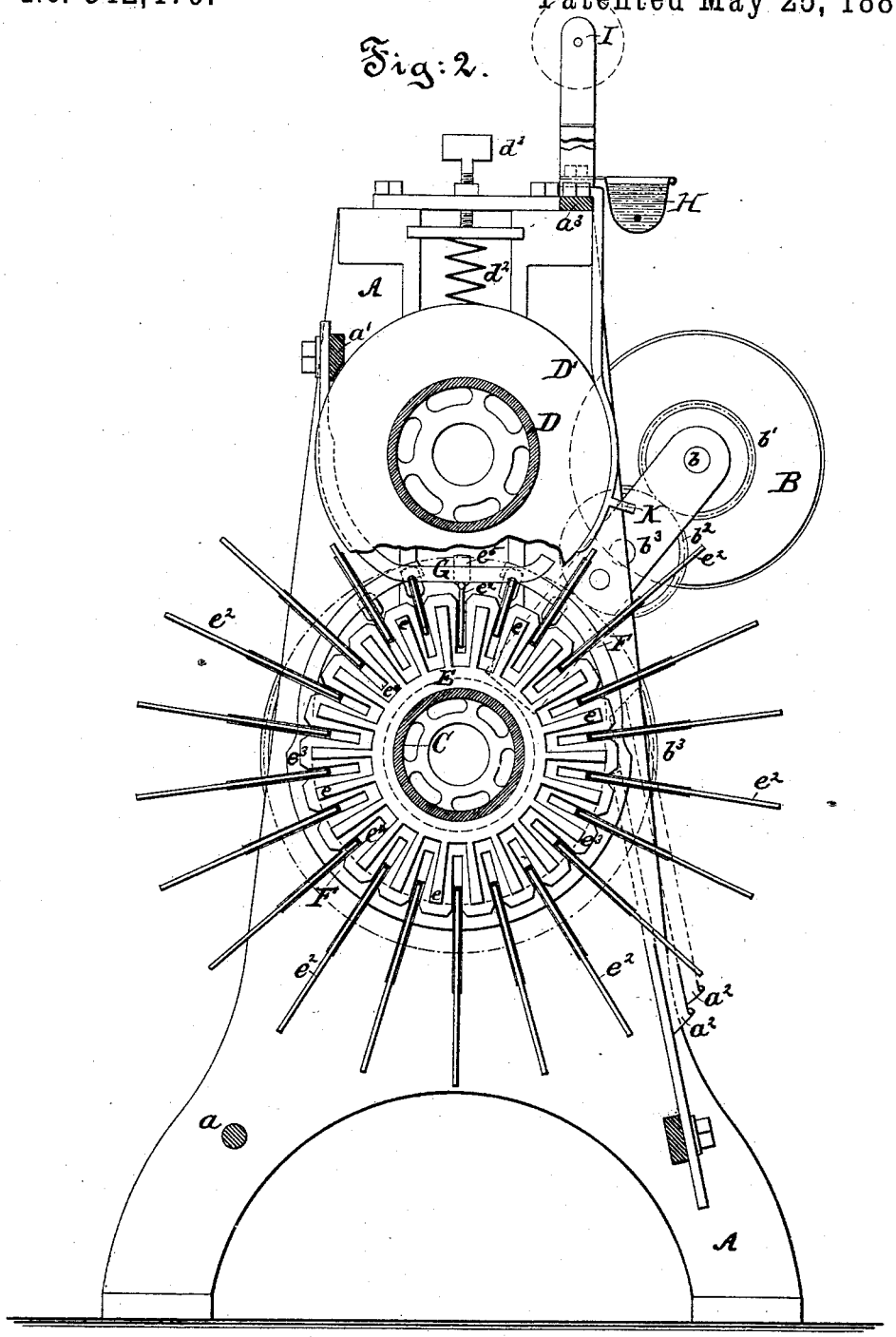
No. 342,479. Patented May 25, 1886.

Fig: 2.



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(Model.) 4 Sheets—Sheet 3.

