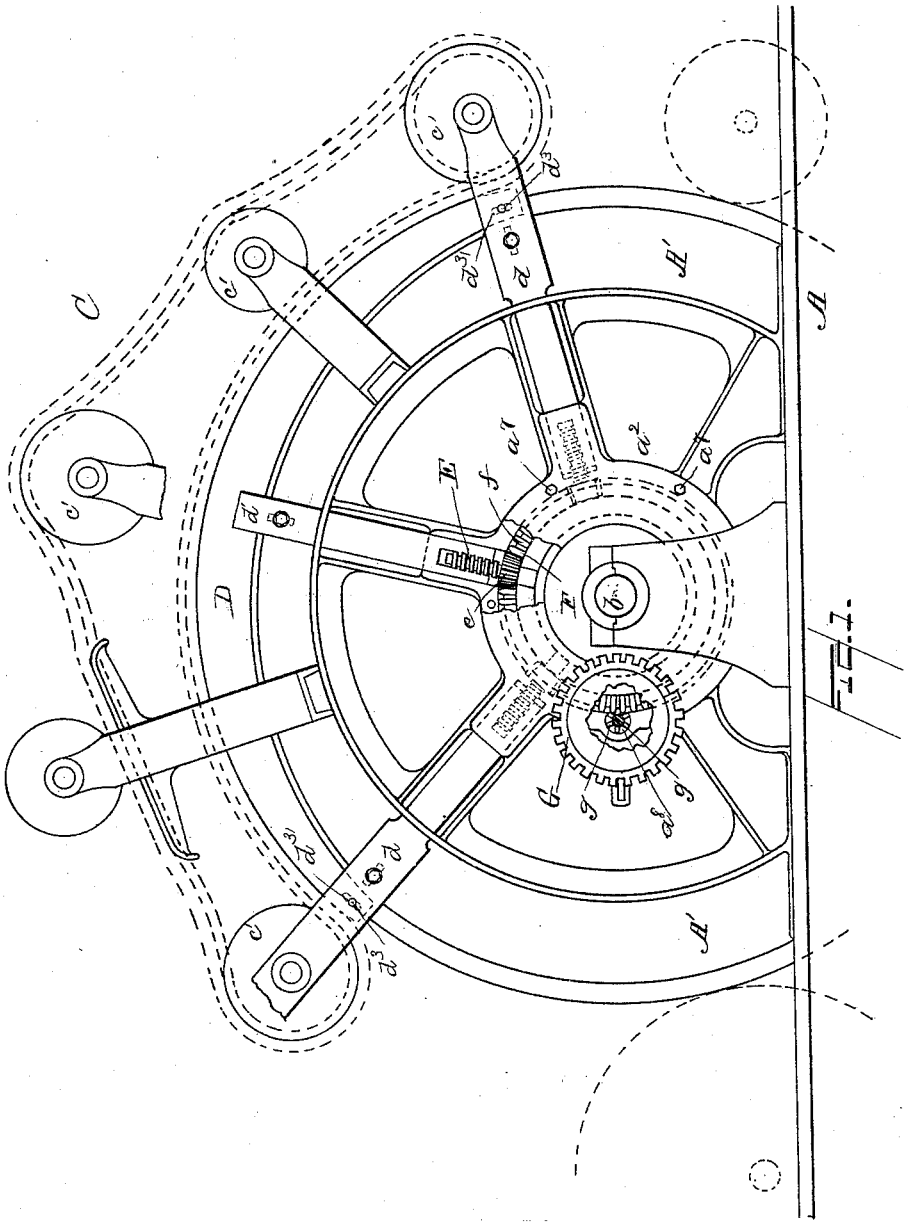
(No Model.) 3 Sheets—Sheet 1

C. L. HILDRETH.

CARDING ENGINE.

No. 458,576. Patented Sept. 1, 1891.



Witnesses:
Winthrop T. Hodges.
Fred Woodies

Inventor:
Chas. L. Hildreth

(No Model.)

