(No Model.) 4 Sheets—Sheet 1.

B. A. DOBSON & W. I. BROMILEY.

CARDING ENGINE.

No. 361,815. Patented Apr. 26, 1887.

FIG. 1.

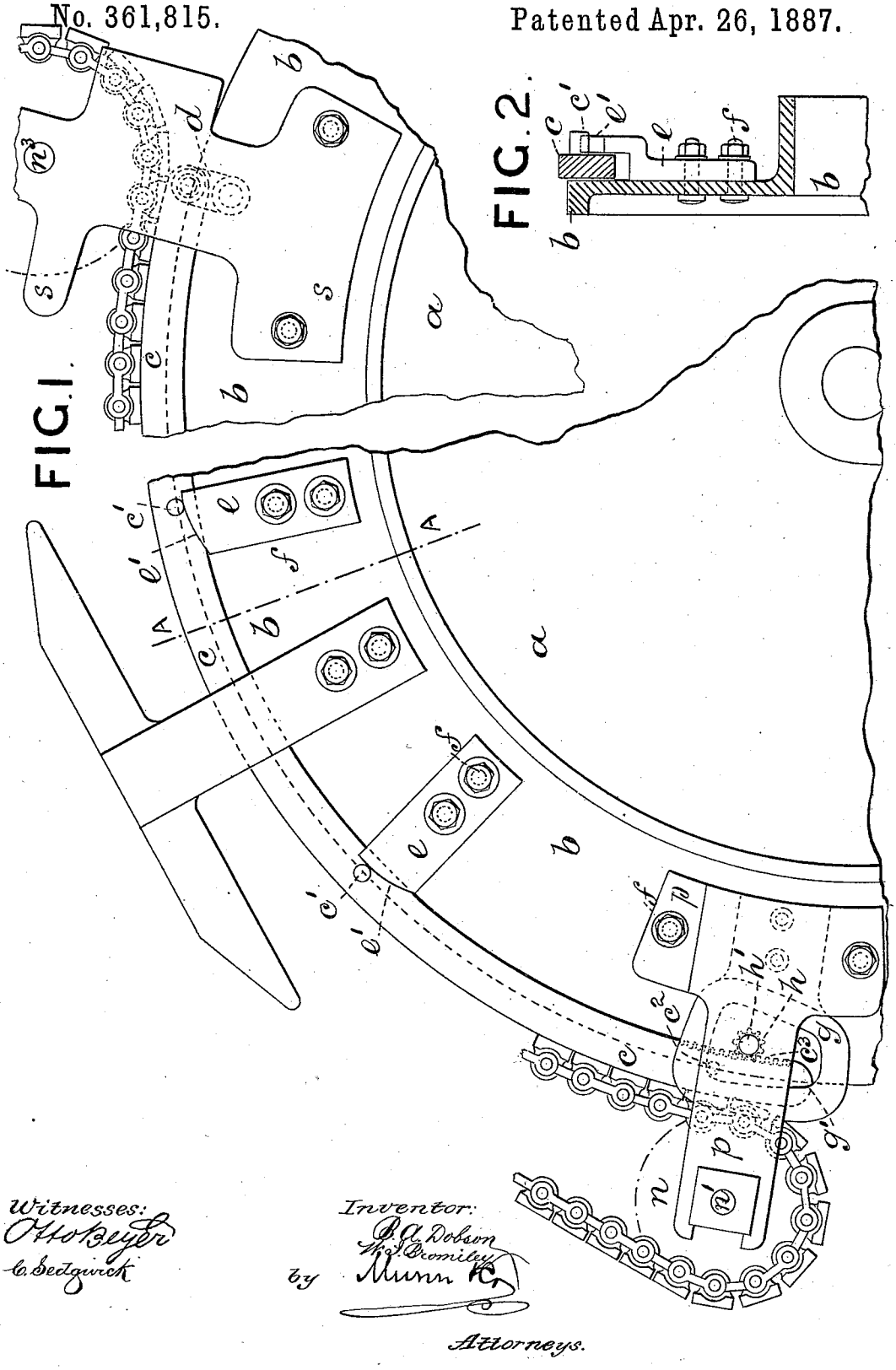


FIG. 2.