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MACHINE FOR WAVING STRIPS OF FABRICS.

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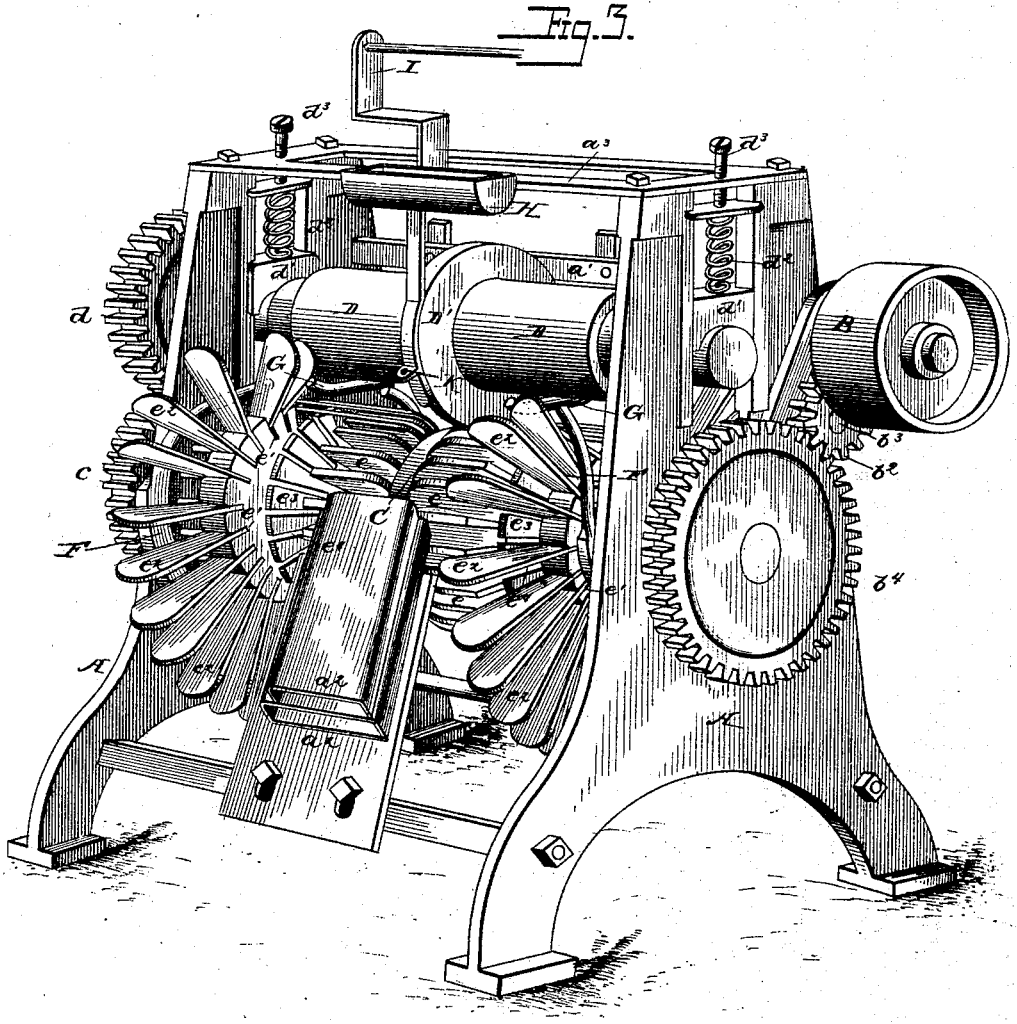
Fig. 3.



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(Model.) 4 Sheets—Sheet 4.

