C. BRAKELL.

Cotton Gin.

No. 51,402. Patented Dec. 5, 1865.

Fig. 1.

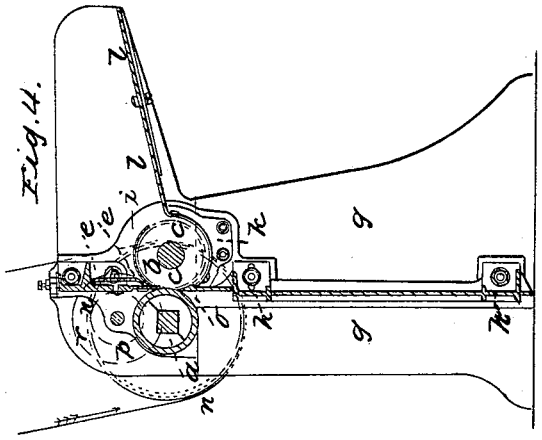


Fig. 2.

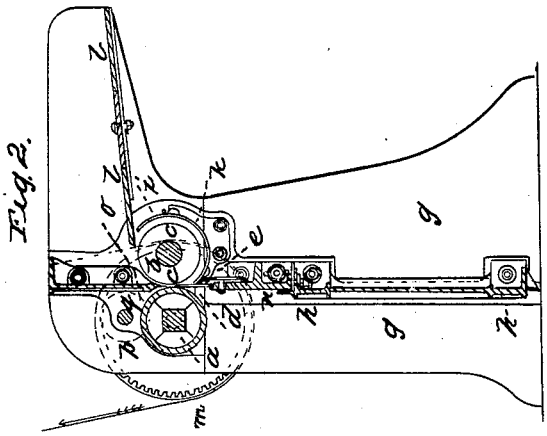


Fig. 3.

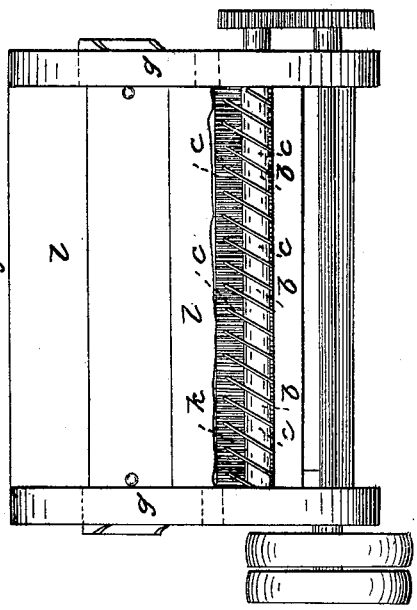
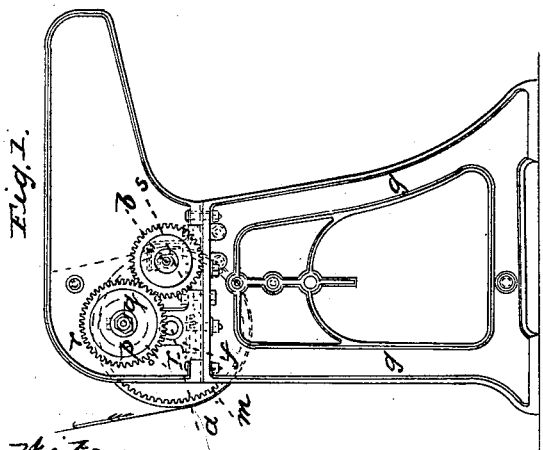


Fig. 4.



Witnesses:
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UNITED STATES PATENT OFFICE.

CHRISTOPHER BRAKELL, OF OLDHAM, ENGLAND.

IMPROVEMENT IN COTTON-GINS.

Specification forming part of Letters Patent No. **51,402**, dated December 5, 1865.

To all whom it may concern:

Be it known that I, CHRISTOPHER BRAKELL, of Oldham, in the county of Lancaster, a subject of the Queen of Great Britain, have invented or discovered new and useful Improvements in Machinery or Apparatus for Ginning or Cleaning Cotton or other Fibrous Materials; and I, the said CHRISTOPHER BRAKELL, do hereby declare the nature of the said invention and in what manner the same is to be performed to be particularly described and ascertained in and by the following statement thereof—that is to say:

Heretofore, in constructing a cotton-gin of the class known as "Macarthy's" gins, it has been usual to combine a gin-roller, acting with a doctor or knife pressed against the gin-roller, together with a vibrating knife or beater, to strip off the seeds and foreign matters. In some cases revolving rollers or axes having thereon pegs, vanes, or spiral blades have been applied to the feeding sides of such gins, in order to keep presenting the seed-cotton to the action of the gin-rollers and their doctors or pressing-knives.

Now, my invention consists in the employment of what I call a "roller-knife" in place of the ordinary reciprocating knife or beater, in combination with the gin-roller and doctor or pressing-knife of a cotton-gin. The roller-knife consists of a roller or axis having fixed thereon a series of circular plates or disks, or equivalent instruments, the edges of which come nearly in contact with the edge of the doctor or pressing-knife, and also with the surface of the gin-roller, in such manner as to cause the seeds and refuse to be beaten off, and at the same time to cause the fibers and seeds to be moved to and fro along the edge of the doctor or pressing-knife.