3 Sheets—Sheet 2.

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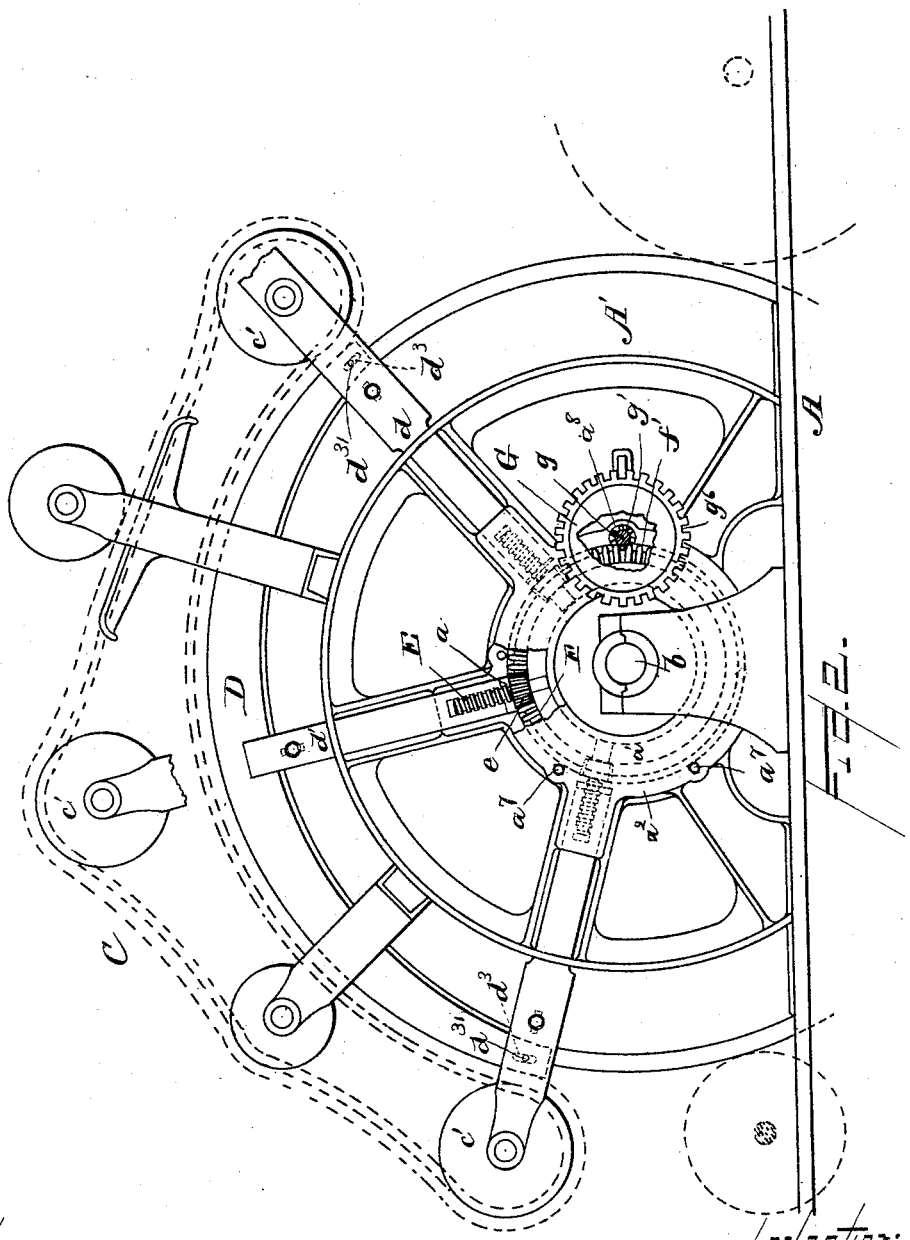

FIG. 2.

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(No Model.) 3 Sheets—Sheet 3.

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CARDING ENGINE.

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FIG. 3.

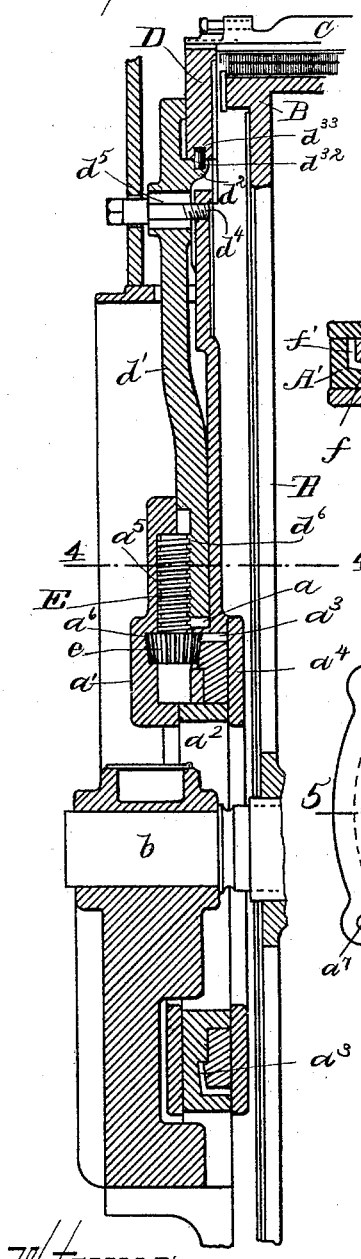


FIG. 4.