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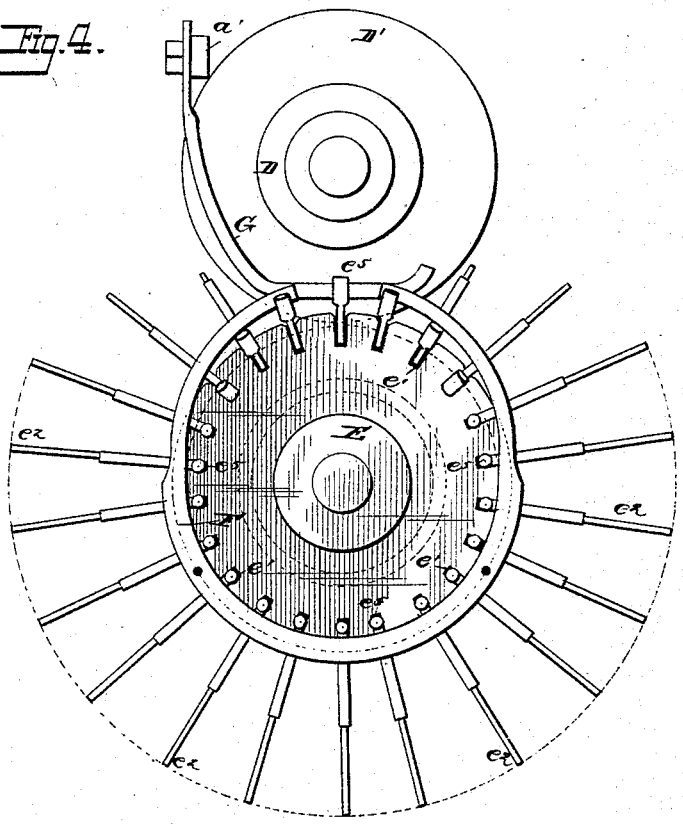
MACHINE FOR WAVING STRIPS OF FABRICS.

No. 342,479. Patented May 25, 1886.

Fig. 4.



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UNITED STATES PATENT OFFICE.

GEORGE TAYLOR AND JAMES HY. TAYLOR, OF NOTTINGHAM, COUNTY OF NOTTINGHAM, ENGLAND.

MACHINE FOR WAVING STRIPS OF FABRIC.

SPECIFICATION forming part of Letters Patent No. 342,479, dated May 25, 1886.

Application filed October 14, 1884. Serial No. 145,517. (Model.)

To all whom it may concern:

Be it known that we, GEORGE TAYLOR, residing at 245 Great Alfred Street, Nottingham, in the county of Nottingham, England, and JAMES HENRY TAYLOR, residing at 16 Gladstone Street, Nottingham, in the county of Nottingham, England, and subjects of the Queen of Great Britain and Ireland, have invented certain new and useful Improvements in Machines for Waving Strips of Fabric; and we do hereby declare that the following is a full and exact description thereof.

Our invention relates to that class of machines by which waves or undulations are produced in strips of fabric which have previously been subjected to the action of a fluting or plaiting machine, the waves being formed by a partial extension or drawing out of the previously-made plaits or flutes. In many cases such waves are formed on either side of the median line of a strip of fabric, the central portion of said fabric being left flat or in substantially the condition in which it came from the fluting or plaiting machine. It is this class of work for which our new machine is especially adapted, although other styles of waving may be made with it, and the machine may within the limits of our invention be so constructed as to make it specially applicable to the production of any one particular style of waved goods.

In the machines heretofore employed the waving devices consisted of two distinct sets of rotary parts, one set for each side of the goods. The usual construction was one which employed disks or wheels, in which were set pins projecting laterally from said wheels, and which during the rotation of said disks being loosely geared together, the pins of one wheel acting on one surface of the goods, pressing the latter down into the spaces between the pins upon the other disk. This construction, although useful in some cases, is objectionable in many circumstances, not only on account of its complicated nature, but also because certain light goods are liable to be injured during their passage through such machines.

In our newly-invented machine we overcome these difficulties in an efficient manner. We employ a single revolving structure to carry both sets of waving devices for the upper and lower surfaces of the fabric, and use a second rotating structure only for effecting the feed. The waving in this machine is effected by supporting the goods upon one set of waving devices, which is fixed upon the revolving structure, and causing the second set of waving devices, which is movable upon said revolving structure, to enter into the spaces between the first set, thus forming depressions in the unsupported portion of the goods. We propose in most cases to heat the machine by suitable appliances, to render the shape imparted to the goods by the waving devices more permanent.

