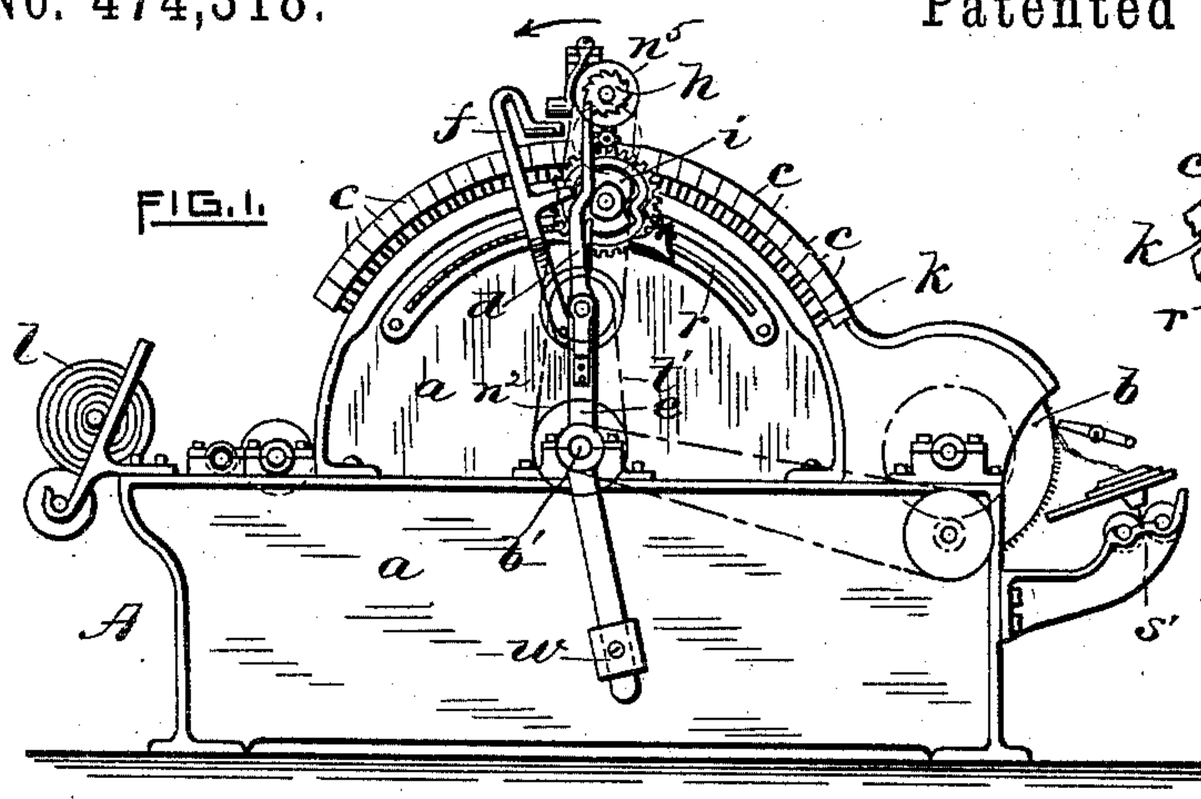
(No Model.) 2 Sheets—Sheet 1.

E. GIBSON.

CARD STRIPPING APPARATUS.

No. 474,318. Patented May 3, 1892.

FIG. 1.



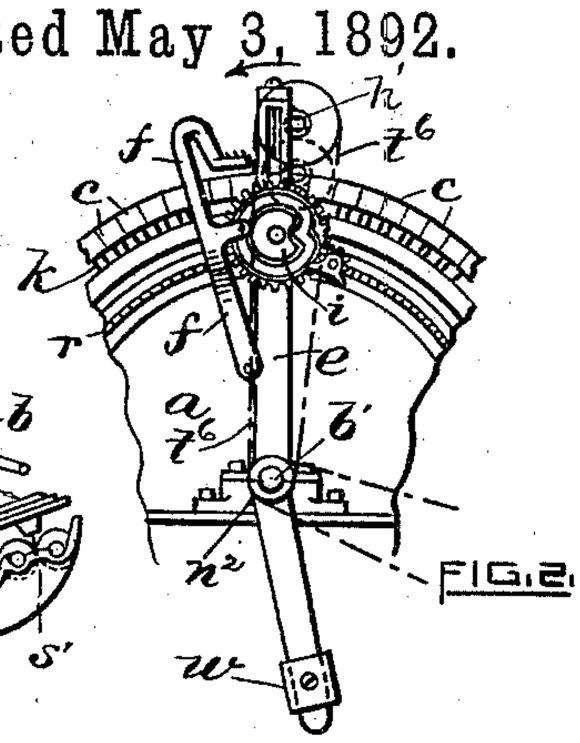


FIG. 2.

