Sept. 11, 1923. 1,467,693

C. E. T. SCRIBNER

LAPPING MACHINE

Filed May 26, 1922 5 Sheets-Sheet 1

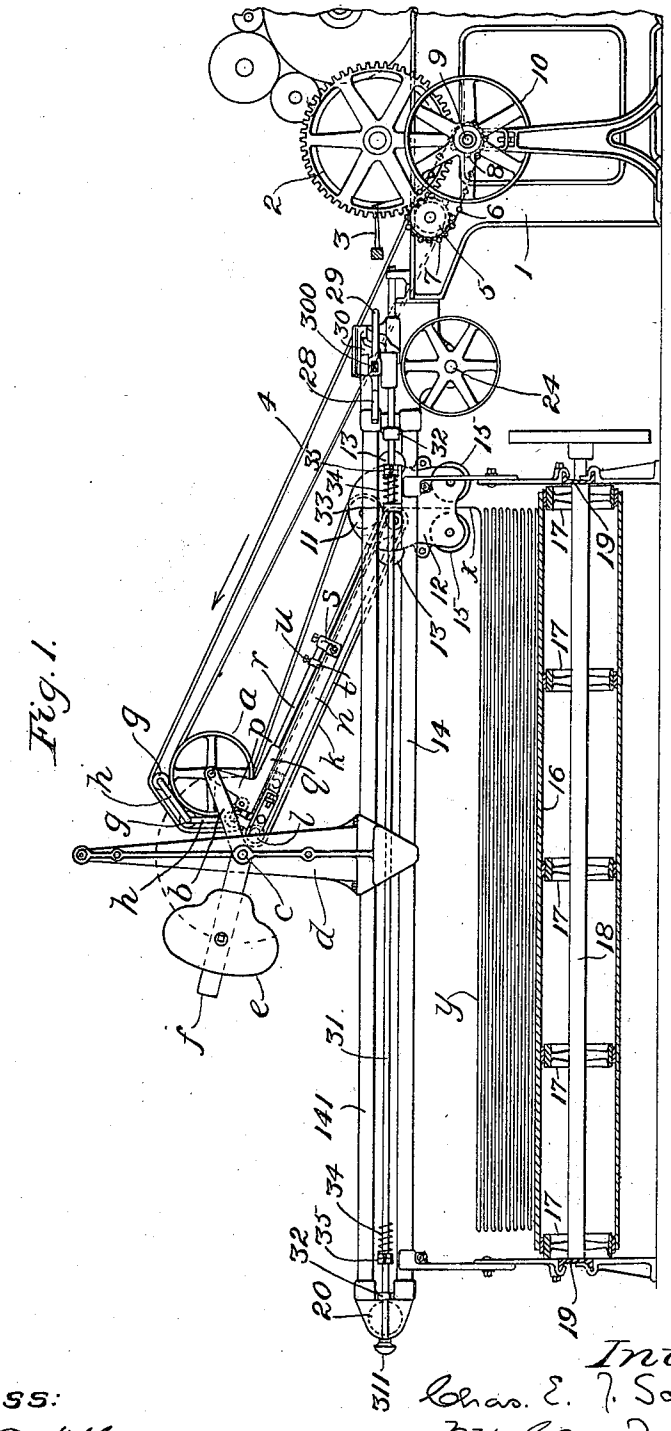

Fig. 1.

Witness:
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Sept. 11, 1923. 1,467,693