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(No Model.) 4 Sheets—Sheet 2.

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FIG. 4.

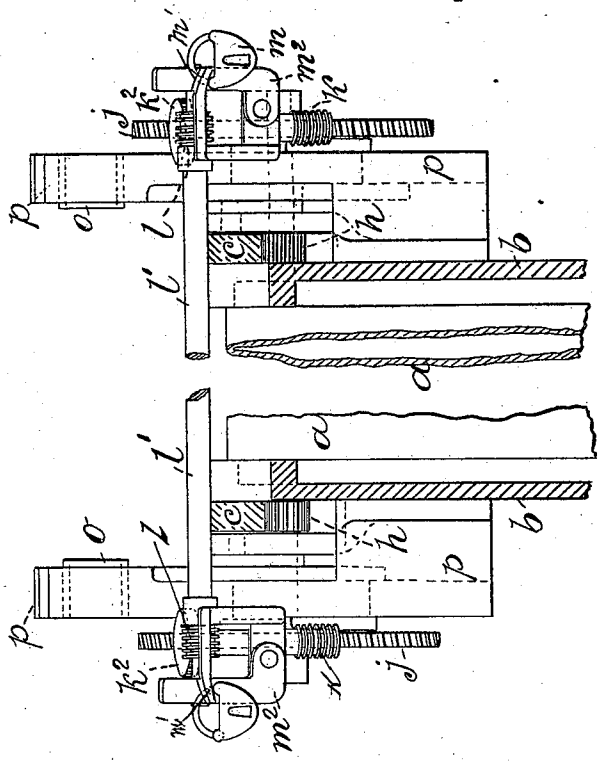
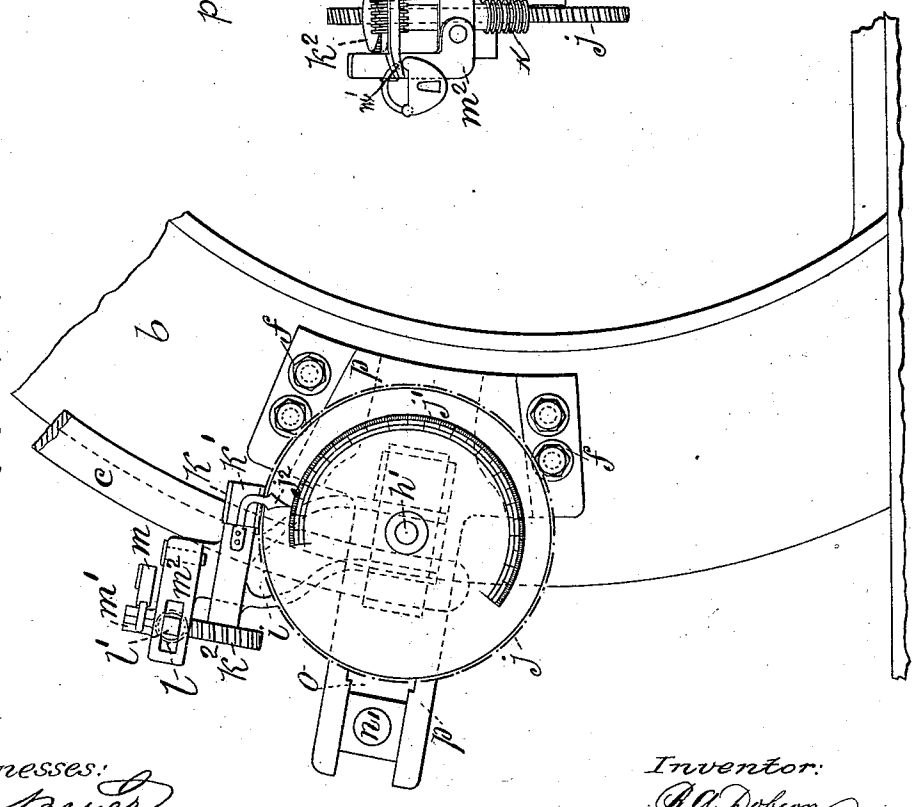


FIG. 3.



