G. Wellman.
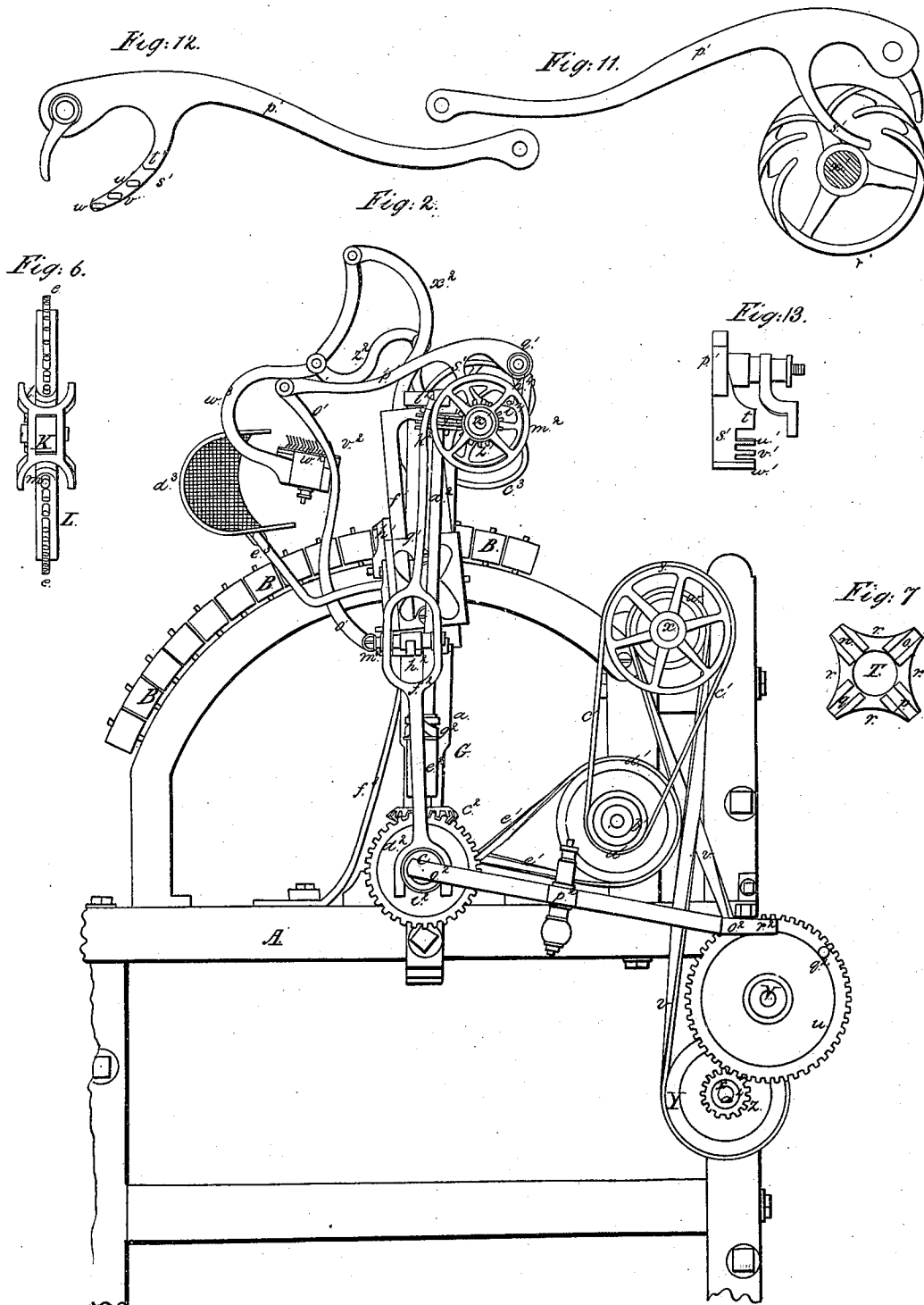## Card Cleaning Mach.

Nº 10,298.   Patented Dec. 6, 1853.

Fig: 1.

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Card Cleaning Mach.

Nº 10,298.   Patented Dec. 6, 1853.

Fig: 12.   Fig: 11.

Fig: 6.   Fig: 2.

Fig: 13.

Fig: 7

G. Wellman.
Card Cleaning Mach.

№ 10,298.   Patented Dec. 6, 1853.