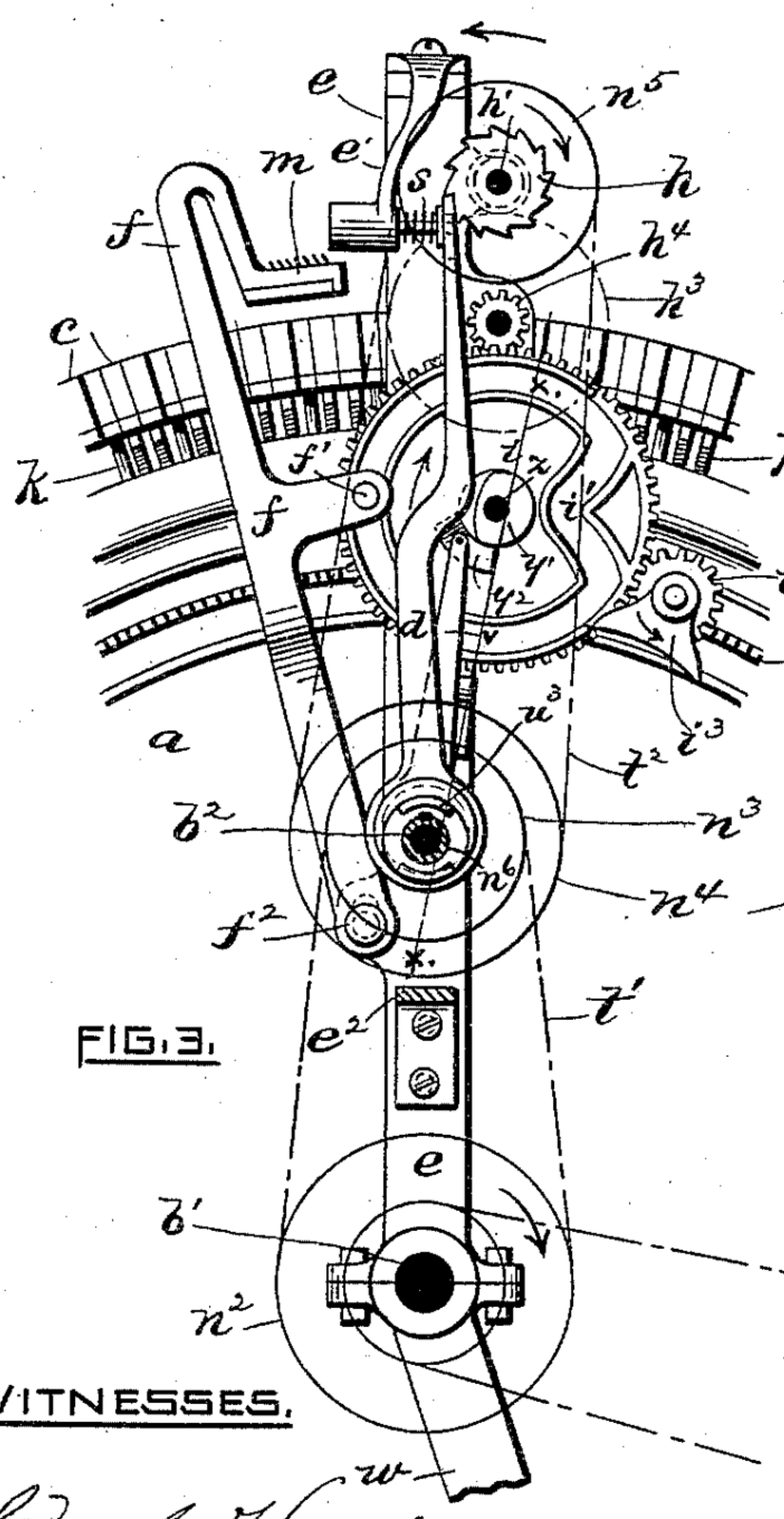


FIG. 3.

