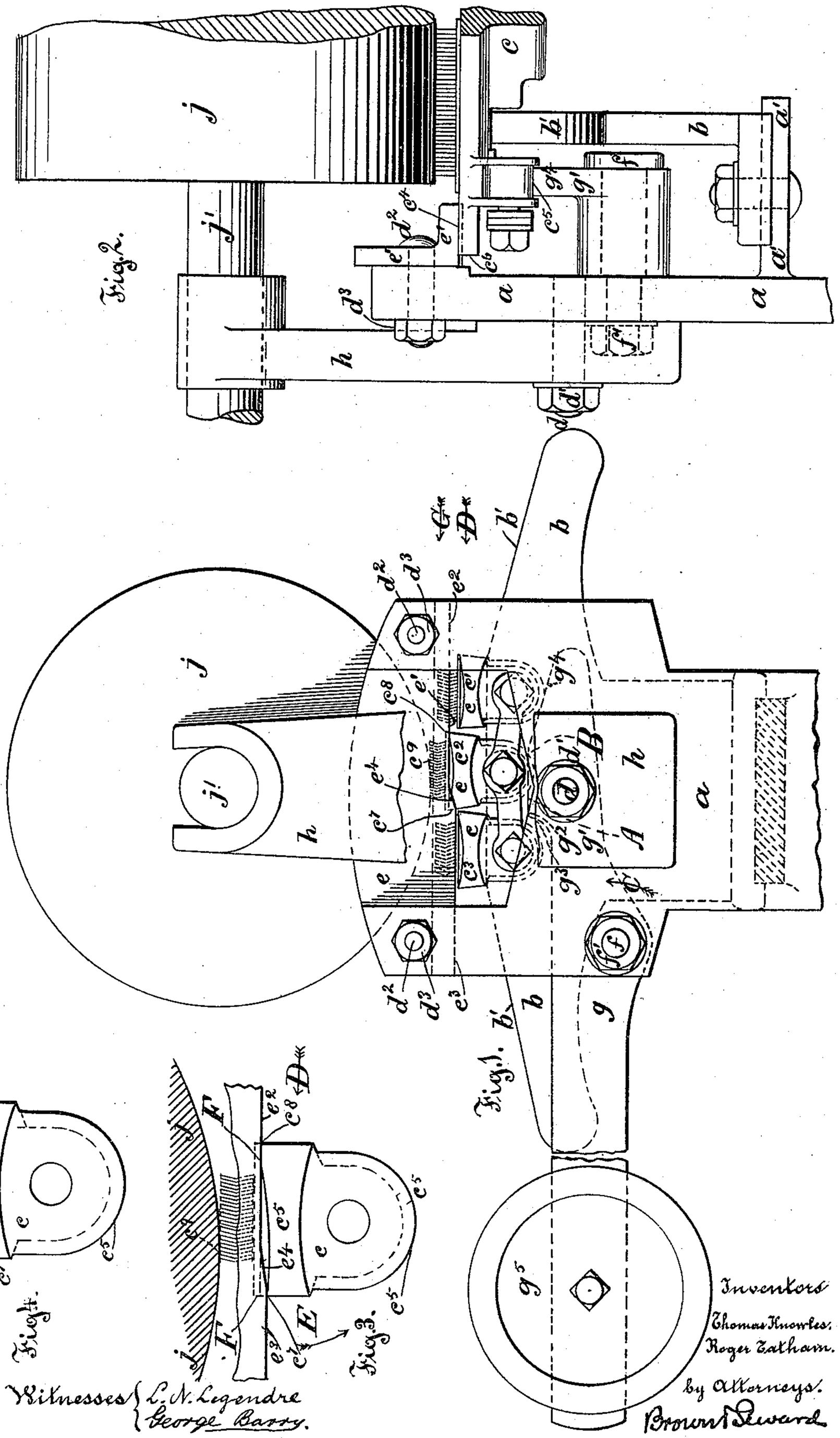
(No Model.)

T. KNOWLES & R. TATHAM.

CARDING ENGINE.

No. 464,029. Patented Dec. 1, 1891.