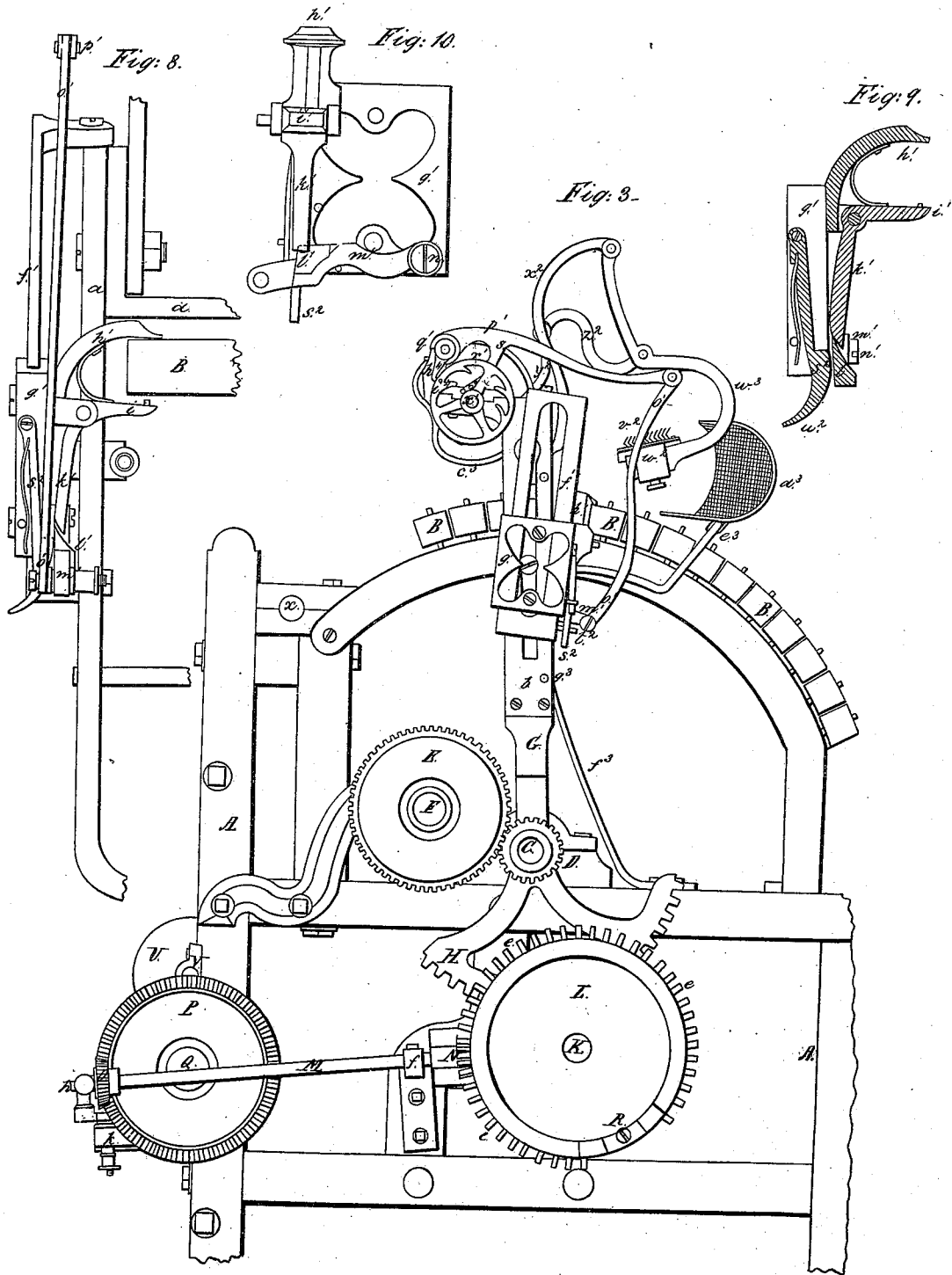Fig: 8.

Fig: 10.