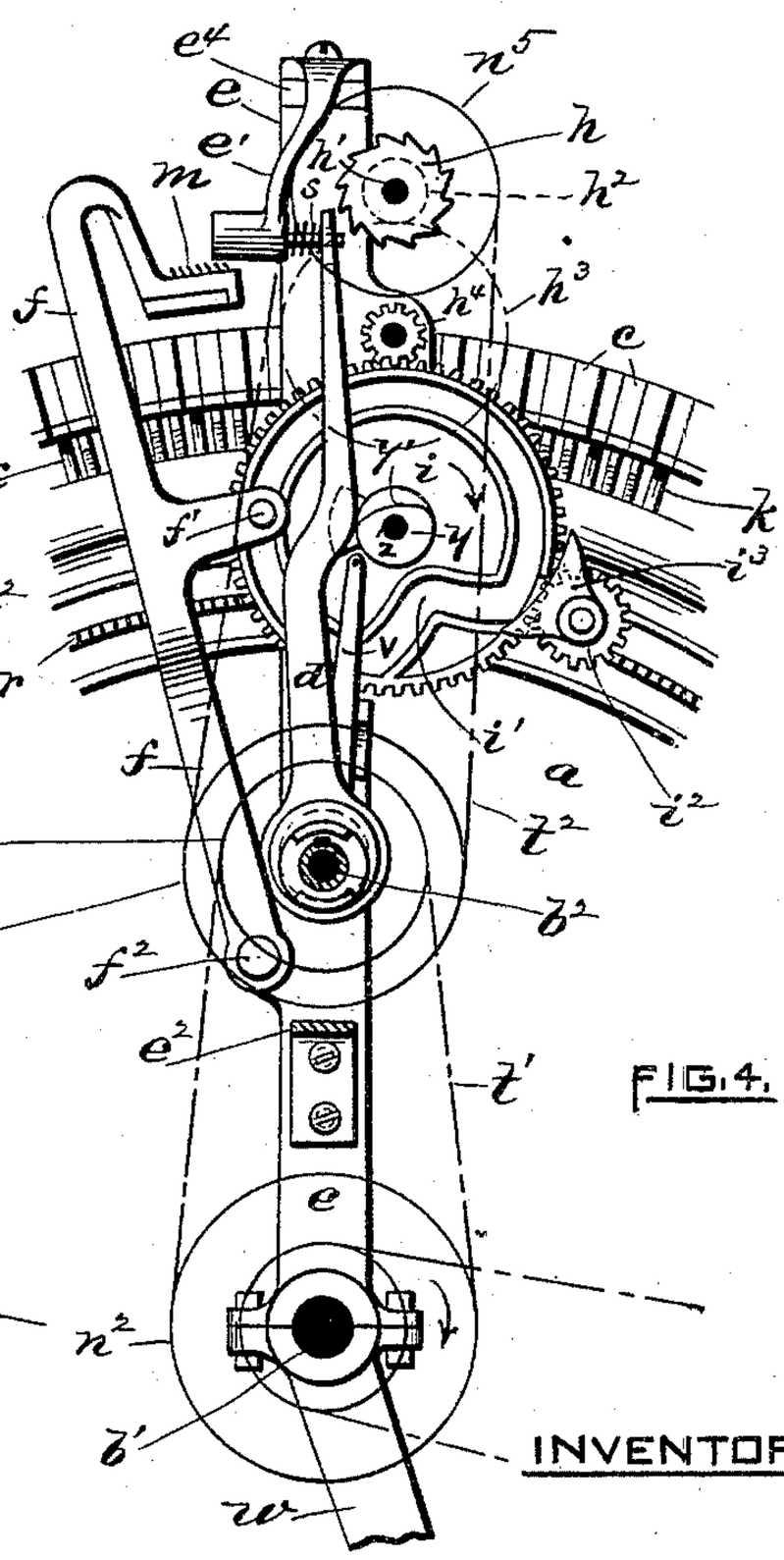


FIG. 4.

WITNESSES.

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(No Model.) 2 Sheets—Sheet 2.

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CARD STRIPPING APPARATUS.

No. 474,318. Patented May 3, 1892.

