No. 612,334. Patented Oct. 11, 1898.

A. GUNERMAN & G. SCHACHT.

COMBING MACHINE.

(Application filed June 29, 1897.)

(No Model.) 2 Sheets—Sheet 1.

Fig. 1.

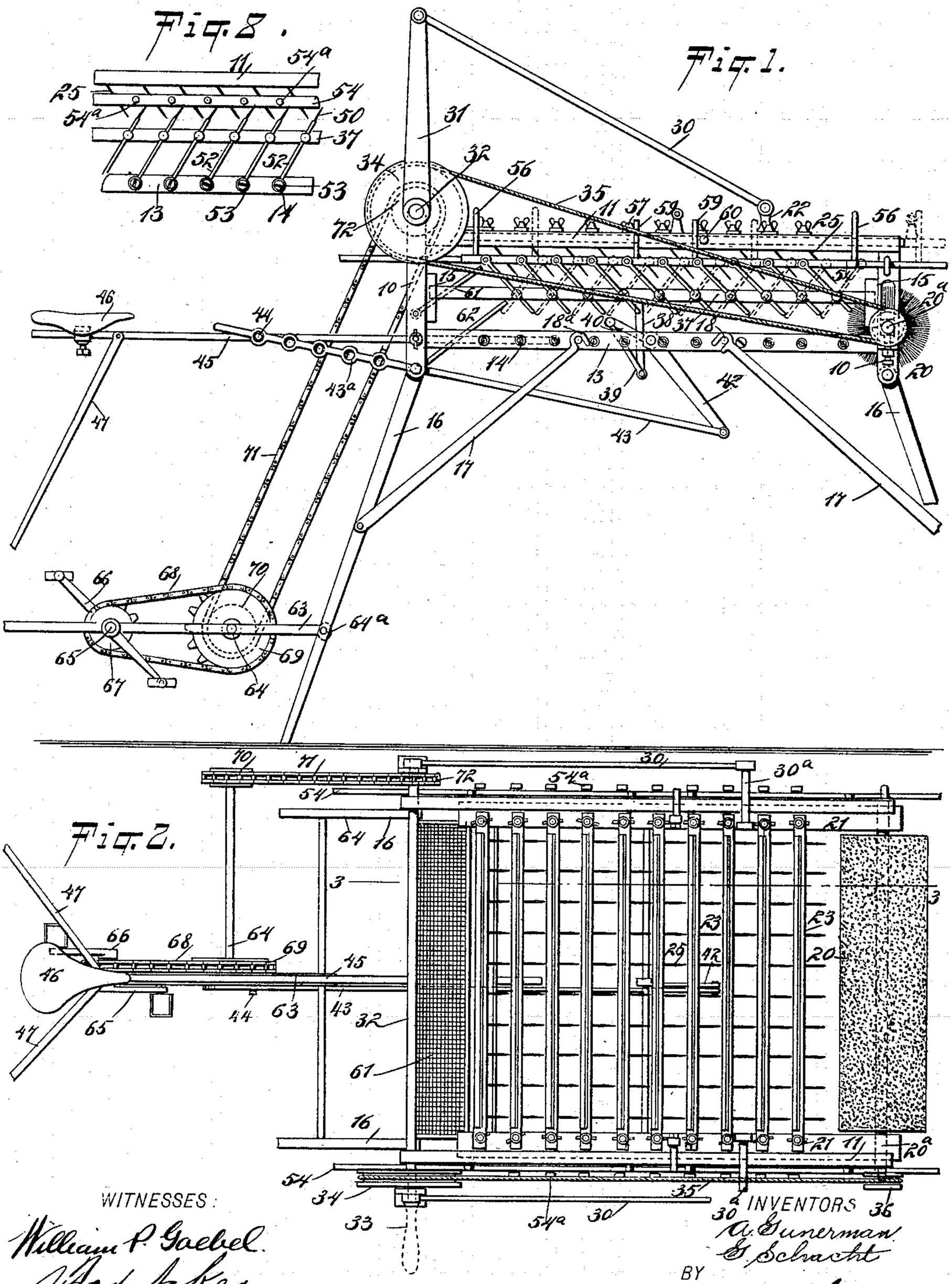

Fig. 8.

Fig. 2.

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Fig. 3.

