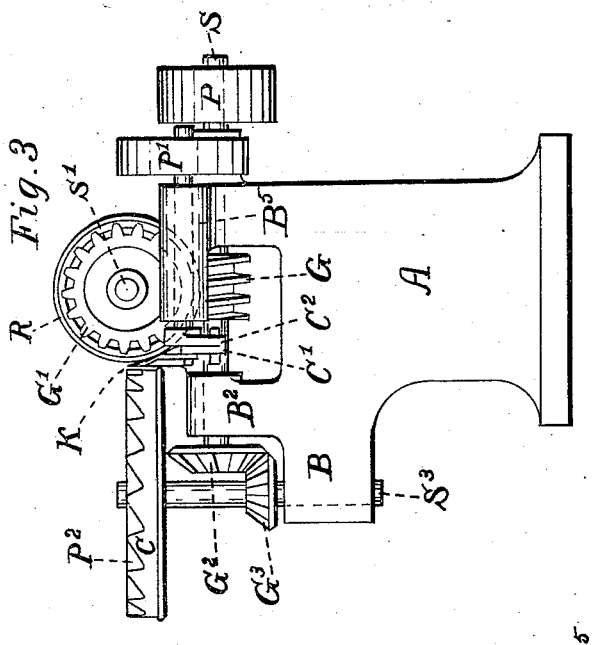
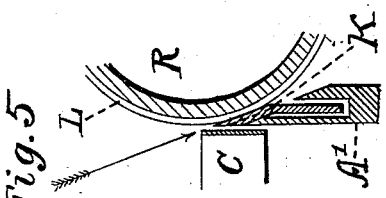
(No Model.)

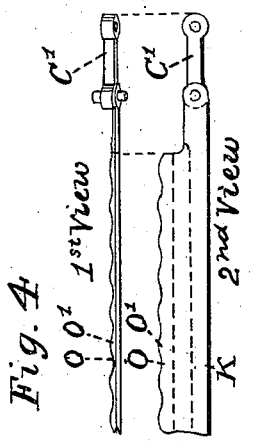
F. H. RICHARDS.

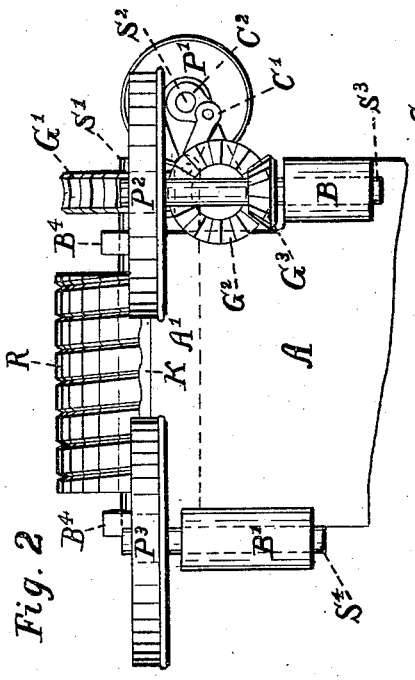
COTTON GIN.

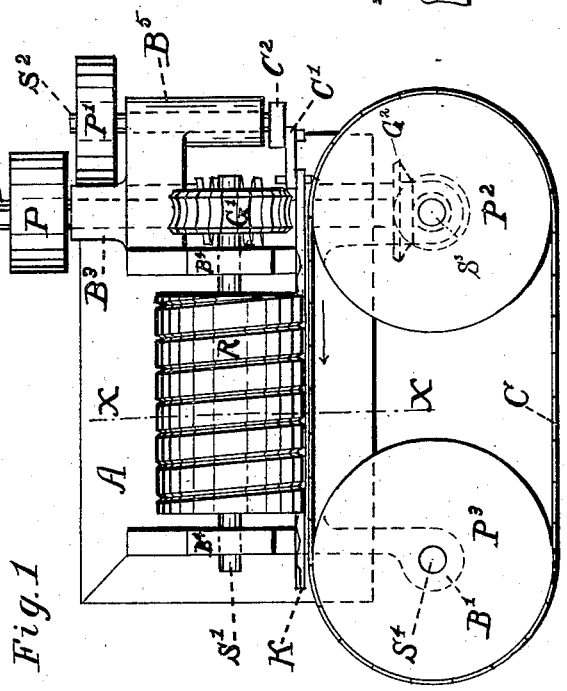
No. 306,104. Patented Oct. 7, 1884.











Witnesses;

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UNITED STATES PATENT OFFICE.

FRANCIS H. RICHARDS, OF SPRINGFIELD, MASSACHUSETTS.

COTTON-GIN.

SPECIFICATION forming part of Letters Patent No. 306,104, dated October 7, 1884.

Application filed January 14, 1884. (No model.)

