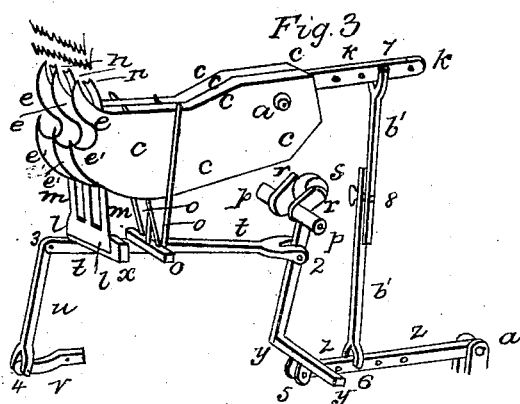
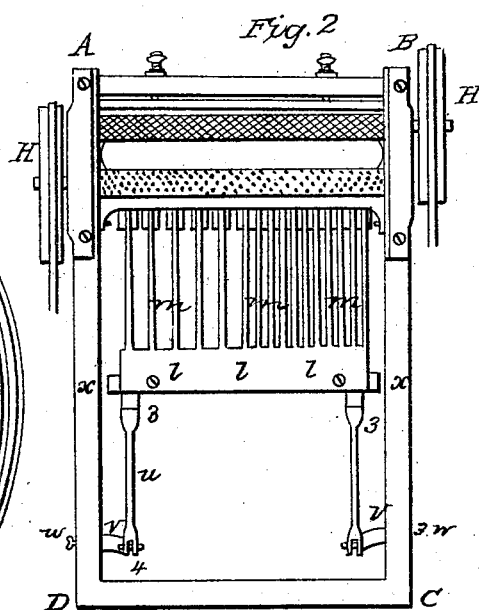
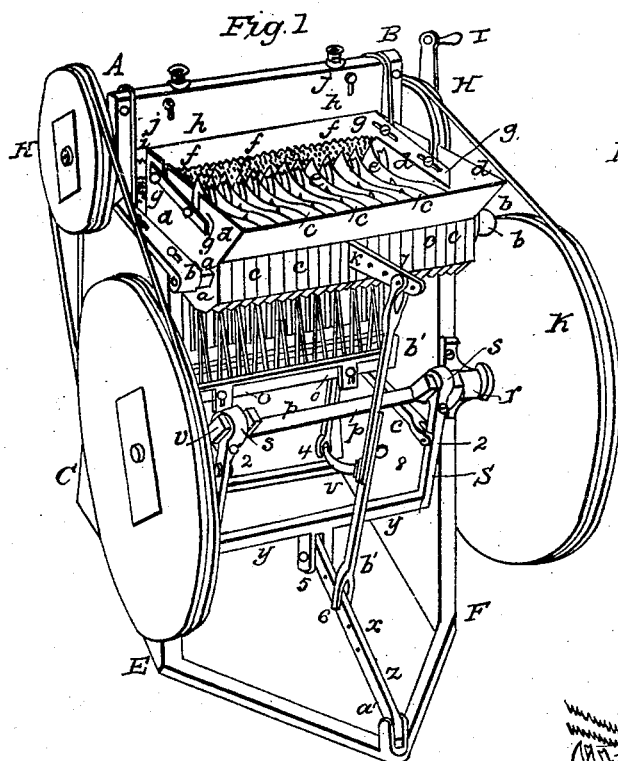


E. CARVER.
Roller Cotton Gin.

No. 2,429.

Patented Jan'y 17, 1842.



UNITED STATES PATENT OFFICE.

ELEAZER CARVER, OF BRIDGEWATER, MASSACHUSETTS.

IMPROVEMENT IN ROLLER-GINS FOR GINNING LONG-STAPLE COTTON.

Specification forming part of Letters Patent No. 2,429, dated January 17, 1842.

To all whom it may concern:

Be it known that I, ELEAZER CARVER, of Bridgewater, in the county of Plymouth and State of Massachusetts, have invented a new and useful Improvement in Roller-Gins; and I hereby declare the following to be a full and exact description of the same, reference being had to the annexed drawings, making part of this specification, and which are hereinafter described.

The roller-gin is a machine for separating the long-stapled or sea-island cotton from its seeds; and it consists of two or more parallel rollers set in any convenient frame. These rollers are usually placed one over the other, and are made to turn in together upon gudgeons at each end, which play in convenient boxes. The rollers are turned by a power applied to the outward ends of the gudgeons. The process of ginning consists in presenting the seed-cotton to that side of the rollers which turn in toward each other, when the fibers are taken in and drawn between the rollers, and the seeds are left behind. The operation of feeding or supplying the gin with cotton has heretofore been performed by hand or imperfectly by machinery. There is a great variety of modifications of this gin in use, both in the construction of the rollers and other parts, to most, if not all, of which my improvement may be applied.