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UNITED STATES PATENT OFFICE.

THOMAS KNOWLES, OF BOLTON, AND ROGER TATHAM, OF ROCHDALE, COUNTY OF LANCASTER, ENGLAND.

CARDING-ENGINE.

SPECIFICATION forming part of Letters Patent No. 464,029, dated December 1, 1891.

Application filed November 24, 1890. Serial No. 372,420. (No model.) Patented in England February 27, 1888, No. 2,912.

To all whom it may concern:

Be it known that we, THOMAS KNOWLES, cotton-spinner, of No. 287 Blackburn Road, Bolton, in the county of Lancaster, and ROGER TATHAM, machine-maker, of Rochdale, in the said county, England, have invented certain new and useful Improvements Applicable to Carding-Engines in which Revolving Flats are Employed, (for which we have obtained British Patent No. 2,912, dated February 27, 1888,) of which the following is a specification.

Our invention relates to those carding-engines in which "revolving flats" are employed; and our invention consists in arrangements of apparatus for grinding the "flats" employed in such carding-engines.

For the purpose of our invention we cause the "back" of each end of the flat about to be "ground" to travel along an inclined surface and pass between the inclined surface and a fixed guide. Each of the inclined surfaces and fixed guides is mounted upon or connected in any suitable manner to one of the "bends" or side frames, or any other suitable part of the carding-engine, so as to be capable of being adjusted in position.

For convenience of description we shall hereinafter in many instances only refer to the apparatus situate at one side of the carding-engine, although the arrangements of apparatus in which our invention consists and the apparatus used in conjunction with our invention are, in so far as may be necessary, applied alike to each side of the carding-engine.

In the accompanying drawings, Figure 1 is a front view, and Fig. 2 a side view, showing so much of a carding-engine as is requisite to illustrate our invention. Figs. 3 and 4 are diagrams, on a larger scale, illustrative of certain details of the working of our invention.

The same letters of reference are applied to corresponding parts in all of the figures.

Secured to the bend of the carding-engine is a bracket *a*. To a projection *a'*, formed upon the bracket *a*, is secured the curved bracket *b*, along the upper edge *b'* of which the revolving flats *c* travel when away from the main cylinder of the carding-engine.

Mounted upon the bracket *a* and secured thereto by the bolts d^2 and nuts d^3 is a bracket *e*. The said bracket *e* is formed with a part *e'*, the lower edge of which is formed with two surfaces e^2 e^3, connected by an inclined surface e^4.

Secured to the bracket *a* by the nut *f'* is a stud *f*, mounted upon which and free to be turned thereon is a lever *g*, one end *g'* of which is formed with a flat or nearly-flat surface g^2, extending from A to B, and inclined surfaces g^3 g^4. The other end of the lever *g* is provided with a weight g^5, which tends to turn the end *g'* of the lever *g* in the direction indicated by the arrow C. In place of the weight g^5, a spring or other equivalent for such weight g^5 may be employed.

Mounted upon the bracket *a*, and secured thereto by means of the bolt *d* and nut *d'*, is a bracket *h*, which supports, so that it may be turned therein, one end of the axle *j'* of the grinding-roller *j*. The bracket *h* is provided with screws and nuts, by means of which the grinding-roller *j* can be adjusted into the required position; but as such screws and nuts are similar to those ordinarily in use for similar purposes we have omitted them from the drawings in order to avoid confusion. One end of each of the flats *c* while away from the main cylinder of the carding-engine passes between the end *g'* of the lever *g* and the bracket *e*.