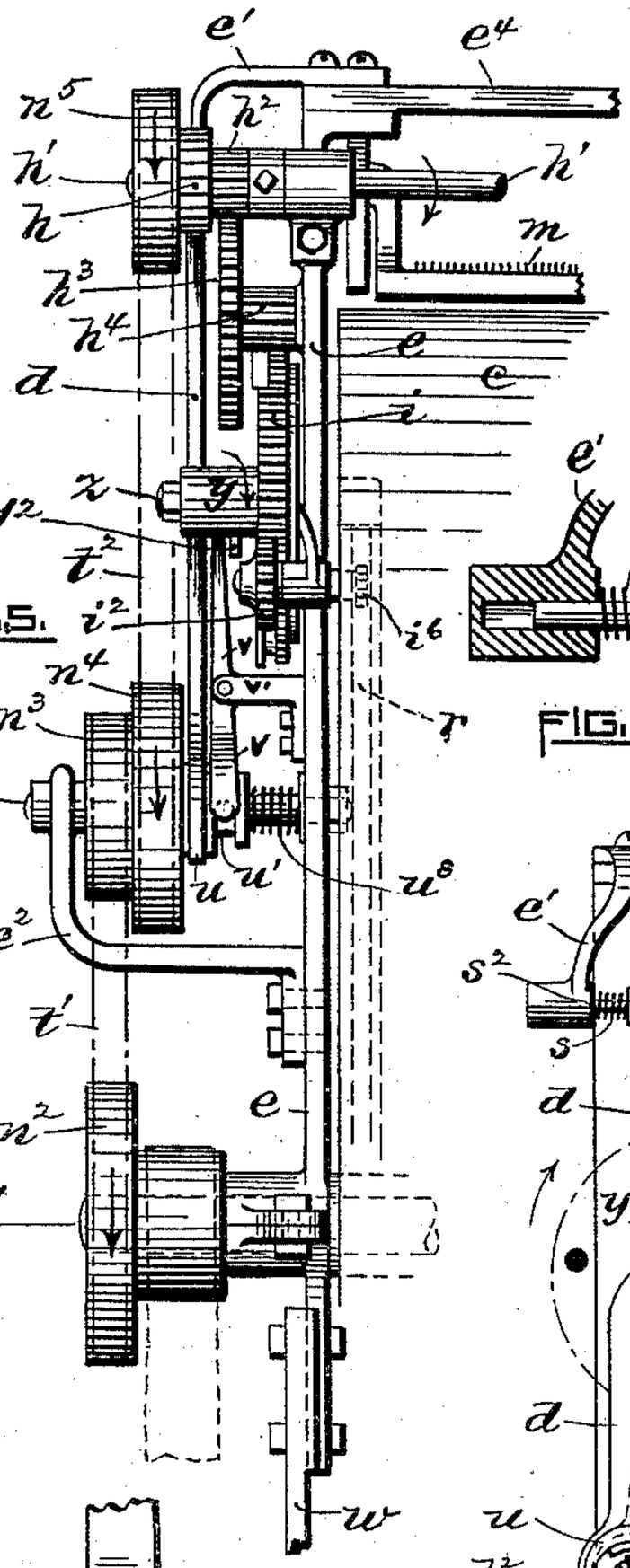

FIG. 5.

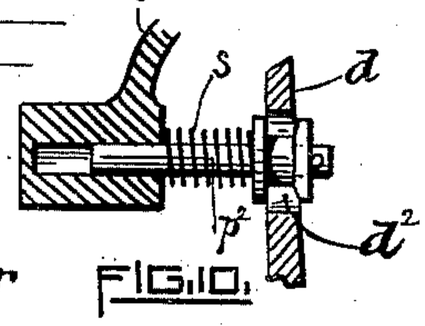

FIG. 10.

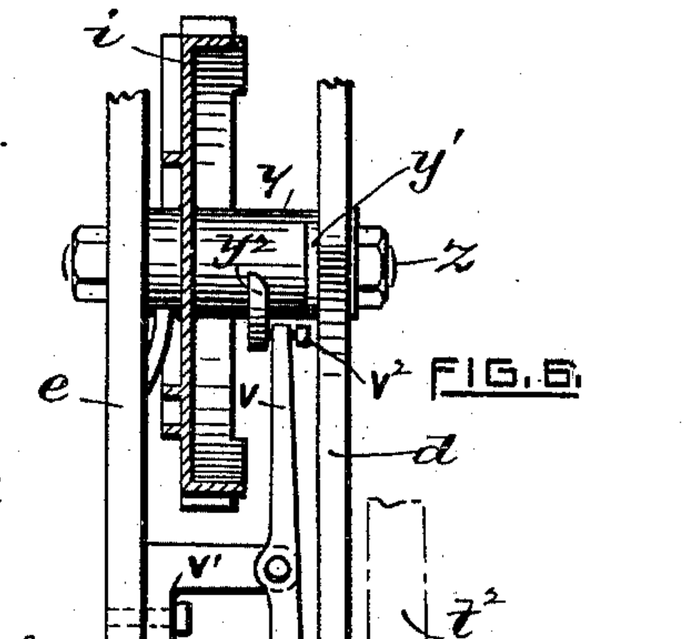

FIG. 6.