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LAPPING MACHINE

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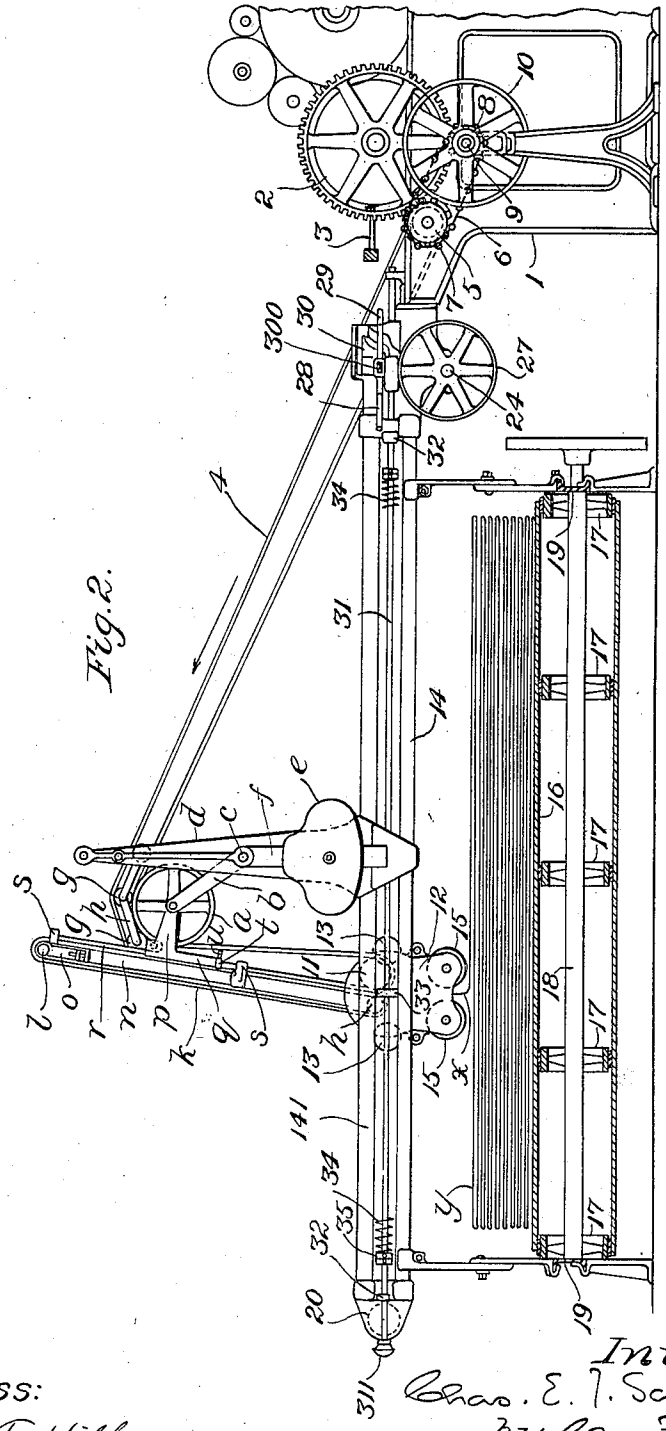

Fig. 2.

