Sheet 1. 2 Sheets.

C. Wellman.

Carding Engine.

No. 14,481. Patented Mar. 18, 1856.

Fig. 3.

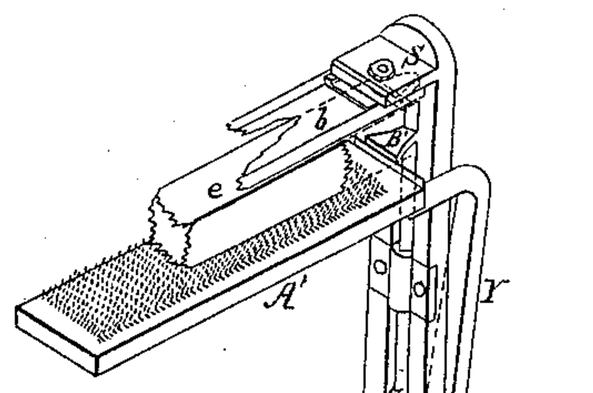


Fig. 5.

Fig. 1.

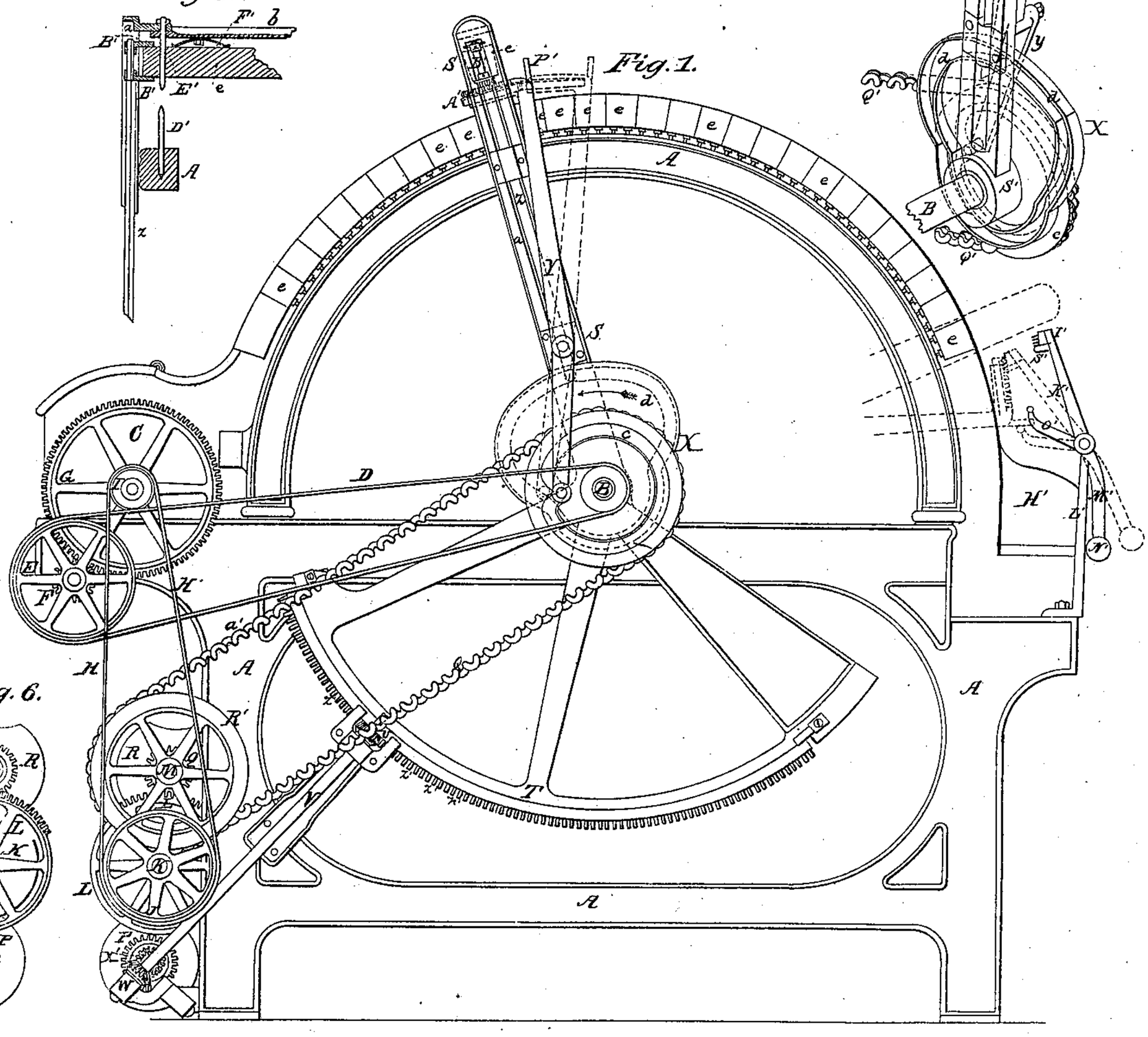
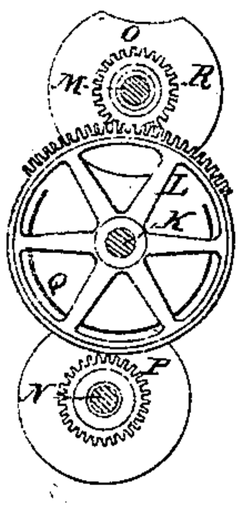