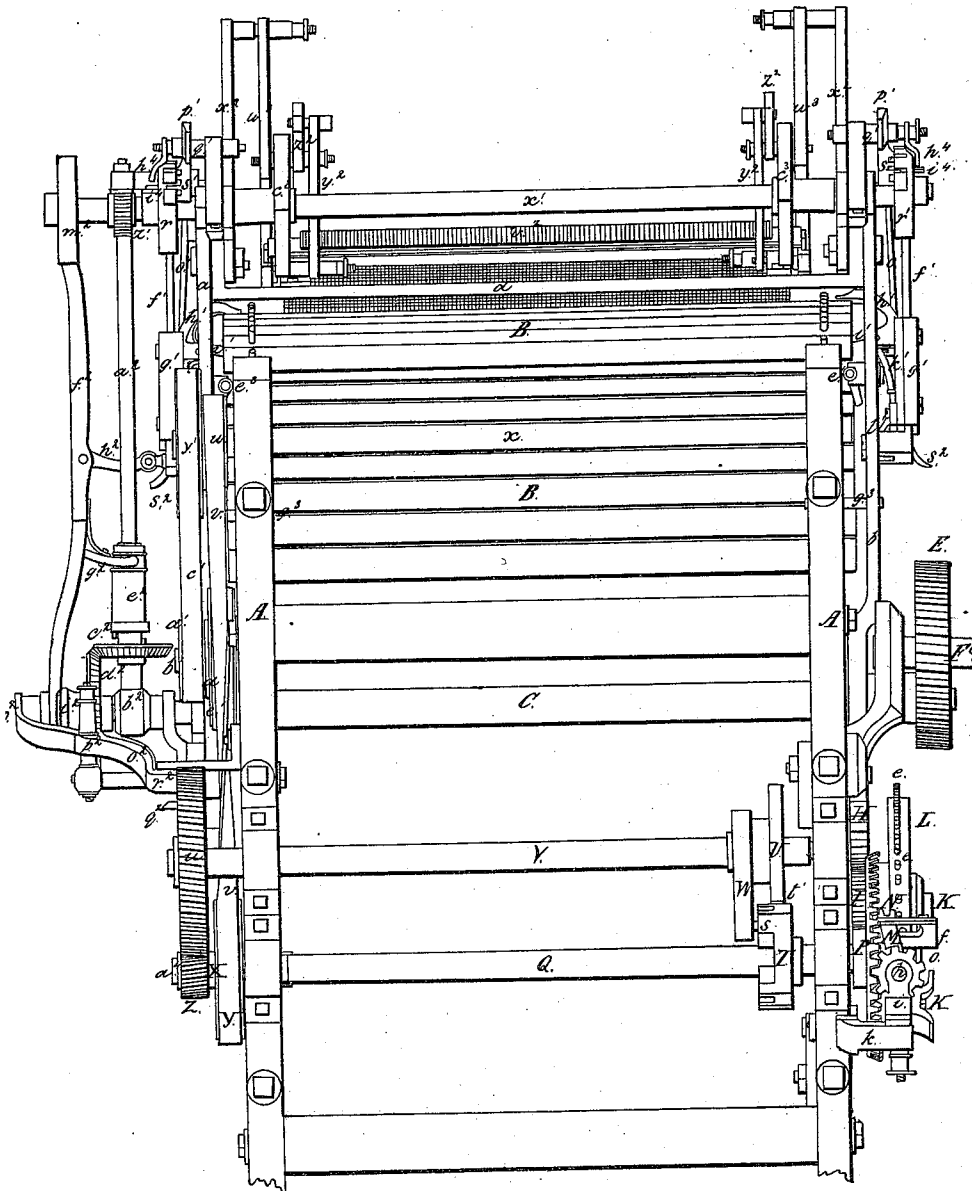Fig: 9.

Fig: 3.

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Fig: 4.

G. Wellman.

Card Cleaning Mach.

