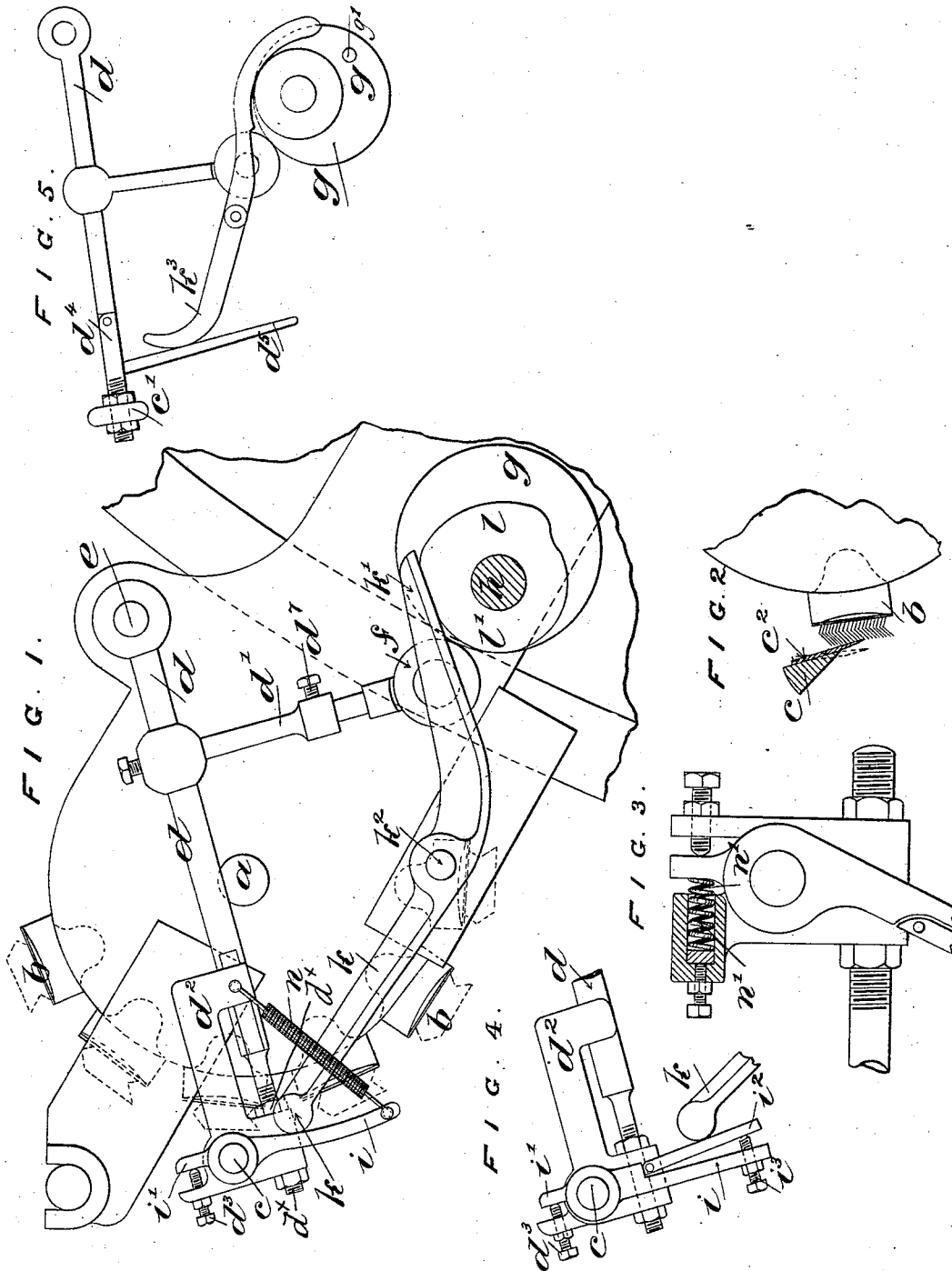


(No Model.)

C. BUTTERWORTH.
REVOLVING FLAT CARDING ENGINE.

No. 542,383.

Patented July 9, 1895.



WITNESSES.

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UNITED STATES PATENT OFFICE.

CHARLES BUTTERWORTH, OF OLDHAM, ENGLAND.

REVOLVING-FLAT CARDING-ENGINE.

SPECIFICATION forming part of Letters Patent No. 542,383, dated July 9, 1895.

Application filed February 9, 1895. Serial No. 537,772. (No model.) Patented in England October 24, 1891, No. 18,346.

To all whom it may concern:

Be it known that I, CHARLES BUTTERWORTH, a subject of the Queen of Great Britain and Ireland, and a resident of 17 Queen's Road, Oldham, in the county of Lancaster, England, have invented a certain new and useful Improvement in Revolving-Flat Carding-Engines, (for which I have obtained a patent in Great Britain, No. 18,346, bearing date October 24, 1891,) of which the following is a specification.

During the working of carding-engines which are provided with traveling chains of flats the waste fiber and fluff which accumulate upon the flats are stripped off by means of a vibrating comb. It is necessary that this comb shall move very closely to the cards upon the flats or shall penetrate between the teeth of the cards to some extent, in order that the comb may be able to strip the cards effectually.

Under present conditions the comb moves in the same fixed arc both when stripping and when returning, so that there is a tendency to drag the teeth backward or otherwise to damage the teeth. The object of my invention is to obviate this defect, and this I accomplish by imparting a secondary motion to the comb, so that it clears the card-teeth during its upward or return motion—that is to say, in addition to the ordinary movement which the comb makes when stripping I impart a second movement toward and from the card which is being stripped.