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LAPPING MACHINE

Filed May 26, 1922 5 Sheets-Sheet 3

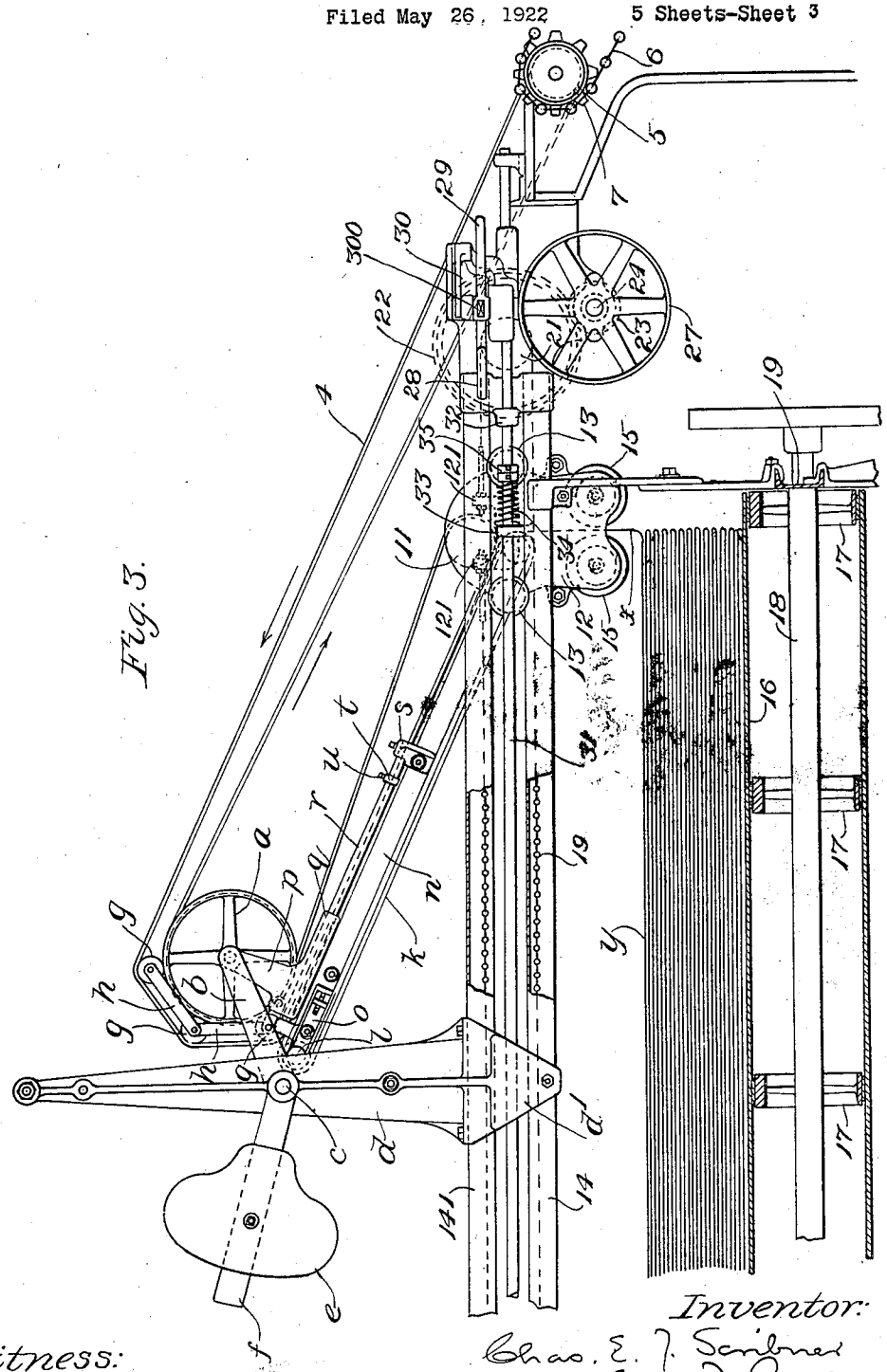

Fig. 3.