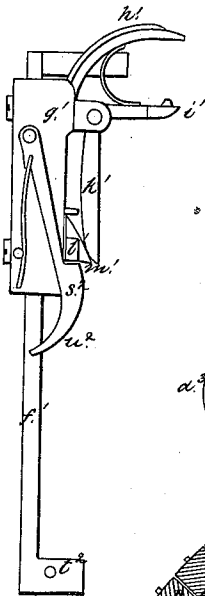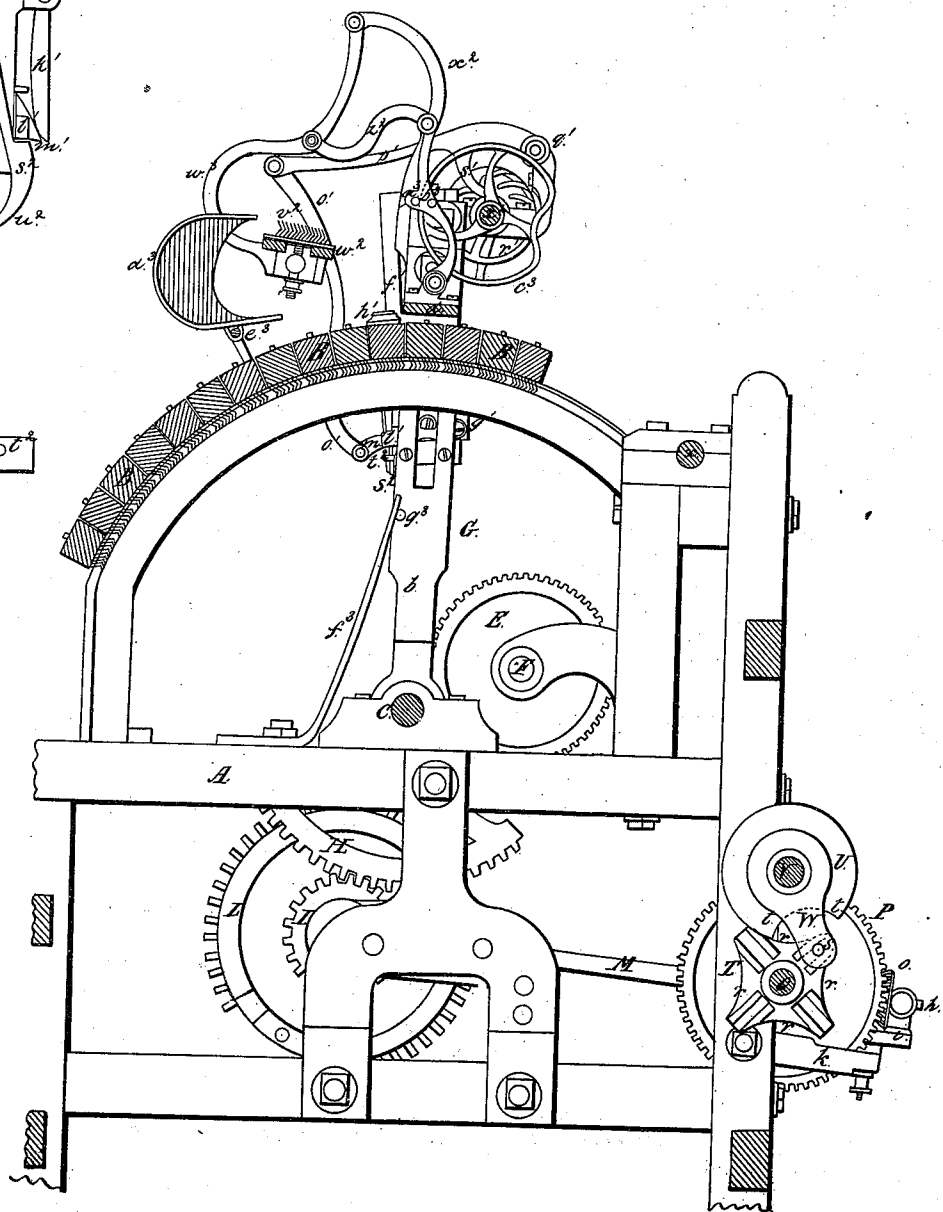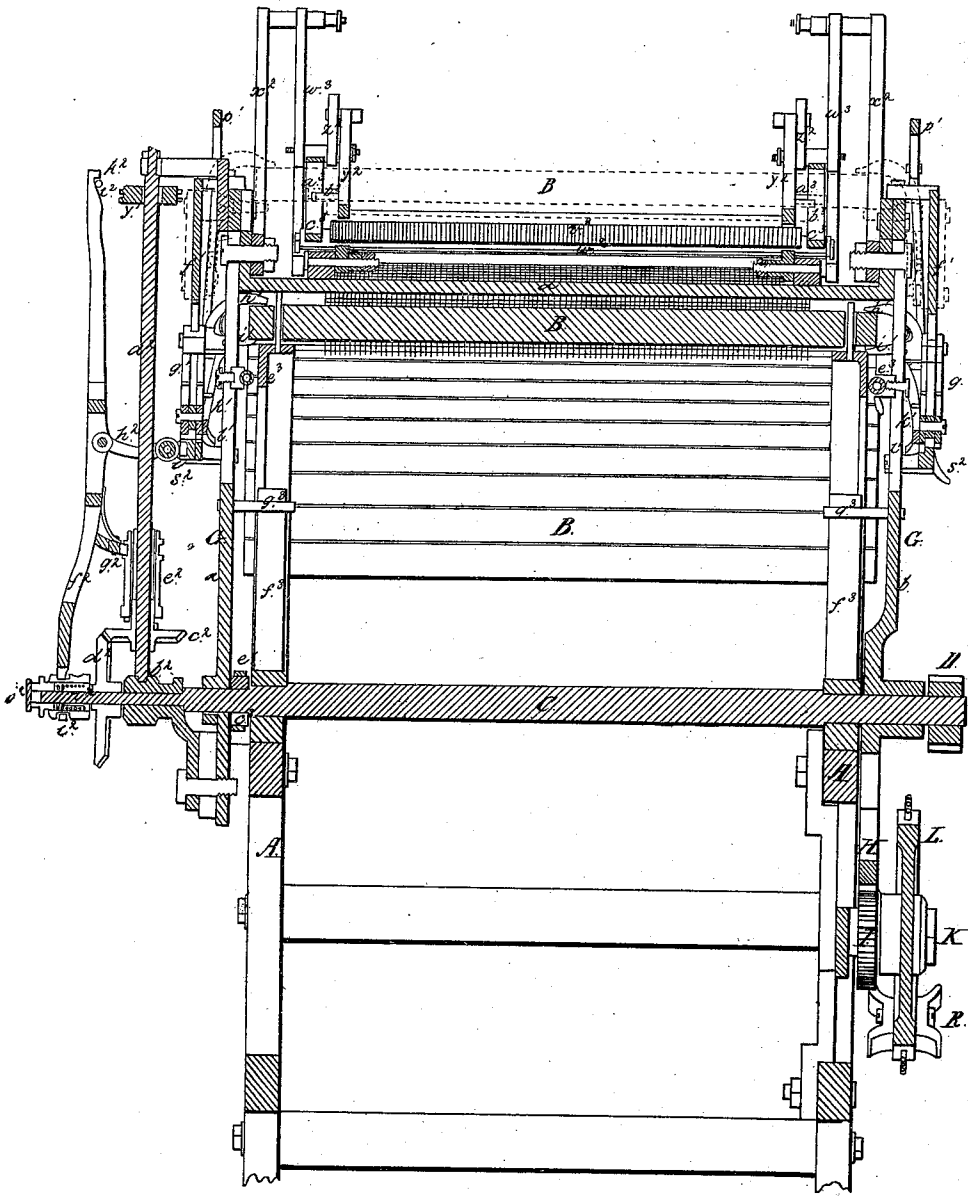Nº 10,298.   Patented Dec. 6, 1853.