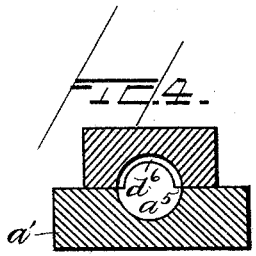


FIG. 5.

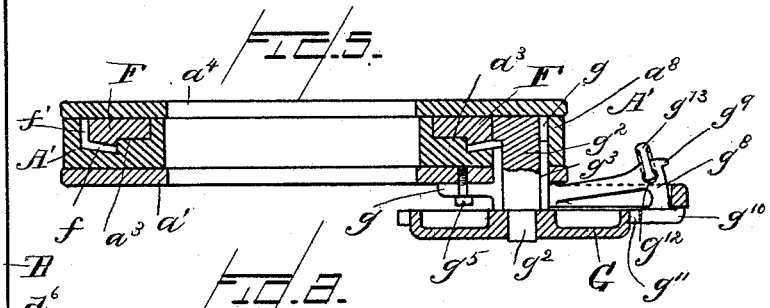
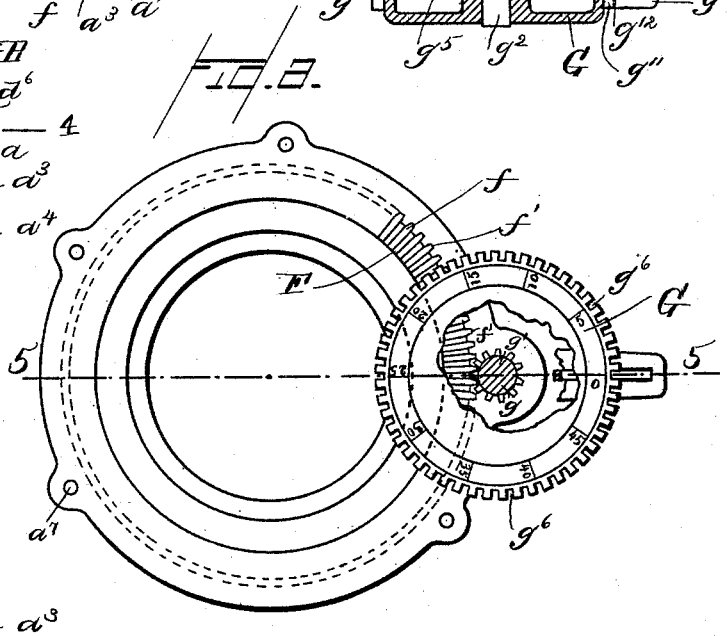


FIG. 8.



Witnesses:
Winthrop T. Hodges
Fred Woodies

Inventor.
Chas. L. Hildreth

UNITED STATES PATENT OFFICE.

CHARLES L. HILDRETH, OF LOWELL, MASSACHUSETTS, ASSIGNOR TO THE LOWELL MACHINE SHOP, OF SAME PLACE.

CARDING-ENGINE.

SPECIFICATION forming part of Letters Patent No. 458,576, dated September 1, 1891.

Application filed June 10, 1891. Serial No. 395,761. (No model.)

To all whom it may concern:

Be it known that I, CHARLES L. HILDRETH, a citizen of the United States, residing at Lowell, in the county of Middlesex and Commonwealth of Massachusetts, have invented a certain new and useful Improvement in Carding-Engines having Traveling Flats, of which the following is a specification.