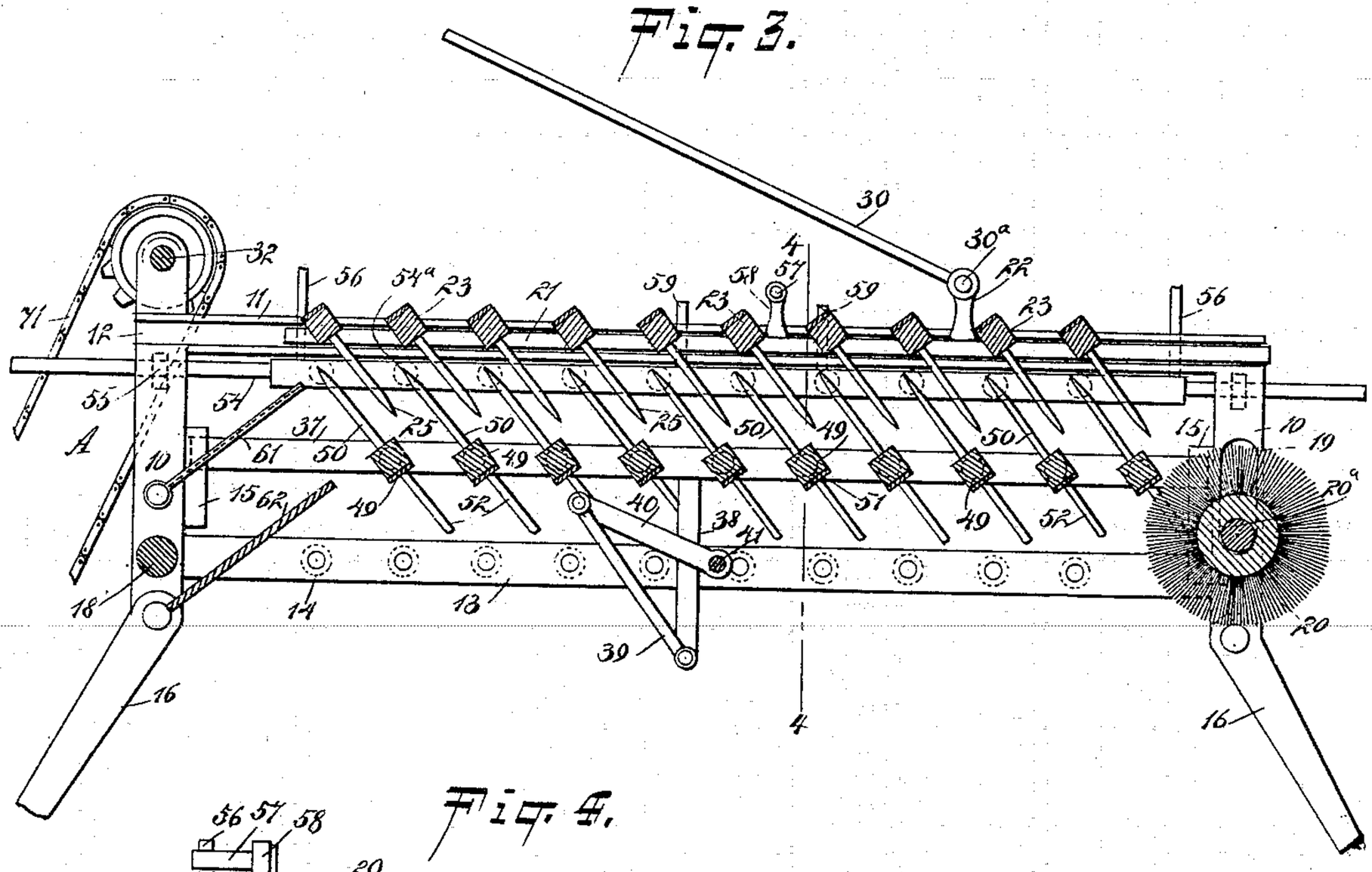


Fig. 4.