Fig. 15.

Fig. 5.

G. Wellman.

Card Cleaning Mach.

Nº 10,298.   Patented Dec. 6, 1853.

Fig: 14.

UNITED STATES PATENT OFFICE.

GEORGE WELLMAN, OF LOWELL, MASSACHUSETTS.

IMPROVEMENT IN CLEANING MACHINE-CARDS.

To all whom it may concern:

Be it known that I, GEORGE WELLMAN, of Lowell, in the county of Middlesex and State of Massachusetts, have invented certain new and useful Improvements in Carding - Engines; and I do hereby declare that the same are fully described and represented in the following specification and the accompanying drawings, letters, figures, and references thereof.

Of the said drawings, Figure 1 denotes a top view of a carding-machine provided with my improvements. Fig. 2 is an elevation of one end of the same. Fig. 3 is an elevation of the opposite end of it. Fig. 4 is a front elevation of it. Fig. 5 is a vertical, central, and transverse section of it. Such other figures as may be necessary to a full description and delineation of my invention or improvements will be hereinafter particularly referred to and described.

In the first place, A represents the main frame of a carding-engine, and B B B, &c., the series of top cards thereof, each of which cards is composed of a bar or lag having a strip of card-teeth fixed on its under surface. The main card-cylinder doffers and other carding-cylinders of the carding-machine are not represented in the drawings, as they have no reference to my invention or constitute no part thereof, and are like such as are in general use.

In the use of common carding-engines it has been customary to cleanse the top cards thereof by manual labor, such being removed at a proper time and cleansed by a card or instrument held in the hand of and operated by a workman or attendant.

The main purpose of my invention is to effect the elevation of each and every one of the top cards from their beds or the frame on which they are supported, the cleansing of such top cards, and their return to their respective beds after being so cleansed, thus producing by mechanism what has heretofore been accomplished by hand-labor.