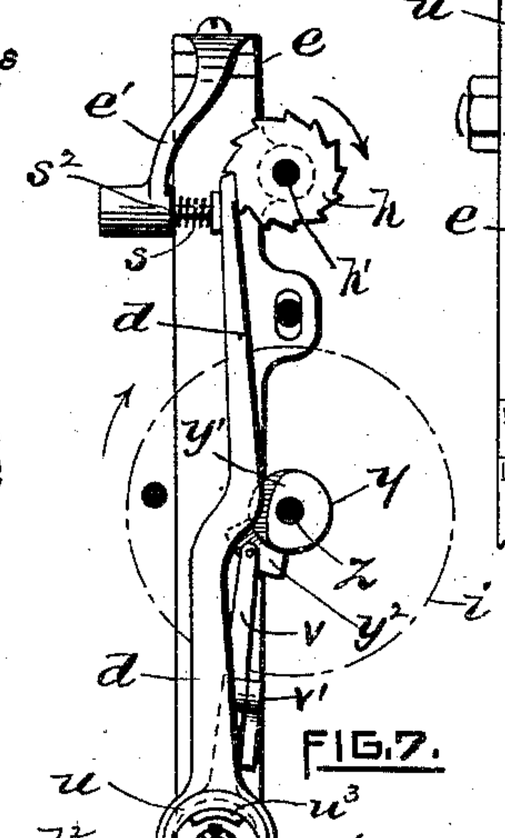

FIG. 7.

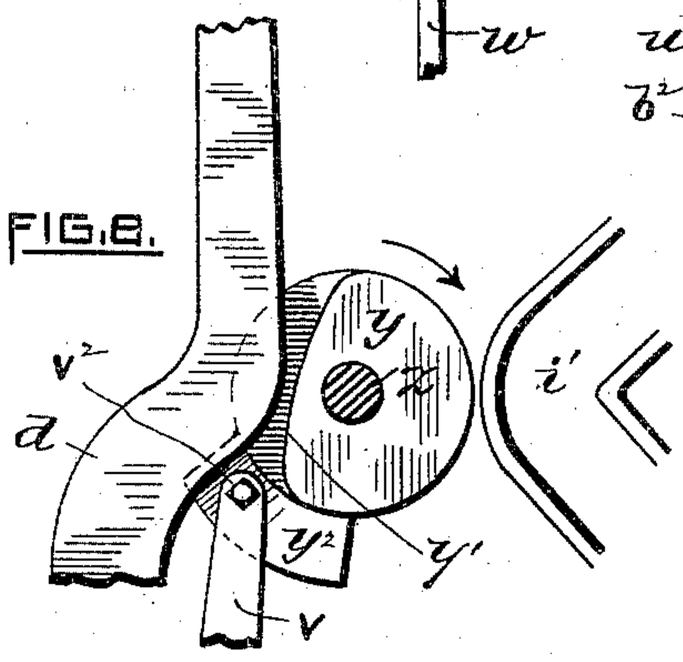

FIG. 8.

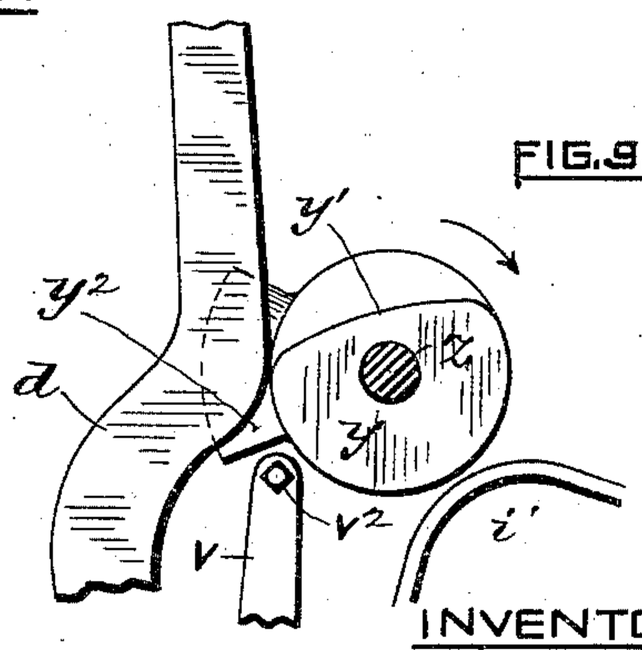

FIG. 9.

WITNESSES.

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UNITED STATES PATENT OFFICE.