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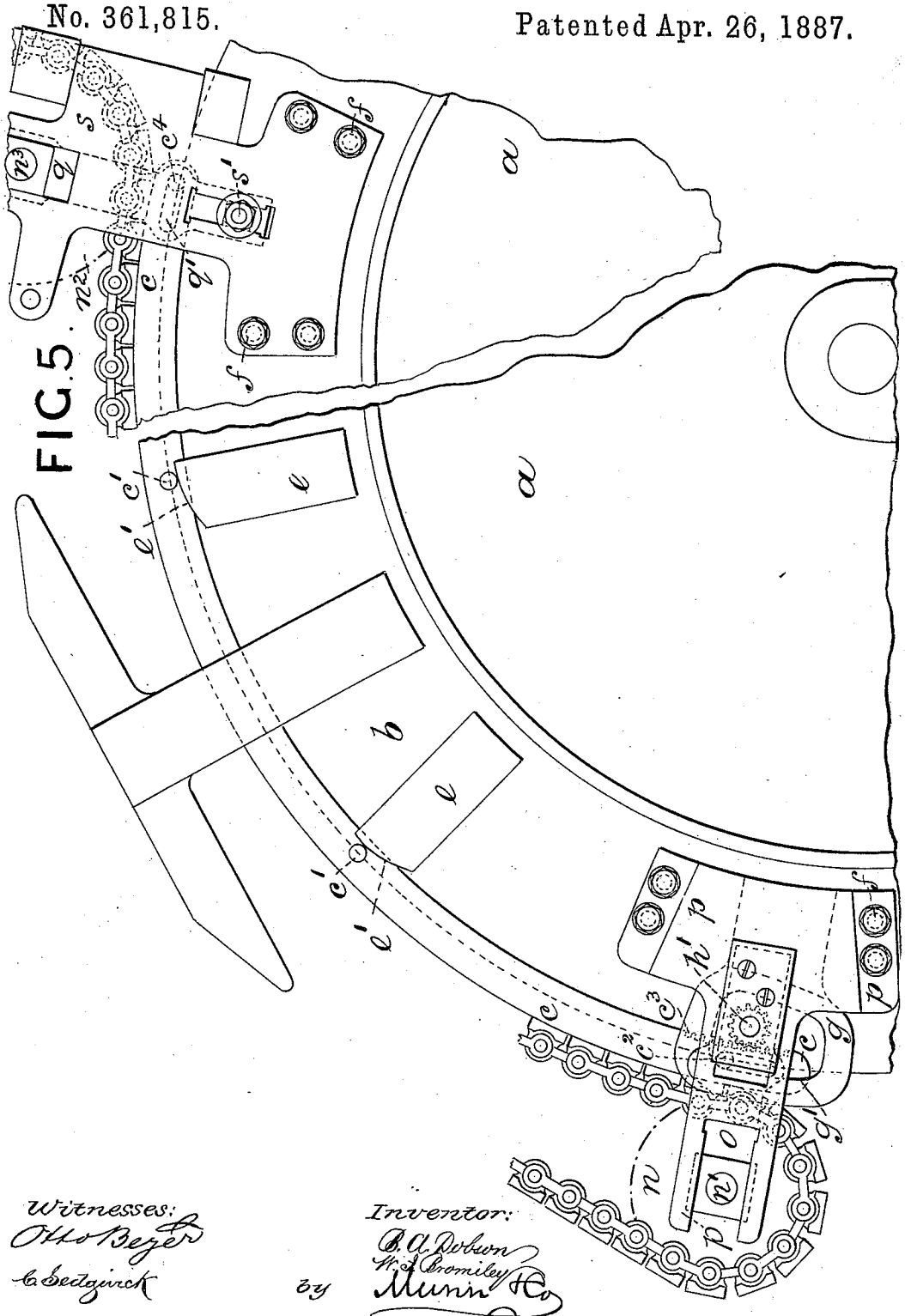
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CARDING ENGINE.

No. 361,815. Patented Apr. 26, 1887.

FIG. 5.



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CARDING ENGINE.

No. 361,815. Patented Apr. 26, 1887.

FIG. 10.