On one end of the main shaft C, extending through the frame, a pinion-gear D is fixed. Engaging with this gear is a large gear E, fixed on a crank or driving shaft F. A rocker-frame G, composed of two bars *a b* and a cross-connection bar *d*, is made to extend up-

ward, working loosely on the shaft C, as seen in the drawings. An arc or sector H of teeth is made to extend downward from the bar *b* and to engage with a gear I, fixed on a shaft K, or to the side of a toothed or pin wheel L, that revolves on the said shaft. The said pin-wheel L is for the purpose of receiving from another shaft M a rotary motion for some time in one direction, and next and for a similar time in an opposite direction. There is a beveled pinion N affixed to the inner end of the shaft M, which pinion takes into the row of teeth or pins *e e*, &c., of the wheel L. The shaft M is sustained in a box *f*, such as will allow it to move laterally, so as to carry the beveled pinion N from one side of the pin-wheel to the other, and vice versa. The opposite end of the shaft has a journal *h* formed in it, which journal is supported in the upper part of a turning post *i*, that is supported on an arm or strip *k*, made to extend from the main frame. Another beveled pinion-gear O is fixed on the shaft M and engages with and turns a larger beveled gear P, that is fixed on a horizontal shaft Q. The pins that extend from the periphery of the wheel L are not set entirely around its circumference, there being a space or interval to which a metallic guide piece or block R is fastened, the same being formed with two semicircular forked ends, as seen in Fig. 6, which is a top view of the said guide-piece and the pin-wheel. The termination of each end of the arc of periphery of the pin-wheel is formed semicircular and concentric with its adjacent forked end of the block R, as seen at *l m*, the concave sides of the said forked ends serving as guides to the pinion N when the teeth of said pinion work against those teeth of the pin-wheel that are within the extremities of the forked ends, and enabling the pinion to change its action from one side of the pins of the wheel to the opposite side of the said pins, by which the motion of the wheel is reversed. There is also on the shaft Q a plate or block T, that has four grooves *n o p q* formed in it in radial directions and at right angles to one another, as seen in Fig. 7, which is an inner side view of such plate T. Between the outer ends of each two grooves the plate is cut or notched inward in the form of a circular arc,

as seen at $r\ r\ r\ r$, which arc is of the same radius as a circular wheel U, that is arranged directly above it and fixed on another horizontal shaft V. An arm W projected from the shaft V carries a pin or stud s, that during each revolution of the shaft V works into and out of one of the grooves $n\ o\ p\ q$. A curved notch t is made in the wheel U, so as to allow the pin s to pass into and out of the grooves $n\ o\ p\ q$. While the circular arc of the periphery of the wheel U is in any one of the notches $r\ r\ r\ r$ the shaft Q is prevented from being revolved; but as soon as the pin or stud s enters into one of the grooves $n\ o\ p$ q the shaft Q is made to turn. Near the other end of the shaft Q there is a tubular shaft X, that runs loosely on a shaft a^4 and carries a pulley Y and a spur-pinion Z. The spur-gear Z engages with a larger gear u, fixed on the end of the shaft V. A crossed endless belt v works around and on the periphery of the pulley Y and that of another pulley w, fixed on a horizontal shaft x, which has another pulley y fixed on it. Around the pulley y and another pulley a', fixed on a tubular shaft b', a band c' runs. On the shaft b' is another pulley d', around which a crossed belt e' passes to and around a small pulley e^2 fixed on the main shaft C.

The shaft C being made to revolve will, by means of the connecting-belts, pulleys, and gears, as above described, impart rotary motion to the shaft V, which latter during each of its revolutions will (through the action of the arm W and its stud s, the block T, and the notched wheel U) impart a rotary motion to the shaft Q through an arc of ninety degrees of a circle.

When the shaft Q is revolved, the beveled gear P on its end will be rotated with it, and consequently cause the pinion O, the shaft M, the pinion N, the pin-wheel L, the gear I, and the arc H to be put in motion, so as to turn the frame G on its bearings. By the above-described machinery this frame is alternately moved from one lag or top card to another throughout the series, and finally brought back again, the mechanism, as shown in the drawings, being calculated to move it from one card to the next but one in advance, always omitting the intermediate card, which is taken up in turn when the frame is moved in an opposite direction. It is a common custom in cleaning the top cards to remove or lift up every other one, instead of every one in succession, leaving the intermediate card down and taking it up the next time going through the series. It will be evident that the mechanism may be arranged or constructed so as to move the frame G from one to the other in the order of their succession, or in any other order that may be desirable.

The frame G carries mechanism for laying hold of the two ends of a top-card bar and lifting it upward above the rest, and not only holding it upward while a brush or card that is also held by machinery connected with such frame is made to pass underneath and in contact with the card-teeth of the said top card and cleanse the same, but afterward depressing it (the top card) down on its support or bed.

To each bar $a\ b$ of the frame G there are slideways f', each set of which carries one of two slides or carriages $g'\ g'$. Fig. 8 is a rear edge view of the slideways and slide of the bar a, those of the bar b being similar thereto.