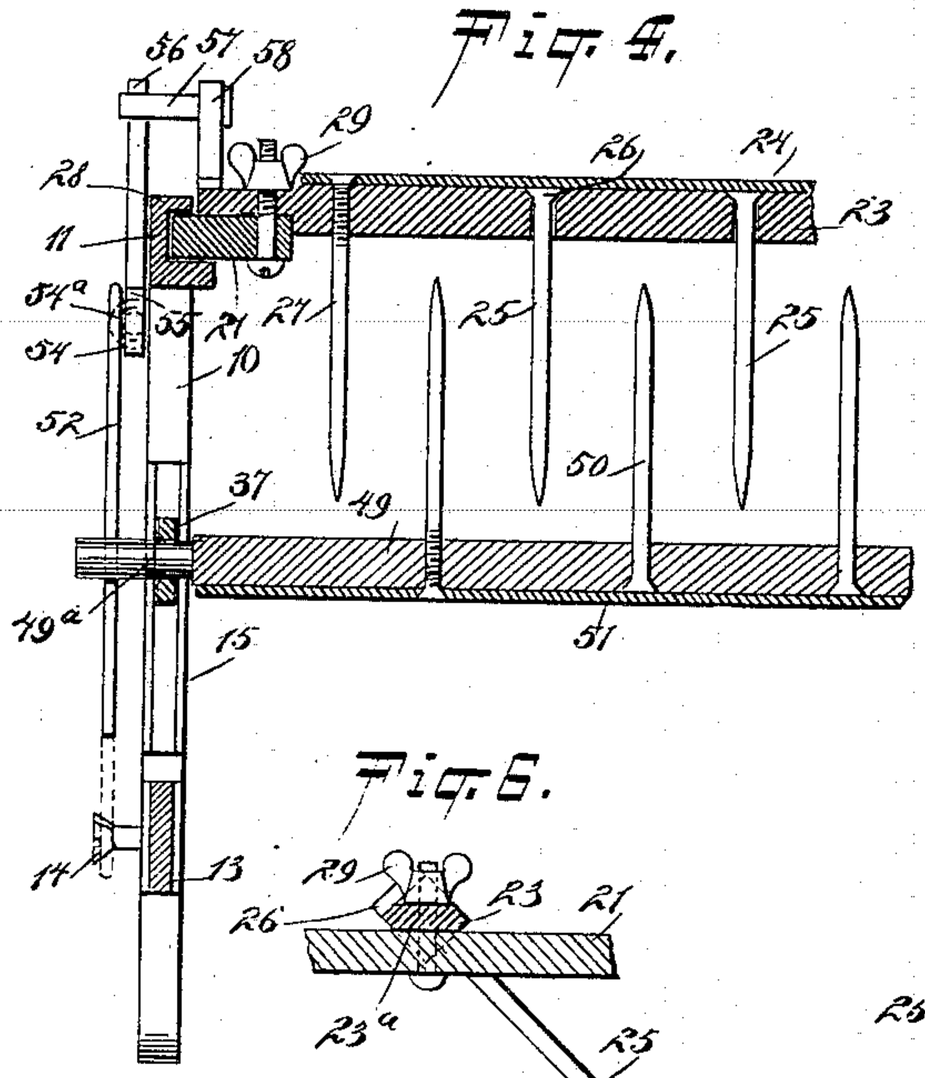


Fig. 5.

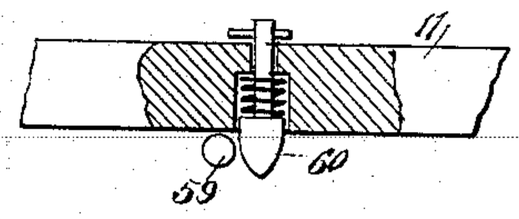
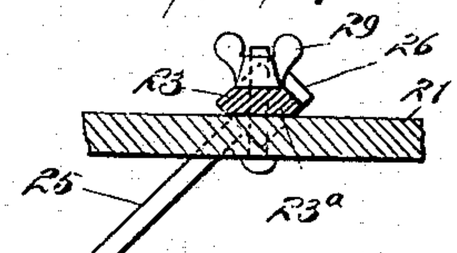


Fig. 6.

Fig. 7.



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UNITED STATES PATENT OFFICE.

ANTHONY GUNERMAN, OF HOBOKEN, AND GEORGE SCHACHT, OF JERSEY CITY, NEW JERSEY.

COMBING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 612,334, dated October 11, 1898.

Application filed June 29, 1897. Serial No. 642,876. (No model.)

To all whom it may concern:

Be it known that we, ANTHONY GUNERMAN, of Hoboken, and GEORGE SCHACHT, of Jersey City, in the county of Hudson, State of New Jersey, have invented a new and Improved Combing-Machine, of which the following is a full, clear, and exact description.

The object of the invention is to improve upon the construction of the combing-machine for which Letters Patent were granted to us February 11, 1896, No. 554,265, said improvements being such that the top and bottom combs may be made to operate in different directions, as the operator may deem desirable, according to the class of material treated.