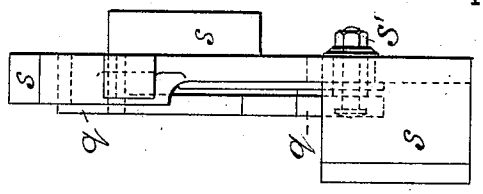


FIG. 9.

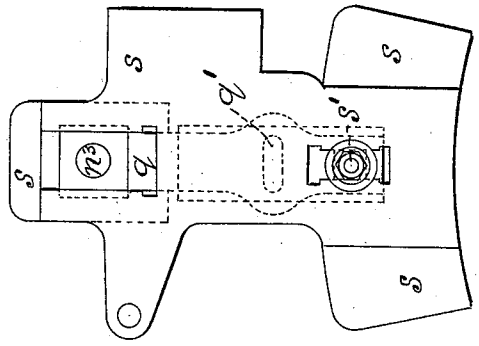


FIG. 8.

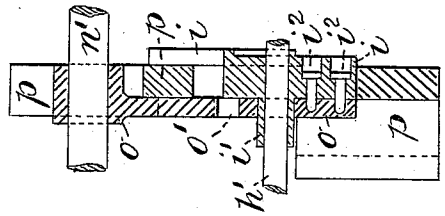


FIG. 7.

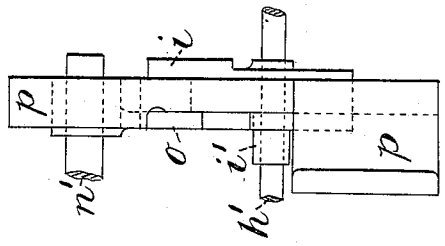
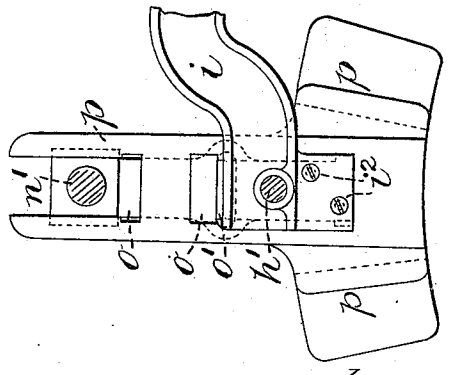


FIG. 6.



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UNITED STATES PATENT OFFICE.

BENJAMIN ALFRED DOBSON AND WILLIAM ISHERWOOD BROMILEY, OF BOLTON, COUNTY OF LANCASTER, ENGLAND, ASSIGNORS TO DOBSON & BARLOW, OF SAME PLACE.

CARDING-ENGINE.

SPECIFICATION forming part of Letters Patent No. 361,815, dated April 26, 1887.

Application filed August 19, 1886. Serial No. 211,245. (No model.)

To all whom it may concern:

Be it known that we, BENJAMIN ALFRED DOBSON and WILLIAM ISHERWOOD BROMILEY, of Bolton, in the county of Lancaster, England, have invented new and useful Improvements in Carding-Engines, of which the following is a full, clear, and exact description.

Our invention relates to improvements in that class of carding-engines in which revolving flats travel upon flexible bends; and the object of our invention is, first, to provide improved means whereby the flexible bends, one or both, may be adjusted separately or simultaneously, so as to insure a more uniform and accurate adjustment of the flats relatively to the main cylinder of the machine, and, secondly, to provide an arrangement for automatically adjusting the front and rear carrier shafts or rollers, around which the flats pass when the flexible bends are adjusted, so that the flats may be accurately adjusted at all points with reference to the main cylinder.