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Sept. 11, 1923. 1,467,693

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LAPPING MACHINE

Filed May 26, 1922 5 Sheets-Sheet 4

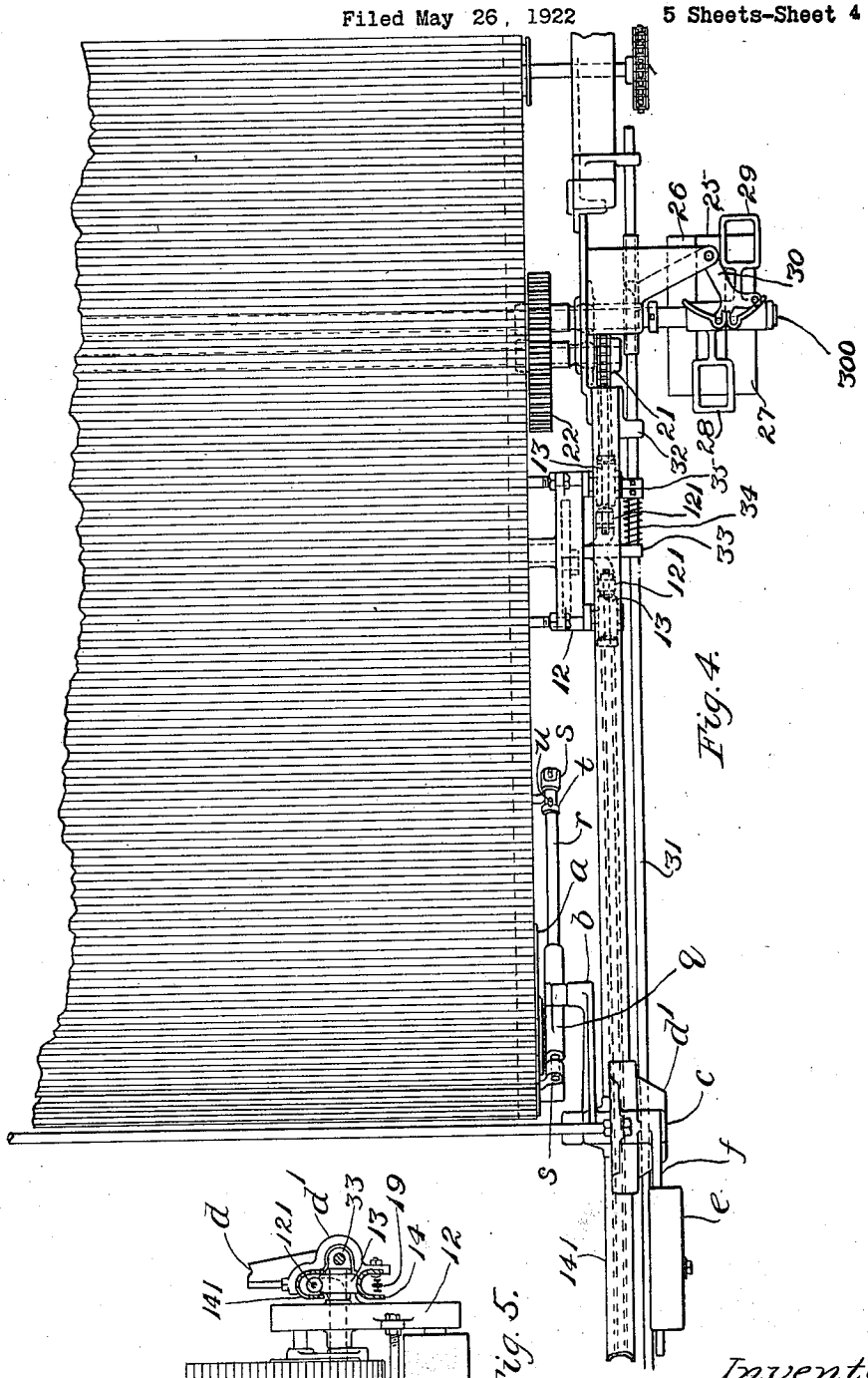

Fig. 4.

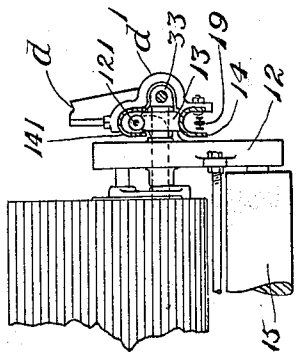

Fig. 5.