Another object of the invention is to provide for driving the machine either by foot or by hand power and whereby when the machine is to be driven by foot-power the operator's seat may be so placed as to steady the machine and hold it upon its support.

Another object of the invention is to provide a simpler, lighter, quicker-acting, and more economic construction than has heretofore been attained, and also to provide not only for a reversal of the lower comb, but likewise a vertical adjustment, together with means for holding the lower comb stationary when desired.

The invention consists in the novel construction and combination of the several parts, as will be hereinafter fully set forth, and pointed out in the claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the figures.

Figure 1 is a side elevation of the improved machine. Fig. 2 is a plan view thereof. Fig. 3 is a vertical longitudinal section on the line 3 3 of Fig. 2. Fig. 4 is a transverse section through a portion of the machine, taken on the line 4 4 of Fig. 3. Fig. 5 is a detail view showing a portion of the upper side rail of the frame in horizontal section, disclosing the bolt. Figs. 6 and 7 are transverse sections through one of the slides carrying the upper combs, showing the combs as facing in two different directions; and Fig. 8 is a side elevation of a portion of the body of the machine, drawn on an enlarged scale and illustrating the manner in which the lower combs are held stationary when desired.

The frame usually consists of corner-posts 10, connected at each side near the top by a channel-iron 11, the groove whereof faces inward, forming slideways 12, and a bottom bar 13, having screws 14 or their equivalents arranged at intervals upon the outer faces of said bars. The corner-posts 10 may be connected in any suitable or approved manner, one connection being shown at the front near the bottom, consisting of a rod 18. On the inner face of each corner-post 10 a bracket 15 is secured, having a slot in its upper end, and the corner-posts are provided with pivoted legs 16, having braces 17 pivotally attached, which braces terminate at their upper ends in hooks which pass over studs 18^a on the outer face of the lower side beams 13 of the frame, as illustrated in Fig. 1.

In each corner-post 10, at the rear, a longitudinal slot 19 is made, in which the shaft 20^a of a brush 20 is entered, the shaft of the brush being located in suitable boxes sliding in the said slot and held in position by set-screws in the customary manner. In each of the slideways 12 made in the channel-irons 11 of the frame a slide 21 is mounted, and each slide is provided, preferably between its center and its rear, with an upright 22. The slides are adapted to carry cross-bars 23 in desired quantities. The cross-bars are usually rectangular in shape and are provided at the top with a strip 24, extending from a point near one end to a point near the opposite end, the strip 24 being adapted to hold teeth 25 in place in the said cross-bars 23, and these teeth have heads 26 formed at their upper ends, which enter countersinks in the cross-bars, the strips 24 passing over the heads of the teeth of the said bars, with the exception of the end teeth, which are designated as 27, and these teeth while also provided with heads are threaded near their heads, and serve to hold the binding-strips 24 in position on the body-sections of said cross-bars. The cross-bars and their teeth 25 constitute the upper comb of the machine. The teeth 25 are adapted to stand at a right angle to the plane of the frame or at an inclination. To

that end opposing longitudinal edges of the cross-bars will be presented one to the top and the other to the bottom portion of the frame, and at each end of each cross-bar, at top and bottom, the said edge surfaces are flattened, the lower flattened surfaces 23ª resting on the slides 21, and the teeth 25 are passed through the cross-bars parallel with the front and rear faces thereof, as indicated in Figs. 3, 6, and 7. Thus it will be observed that when the cross-bars of the upper comb are in one position the teeth of the comb will incline rearwardly, as shown in Figs. 3 and 6; but when the position of the cross-bars is reversed or the said bars turned end for end the inclination of the teeth of the upper comb will be in direction of the front of the machine, as shown in Fig. 7. The cross-bars carrying the teeth of the upper comb are secured on the slides 21 by means of bolts 29, preferably provided with thumb-nuts. The upper comb is given a lateral movement forwardly and rearwardly by connecting-rods 30, pivotally attached to the upright brackets or arms 22, attached to the slides, the connection being made through the medium of outwardly-extending arms 30ª, as shown in Fig. 2. The connecting-rods 30 are pivotally connected to crank-arms 31, which are secured to a drive-shaft 32, journaled in the extensions of the posts 10 of the frame at the front, and this shaft may be revolved by hand by means of an attached crank-handle 33, if desired, the handle being shown in dotted lines in Fig. 2. At one end of the drive-shaft a pulley 34 is secured, and this pulley is connected by a belt 35 with the shaft 20ª, carrying the brush 20.