Fig. 6.



Sheet 2. 2 Sheets.

C. Wellman.

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Fig. 9.

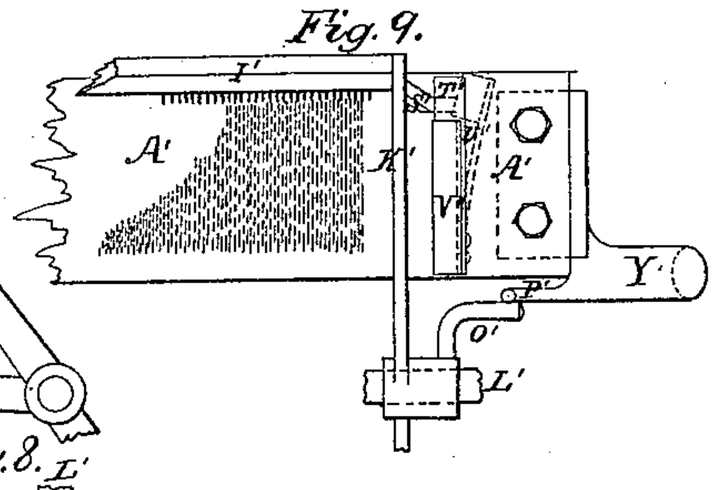


Fig. 7.

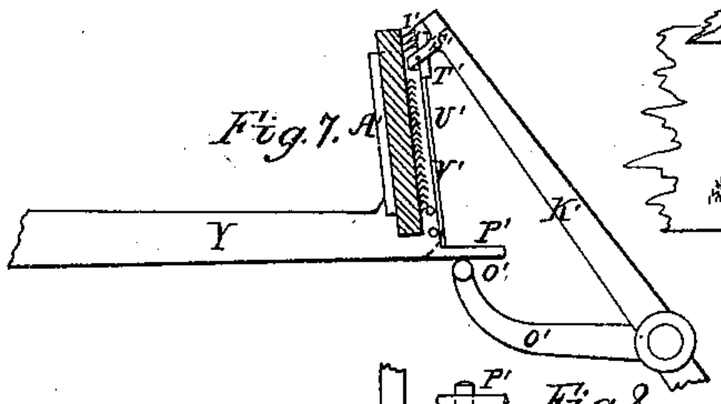


Fig. 8.