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Sept. 11, 1923. 1,467,693

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LAPPING MACHINE

Filed May 26, 1922 5 Sheets-Sheet 5

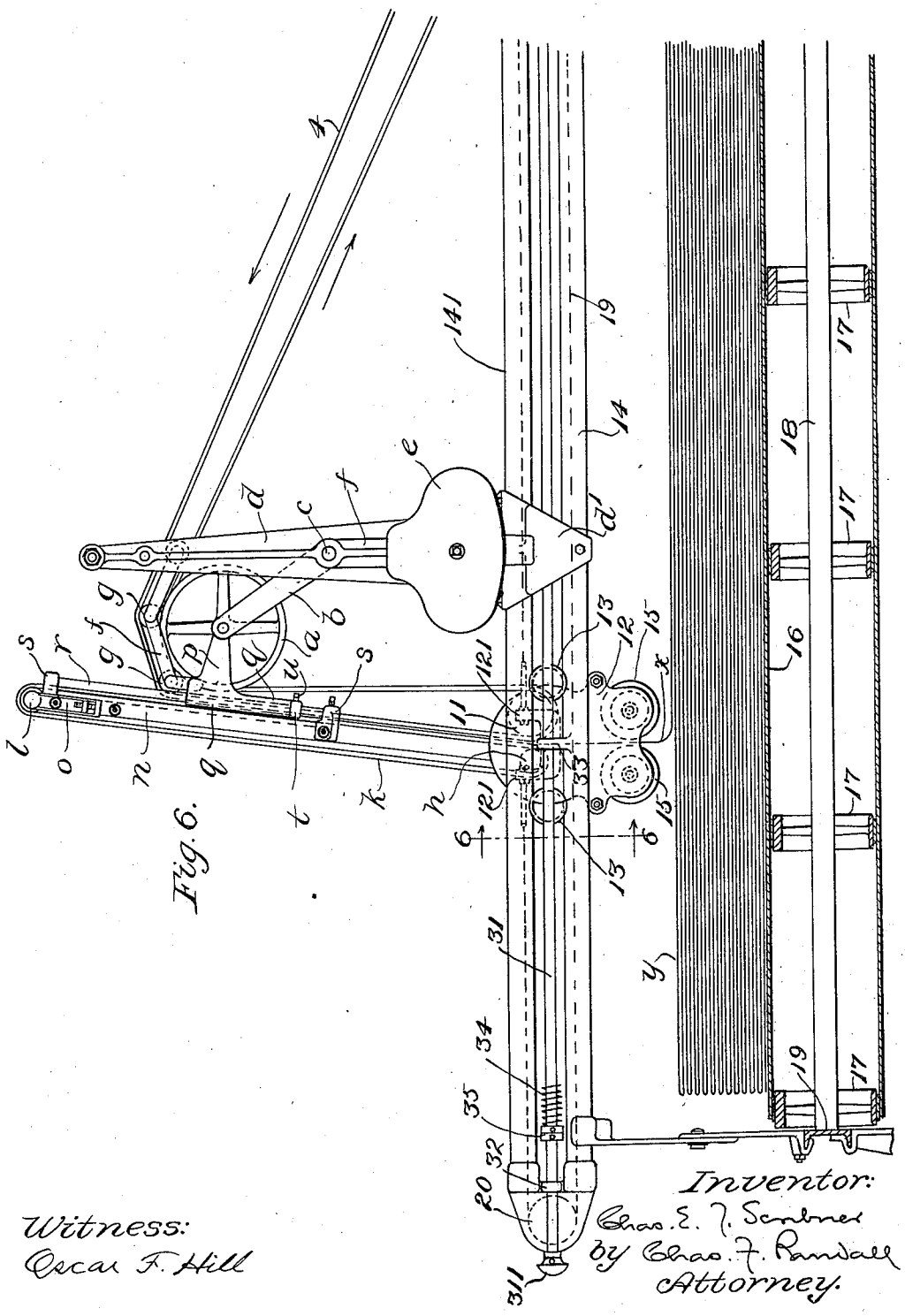

Fig. 6.

Witness:
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Patented Sept. 11, 1923. 1,467,693

UNITED STATES PATENT OFFICE.

CHARLES E. T. SCRIBNER, OF MEDFORD, MASSACHUSETTS.

LAPPING MACHINE.

Application filed May 26, 1922. Serial No. 564,000.

To all whom it may concern:

Be it known that I, CHARLES E. T. SCRIBNER, a citizen of the United States, residing at Medford, in the county of Middlesex, State of Massachusetts, have invented a certain new and useful Improvement in Lapping Machines, of which the following is a specification, reference being had therein to the accompanying drawings.

The invention is an improvement upon lapping machines of the type embracing the well-known so-called camel-back lapper. The general object of the invention is to provide a lapping machine capable of securing all the desirable results that are secured by the camel-back machine, but free from certain serious drawbacks and disadvantages of the latter.

One of the drawbacks or disadvantages of the usual camel-back lapper is the height of the elevated portions of the run-out apron. The height reached by the peak of the said apron ordinarily is seven or eight feet from the floor on which the machine stands, necessitating corresponding head-room.

Another of the said drawbacks or disadvantages is the steep slant or inclination of the carrying-out portion of the said apron, namely the portion thereof extending from the source of fiber-supply to the elevated apex of the camel-back. The steepness increases materially as the delivery portion of the said apron is traversed toward the source of supply in laying the fleece or sliver upon the accumulating apron. It interferes with the upward feed of the leading end of the fleece, either in starting up or following a parting of the fleece. Such steepness of slant or inclination of the carrying-out or ascending portion of the run-out apron produces a tendency of the fleece resting thereon, and moving upward therewith, to part and to roll or slide back upon itself toward the Garnett machine or other source of supply. This tendency makes continuous trouble in handling inferior grades of stock. All partings or breakages necessitate piecings, which are undesirable. In practice, it is an aim of the manufacturer to keep the fleece as smooth and uniform as possible, and hence piecing or joinings by which the uniformity is affected are objectionable. It may further be stated that the lower the grade of the stock which is operated upon, the greater is the tendency to breakage.

Another of the said drawbacks or disadvantages of the usual camel-back lapper is the necessary wide spacing of the accumulating apron, or other receiver upon which the lap is formed, from the Garnett machine or other machine supplying the fleece of fibrous material, and the consequent large amount of floor space occupied by the assembled machine. The accumulating apron of the said lapper is separated from the doffer of the Garnett machine by a distance considerably greater than the distance from the said doffer to a vertical line dropped from the apex of the camel-back in the position of the camel-back corresponding with the innermost position of the traversing carriage with which the delivery portion of the run-out apron is connected. The reason for this is that the said delivery portion and carriage cannot be caused to pass in under the said peak, because the delivery portion must at all times extend outward at a proper inclination to support the portion of fleece extending downward from the apex of the camel-back to the carriage. As such lapper ordinarily is equipped, if the delivery portion should approach too closely to a vertical position, or should be swung inward under the apex of the camel-back, the fleece would tear apart of its own weight. Hence, in ordinary practice heretofore a considerable distance has intervened between the Garnett machine and the accumulating apron, in order to enable such an inclination to be maintained, this extent of spacing involving the occupancy of a relatively large amount of floor-space by the assembled machines.