My present invention relates to carding-engines having traveling flats and it contemplates the same general objects as the invention described in application, Serial No. 387,381, filed by me April 2, 1891, these objects, briefly stated, being to enable the flexible bends of a carding-engine to be quickly adjusted to vary the distance from the carding-surface of said main cylinder of the carding-surfaces of the flats traveling on said bends, while the said bends are maintained in concentricity with the main cylinder in their various positions of adjustment to indicate the amount of such adjustment and to prevent accidental or unauthorized movement of said bends after such adjustment. In the present invention the devices employed for the purpose of effecting these objects are to a certain extent the same as in the application aforesaid. Instead, however, of making use of a rotary scroll and of blocks engaged thereby and connected with or forming parts of the radial bend-supporting arms, as in the said application, I use in the construction herein presented and in the combination hereinafter defined a bevel-gear which engages bevel-pinions carried by radial screws, each of said screws being parallel with the axis of one of said radial bend-supporting arms, and each engaging a nut or threaded portion of the radial arm to which such screw is parallel.

My invention will first be described with reference to the accompanying drawings, and then be particularly pointed out in the claims at the close of this specification.

In the accompanying drawings, Figure 1 is a view in elevation of the right-hand side of such parts of a carding-engine provided with my improvement as are necessary to the understanding of the following description, part of the outer cover of the gear-case and part of the notched wheel being broken away to show features which otherwise would not be visible, certain parts being indicated by dotted lines. Fig. 2 is a similar view of the left-hand side of the carding-engine. Fig. 3 is a view in section on the line 3 3 in Fig. 2, certain parts which are cut by the plane of section being shown in elevation. Fig. 4 is a view in transverse section on the line 4 4 in Fig. 3 of a part of the outer cover hereinafter mentioned and a part of one of the radial bend-supporting arms. Fig. 5 is a view in section on the line 5 5 in Fig. 6. Fig. 6 is a view in side elevation, with certain parts broken away, of the compound gear and devices adjacent thereto.

The frame A, including the arches A′, the main cylinder B, its shaft b, the endless chain or series of top flats C, the rolls c', on which said chains C travel, and the flexible bends D, which support said flats while the same are in proximity to the main cylinder, are or may be all of the usual construction and operation and are used with other parts ordinarily found in carding-engines. Each bend D is supported in the usual manner upon three radial arms $d\ d'\ d$, the middle one d' of which is provided with a ledge d^2, on which the middle portion of said bend D rests, and with a pin d^{32}, fixed tightly in the ledge d^2 and fitting tightly in a hole d^{33} in the lower part of the flexible bend D. The axis of the hole d^{33} is coincident with the central radial line of the flexible bend D. The pin d^{32}, connecting, as it does, the flexible bend D with the middle radial arm d', prevents the flexible bend D from sliding circumferentially with respect to the middle radial arm d'. The other arms $d\ d$ are connected to said bend by studs $d^3\ d^3$, which enter and have a sliding fit in slots $d^{31}\ d^{31}$, formed in the ends of said bend parallel with the outer curved surface, each of said arms $d\ d'\ d$ being guided vertically by a guide-stud d^4, Fig. 3, supported in the corresponding arch A′ and passing through a longitudinal slot d^5 in the said arm, and by a radial slot a, formed in the outer face of said said arch and opening into the corresponding gear-case a^2. Each gear-case a^2 consists of a portion of an arch A′, provided with an annular groove a^3, substantially concentric with