To each of the slides $g'\ g'$ there is a gripper or jaw h', that is fastened firmly to the slide and made to project over the ends of the next adjacent top-card bar. There is also another jaw i', that extends underneath the said end of the top-card bar, and is formed on the short arm of a bent lever k', (see Figs. 8 and 9,) the latter being a vertical section through the jaws, lever, and the slide or cam by which the lower jaw-lever is moved, so as to force the said jaw against the under side of the end of a top-card bar. This cam or contrivance is shown at l', and as fixed on a lever m'. An inner side view of the slide g' is represented in Fig. 10, in order to show the lever m', which moves vertically on a fulcrum or pin n', inserted through its rear end and fastened in the frame or slide g'. The front end of each of the levers $m'\ m'$ is jointed to the lower end of one of two bars $o'\ o'$. Each of the bars o' is jointed at its upper end to one end of one of two levers $p'\ p'$, that work on fulcra $q'\ q'$ at their rear ends. In Fig. 11 we have an inner side view of one of these levers and the cam-wheel by which it is raised, both of the said cam-wheels being seen at r' r' in Figs. 1 and 4.

A curved arm s' extends down from each lever p' and is formed with projections $t'\ u'\ v'$ w', as seen in Fig. 12, (which is an outer side view of the lever,) and Fig. 13, which is an edge view of the arm.

The projections $t'\ u'\ v'\ w'$ of each lever-arm operate in connection with the adjacent cam r', the latter when revolved being made so to act on them as to lift its lever at the proper time and to the proper height, so as not only to close the lower jaw i' against any top card-bar that may be between it and the upper jaw, but also to lift up the slide g' and such top card-bar. In Fig. 14 (which is a vertical section of the machine taken in line of the axis of the main shaft C) the elevation of the slides $g'\ g'$ and the top card is represented by red lines. The said cam-wheels $r'\ r'$ are fixed on a horizontal shaft x', that is put in revolution by the action of an endless screw y' on a worm-gear z', that is fastened to the shaft in the position as seen in the drawings. The endless screw y' is fixed on an upright shaft a^2, whose lower end is stepped and supported in a bearing b^2, through which the shaft C plays, the said bearing being fastened to the arm a. Near the lower end of the shaft a^2 a beveled pinion c^2 is placed on the shaft

and made to turn loosely on it. The said beveled pinion is made to engage with and be turned by a beveled gear-wheel d^2, that is fastened on the shaft C and revolves with the said shaft.

There is a clutch e^2 placed on the shaft a^2, and made to slide freely up and down on it, but having a spline or feather connection with the shaft, such as will prevent it from being rotated on and independently of the shaft. The object of this clutch is to connect the beveled pinion c^2 to the shaft a^2 and to disconnect it therefrom at such times as it may be necessary so to do. The said clutch is connected with a bar or lever f^2 by a fork g^2, such fork being made and applied to the lever and clutch, so as not only to permit the revolution of the clutch, but to effect the upward or downward movement of the clutch when the lever or bar f^2 is moved either upward or downward.

The lever or bar f^2 is connected with the slideways of the bar a by means of a link or bar h^2, that is jointed or hinged to each, so as to permit the lever to be raised upward. The lower end of the lever f^2 is forked and rests in the groove of a slide i^2, that is placed on the shaft C and slides freely in a longitudinal direction on it. The upper end of the lever is formed with a hook, as seen at k^2, which hook operates in connection with a pin l^2, that projects from the periphery of a wheel m^2, which is fixed on the outer end of the shaft x'.

Within the slide i^2 and around the shaft C there is a helical spring n^3, that operates to force the slide outward, or in a direction away from the beveled gear next to it. One arm of a lever o^2 rests against the outer end of the slide i^2. The fulcrum of the lever o^2 is arranged as shown at p^2, and the other arm of the lever is formed and extends toward and by the side of the spur-gear u, fixed on the shaft V.

A small cam q^2 is made to project from the side of the gear u, and during the revolution of the gear it is brought into contact with the inner side of the adjacent arm of the lever o^2 and presses the said arm outward, so as to cause the slide i^2 to be moved inward, and thereby move the lever f^2 in such a direction as to move its hook k^2 off the pin l^2, so as to permit the gravitating power or weight of the clutch e^2 to carry the clutch downward and into connection with the beveled pinion c^2, so which the top card is elevated above its bed, as to put or set in operation the machinery by held up, and finally depressed again down upon its bed.