The invention consists in the construction, combination, and arrangement of parts and details, as hereinafter fully described, and pointed out particularly in the claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1 is a side elevation of a carding-engine in part provided with my improved mechanism for adjusting the flexible bends. Fig. 2 is a cross-section taken on the line A A, Fig. 1. Fig. 3 is a side elevation showing the mechanism for adjusting the flexible bends and the dial for indicating the adjustment. Fig. 4 is a plan view of the same, the engine-bends being in section and part of the main cylinder being broken out. Fig. 5 is a view similar to Fig. 1, but illustrating the mechanism whereby the carrier-shafts are adjusted simultaneously with the flexible bends. Figs. 6, 7, and 8 are detail views showing the arrangement of the adjustable rear, center, or carrier shaft, and Figs. 9 and 10 serve to illustrate the arrangement of the adjustable front, center, or carrier shaft.

a designates the main cylinder of the carding-engine, and *b b* the engine-bends. Each flexible bend *c* is connected at one end to the engine-bend *b* by a pivoted link, *d*, and at its other end the flexible bend is provided with a pin, stud, or projection, c^2, which runs on the curved or inclined cam edge *g'* of a slot formed in a bracket, *g*, bolted or otherwise secured to the bend *b*. At several points on its length each flexible bend *c* is also provided with pins, studs, or projections *c'*, which run on the curved or inclined cam edges *e'* of brackets *e*, secured to the engine-bend by bolts *f*, or formed integrally with the bend. The inner side of the rear end of each flexible bend *c* is formed or provided with rack-teeth c^3, with which engages a pinion, *h*, fixed on a stud or short shaft, *h'*. The shaft *h'* is mounted to turn, as shown in detail in Figs. 6, 7, and 8, in a boss or bearing, *i'*, formed on the inner side of the end of a bracket, *i*, and also in said bracket, which carries at its upper end the worm mechanism for turning the shaft *h'*, as hereinafter described.

The boss or bearing *i'* is received in an aperture formed in a link or block, *o*, mounted to slide within the grooved and slotted bracket-piece *p*, secured to the engine-bend *b* by bolts *f*, as best shown in Fig. 5, and to the sliding block *o* the end of the bracket *i* is rigidly attached by bolts i^2, as shown in Fig. 6.

The pin c^2, fixed on the end of the flexible bend *c*, besides passing through the slot in the bracket *g*, also rides in a transverse slot, *o'*, formed in the sliding block *o*, as shown in Figs. 6 and 8, and clearly indicated in Fig. 5. With this construction, when the flexible bends *c* are to be set for adjusting the flats relatively to the main cylinder *a*, the short shafts *h'* are rotated, as hereinafter described, causing the bends *c* to move lengthwise, owing to the engagement of the spur-wheels *h* with the rack-teeth c^3 on the bends *c*. Then, owing to the link-connection of the flexible bends *c* to the engine-bends at one end, and the pins *c'* and c^2 being guided on their respective cam-edges *e'* and *g'*, the bends *c* are moved outward or inward from the cylinder *a*, according to the direction in which the shaft *h'* is turned, thus

properly adjusting the flats traveling on the flexible bends *c*.

The pins c^2 on the flexible bends ride in the slots *o'* of the sliding blocks *o*, which carry the shafts *h'*, and thus cause the said blocks *o* to be moved outward or inward with the bends *c*, so that the spur-wheels *h* are held continually in engagement with the rack-teeth c^3 on the flexible bends when the same are being adjusted.

For accurately adjusting the bends I provide the short shafts *h'* with worm mechanism for turning them, as shown in Figs. 3 and 4.

As therein illustrated, a large worm-wheel, *j*, is fixed upon the outer end of each shaft *h'* and is in gear with a worm, *k*, mounted on a shaft, *k'*, which is journaled in a suitable bearing fixed or formed upon the movable bracket *i*. The outer end of either worm-shaft *k'* also carries a worm-wheel, k^2, with which are in gear worms *l* on the ends of a transverse shaft, *l'*, extending across the engine and journaled near its ends in bearings fixed or formed upon the movable brackets *i* on either engine-bend *b*. Thus by turning the shaft *l'* the flexible bends *c* on either side of the cylinder *a* can be adjusted simultaneously, or, if desired, by disconnecting said shafts *l'* the bends *c* may be adjusted independently of each other. For indicating the amount of such adjustment, I provide the outer face of the large worm-wheels *j*—one or both, according as they are connected or not—with circular scales *j'*, with which register pointers or indices j^2, attached to the bearings of the worm-shafts *k'* or other suitable supports.