In the drawings, Figure 1 is an end elevation of part of one of my improved gins. Fig. 2 is a transverse section of the same, showing the doctor or pressing-knife below the ginning-roller. Fig. 3 is a plan. Fig. 4 is a transverse section of part of one of my improved gins, showing the fixed or pressing knife fixed above the ginning-roller.

In each of these figures the same letters of reference are used to indicate the same parts.

a is the gin or roller, of the ordinary construction, covered with leather, or it may be of any suitable material.

b is another roller, having a number of knives, *c*, consisting of flat circular plates or disks fixed at an angle with the axis of the roller. This roller *b*, I call the "knife-roller."

d is the ordinary stationary or fixed knife or doctor, which is caused to press against the surface of the gin-roller *a* by means of springs *e*. The doctor or knife is nearly in contact with the edges of the flat plates or disks of the knife-roller *b*.

The ends of the axes of the two rollers *a* and *b* are supported in the bearings *f* on the side frames, *g*, which are connected by cross-frames *h*.

The knife-roller is partly inclosed in a casing, *i*, part of which is formed as a grating or grid, *k*.

l is a feed-board, on which the attendant places the seed-cotton or other fibrous material to be operated upon, which is progressively pushed to the casing *i*.

The gin-roller *a* and the roller-knife *b* are geared together, as shown in the drawings. The strap or band from the driving-power is applied to the pulley *m* and the motion is communicated therefrom. The seed-cotton or other fibrous material to be cleaned is constantly fed into the casing *i*, between the spaces of the knives of the knife-roller *b*, by which knives the cotton or fiber is brought in contact with the surface of the roller *a*, and by such roller *b* the cotton is moved along the roller *a* and the pressing-knife or doctor, which stops the seeds, burrs, or other refuse, which are cleared away from the edge of the pressing-knife by the action of the knife-roller, and such seeds and refuse pass through the grid.

The cross-frame *n*, on which the pressing-knife or doctor *d* and its spring *e* are fixed, has the bolt-holes (by which the knife or doctor is fixed to the frame of the gin) slotted, so that it can be easily raised or lowered. I have found that a speed for the gin-roller of about one hundred and fifty revolutions per minute and for the knife-roller of about five hundred revolutions per minute answers very well.

The action of the knife-roller is such that it not only beats the seeds and refuse, but also moves the unginned cotton to and fro along

the surface of the ginning-roller and to and fro along the edge of the pressing-knife or doctor, and by so doing it more advantageously than heretofore loosens or separates the seed and other refuse from the cotton or other fibers.

In the drawings it will be seen that the circular plates or disks forming the knives of the knife-roller are so placed that their acting parts, at or near their peripheries, extend beyond or overlap each other to such an extent that the seed-cotton is moved by each knife along the pressing-knife or doctor to a point some distance within the range of the action of the next knife, by which the seed-cotton is moved a sufficient distance for the effectual separation of the seed from the cotton. I have found in practice that an overlap of from one-half to three-fourths of the distance between the knives answers well for long-stapled cotton, and from one-fourth to one-half of the spaces between the neighboring knives for cotton of short staple. The distance between the knives I prefer to be one and three-fourths to two inches for long staples and one and one-half to one and three-fourths inch for short staples; but this may be varied, and the depth of the knives from their circumference to the body of the roller I prefer to make about one and one-half to two inches. The advantages derived from the action of the knives in consequence of their thus overlapping each other are not only that the seed and impurities are more effectually and advantageously removed from the cotton or fibers, but the surface of the gin-roller is better preserved, as the working is more equally divided over its whole surface.

At the point marked *o* a guard is applied to the roller-knife embracing about one inch of its circumference and being nearly in contact with it. This is desirable, not only to prevent the seeds from being crushed by getting between the edges of the knives of the roller-knife and the surface of the gin-roller, but also to prevent the choking up of the gin by too much cotton passing to the roller-knife.

As the gin-roller *a* wears away and becomes of less diameter it is moved up to the doctor or pressing-knife *d* and to the roller-knife *b*. This object may be accomplished in various ways. In the drawings it is shown to be attained by forming the inner surface of the driving-pulley *m* on the shaft of the gin-roller *a* with internal teeth, which gear with a spur-pinion, *p*. This pinion is fixed on a spindle or shaft, *q*, and on the other end of this shaft is fixed a wheel, *r*, which gears with the wheel *s* on the shaft or spindle of the knife-roller *b*. By this arrangement it will be seen that the axis of the gin-roller with its pinion can be moved nearer to the roller-knife or farther from it without interfering with the proper gearing of the wheels.

Having now described the nature of my invention and the manner in which the same is performed and carried into effect, I would have it understood that what I claim is—

The arrangement of the roller-knife *b* with a gin-roller, *a*, and pressing-knife or doctor *d*, as herein described.

C. BRAKELL.

In presence of—
E. W. BARTON,
W. H. TALBOT,
Both of Manchester, clerks to Darbishire & Ashworth, Solicitors.