As soon as the cam q^2 passes by or beyond the part or hand r^2 of the lever o^2 the pressure of the lever against the slide i^2 is removed thereform, so that the reaction of the helical spring that is in the slide is left free to operate or move the lever f^2 so as to throw its lower end outward, and thus cause a simultaneous movement of the upper end of it in the opposite direction, whereby the hook k^2

will be brought into the right position for the pin l^2 of the wheel m^2 to meet it and lift it and the lever when the said pin is moved around against it. As soon as the top card has been lowered down to its bearings the pin l^2 is brought against the hook, so as to lift it and thereby lift the lever f^2 and the clutch e^2, so as to unclutch the pinion c^2 and the shaft a^2. The said shaft and pinion are to be kept unclutched while the machinery that moves the frame G is moved to and over the next top card that is to be raised and cleansed.

In order to preserve the pressure of the lower jaw i' against the top card, a spring-latch s^2 is fixed to the slide-frame g', as seen in Fig. 15, which is a rear view of the carriage g' and some of the adjacent parts. This latch springs under the lever m' when the latter is raised up high enough. During the next descent of the frame or carriage g' the curved part u^2 of the latch is brought against a stationary pin t^2, so as to unclutch the latch from the lever m' and allow it to descend.

The next part of the machinery to be described is that by which a top card, when lifted upward above its bed, is cleansed. For this purpose a stripper brush or card v^2 is used. It is fastened on a bar w^2, that is fastened to the ends of two bent levers $w^3 w^3$, which are jointed to the tops of curved arms or posts $x^2 x^2$, that project upward from the frame G, as seen in the drawings. There are also two rocker-levers $y^2 y^2$, arranged as seen in the drawings, and made to be supported on the frame G and to rock on shafts or fulcra at their lower ends. The upper end of each of the said rocker-levers is jointed to one of two connecting-rods $z^2 z^2$, whose other end is jointed to the middle part of the adjacent lever w^3. From the outer side of each of the said rocker-levers $y^2 y^2$ two pins $a^3 b^3$ are extended at a short distance apart, and receive between them the rim of one of two cam-wheels $c^3 c^3$, both of which cam-wheels are fixed on the shaft x' and are made to revolve by and with it. These cam-wheels should be so formed that during the time that the machinery which moves the top card is in operation they shall produce no motion of the stripper-card v^2, also so that after the top card has been raised upward they (the cams) shall so move the rocker-levers as to cause the stripper-card to pass or move underneath the top card and against it and back again to place, whereby the stripper-card will be made to remove from the top card the surplus waste or matter to be taken from it.

A trough or spout d^3, made of wire netting, may be arranged as seen in the drawings, so as to catch the waste that may fall from the stripper, such trough or receptacle being supported on rods or arms $e^3 e^3$, that project from the frame G. The trough necessarily moves with and is moved by the frame G.

To counterbalance the weight of the frame.

G and its machinery when the said frame is descending toward a horizontal position, or toward the lowest lags or top cards, springs f^3 f^3 may be applied to the frame A, and arranged as seen in the drawings, such springs being, respectively, met and pressed against by pins or studs g^3 g^3 during the descent of the frame G.

In order to render certain the depression of the top card down on its seat after it has been raised off the same to be cleansed, a small arm h^4 is extended from each lever p', as seen in the drawings. At the proper time a pin i^4, that projects from the side of each of the cam-wheels r' r', comes into contact with the arm and insures the proper movement of the lever.

Having thus described my invention, what I claim is as follows:

1. In combination with a series of top cards of a carding-engine, not only a mechanism for raising one or more of such top cards and holding the same upward and afterward depressing the same back into place, but a mechanism for acting on and cleansing such top card or cards when or while so elevated, not meaning in the above to claim either the mechanism for moving the top card or cards or that for cleansing it or them in their separate combination with the series of top cards, but to lay claim to both in their joint combination and with the series of top cards, substantially in the manner described.

2. In combination with the series of top cards and mechanism for raising and cleansing a top card and restoring it to its seat, the mechanism for moving the raising and cleansing mechanism in succession from one top card to the other, and whether from one card to the next one throughout the series or from one to another of them to the next but one or in any other order, substantially as specified.

3. The combination of the grooved block T, or the grooves n o p q and circular arcs r r r r, the arm W, with its stud s, or the equivalent of said arm and stud, and the notched wheel U as applied to the shafts Q and V and made to operate together, substantially as specified.

In testimony whereof I have hereto set my signature this 17th day of May, A. D. 1852.

GEORGE WELLMAN.

Witnesses:
    BENJ. F. PERKINS,
    E. F. SHERMAN.