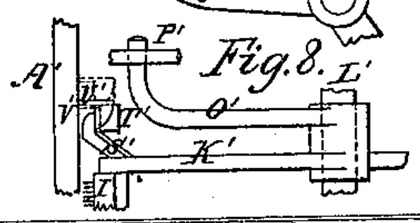
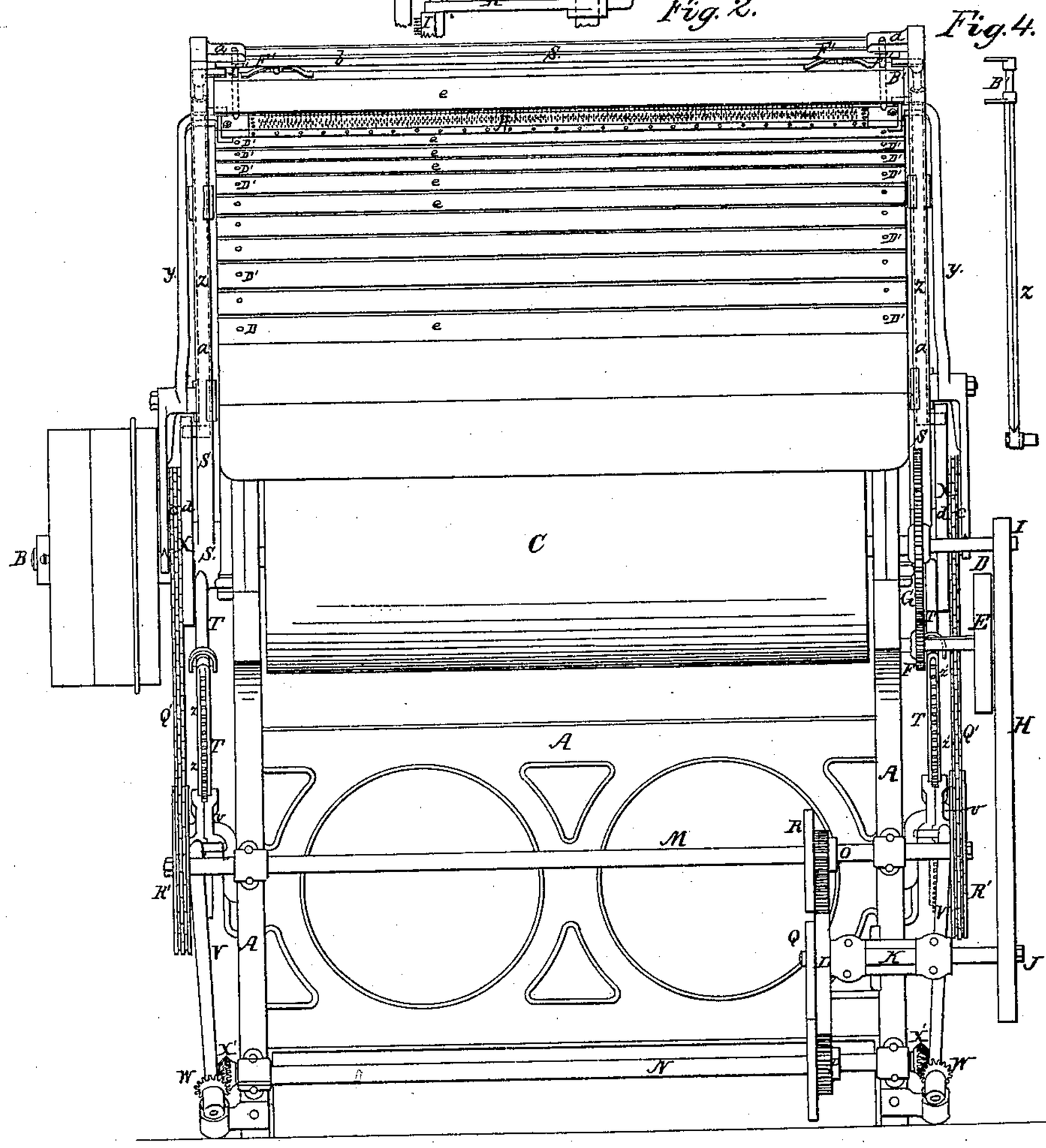


Fig. 2.

Fig. 4.



UNITED STATES PATENT OFFICE.

GEORGE WELLMAN, OF LOWELL, MASSACHUSETTS.

IMPROVEMENT IN STRIPPING TOP-FLATS OF CARDING-MACHINES.

Specification forming part of Letters Patent No. **14,481**, dated March 18, 1856.

To all whom it may concern:

Be it known that I, GEORGE WELLMAN, of Lowell, in the county of Middlesex and Commonwealth of Massachusetts, have invented certain new and useful Improvements in the Machinery Used on the Self-Top-Stripping Carding-Engine described in the specification of my former patent; and I do hereby declare that the same is fully described and represented in the following specification and accompanying drawings, letters, figures, and reference thereof.