EVERETT GIBSON, OF PROVIDENCE, RHODE ISLAND, ASSIGNOR OF ONE-HALF TO EDGAR G. DURFEE, OF SAME PLACE.

CARD-STRIPPING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 474,318, dated May 3, 1892.

Application filed January 23, 1892. Serial No. 419,017. (No model.)

To all whom it may concern:

Be it known that I, EVERETT GIBSON, a citizen of the United States, residing at Providence, in the county of Providence and State of Rhode Island, have invented certain new and useful Improvements in Card-Stripping Apparatus; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters of reference marked thereon, which form a part of this specification.

My invention relates to cotton-carding machines, but more especially to the mechanism or attachment usually present on such cards for automatically stripping or cleaning dirt, short cotton, &c., from the top flats or slats.

A device in general use for stripping top-flats is that known as the "Wellman Self-Stripper," introduced by Wellman & Woodman in 1856. In the device last referred to, as well as in some other forms of card-stripping apparatus, the operation of cleaning or stripping the lint, &c., from the under side of the top-flats by the cleaner-comb has been performed in a uniform time or regular rate of speed—that is, assuming that the time required to clean all the flats be, say, thirty minutes, the device will then make one double stroke or reciprocation around that portion of the card occupied by the top-flats during the time named, it being understood that the device picks up each alternate top-flat, thereby cleaning all the flats during one double stroke; but it is found that the time taken to clean each individual flat leaves the card-cylinder exposed too long, thereby producing thin places or streaks in the sliver, such defect being more especially apparent when short-staple cotton is being carded. It is to be further understood that the total time thus consumed during the operation of once stripping or cleaning all the flats is first determined by the quality and kind of staple passing through the card.

The object I have in view is to provide card-stripping devices of the class before referred to with an improved mechanism or attachment whereby the rate of movement is made variable.

In order to accomplish this result, my invention consists, essentially, of a card-stripping attachment provided with a continuously-revolving master or mangle wheel for controlling the several movements or operations of the stripper, in combination with mechanism arranged to revolve said wheel at varying rates of speed during each revolution, all as will be more fully hereinafter set forth and claimed.

I do not wish it to be understood that my present invention is the only device having for its object the automatic operation of the stripper at varying rates of speed, as mechanisms have previously been applied to carding-machines to automatically drive the stripper during the work of raising and stripping the flats at a different and greater rate of speed than it is driven while traveling from one flat to another.

In the accompanying two sheets of drawings, Figure 1, Sheet 1, is an end elevation showing the major portion of a cotton-carding machine provided with a well-known form of card-stripping mechanism combined with my improvement. Fig. 2 is a similar view, but showing less of the card, my device being omitted. Fig. 3 is an enlarged elevation of said card-stripping mechanism provided with my improvement, the relation of the parts substantially corresponding to the instant the slow-moving propelling mechanism commences to act immediately succeeding the replacing of the last-cleaned flat. Fig. 4 is a similar view showing the slow-feeding mechanism just after being automatically disconnected and immediately preceding the action of the now quick-moving cam as it revolves to operate the cleaning flat. Fig. 5, Sheet 2, is a side elevation of said card-stripping mechanism, viewed from the right of Fig. 3. Fig. 6 is an enlarged transverse sectional view taken substantially on line *x x* of Fig. 3, as viewed from the left. Fig. 7 is a front elevation introduced to more clearly indicate some of the parts forming my invention. Fig. 8 is a front view, still more enlarged, showing the relation of the center portion of the cams, &c.,

corresponding to the position indicated in Fig. 3. Fig. 9 is a similar view of the parts corresponding with Fig. 4, and Fig. 10 is an enlarged sectional view showing the upper portion of the feeding-pawl.

The following is a detailed description of my invention and the manner of its operation. I will, however, first briefly describe a well-known card-stripping attachment. The frame *a* of the carding-machine is adapted to receive a lap *l*, and is further provided with the usual mechanisms for converting the lap into a sliver *s'* after the carded stock is combed from the doffer *b*. The usual form of card-stripping attachment minus my present improvement is indicated in Fig. 2, wherein the counterweighted stripper-frame *e* is propelled back and forth on its axis *b'* through the medium of a train of gearing driven by the primary belt t^6, and a compound cam and mangle wheel *i*, intergearing with said train, operating at intervals to lift a flat *c*, followed by cleaning and replacing it, after which the apparatus is propelled ahead to the next alternate flat by a pinion working into the semicircular mangle-rack *r*, where it stops and the flat-cleaning operation is repeated. The said driving-belt t^6 is continuously running at a regular speed, while the card itself is in operation. Therefore the relative movements of the mechanism in lifting, cleaning, and replacing the flats are wholly dependent upon and governed by the speed of the belt. I would state that the opposite end of the card is provided with similar mechanism, (the driving-pulleys and belt being omitted,) the same being driven from the front end by power transmitted through the continuously-revolving shaft *h'*, extending across the machine, as usual. The shaft *h'* makes, say, six-tenths of a revolution to one revolution of the driving-pulley n^2, secured to the cylinder-shaft *b'*.