The accompanying drawings, forming a part of this specification, represent what we consider the best means of carrying out our invention.

Figure 1 is a front elevation of our improved machine, certain portions being represented in section; and Fig. 2 is a transverse section on the broken line $x\,x$, Fig. 1; Fig. 3, a perspective view of the machine, taken from the front; and Fig. 4, a detail side elevation of one of the rolls carrying the hinged blades, the feed-roll above the same, and the blade-operating cams, the said parts being in their relative positions, but separate from the rest of the machine.

Similar letters of reference indicate like parts in all the figures.

A A are the side frames of the machine, rigidly connected by means of stay-bars *a*. The motion of the revolving parts is derived from a pulley, B, turning loosely upon studs *b*, and to which is secured a pinion, b', which, through the intermediate pinion, b^2, turning upon stud b^3, drives the wheel b^4, which latter is fastened upon the trunnion of the cylinder or roll C. This roll, at or near its center, is formed with a wheel or flange, C′, of considerably larger diameter than the roll itself.

D is a second roll, receiving its motion from the roll C through the wheels *c d*, as shown. The roll D is also formed with a central flange, D′, similar to flange C′. The bearing-pieces d' of roll D are capable of sliding in slots formed in the frame of the machine, and are acted upon by springs d^2 so as to hold the

flange D′ in contact with flange C′, the pressure between these flanges being regulated by means of the thumb-screws d^3, by turning which in one direction or the other the tension of the springs d^2 may be increased or diminished. The two flanges C′ D′, thus held in elastic contact with each other, constitute the feed mechanism of the machine, the strip of goods to be waved being clamped between them and moved along as they revolve, while the waving is effected at the same time by the mechanism now to be described.

Upon the roll C, on each side of the flange C′, is mounted a sleeve, E. Each of these sleeves carries near the flange C′ a series of radial ribs or blades, *e*, and at the farther end, near the side frames, is formed a corresponding number of lugs, *e′*, to which are hinged the blades e^2 in such position that when turned inward or toward the flange C′ these blades e^2 enter into the recesses formed by the radial ribs *e*.

Between the ribs *e* and the lugs *e′* the sleeves E carry each a flange, e^3, which is formed with narrow radial slots e^4, in which the blades e^2 are received and guided when being turned inward into the spaces between the ribs *e*. Each of the blades e^2 is formed near the hinge portion with a stud, e^5, projecting backward at a right angle with the main body of the blade.

F F are two cams of annular or nearly annular shape and permanently fixed to the side frames of the machine, so as to be substantially concentric with the roll C. The upper portions of these cams, preferably of round section, are bent inward toward the flange C′, and these cams are preferably not continuous, but have an open space just opposite the roll D. These cams F serve to impart an independent motion to the blades e^2 upon their pivots as the roll C, with the sleeves E, revolves, in the following manner: During that part of the revolution where the blades e^2 are not opposite or nearly opposite the roll D the studs e^5 bear against the inside of the cams F, so as to cause the blades e^2 to extend outward radially; but as the studs e^5 of the blades e^2 move upward toward the roll D they leave the cams F, on account of the latter being bent toward the flange C′, and these inwardly-bent portions of the cams F then begin to act against the backs of the blades e^2, pressing the same inward, and thus causing said blades to gradually assume a position parallel to the axis of the roll C, with their broad ends in the spaces between the ribs *e*. While the blades e^2 are opposite the roll D, where the cams F are discontinued, they are held in the depressed condition by means of the pieces G, bearing against their backs, as shown, the pieces G being adjustable upon the stay-bar *a′*, as shown. The reverse of this action takes place as the blades e^2 leave the position opposite the roll D, when, the backs of the blades e^2 being no longer held down by the cam-pieces G, the studs e^5 begin again to bear against the cams F, and are forced outward, so as to turn the blades e^2 into the radial position. The action of this mechanism upon the goods will be readily understood. The strip of fabric passes through an adjustable guide-channel, a^2, of which there may be two or more to accommodate various widths, toward the feed-flanges C′ D′, which grasp it on its center line and feed it along, while both sides of the strip are partially supported upon the ribs *e*, and as the blades e^2 move inward successively they press the unsupported portion of the goods down into the spaces between the ribs *e*, thus imparting to the same the desired waved aspect. It will be understood that in effecting this the previously-formed flutes or plaits in the goods are partially opened or drawn out, this drawing out furnishing the increased surface of the waved portion, while in the center said plaits or flutes are strongly compressed by the feed-flanges C′ D′. If desired, the effect of this compression may be rendered more permanent by the application of one or more gum threads, for which purpose a gum-trough, H, is arranged upon the cross bar a^3, in which one or more threads from spools upon the holder I are moistened with gum, and from which they pass through the guide-eye K to the strip of goods and between the wheels C′ D′, which firmly press it upon the goods.