the shaft b of the main cylinder B, a nearly annular cover a', concentric with said groove a^3 and closing the radial slots a, and another nearly annular cover a^4, arranged over the inner end of said groove a^3. The lower end portion of each radial arm is provided on its outer side with a segmental nut d^6, formed on or secured thereto, and which is engaged by a radial screw E, which turns in a radial semi-cylindrical recess a^5 in the inner face of said outer cover a'. To the inner end of each screw E is secured a bevel-pinion e, turning in a suitable enlargement a^6 of the recess a^5, the inner and outer ends of said recess preventing longitudinal movement of said screw E and pinion e. Each pinion e is engaged by the bevel-teeth f of a compound spur-and-bevel gear F, which is arranged in the gear-case a^2, above described, and has a running fit therein, and is retained in said case by the cover a^4, the covers a' a^4 being held in place by bolts a^7, which pass through said covers and through the arch. The spur-teeth f' of the compound gear F are engaged by the spur-teeth g of the spur-pinion g', which has a running fit in a hole a^8 in the arch A', the said hole a^8 being cylindrical, except that at one side it opens into the annular groove a^3 sufficiently to allow said spur-teeth to engage each other. The spur-pinion g' is fast on a shaft g^2, which turns in a pipe-box or journal-box g^3, secured to or formed in one piece with a plate g^4, secured, as by a bolt g^5 or other convenient means, to the outside of the outer cover a'. To the outer end of the shaft g^2, concentrically with the pinion g', is secured a notched wheel G, the notches g^6 in the periphery of which are arranged at equal intervals from each other and numbered in regular succession or provided with other distinguishing marks, substantially as described in said other application. The plate g^4 is provided with a slot g^7, radial to the shaft g^2, and extending from the pipe-box g^3 beyond the periphery of the wheel G, and in said slot is arranged a hook-shaped latch g^8, of sufficient length and thickness to fill loosely said slot, the inner end of said latch or end nearest the box g^3 being wide enough to fit loosely the space between the outer cover a' and the wheel G and allow the outer end of said latch to swing inward and outward from the arch A', the amount of such swing being limited by stop projections g^9 g^{10}, which reach beyond the outer end of said slot on opposite sides of said plate g^4, said stop projections also preventing the removal of said latch from its slot without removing the notched wheel G. The outer end of said latch has a hook or dog g^{11}, which curves outward and extends toward the pipe-box g^3, and the free end of said dog is adapted and arranged to fill any notch of the wheel G and prevent its rotation when the outer stop g^{10} is in contact with the outer face of the plate g^4, the space between said free end and the body of said latch being sufficiently greater than the thickness of said wheel G at its periphery to allow said last-named wheel to turn freely to rotate the gear F when the inner stop g^9 is in contact with the inner face of said plate g^4.

To prevent operatives or unauthorized persons from tampering with the devices which vary the curvature and position of the flexible bend, the latch g^8 is provided with a hole g^{12} to receive the bow of a padlock g^{13}, the said bow, when the latch is in engagement, being in contact with the inner side of said slotted plate, and when the padlock is locked preventing any movement of the latch, and therefore any movement of the notched wheel E.

Although I deem the direct engagement of pinion g with wheel F to be best, yet if it be deemed desirable the connections between the pinion and gear may be through intermediate gears, or, if desired, a worm and worm-wheel may be introduced between the notched wheel and the bevel gear-wheel, such worm-wheel, for instance, forming part of the compound wheel. These changes I consider wholly within the scope of my invention, and to be included by the reference to gear connection in certain of the following clauses of claims.

I do not broadly claim herein the combination, with bend-adjusting devices, of the notched wheel and its latching and locking devices, for I have claimed the same in my application hereinbefore mentioned.

I claim as my invention—

1. The combination, with the flexible bend and its radial supporting-arms, of the screws serving for the adjustment of the said radial arms, the bevel-pinions carried by the said screws, the bevel gear-wheel meshing with the said pinions, a notched wheel in gear connection with the said bevel gear-wheel, and a latch adapted to enter any notch of the said wheel and to prevent rotation thereof, substantially as described.

2. The combination, with the flexible bend and its radial supporting-arms, of the screws serving for the adjustment of the said radial arms, the bevel-pinions carried by the said screws, the bevel gear-wheel meshing with the said pinions, a notched wheel in gear connection with the said bevel gear-wheel, a latch adapted to enter any notch of the said wheel and to prevent rotation thereof, and a lock to hold said latch in engagement with said notched wheel, substantially as described.

3. The combination, with the arch of the frame of a carding-engine, the flexible bend, and the radial supporting-arms guided by the said arch and having threaded portions, as described, of the bevel gear-wheel mounted on said arch, means whereby the said gear-wheel may be turned definite angular distances, screws in engagement with the threaded portions of the radial arms and having bevel-pinions in engagement with the bevel gear-wheel, and a cover holding said screws and pinions in place and recessed to receive the same, substantially as described.

4. The combination, with the arch of the frame of a carding-engine, the flexible bend, and the radial supporting-arms guided by the said arch and having threaded portions, as described, of the bevel gear-wheel mounted in a groove on the inner side of the said arch, means whereby the said gear-wheel may be turned definite angular distances, screws in engagement with the threaded portions of the radial arms and having bevel-pinions in engagement with the bevel gear-wheel, a cover holding said screws and pinions in place and recessed to receive the same, and a cover fitting over the groove in the arch to hold the bevel gear-wheel in place, substantially as described.

CHAS. L. HILDRETH.

Witnesses:
WINTHROP T. HODGES,
FRED WOODIES.