In my improvement or attachment as adapted to the self-stripping mechanism just referred to I retain substantially all parts of it, except the belt t^6; but in addition I provide the front or driving side with the mechanism about to be described, including a counter-shaft or stationary stud b^2, carrying compound pulleys n^3 n^4, the former being driven from the lower pulley n^2 by a belt *t'* and the latter driving the upper shaft *h'* by means of the belt t^2 and pulley n^5, secured to said shaft, the proportion of the several pulleys, as drawn, being such that the shaft *h'* is thus driven some three and one-half times faster than usual. The stripper-frames *e* are loosely mounted on the outer ends of the card-cylinder shaft *b'*, and are tied together at the top by the transverse brace e^4, substantially as common. The combined master or mangle wheel and cam *i* is mounted on a stud or shaft *z*, carried by the frame *e*. The wheel is arranged in connection with the smaller gear-wheel i^2 and locking-pawl i^3 to further serve as an escapement device, also as usual. The wheel *i* is revolved by the pinion h^2 on shaft *h'*, wheel h^3, and pinion h^4, the latter intergearing with the teeth formed on the periphery of the mangle-wheel. Upon the inner end of the short shaft carrying the said wheel i^2 is secured a pinion i^6, (see dotted lines, Fig. 5,) intergearing with the semicircular rack *r*. The circumference of this pinion i^6 is such that one revolution of it will advance the stripper from the center of one flat to the next alternate one a distance, say, of three inches.

To the usual stripper-frame *e* I secure the following parts, viz: a bracket e^2, adapted to support the outer end of the stationary shaft b^2, a bracket *v'*, in which the shipper-lever *v* is fulcrumed, and a top bracket *e'*, supporting and guiding the upper portion of the vertical reciprocating pawl or pusher *d*. The hub *y* of the mangle-wheel is cut away at one side, (opposite the cam *i'*,) as *y'*, to allow the said pawl *d* to work past it freely when in use—that is, when the wheel *i* is turning at its slowest speed. The hub is further provided with a cam y^2, projecting from and extending around, say, about one-eighth of its circumference.

Upon the shaft b^2 is loosely mounted the main or driving pulley n^3, having a long hub n^6, Fig. 6. Adjacent to the inner edge of this pulley is a larger pulley n^4, arranged to turn freely on said hub, the point of a screw n^7, passing through large-pulley hub and engaging a peripheral groove g^4, formed in the hub n^6, serving to prevent the pulley from endwise movement. Upon the last-named hub is fitted a splined clutch provided with teeth or lugs u^3, arranged to engage similar lugs n^9, formed on the pulley n^4. This clutch is also arranged to form an eccentric *u*, which is grooved to freely receive the enlarged lower end of the elongated pawl *d*. It is further provided with a groove *u'* to receive the forked end of the shipper-lever *v*, the upper end of the latter being provided with an adjusting-screw v^2, arranged to engage with the face of the cam y^2 before described. From this it will be seen that at a certain point in the revolution of the continuously-moving wheel *i* the well-rounded end of the cam y^2 will be brought into contact with the screw v^2, thereby withdrawing the continuously-revolving spring-resisted clutch from the loose pulley n^4. As soon as the said cam has passed the shipper-lever the spring u^8 acts to automatically force the clutch again into engagement with the pulley n^4.

To the front end of the top driving-shaft *h'* is secured a ratchet-wheel *h*, the same being located intermediate of the pulley n^5 and pinion h^2. (See Fig. 5.) This wheel is arranged to turn the shaft in the same direction as the belt-driven pulley n^5. The ratchet-wheel is driven by the said pawl or eccentric connection *d*. The upper portion of the said connection *d* is provided with a slot d^2, Fig. 10, through which passes a collared stud p^2, mounted to move endwise in the top

bracket e'. The spring s is employed to keep the pawl in normal engagement with the ratchet-wheel.