In most cases we prefer to heat the apparatus by burning gas or a mixture of air and gas in the hollow rolls C D, as this serves to set the waves formed or render them more permanent than would be the case if the machine were used cold.

Many modifications may be made in the details without departing from the principles or sacrificing all the advantages of the invention. The duplication of the waving devices does not form a necessary feature. They may be on one side only of the flanges C′ D′, so that the latter act upon one edge of the goods, instead of at or near the central portion.

The cams F may be continuous, instead of being open opposite the roll D, and in that case the pieces G may be dispensed with. We prefer, however, the open cams F and additional pieces G, as in consequence of the adjustability of the latter the depths of the waves formed may be regulated within certain limits.

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

1. In a waving-machine, the combination, with a carrier revolving on its axis, of two co-operating sets of blades or ribs, one set of which is fixed upon said carrier, while the other set is mounted movably thereupon, substantially as specified.

2. In a waving-machine, the combination, with a carrier revolving on its axis and carrying two co-operating sets of blades or ribs, one set being fixed, while the other is movable, of a wheel arranged to form conjointly with a portion of the carrier a feed mechanism, substantially as specified.

3. In a waving-machine, the combination, with a carrier revolving on its axis and carrying two co-operating sets of blades or ribs, one set being fixed, while the other is movable, with mechanism whereby the moving devices are caused successively to enter into the spaces between the fixed devices and to move out from said spaces, substantially as described.

4. In a waving-machine, the combination, with a feed mechanism consisting of two rotating devices, of devices that effect the waving, the latter being all carried upon one of said feed devices, substantially as specified.

5. In a waving-machine, the combination, with a carrier revolving on its axis and carrying two co-operating sets of blades or ribs, of a wheel arranged to form conjointly with a portion of the carrier a feed mechanism, and of controlling means for the waving devices adapted to cause the latter to act upon that portion of the goods which is at the time passing through the feed mechanism and to liberate the goods as they leave the feed mechanism, substantially as described.

6. In a waving-machine, the combination, with a rotating carrier and a wheel constituting conjointly with a portion of the former a feed mechanism, of two waving mechanisms carried upon said carrier, one on each side of the feed mechanism, substantially as described.

7. In a waving-machine, the combination of radial ribs, as *e*, with hinged blades, as e^2, said ribs and blades being carried upon one carrier, with means for rotating said carrier, and with a stationary cam adapted to cause the blades e^2 to enter the spaces between the ribs *e*, substantially as described.

8. In a waving-machine, the combination of radial ribs *e* and hinged blades e^2, said ribs and blades being carried upon one carrier, with means for rotating said carrier, and with a stationary cam or cams adapted to cause the blades e^2 to enter the spaces between the ribs *e* and to withdraw them therefrom, substantially as described.

9. In a waving-machine, the combination of radial ribs *e* and hinged blades e^2, said ribs and blades being carried upon one carrier, with means for revolving said carrier, a stationary cam adapted to cause the blades e^2 to enter the spaces between the ribs *e*, and with an adjustable cam controlling the position of the blades in the spaces between the ribs, substantially as specified.

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