Of the said drawings, Figure 1 represents an end elevation of the frame and a few of the working parts to a carding-engine, and having my improved stripping apparatus attached. Fig. 2 is a side elevation of the same. Fig. 3 is a perspective view, from the inside of the machine, of a part of one top card elevated in the jaws of one of the lifting-rods, a part of the stripper-card in the act of cleansing said top card, also showing the chain belt around the gear that is formed in the circumference of the smaller of the two grooved cams, also showing the manner in which the two cams, or rather the double cam, acts first to operate the lifting-rod and then the stripper-lever. Fig. 4 is a view of the lifting-rod and jaw detached. Other figures will be referred to hereinafter.

The same letters when used in different figures indicate the same parts.

I will, in the first place, before giving the detailed description of my improvements, make a few statements, which shall give a general idea of their object and nature.

First. I have so modified and arranged the different parts of my former machine as to render the whole apparatus—namely, both that for raising, stripping, and depressing the top cards and that for moving the frame which carries the same from top to top—dependent upon for its motion one single pulley or gear fixed upon the doffer-shaft, and in altering the size of this pulley or gear I regulate at pleasure the number of tops to be stripped per minute.

Second. Another improvement has been the combination of the short shaft K, Figs. 1, 2, and 6, and its segmental gear and rim with the two shafts M and N in such a manner as that the short shaft K, being in motion all the time, shall, by means of its segmental gear and rim, give motion first to the shaft M and then to the shaft N, or vice versa, and not only so, but the shaft M shall remain at rest and be immovable while the shaft N is in motion, and, vice versa, the shaft N shall remain at rest and be immovable while the shaft M is in motion.

Third. The third improvement is in the application of the segmental pin or mangle-wheels T T to the upright bars *a a* of the traversing frame S, so that motion shall be communicated to them direct from the shaft N through the inclined bevel-shafts V V.

Fourth is the arrangement of the levers Y Y, carrying the stripper-card, having bearings on studs in the arms *a a* near the center of the machine, and so combining them with the cams X X and their circumscribing gears as that motion is communicated to them direct from the shaft M by means of the chain belts Q′ Q′.

Fifth is the manner of securiug the top card in its elevated position by means of the rods or pins E′ E′, Figs. 2 and 5, and the springs F′ F′, attached to the traversing frame S, the pin being used to prevent lateral motion of the top card while it is being operated upon by the stripper-card, and the springs holding it to its seat upon the lifting-jaws.

Sixth is the arrangement of the lifting-jaws, so combining them with the cams X X and their gears as that motion is communicated to them direct from the shaft M by means of the chain belts Q′ and the rods *z*.

Seventh. My seventh improvement is in the machinery used for cleansing the stripper-card and in disposing of the strippings from the top cards, which I shall describe particularly in the following specification.

A is the main supporting-frame of a carding-engine.

B is the shaft of the main carding-cylinder.

C is the doffer-cylinder, driven from the shaft B by the band D, passing round the pulley E, which is on the same stud with a pinion F, and turning it, which turns the gear G, fixed on the shaft of the doffer-cylinder C. From the shaft of the cylinder C all the motion is derived to operate the whole stripping apparatus, and first the band H passes from the pulley I on the shaft of the cylinder C to

a pulley J, fixed upon the end of a short shaft K near the bottom of the frame. This shaft K has fixed to its other end a gear L, which has about two-thirds of its teeth cut away, and which I call the "segmental gear" L.

Situated above the shaft K is a shaft M, having two chain pulleys or gears R′ R′, fastened one to each end of it, and which, by means of the chain belts Q′ Q′, passing around them, give motion to the cams X X, which are for raising, stripping, and replacing the top card; and situated below said shaft K is another shaft N, which gives motion to the frame S, that carries the raising and stripping apparatus from one top card to another.

On the shaft M is a pinion O, one-third as large as the segmental gear L, from which it derives motion.

P is a pinion fixed upon the shaft N, of the same size as the pinion O and driven by the same gear L.

When a poor or dirty staple of cotton is being carded by the machine, it will fill up the teeth of the top cards much sooner than when good and clean cotton is used; consequently the top cards will need stripping oftener. Now, as the shaft K has a constant motion and imparts movement to all the rest of the stripping apparatus, it is evident that if the speed of this shaft is increased the top cards will be stripped the oftener. This may be done by increasing the size of the pulley I, which drives the shaft K. Every revolution of the segmental gear L will first cause one revolution of the pinion O and shaft M, and then cause one revolution of the pinion P and shaft N, the shaft M completing its revolution before the shaft N begins its, and so on.