My said improvement consists in a combination of machinery to be attached to the gin on that side of the rollers on which the cotton enters between them, and is designed to feed the gin regularly and with a uniform quantity of cotton, and so to cause the gin to operate more rapidly and equably, and with less expense of labor and attendance, which said improvement I describe as follows:

On a shaft parallel with, and four or five inches or at any other convenient distance from, the rollers, placed about as high as the plane which passes between the rollers, and supported at the ends by the frame of the gin, I place what I call the "carriage-grate," into which the cotton to be ginned is put. The carriage-grate consists of plates of steel or other metal extending from the shaft aforesaid toward the rollers, so as to come nearly up to them. These plates are set edgewise, and are about two inches deep in front, more or less. The upper edges may be slightly

concave, forming a kind of cradle for the seed-cotton. The plates are set so far apart as to permit a cotton-seed, when stripped of its fibers, to fall readily between them. I sometimes, instead of the thin plates, use rods or bars of metal for the same purpose, though I prefer the plates as above described. Between those ends of these plates or bars which are fastened to the shaft aforesaid, pieces of wood or metal should be inserted, so as to keep them steady; or the plates or bars may be inserted into a solid piece of wood or metal for the same purpose. Those ends of the plates or bars which approach the rollers rise to a point or tooth at the top, and below these points on each is formed one or more spur or hooked teeth, pointing upward. The upper row of teeth or pointed tops of the plates are so placed that as the machine is worked these points shall rise from about the plane or line which passes between the rollers considerably above said plane or line—say one or two inches, according to the different kinds of cotton to be ginned and the velocity of the rollers as compared with the up-and-down motion of the carriage-grate. The rows of spurs or hooked teeth which are below these points are designed and adjusted for the purpose of catching and drawing up the seeds should any fall before all the fibers are ginned off. The number of plates is such as to make the breadth of the grate nearly equal to the length of the working part of the rollers. The two outside plates are wider and rise higher than the others, thus forming the ends of the cradle for the seed-cotton. To these outside plates I attach what I call a "gage," extending across from one to the other of them at a short distance above the upper edges of the inside plates, and nearly over the points or teeth on them. This gage is a thin strip of metal placed edgewise, and I sometimes make it toothed on its lower edge. I make it movable on the outside plates by means of slits and screws or otherwise, in order in part to regulate the quantity of cotton to be conveyed to the rollers.

I sometimes use a comb for the purpose of catching and drawing out the fibers of cotton from between the gage and the points of the carriage-grate while the grate is rising up, so that they shall the more readily be drawn in by the rollers as it descends. This comb is a

thin plate of metal attached to the frame of the gin in front of the carriage-grate, and is made with short teeth upon its lower edge. It is so adjusted with respect to the points of the carriage-grate that as the carriage-grate rises the points of the grate and the gage pass considerably above the toothed edge of the comb, and so near it that the teeth of the comb shall catch into the seed-cotton which is lodged between the points of the carriage-grate and the gage, so drawing out the fibers till the grate begins to descend, thus leaving them in a proper state to be taken in readily by the rollers when the grate descends and the fingers of the feeding-hand, as hereinafter described, approach. This comb I attach to the frame by slits and screws or otherwise, so as to be adjusted in the best manner, for the purpose aforesaid. On that side of the shaft aforesaid which is opposite to the spurs or toothed ends of the carriage-grate is a horizontal arm, by which a lever motion is communicated, which is made to move the toothed ends of the carriage-grate up and down, playing on the gudgeons of said shaft.

On the end of the shaft which drives the machinery of my improvement, and which I usually place a few inches below and a little in the rear of the last-mentioned shaft, is a pulley by which this shaft (which I call the "crank-shaft" or "driving-shaft") is turned. This shaft is made with a crank near each end, but within the frame. From these cranks are suspended two hanging rods, from which two horizontal arms project forward under the carriage-grate. These arms are connected with said rods by a hinge or pivot joint at one end, and by like joints at the other ends to the top of two perpendicular bars, the lower ends of which last-mentioned bars are connected by a like joint with standards attached to the frame of the gin. These standards are made movable by slits and screws, so as to be moved up or down, forward or back, for the adjustment in part of the feeding-hand hereinafter described.