c' c² c^3 are flats. The flat *c'* is about to be ground. The flat c^2 is being ground by the grinding-roller *j*, and the flat c^3 has been ground. The motion of each of the flats *c* in the direction indicated by the arrow D causes each of such flats *c'* to pass beneath the grinding-roller *j*. The portion of each of the flats *c* which at times is against the surfaces e^2 e^4 e^3 of the bracket *e* is that portion c^4 of the flat *c* which is supported by the flexible bend or other bend when the said flat *c* is "at work." The movement of the flats *c* in the direction indicated by the arrow D will cause the portion c^5 of each of such flats *c* to travel along the inclined surface g^4 and the surface g^2 of the lever *g*. The weight g^5 will cause the end c^6 of the flat *c* to be pressed against the surfaces e^2 e^3 of the bracket. The movement of the flat *c* in the direction indicated by the arrow D will cause the edge c^7 of the flat *c* to pass along the surface e^3 and the

edge c^8 to travel along the surface e^2. While the edge c^7 is traveling along the surface e^3, and while the edge c^8 is supported on the surface e^2, the "wire surface" c^9 of the flat c will be operated upon by the grinding-roller j, which is caused to rotate in the manner in which grinding-rollers are ordinarily caused to rotate.

Fig. 3 is a detached view showing, upon a larger scale, the grinding-roller j and a section of a flat c being ground, the surfaces e^2 e^3 and inclined surface e^4 being shown detached in order that confusion may be avoided. The surface e^3 is formed at such a height above the surface e^2 that when the edge c^7 of the flat c is traveling along the surface e^3 and the edge c^8 of the flat c is traveling along the surface e^2 the flat c will be tilted in the direction indicated by the arrow E, so that the surface F F of the flat c will be parallel to the surface e^2 and the surface e^3, and that the "card-wire surface" c^9 of the flat c will be ground parallel to the surface F F of the flat c, to which the "card-wire" c^9 is attached. After the wire c^9 of the flat c has been operated upon by the grinding-roller j a continued movement of the flat c in the direction indicated by the arrow D will carry the flat c clear of the surfaces e^2 e^3 and the surface g^2 upon the lever g. By causing the edges c^7 c^8 of each flat c to travel along the surfaces e^2 e^3 while the flat c is being ground, we insure that the wire of all the flats shall be ground uniformly in relation to the surfaces by which such flats are "heeled" when at work.

The diagram Fig. 4 shows on a larger scale the advancing edge of a flat as being about to commence to pass along the inclined surface e^4, and indicates the manner in which the part c^{10} of the card-clothing of a flat which may from any cause be too near the advancing edge of the flat or may project too much from the foundation of such card-clothing will be ground so as to be brought into the condition requisite for proper working and so that it will not come into contact with the card-surface of the main cylinder to a greater extent than the corresponding portion of each of the other flats. It will be seen from Fig. 4 that before the edge c^7 of the flat c commences to pass along the inclined surface e^4 the angle c^{10} of the card-clothing upon the said flat c will, if it is too near to the advancing edge of the flat or projects too far from such flat c, come into contact with the grinding-roller j and receive a grinding and be ground down to the required extent. As soon as the edge c^7 of the flat c commences to pass along the inclined surface e^4 further contact between the card-surface of the flat c and the grinding-roller j will not take place until the edge c^7 of the flat c arrives in contact with the surface e^3. The angle c^{10} of the card-surface of the flat c will thus be ground at an angle to the remainder of such card-surface.

The amount of carding-surface to be presented to the main cylinder by the flats operated upon by the grinding-roller may be regulated by the extent to which the angle c^{10} of the flat is ground by the grinding-roller being varied. The extent to which the angle c^{10} of the flat is ground may be varied by the relative positions of the inclined surface e^4 of the bracket e, and the point of contact between the angle c^{10} of the flat and the grinding-roller j being varied by the bracket e or the grinding-roller being moved in the direction indicated by the arrow G or in the direction opposite thereto into the required position.

If desired, special means for facilitating the movement of the grinding-roller j or bracket e may be provided.

Having fully described our invention, what we claim, and desire to secure by Letters Patent, is—

The hereinbefore-described arrangements of apparatus for grinding the flats employed in carding-engines in which revolving flats are employed, which arrangements of apparatus consist in fixed parts provided with surfaces e^2 and e^3, formed parallel with each other and separated from each other by a difference of level such that a flat held against the surfaces e^2 and e^3 will have its card-wire surface parallel to said surfaces e^2 and e^3 and in levers, such as g, by means of which the flats being ground may be successively held against the surfaces e^2 e^3, and arranged, employed, and operating in conjunction with a grinding-roller, substantially as and for the purposes hereinbefore described.

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