Q, Figs. 2 and 6, is a rim projecting from the side of the segmental gear L, and which occupies such part of the circumference of the gear as is not occupied by the teeth, or about two-thirds. This rim is intended to act upon a notched plate-wheel R (fixed upon the side of the pinion O) in the following manner, viz: While the pinion O is just completing its revolution the end of the rim Q is just entering the notched portion of the circumference of the plate-wheel R, and when the last tooth of the segmental gear L has left the pinion O the rim Q will be fully entered upon the notch in the wheel R, and as the concavity of the notch exactly fits the convexity of the rim, the plate-wheel, and consequently the pinion O and shaft M, will be prevented from turning, while the segmental gear L will continue its revolution in order to set in motion and then hold stationary in a similar manner the pinion P and its shaft N.

S S is a frame hung upon and movable about the ends of the boxes of the main cylinder-shaft B. It consists of the two upright bars *a a*, one on each end of the engine, having their upper ends connected together by the horizontal connecting-bar *b*. Connected to and extending downward from the lower ends of these two bars *a a* are the two segmental pin-wheels or mangle-arcs T T. These are moved back and forth by the revolutions of the pinions U U, fixed upon the ends of the inclined shafts V V, upon the other ends of which shafts are the bevel pinions W W, which are driven by the bevels X′ X′ on the ends of the shaft N. The inclined shafts V V are supported in such a manner as to allow of a short vibration in their upper ends, enough so that when the pinions U U have moved the segmental-pin-wheels T T so far in one direction as to bring the last pin in each of the series of the mangle-pins Z′ Z′, &c., opposite to them, they can make a half-revolution about said pins and move to the opposite sides of the two series, and then produce a motion of the frame S S in an opposite direction.

The peculiarities of the movement of the frame S S are more fully described in my former patent, and do not constitute a part of my present improvements.

X X are double-faced grooved cams movable about the ends of the boxes of the main shaft. The outer faces *c c* of these cams are intended to operate the two stripper-levers Y Y, and the inner faces *d d* to operate the lifting-rods Z Z. The levers Y Y are hung on and are movable about stud-pins which are fastened one to each of the arms *a a* of the frame S. Upon the lower ends of the levers are fixed short pins with a friction-roll about them, and which are intended to play in the grooves of the outer faces *c c* of the cams X X. The other ends of the two levers Y Y extend above the upper surface of the series of top cards, and are connected together by the stripper-card A′, which is firmly secured to them. Now at every revolution of the cams X X the levers Y Y are made to operate forth and back once; consequently the stripper-card moves forward beneath the the top card, which has been previously elevated, brushes against the teeth of said top card, and in coming back removes from the teeth all the dirt and strippings that may be there. The lifting-rods Z Z slide up and down in bearings in the arms *a a*, and fastened to their upper ends are the lifting-jaws B′ B′. (Seen more clearly in Figs. 3, 4, and 5.) A pin in the lower ends of the lifting-rods carries a friction-roll that is intended to play in the grooves of the inner faces *d d* of the cams X X, and thus when the cams revolve the lifting-rods Z Z and the jaws B′ B′ are elevated, and as the two jaws inclose each an end of one of the top cards *e e e*, &c., said top card will be elevated from its bed also.

The manner of securing the top card when raised may be seen better at Fig. 5, which is a longitudinal section of a portion of the bar *a* and connecting-bar *b*, also of the lifting-jaws, and a portion of the top card in its elevated position, &c. A is a section of the frame or bed, and upon which the top card

rests. D′ is a pin fastened to the frame A and projecting above it, for the purpose of entering a hole made in the top card. Now when the top card is being elevated it is guided by this pin D′ until it is raised sufficiently to be guided by the pin or dagger E′, which hangs directly over D′. It then moves up the pin E′ until its upper surface comes in contact with the springs F′ F′. The top card, now being raised to its full height, is kept in that position until the stripper-card moves beneath it. Then the stripper-card rests an instant while the top-card is depressed a very little, settling the teeth of the stripper-card into those of the top card. This is accomplished by having a little fall or offset in the grooves of the inner faces *d d* of the cams X X, which will force the lifting-jaws down accordingly, and the springs F′ F′ will force the top card down upon the stripper-card, as aforesaid. Then the stripper-card moves back again to its place, and the top card is depressed by the action of the lifting-jaws and rod and cam back again to its bed or seat, and so each top throughout the series is treated in its turn in like manner.