In order that the nature and application of my invention may be clearly understood, I will describe the same with reference to the accompanying drawings.

In the said drawings, Figure 1 represents a side elevation of my improved stripping apparatus, parts of the carding-engine not necessary to the illustration of the invention not appearing in the drawing. Fig. 2 shows the comb-shaft and comb in cross-section. Fig. 3 shows a modified form of the spring for keeping the comb in its normal position. Fig. 4 shows a modification of the comb-shaft lever. Fig. 5 is a view of a modified form.

Referring first to Fig. 1, *a* is the shaft upon which are fixed the ordinary carrier-wheels which take the flats out of action, and *b b* represent a few of the flats as they would ap-

pear when passing to and from the point at which they are stripped. The stripping comb-shaft *c* is carried by vibrating arms on each side of the engine, one of these arms appearing at *d*. These arms are secured upon the ends of a rocking-shaft *e*, so that when one arm *d* is acted upon both arms move in unison. Upon the arm *d* is fixed a second arm *d'*, which is in two parts, adjustable relatively to each other by means of the set-screw *d''*, and carries an antifriction-bowl *f*, which rests upon the periphery of an eccentric-cam *g*, which is mounted upon a stud *h* and is connected with the pulley which drives the worm-shaft which imparts motion to the shaft *a*.

The action of the parts as so far described with reference to the drawings is of an ordinary character, and for this reason it has not been considered necessary to more fully describe and illustrate such action.

In ordinary practice the comb would be fixed directly to the arms which would correspond with the arms *d*, but under my improvement the ends of the comb-shaft are mounted to rock or swivel. In the example the comb-shaft *c* is mounted in carrier-blocks *d²*, which are adjustable upon the arms *d*, in order that the shaft may be capable of being adjusted with relation to the cards which are to be stripped, said adjustment being effected by the screw-threaded end of the arms *d* and the nuts *d³*. The comb *c* is hidden in Fig. 1, but appears in Fig. 2, in which the comb-support and the comb are represented in cross-section. It will be seen that if the cone-shaft and the comb are caused to rock in their bearings the acting part of the comb will be moved toward and from the card which is to be stripped, as indicated by the dotted lines and full lines in Fig. 2. A lever *i* is fixed upon the comb-shaft and is formed with a finger *i'*, which bears against the end of a screw *d³*, which is adjustable in the carrier-block *d²*. The lever *i* bears upon the end *k* of the lever *k k'*, which is mounted to rock upon a fulcrum at *k²*. The other end *k'* of the lever rests upon a second cam *l l'*, which is formed in one with or is attached to the cam *g*, so that the two cams revolve together. The said second cam has part of its periphery *l* of a longer radius than the other part *l'*, and the parts of the apparatus are so adjusted as that

the lever k shall be in contact with the part l during the up or return stroke of the comb. It will be readily understood that when the lever is in contact with the part l the end k of the lever will be moved farther outward toward the left hand, and that this will have the effect of turning the comb-shaft in its bearings, whereby the comb will be moved away from the flat card, so that during the return movement the comb will be quite clear of the card-teeth. When the lever passes to the part l' of the cam, a spring n , acting upon the lever i , brings back the comb to its working position and causes the finger i' to bear against the screw d^2 , which determines the closeness of approach of the comb to the cards. In the modification, Fig. 3, a spring n' is differently applied to answer the same purpose as the spring n . By means of this combination of the ordinary stripping movement of the comb with the secondary movements from and to the cards, the comb while stripping a card is withdrawn from the card at the end of each downward movement and is returned to the card at the commencement of such downward movement, so that any injurious effect upon the card during the return movement is entirely obviated.

Fig. 4 illustrates a modification in the form of the lever i . In this example the said lever is made in two parts $i^1 i^2$, one part i^2 being hinged to the other i^1 and being acted upon by an adjustable screw i^3 , so that the action of the lever $k k'$ upon the comb-shaft may be capable of being regulated by moving the hinged part toward or from the said lever.

In Fig. 5 the bar c' which carries the comb is attached to parts d^4 , which are hinged to the arms d and are acted upon by a lever k^3 , which bears against a finger d^5 which projects from the part d^4 . A stud g' upon the cam acts upon the lever and causes it to press upon the finger d^5 , so as to lift the comb-bar at the times when the comb has reached the end of its stripping stroke, the comb being thereby

moved away from the card-teeth. The said stud would continue to act upon the lever until the comb has about completed its return stroke, when the comb would be returned into action.

An advantage arising from the use of my invention is that the comb may be set to penetrate between the teeth of the cards to a greater extent than can be safely done when the ordinary rigid comb is used, so that the attendant may set the comb more or less deeply in without risk of damaging the cards, the result being that the cards may be more completely stripped.

I declare that what I claim is—

1. In combination, the comb, the oscillating supports therefor, said comb being pivotally connected thereto, the arm or lever extending from the pivotal support and means for oscillating the lever to move the comb toward or from the flats, substantially as described.

2. In combination, the oscillating supports, the carrier block adjustable thereon, the comb pivotally connected with said carrier block and means for oscillating the comb about its pivot, substantially as described.

3. In combination, the flats, the comb, the oscillating supports for the said comb, means for moving the comb about its pivotal connection toward and from the flat and means for adjusting the comb toward and from the flat in addition to its pivotal movement and its oscillation, substantially as described.

4. In combination, the flats, the oscillating arms d , the comb in pivotal connection therewith and having a depending arm connected with the pivot and the lever and cam for operating said arm, substantially as described.

In witness whereof I have hereunto set my hand in presence of two witnesses.

CHARLES BUTTERWORTH.

Witnesses:

DAVID FULTON,
RICHARD IBBERSON.