The lower comb consists of side bars 37, which are mounted to slide in the slots in the brackets 15, as shown in Figs. 3 and 4, and cross-bars 49, located correspondingly to the cross-bars of the upper comb, the cross-bars 49 being provided with spindles 49ª at their ends, journaled in the side bars 37 and extending outward beyond the sides of the frame, as shown in Fig. 4. The teeth 50 are secured in the cross-bars of the lower comb in like manner as the teeth 25 of the upper comb, being held in place by a cover-strip 51; but the teeth of the lower comb face upwardly instead of downwardly, and usually incline in direction of the front of the machine, while the teeth of the upper comb incline in direction of the rear of the machine.

The lower comb is adapted to be raised and lowered to or from the upper comb, and this is accomplished by attaching downwardly-extending bars 38 by bolts or otherwise to the central portion of the side bars of the comb and pivoting to the lower ends of the downwardly-extending bars 38 links 39, which in their turn are pivotally connected with crank-arms 40, secured to a rock-shaft 41, journaled in the lower portion of the frame, and the said rock-shaft at its center is provided with a second downwardly-extending main crank-arm 42, which is attached to a shifting-rod 43, being provided at its forward end with a series of openings 43ª, any one of which is adapted to be passed over a pin 44, located on a horizontal rod 45, which extends forward from the forward lower end bar 18 of the frame at or near the center of its forward end. By moving the shifting-rod 43 forward or rearward the lower comb may be raised or lowered, and through the medium of the locking device just described, or any equivalent thereof that may be employed, the lower comb may be held in its adjusted position.

A saddle 46 is adjustably secured on the bar or rod 45, and adjacent to the saddle the rod or saddle-support 45 is provided with legs 47, pivoted thereto and arranged for engagement with the ground or other support upon which the machine is to rest.

It is desirable in the operation of the machine that the teeth of the lower comb should have a vibratory and combing movement during certain stages of the movement of the upper comb in order to bring about an effective separation of the hair or other article under treatment. Such movement is brought about by adjustably placing pins 52 in the trunnions 49ª of the cross-bars of the comb, each pin having an eye 53 at one end. The pins are loosely passed through the trunnions and may be shifted at any time to bring their eyes 53 either above or below the lower comb. Such movement is brought about by adjustably securing pins 52, having an eye 53 at one end, in the trunnions 49 of the cross-bars of the lower comb. Ordinarily the eyes 53 of the pins 52 receive buttons 54ª, located on sliding bars 54, which are placed on each outer side of the frame, having movement in suitable brackets or hangers 55. The sliding bars 54 are provided at or near each end with an upwardly-extending pin 56, adapted to be engaged by horizontal fingers 57, which are outwardly projected from standards 58, secured to the slides 21 of the upper comb. The uprights or standards 58 are located at or near the central portion of said slides, and consequently move the lower comb forward or rearward when the upper comb is near the limit of its forward or its rearward stroke. In order that the lower comb shall be held stationary at other times during the movement of the upper comb, pins 59 are projected upward from the sliding bars 54, one at each side of the center of each bar, and these pins are arranged to engage with bolts 60, (shown in Fig. 5,) which bolts are spring-controlled and are fitted in suitable recesses made in the upper or channel bars 11 of the main frame. Any necessary number of the bolts 60 may be used.

If it is desired to hold the teeth of the lower comb stationary, said result may be accomplished by placing the pins 52 in a position the reverse of that shown in Fig. 4 and illustrated in Fig. 8, in which the eyes of the pin 52 receive the buttons or screws 14 on the outer faces of the rigid side bars 13 of the

frame. The pins 52 may likewise be employed for holding the teeth of the lower comb either at a forward or at a rearward inclination, as shown in Figs. 3 and 8.