Across the two horizontal arms, near their forward ends, is placed a bar, which is adjusted thereon by slits and screws, so as to be moved forward or back. To this bar is fixed what I call the "feeding-hand," which is composed of long fingers of steel or other elastic material, rising in nearly a vertical position, and at right angles with the two arms to which the bar is attached, and passing up between the plates of the carriage-grate, so that in the operation of the machine the ends of the fingers shall move forward and upward at the same time till they pass quite through the grate and carry a small quantity of cotton up to the rollers and then move backward, at the same time inclining downward, passing under the cotton in the grate, and so on alternately. These fingers must be so long that the bar to which they are fixed shall not interfere with the plates of the carriage-grate when the feeding-hand rises. The tops of the fingers are

bent forward slightly toward the rollers, and may be either simply pointed or divided so as to form a claw, in order to catch the cotton and draw it toward the rollers. To this same bar to which the feeding-hand is attached, or to another bar similarly adjusted to the horizontal arms aforesaid, I sometimes attach another set of fingers, which extend up between the plates of the carriage-grate a short distance behind the feeding-hand, and have a like motion with said hand, for the purpose of moving the cotton along toward the fingers of the feeding-hand, that they may the more readily carry it to the rollers. The two rods that are suspended from the cranks aforesaid are connected together by a transverse bar at their lower ends. From the middle of this bar, and connected with it by a hinge or pivot joint, a horizontal arm projects back, and is fastened by another like joint to a standard on the hinder part of the frame. From this last-mentioned horizontal arm a connecting-rod passes up to the arm, which projects back from the shaft of the carriage-grate. This rod is connected at each end with said arms by movable pivot-joints, so as to be moved forward or back at either end of the rod for adjustment, and thus vary the comparative motion of the carriage-grate and feeding-hand. This rod is also in two parts, connected by a slit and screw or otherwise, for the raising or lowering the toothed end of the carriage-grate; and thus, by these several contrivances aforesaid, the machine may be accommodated to the feeding of cotton of different degrees of dryness, or to feed faster or slower, as may be desired.

In the operation of the machine the seed-cotton is placed upon the carriage-grate. By turning the crank-shaft, a vibratory motion up and down is given to the toothed ends of the carriage-grate. A compound motion, as given by the cranks and the rods moving in hinge-joints, is also communicated to the feeding-hand, and with the described adjustment of the several parts aforesaid, when the carriage-grate descends, the feeding-hand, having before been drawn backward and downward, moves forward and at the same time rises upward till its points pass up into the cotton, so as to take it along with them to the rollers, and when it has performed its office the points of the fingers simultaneously recede and sink below the cotton in the carriage-grate, and at the same time the carriage-grate rises, and with its pointed tops and the gage over them prevents too much cotton from being drawn between the rollers, while also, as the points of the carriage-grate continue to rise above the teeth of the comb, the comb catches and draws out the fibers of cotton over the points of the grate and leaves them in such a state as to be more readily caught between the rollers in the next downward motion of the carriage-grate, when the feeding-hand again appears from below, again to press the cotton against the rollers. The

elasticity of the feeding-fingers is to be such that if it happen that two or more seeds should be pressed forward they may spring back before they shall either pierce the seeds or press them too hard against the rollers.

I will now describe my improvement with reference to the drawings annexed.

Figure 1 represents a perspective view of the machine as seen from the rear, showing the several parts of my improvement. Fig. 2 is a front elevation of the machine, showing those parts not exhibited in Fig. 1. Fig. 3 exhibits a section of the operating parts of my improvement as divided vertically from front to rear, the rollers and frame being removed.

In each of the figures like parts are designated by the same letters of reference.

In Figs. 1 and 2, A B C D E F is the frame which supports the operating parts of the gin. *a* is the shaft on which the carriage-grate rests, and plays in the boxes *b b*; *c c c c*, the plates of the carriage-grate, rising into points at their forward ends, *e e e*, near the rollers. *d d d* are the spurs or lower teeth on said plates; *d d d d*, the outside plates of the carriage-grate; *f f f*, the gage attached to the outside plates by the slits and screws *g g*. *h h h* represent the comb to draw out the fibers over the points of the carriage-grate, attached to the frame of the gin by the slits and screws *j j*, the lower or toothed edge of which is seen at *i*. *k k* is the horizontal arm which communicates the motion to the carriage-grate; *l l l*, the feeding-hand, with its fingers *m m m* extending up between the plates of the carriage-grate, and attached to the bar *x x*, the points of which fingers appear at *n n n*. *o o o o* represent those fingers and their attachment which draw the cotton along to the feeding-hand; *p p*, the crank-shaft; *r r r r*, the cranks on said shaft; *s s s s*, the hanging rods suspended from the cranks; *t t*, the horizontal arms which project forward under the grate. These arms are connected with the rods *s s* by the hinge-joints 2 2, and with the two perpendicular bars *u u* by the joints 3 3. The perpendicular bars *u u* are connected with the standards *v v* by the joints 4 4, which standards are attached to the frame by slits and screws, as seen at *w w* in Fig. 2. *y y* is the transverse bar which connects the rods suspended from the cranks; *z z*, the horizontal arm extending from the hinge-joint 5 to the standard *a'*, attached to the frame of the gin. *b' b'* is the connecting-rod connecting the arm *z z* with the arm *k k*, and attached by the movable pivot-joints at each end, 6 and 7. 8 is the screw and slit which connects the two parts of this rod. K is the pulley on the crank-shaft, which in the drawing is driven by a band leading from the roller-pulley H, though in the full-sized gin it should receive its motion from the drum or wheel which drives the roller-pulleys and have a much slower motion than the roller-pulleys—say as one to four or six. I is the winch which turns the rollers in this drawing.