To all whom it may concern:

Be it known that I, FRANCIS H. RICHARDS, a citizen of the United States, residing at Springfield, in the county of Hampden and State of Massachusetts, have invented certain new and useful Improvements in Cotton-Gins, of which the following is a specification, reference being had to the accompanying drawings, forming a part thereof.

This invention relates to that class of cotton-gins known as "roller-gins;" and it consists in certain combinations of mechanism hereinafter described and claimed.

In the drawings, Figure 1 is a plan view of a machine embodying my invention. Fig. 2 is a front elevation of the same, with the seed-clearer removed. Fig. 3 is an elevation of that end of the machine at the right hand in Figs. 1 and 2. Fig. 4 shows two views of the doctor-knife, somewhat enlarged, of which the first is taken from the direction of the arrow in Fig. 5 and the second from the front of the machine. Fig. 5 is a partial section in line *x x*, Fig. 1, as seen in the direction of the arrow, and somewhat enlarged.

Similar letters refer to similar parts throughout the several views.

The frame of the machine A may be composite or made integral, as shown in the present instance. The bearings for the several shafts may also be attached thereto or formed integral therewith. Two of these bearings, B^2 and B^3, carry the driving-shaft S, which is driven by a pulley, P, fixed thereto. This shaft carries a worm-pinion, G, for driving the worm-wheel G′, which is fixed upon the friction-roll shaft S′, and a bevel-wheel, G^2, for driving the bevel-wheel G^3, and thereby the band-wheel shaft S^3, which is supported by the bearing B. This shaft S^3 carries a driving band-wheel, P^2, and at the opposite end of the machine a similar shaft, S^4, which is supported by bearing B′, carries a driven band-wheel, P^3, which is a duplicate of the former one, P^2. The endless seed-clearer C, of the usual description, (see United States Patent No. 185,452,) is adapted to be carried upon and driven by these band-wheels. Immediately back of the rear side of the seed-clearer, parallel thereto, is a bar or a portion of the frame A′, (shown best in Fig. 5,) formed with a groove adapted to receive a doctor-knife, K, which is arranged to be reciprocated therein longitudinally. The friction-roll shaft S′ is carried in bearings B^4, which are constructed to support this roll in the usual or proper position relative to the doctor-knife. These bearings B^4 may be fixed, adjustable, or elastic, as the case may require. The friction-roll has the usual covering, L, Fig. 5, of porous leather or other suitable material.

The part of the doctor-knife near the upper edge thereof in contact with said roll is formed to have an undulating surface, as shown best in the first view of Fig. 4, wherein O is a depressed and O′ an elevated portion thereof. These undulations being continued upward to the upper edge of the doctor-knife, the upper portion of which, as seen in end view, as in Fig. 5, is of a wedge-shape form in cross-section, the resultant outline of that edge is also incidentally made undulating, as in the second view of Fig. 4. By suitably modifying the undulating surface of the doctor-knife the depth of the undulations thereon may decrease as they approach the upper edge of the said knife, leaving the said edge perfectly straight.

For producing the required longitudinal reciprocation of the doctor-knife, I have shown an ordinary crank motion consisting of a shaft, S^2, which is driven by a pulley, P′, and carried in a bearing, B^5, a crank, C^2, on said shaft, and a connecting-rod, C′, for communicating motion from the crank to the doctor-knife.

The purpose for which I make the doctor-knife with the described undulations, which need not always be in the exact form shown, however, is to increase its efficiency to roll over the seeds during the ginning operation, and thus enable the seed-clearer to beat them off with greater facility. The depth of the depressions O is intended to conform to the degree of elasticity or compressibility of the roll-cover L, so there will always be some pressure, even in the lowest parts thereof, but much less than upon the elevated portions O′. When a tuft of cotton fiber is drawn downward between the friction-roll and the doctor-knife at O until the seed rests against the edge of the latter, the horizontal motion of said knife, by sliding the surface elevation O′ upon the said tuft, tends to increase the pressure, and consequently the draft of the roll upon it, and to

roll over the tuft between the said roll and knife, and thus continually present different sides of the seed to the blows of the seed-clearer. The distance through which the doctor-knife should be reciprocated is preferably made variable by making the crank-pin adjustable in the crank C^2, or equivalent means, so that it may be readily adapted to the conditions required for working different grades of cotton.

The operation of my present machine, with the exception of the doctor-knife, the operation of which I have already hereinbefore described, is substantially the same as that of other roller-gins of the same class. A feed-board (not shown) is to be provided for convenience in handling the seed-cotton, which is fed to the friction-roll R, ginned thereby, and delivered from the machine in the usual manner.

Having thus described my invention, I claim—

1. In a cotton-gin, in combination, a suitable seed-clearer, a friction-roll, R, doctor-knife K, means for supporting said doctor-knife, and means for imparting a longitudinal motion thereto, substantially as described.

2. In a cotton-gin, in combination, a friction-roll, and a doctor-knife having an undulating surface bearing against said roll, substantially as and for the purpose described.

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Witnesses:
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