The material to be combed is introduced between the teeth of the upper and lower combs at the front of the machine, between the upwardly-inclined perforated shield 61 and a parallel lower shield 62, the upper shield being perforated to permit of the dust readily passing out from the material as fed to the machine. The material is thoroughly disintegrated or separated while passing between the upper and lower combs, the dust dropping down through the spaces between the cross-bars of the lower comb, and the material is thoroughly brushed and cleaned as it passes out at the rear of the machine. A side bar 63 is pivoted to a connecting-rod 64ª for the forward legs 16 and to a connecting-rod extending, for example, between the supporting-legs 47 of the saddle-supporting bar. When the machine is to be driven by foot-power, a shaft 64 is journaled in the bar 63, together with a second shaft 65. The shaft 65 is in advance of the shaft 64 and is provided with pedal-cranks 66, easily reached by the foot of the operator when said operator is seated on the saddle, and the shaft 65 is further provided with a sprocket 67, connected by a link belt 68 with a larger sprocket 69, located on the shaft 64. The shaft 64 is provided with a second and smaller sprocket 70, connected by a chain belt 71 with a sprocket-wheel 72, located on the drive-shaft 32.

The supports for the main frame and all projecting portions therefrom, together with the parts of the auxiliary or front frame, are pivotally connected and in such manner that the entire machine when not in use may be so folded as to occupy but little room.

Having thus described our invention, we claim as new and desire to secure by Letters Patent—

1. In a combing-machine, the combination with a reciprocating upper comb, of a lower comb, and means for imparting a vibratory movement to the lower comb from the upper one, substantially as described.

2. In a combing-machine, the combination with an upper comb, and means for reciprocating it, of a lower comb, and means for imparting a vibratory movement to the lower comb from the upper comb when said upper comb is near the limit of its forward and rear strokes, substantially as described.

3. In a combing-machine, the combination with an upper comb, and means for reciprocating it, of a lower comb provided with pivoted tooth-carrying bars, and means for rocking the tooth-carrying bars of the lower comb from the upper comb, substantially as described.

4. In a combing-machine, the combination with an upper comb, and means for reciprocating the same, of a lower comb, comprising vertically-adjustable side and pivoted tooth-bars mounted in the side bars, and means for rocking the said tooth-bars from the upper comb, substantially as described.

5. In a combing-machine, the combination, with an upper comb provided with reversible tooth-carrying bars, the teeth of the said bars being inclined, and means for reciprocating the said upper comb, of a lower comb provided with tooth-carrying bars mounted to rock, means, substantially as described, for rocking the toothed carrying-bars of the lower comb by the action of the upper comb, and locking devices for the toothed bars of the lower comb, whereby said toothed bars of the lower comb may be held stationary when desired.

6. In a combing-machine, a comb consisting of side bars and cross-bars rectangular in cross-section having opposing longitudinal edges flattened at the end portions of said cross-bars, enabling the said cross-bars to fit snugly to the side bars, teeth loosely fitted in the cross-bars, and binding-strips attached to the cross-bars and extending over the head portions of said teeth.

7. In a combing-machine, an upper comb and means for reciprocating the same, a lower comb, the comb-bars whereof are pivoted, a trip connection between the comb-bars of the lower comb and the upper comb, and means for adjusting the lower comb to and from the upper comb, for the purpose set forth.

8. In a combing-machine, the combination with an upper comb and means for reciprocating the same, a second comb having pivoted tooth-carrying bars, a shifting-bar connected with the pivoted tooth-carrying bars, and means for operating the shifting-bar from the reciprocating comb, as and for the purpose specified.

9. In a combing-machine, the combination, of an upper comb and means for reciprocating the same, a second comb having pivoted tooth-carrying bars, a shifting-bar, means for operating the shifting-bar from the reciprocating comb, and means, substantially as described, for carrying the pivoted tooth-carrying bars to and from the teeth of the reciprocating comb.

10. In a combing-machine, a comb consisting of side pieces, toothed bars pivoted in the said side pieces, a frame supporting the said side pieces, and pins connected with the pivoted toothed bars, and arranged for locking engagement with the said frame.

11. In a combing-machine, the combination, with an upper comb and means for reciprocating the same, the toothed bars whereof are reversible, of a lower comb having pivoted teeth-carrying bars, and adjusting device whereby the lower comb may be carried to or from the upper comb, and trips connected with the pivoted toothed bars, said trips being adapted for attachment to the frame of the machine, or to be operated upon by the movement of the reciprocating comb, for the purpose set forth.

12. In a combing-machine, the combination, of an upper comb, means for reciprocating the same, a lower comb provided with pivoted teeth, means for rocking said teeth at intervals by the action of the upper comb, a shifting-lever connected with the lower comb and adapted to raise and lower the same, a locking device for the said shifting-lever, a drive-shaft, pedals carried by the drive-shaft, and means, substantially as described for operating the upper comb from the said drive-shaft.

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