As hereinbefore stated, some forms of card-stripping devices—as, for example, the one represented in Fig. 2—revolve the mangle-wheel i continuously at a regular rate of speed at all times when it is lifting, cleaning, and replacing the top-flat and also when it acts to propel the apparatus ahead preparatory to cleaning the next alternate flat. With my improvement or attachment the speed of the stripper is so automatically regulated and controlled that although the total time consumed in cleaning a flat, &c., and advancing the stripper to the next flat to be operated upon is or may be the same as strippers traveling at an invariable rate yet the speed of the revolving mangle-wheel while propelling or advancing the stripper is a great deal slower, its speed being greatly increased during the remainder of the wheel's revolution while the flat is being lifted, cleaned, and replaced.

The operation of my device is as follows, assuming, first, that the apparatus is driven, say, by the primary belt t', driving the counter-shaft pulleys n^3 n^4, and the belt t^2, leading from the last-named pulley onto the pulley n^5 of the top driving-shaft h'. In Figs. 1, 3, 7, and 8 the relation of the parts correspond substantially to the position immediately succeeding the replacing of the last-cleaned flat—that is, the cam y^2 has just withdrawn the clutch from the pulley n^4. (See also Fig. 6). At the same time the upper end of the pawl d vibrates into engagement with the ratchet-wheel, the mangle-wheel thereby being rotated at the slowest speed, it being remembered that the continuously-revolving pulley n^3 always reciprocates the pawl at a uniform speed by eccentric u. This slow action is continued during the engagement of the shipper-lever with the cam y^2, with the result that the stripper is advanced to or nearly to the next alternate flat c through the medium of the gear-wheel i^2, pinion i^6, and rack r. At substantially the same instant that the cam leaves the shipper-lever the spring w^8 forces the clutch into re-engagement with the larger pulley n^4, and the concentric portion of the wheel-hub y, coming in contact with the pawl, forces the latter from the wheel h, the relation of the parts then being substantially as represented in Figs. 4 and 9. As the frame e comes to a state of rest the concave portion of the usual locking-pawl i^3 engages the periphery of the revolving wheel i to prevent further axial movement of the rack-pinion, &c. The belt t^2 now upon coming into action revolves the mangle-wheel at the maximum speed, the result being, first, to automatically lift the flat; next, to vibrate the arm f to pass the cleaner-comb m under the flat (by means of the roll f' and cam portion i') and draw it back, thereby removing dirt, lint, &c., from the flat, and, finally, to replace the thus-cleaned flat. When this latter is effected, the belt will have revolved the mangle-wheel sufficiently to again bring the cam y^2 into position to engage the shipper-lever v, thus completing the operation and corresponding with one revolution of the mangle-wheel.

I make no claim, broadly, to mechanism for lifting, cleaning, and replacing a top-flat and propelling the apparatus ahead to the next flat to be operated upon wherein all the operations are effected in a substantially uniform time or invariable rate of movement; neither do I claim, broadly, mechanism arranged to automatically drive the stripper during the work of raising and stripping the flats at a different and greater rate of speed than it is driven while traveling from one flat to another.

I claim as my invention—

1. In a card-stripping apparatus, the combination of a belt-driven pulley n^3, revolving at a substantially uniform speed, a spring-resisted pawl and clutch working in unison with the pulley, a loose pulley located between said clutch and pulley, a shaft h', driven at fixed intervals by said pawl, and a belt leading from the loose pulley, a mangle-wheel arranged to perform the usual functions of such wheels, a gear-train actuated by the shaft h' and driving the mangle-wheel, and cams formed on the mangle-wheel, arranged to throw said clutch and pawl into and out of action, substantially as described.

2. In a card-stripping device, the combination, with the mangle-wheel and its usual dependent parts and the gear-train intergearing with and rotating said wheel, of a pawl or pusher reciprocating at a regular rate of movement and actuating said gear-train, means, as described, for throwing the pawl into and out of action, a clutch-pulley and belt operating the gear-train independently of and faster than said pawl, and means, as described, for operating the clutch portion of said pulley, substantially as hereinbefore described, and for the purpose set forth.

3. The combination of a mangle-wheel and the usual dependent parts actuated and controlled therefrom, a driving-shaft, as h', having a pulley and ratchet-wheel secured thereto, a gear-train transmitting motion from said shaft to the mangle-wheel, and means, substantially as described, for actuating said driving-shaft through the pulley and ratchet-wheel at different rates of speed during each revolution of the mangle-wheel, for the purpose set forth.

In testimony whereof I have affixed my signature in presence of two witnesses.

EVERETT GIBSON.

Witnesses:

GEO. H. REMINGTON,

IDA M. WARREN.