The end of the shaft *l'* is squared to receive a key for turning it; and for locking the shaft in position after adjustment I provide a slotted locking-piece, m^2, pivoted to a suitable support on the movable bracket *i* and arranged to swing so that its slot will engage the squared stem of the shaft *l'* and prevent it from being turned. An ordinary padlock, *m*, can then be passed through eyes *m'*, formed on the locking-piece m^2 and in an adjacent fixed support, so that unauthorized persons are prevented from tampering with the adjustment of the flats.

In order that the front and rear rollers, carrying the flats, may be adjusted simultaneously with the flexible bends *c*, I mount their respective shafts n^3 and *n'*, as shown in Figs. 5 to 10, in bearings formed on the outer ends of the sliding blocks *o*, before referred to, and similar sliding blocks, *q*, guided in the bracket-pieces *s*, which are secured to the engine-bends *b* by bolts *f*. Each sliding block *q* is operated from the flexible bend *c*, similarly to the block *o*, by a pin or stud, c^4, on that end of the bend *c* riding in a slot, *q'*, formed in the said block. The sliding blocks *o* and *q* on both engine-bends being moved outward simultaneously with the flexible bends *c*, the shafts *n' n*^{3} of the carrying-rollers are adjusted coincidently therewith, so that the flats will be set at a proper distance from the main cylinder *a* at all points on their length, the worm mechanism aiding in the accurate adjustment of the movable parts.

Having thus fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a carding-engine, the combination, with the engine-bend, the flexible bend movable lengthwise, and devices, substantially as described, whereby the flexible bend is adjusted radially when so moved, of a rack on the flexible bend, a gear-wheel engaging the same, a movable block or bearing carrying the gear-wheel, and mechanism whereby the block is radially adjusted automatically with the flexible bend, substantially as shown and described.

2. In a carding-engine, the combination, with the engine-bend, the flexible bend, gearing for moving the same lengthwise, and devices, substantially as described, whereby the flexible bend is adjusted radially when so moved, of a movable bracket or support for the said gearing and mechanism whereby the movable support is radially adjusted with and by the flexible bend, substantially as shown and described.

3. In a carding-engine, the combination, with the engine-bend, the flexible bend, gearing for moving the same lengthwise, and devices by which the flexible bend is adjusted radially when so moved, of mechanism for indicating the adjustment, a movable bracket or support for the indicating mechanism, and means whereby the bracket or support is radially adjusted coincidently with the flexible bend, substantially as shown and described.

4. In a carding-engine, the combination, with the engine-bends, the flexible bends, gearing for moving each flexible bend lengthwise, and devices by which they are adjusted radially when so moved, of a worm-wheel connected with the said gearing on each engine-head, and a worm-shaft connecting and engaging both of the worm-wheels for adjusting the flexible bends equally and simultaneously, substantially as shown and described.

5. In a carding-engine, the combination, with the engine-bend, the flexible bend, an adjusting shaft having a squared end, and mechanism connecting the shaft with the flexible bend, of a hinged piece slotted to receive the squared end and means for locking the hinged piece in position when so engaged, substantially as shown and described.

6. In a carding-engine, the combination, with the engine-bend, the flexible bend movable lengthwise and radially, and means for so adjusting it, of the radially-adjustable carrying-roller bearing and connections between said bearing and the flexible bend, whereby when the flexible bend is adjusted the said bearing will be simultaneously adjusted therewith, substantially as set forth.

7. In a carding-engine, the combination, with the adjustable flexible bend and the radially-adjustable carrying-roller bearing, of a

pin or projection on one riding in a slot in the other and means for radially adjusting the flexible bend, substantially as shown and described.

8. In a carding-engine, the combination, with the flexible bends carrying the revolving flats, of racks on the flexible bends, pinions in gear with the racks, worm-wheels on the shafts carrying said pinions, worms in gear with said worm-wheels, other worm-wheels on the shafts carrying said worms, and a worm-shaft for operating the latter worm-wheels, substantially as set forth.

9. In a carding-engine, the combination, with the flexible bends carrying the revolving flats, of pins or projections on said bends, sliding blocks in which the rollers carrying the flats are journaled and provided with slots in which the pins or projections ride, and means for adjusting the flexible bends radially, substantially as specified.

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