By turning the winch I motion is communicated to the pulley K and to the crank-shaft *p p*. The cranks by means of the hanging rods *s s* and transverse bar *y y*, cause the arm *z z* to move up and down. This up-and-down motion is communicated by the connecting-rod *b' b'* to the arm K K, which gives a motion up and down to the toothed ends of the carriage-grate. It also, by means of the hanging rods *s s* and the perpendicular bars *u u*, moving in hinge-joints, causes the horizontal arms *t t* and the feeding-hand *l l* and the bar and fingers *o o o* to move simultaneously upward and forward, and then downward and backward, the whole being so adjusted that as the carriage-grate descends the feeding-hand rises and advances its fingers *m m m* upward between the plates of the carriage-grate about as high as the line of contact between the rollers, and takes the cotton up to the rollers; and when the carriage-grate begins to rise the feeding-hand begins to descend below the surface of the grate and recede beneath the cotton; and as the carriage-grate continues to rise above the lower or toothed edge of the comb *h h h* the teeth of said comb catch and draw out the fibers of cotton held between the points of the carriage-grate and the gage, in which state they are presented to the rollers when the carriage-grate descends and the fingers of the feeding-hand again appear from below, and so on while the machine continues to operate.

Though I have described above what I deem to be the best combined motion of the feeding-hand and carriage-grate, a very good result may be obtained by a slight variation of the motion of the feeding-hand without changing the principle of my invention, and which I here describe as a modification thereof, embraced and referred to in the claim hereinafter made. Instead of the up-and-down or somewhat elliptical motion given to the feeding-hand, as hereinafter before described, I sometimes give said hand only the forward-and-backward motion in a right line. In this case, as the feeding-hand advances, the carriage-grate descends till the cotton is brought in contact with the points of the fingers of the feeding-hand, and they, moving forward, take it to the rollers, when the grate again ascends and raises the cotton above the points of the fingers, and they then move backward in the same plane in which they advanced. In this case the horizontal arms *t t*, Fig. 3, to which the feeding-hand is attached, instead of moving on the hinge-joints 2 and 3, in the manner there shown, may be made to slide in a groove or on ways on the frame of the gin, and the forward and back motion communicated to them by cams on the crank-shaft *p p*, (or other devices familiar to machinists,) so adjusted as to throw the feeding-hand forward as the grate descends and backward after the grate has begun to rise and ascended so far as to allow the fingers to pass under the cotton in the grate.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The manner in which I have arranged and combined the feeding-hand, having a forward and back motion, (whether the points of its fingers during said motion describe a right line or a figure somewhat elliptical,) with the carriage-grate, having an up-and-down motion, so to co-operate with each other in feeding the cotton to the rollers of the roller-gin, in the manner herein set forth, whether they be used with the gage and comb, as hereinbefore described, or with either or neither of them; and although in describing the foregoing machine I have shown what I deem to be the best manner of communicating the required motion to the feeding-hand and carriage-grate, having found the same to answer well in practice, I do not intend to limit myself to the particular arrangements of the crank-shaft, levers, bars, or connecting-rod, as herein set forth, as the feeding-hand and carriage-grate may be made to operate in a similar way by means of cams or other devices

well-known to machinists, and I intend, therefore, to vary the arrangement of these parts in any manner which I may deem proper, while the combination and operation of the feeding-hand and carriage-grate for governing and regulating the feeding the cotton to the rollers remain substantially the same with that herein fully made known.

2. I also claim as my invention, and desire to secure, as aforesaid, the feeding-hand, as herein substantially described, with respect to the rollers, claiming the same whether it be used with the grate for holding the seed-cotton, as herein described, or with any other grate or apparatus for holding said cotton, either moving or stationary, which is so constructed as to allow the said motion of the fingers of the feeding-hand to take the seed-cotton to the rollers.

ELEAZER CARVER.

Witnesses:

ARTEMAS HALE,
CALEB S. HUNT.