The next point to be considered is the manner of disposing of the strippings or waste that is collected by the stripper-card A′ from the several top cards. This may be done by providing a receptacle H′, which shall be fastened to the engine near the feed-rolls, as represented in Fig. 1, and directly over this receptacle is hung a narrow strip of wood having upon its lower surface a comb or card-clothing or other suitable material that shall rake or comb from the stripper-card, when it comes in contact with it, all the strippings that shall have been collected upon it in going from the first top card to the last and back again to the first. I′, Fig. 1, is the card-comb fastened to the end of the lever K′, there being another similar lever on the opposite side of the frame to support the opposite end of the comb I′. This lever is hung on the post L′ and has an arm M′, extending downward, with a weight N′ upon the end of it, which is for the purpose of keeping the comb I′ suspended in its position over H′. It also has a fork or branch O′, which, when the projection P′ on the lever Y approaches it, is struck by it and causes the comb I′ to be borne down, so that the teeth of it (I′) engage in the teeth of the stripper-card containing the strippings. (This position is shown by the red lines in Fig. 1. It is also shown more clearly in Figs. 7, 8, and 9, being different views of the position drawn on an enlarged scale.) This it does while the frame S is being moved over that top card nearest to the receptacle H′. Now, after this top card is raised to position, the stripper-card moves forward to clean it, and in moving forward the comb I′ combs off all the strippings that have been collected upon the stripper-card, drops them into the receptacle H′, and then the weight N′ on the opposite end of the lever K′ causes that end to fall and brings the comb I′ up into its former position. It is necessary to have some contrivance to keep the comb I′ in contact with the teeth of the stripper-card A′ while it (A′) is being cleaned by it, and such contrivance is shown in Figs. 7, 8, and 9, being three different views of it. When the comb I′ strikes upon the stripper-card, a projection S′ on the end of the arm K′ strikes a wedge-shaped block T′, which is fastened to the end of a spring U′, and causes the block to recede, as shown by the red lines, Figs. 8 and 9, until the end of the projection is forced below the block T′, which then, by the action of the spring U′, is made to close over the end of the projection S′, and thus holds it upon the surface of the stripper-card. This block T′ forms the mouth-piece to a groove or channel V′ on the stripper-card A′, and the projection S′, being entered in this groove, will hold the comb I′ upon the surface of the stripper-card A′ while it (A′) is moving forward to clean the top card, and will escape from the groove at the opposite end from which it entered, the groove being long enough to hold the projection until the comb I′ has passed in contact with the whole surface of the stripper-card.

Having thus fully described my improvements, what I claim as new, and desire to secure by Letters Patent, is—

1. The combination of the segmental gear L, with its projecting rim Q, and the pinions O and P, with their attached notched plate-wheels, all as applied to the shafts K, M, and N, for the purpose of giving the alternate intermittent movements to the shafts M and N, as specified.

2. The arrangement of the mangle-pins Z′ Z′, &c., in the arc of a circle, upon the center of which the frame carrying the stripping apparatus vibrates, for the purpose of avoiding intermediate gearing and consequent backlash, as described.

3. The combination of the cams X X with the chain-belt Q′, the chain-pulleys R′, and shaft M, arranged and made to operate together, as described.

4. The combination of the cams X X with the levers Y Y, carrying and operating the stripper-card, in the manner specified.

5. The combination of the cams X X with the lifting-rods Z Z, and the levers Y Y, arranged and made to operate in connection, as described.

6. The combination of the springs F′ F′ and the pins E′ E′ and their application to the frame S, for the purpose specified.

7. A mechanism for cleaning the stripper-card, arranged and applied substantially as described.

8. The segmental gear L and its rim Q, as

applied and operated for the purpose of giving motion both to the mechanism for raising, stripping, and depressing the top card and to the mechanism for moving the raising and stripping mechanism from one top card to another, not moving both at the same time, but alternately, first one and then the other.

In testimony whereof I have hereto set my signature this 7th day of October, A. D. 1854.

GEORGE WELLMAN.

Witnesses:
NATHANIEL WRIGHT,
O. E. CUSHING.