Specific objects of the invention are to reduce the height of the elevated portions of the run-out apron; to reduce or lessen the pitch or inclination of the carrying-out portion of the said apron; and to enable the apron or other receiver upon which the lap is formed to be located closer to the Garnett machine than heretofore, so as to reduce materially the amount of floor-space occupied by the assembled machines.

An illustrative embodiment of the features of the invention is shown in the accompanying drawings, in which latter,—

Fig. 1 shows a lapper containing the said embodiment, and a portion of a Garnett machine serving to supply fibrous material in the form of a fleece to the run-out apron of the lapper, the parts being shown mainly in side elevation but with the accumulating

or receiving apron on which the lap is formed, and the lap thereon, shown in vertical section. In this view the carriage and the delivery-portion of the run-out apron are at the end of their traverse which is nearer the Garnett machine.

Fig. 2 is a view similar to Fig. 1, but with the carriage, etc., near the outer limit of the traverse.

Fig. 3 is a view on a larger scale than Figs. 1 and 2, showing the right hand portion of the lapper with the parts in the same positions as in Fig. 1.

Fig. 4 is a partial plan view of the parts which are shown in Fig. 3.

Fig. 5 is a partly sectional detail view.

Fig. 6 is a view on the same large scale as Figs. 3 and 4, showing the left hand portion of the lapper with the parts in the same positions as in Fig. 2.

The relation between a lapper embodying my present improvements and a Garnett machine are indicated in Figs. 1 and 2, in which the Garnett machine as an entirety is indicated at 1, 2 being its doffer cylinder, and 3 being the doffer-blade or knife by which the fibrous material is stripped from the doffer-cylinder in the form of a fleece and delivered to the run-out apron 4 of the lapping machine.

At the receiving end of the course of the said run-out apron 4, such apron is shown as encircling a roll 5, (sheaves may be employed if preferred,) located in this instance in close proximity to the doffer-cylinder and driven by means of a sprocket-chain 6 and sprocket-wheels 7, 8, from a shaft 9 actuated by means of a band (not shown) passing around a band-pulley 10 upon said shaft.

The fleece stripped from the doffer-cylinder 2 by the action of doffer-knife or comb 3 is received upon the upwardly and outwardly moving run of the run-out apron 4, and is conveyed by the said apron to the place of discharge upon the receiver. The receiver in this instance is an accumulating apron 16. The said accumulating apron 16 is shown as supported, as in practice heretofore, by means of sheaves or pulleys 17, 17, upon each of a series of shafts 18 mounted on bearings in connection with supports 19, 19. The said shafts are rotated by means of suitable driving connections (not necessary to be described) and the apron is thereby caused to travel transversely with relation to the Garnett machine as usual.

At the delivery end of the course of the run-out apron 4 such apron is shown as encircling a roll 11, one or more sheaves may be employed if preferred, mounted upon a carriage 12 that is supported at each side of the lapper by means of trucks 13, 13, resting and traveling upon a rail 14. In the operation of the machine the carriage is traversed upon the rails 14 back and forth above the accumulating apron or receiver 16, to lay the fleece x thereon in layers to form a lap as y.

In this instance the fleece, after leaving the delivery-portion of the run-out apron, passes as usual between a pair of guide-rolls 15, 15, which are supported by the lower portion of the carriage 12.

The action, so far as running out the fleece as received from the Garnett machine or other source of supply, and depositing the fleece in transverse folds upon the receiver as a result of the traversing movement of the carriage toward and away from the Garnett machine, is substantially as usual.

In this embodiment of the invention the traversing movements of the carriage 12 toward and from the Garnett machine above the accumulating apron are produced by means of a chain 19 with which said carriage 12 is connected, and means whereby said chain is moved first in one direction and then in the other direction. The said chain extends around sprocket-wheels 20, 21, at opposite ends of the track-rails 14, (wheel 21 being shown only in Figs 3 and 5), the ends of the chain being engaged with projections 121, 121, Figs. 3, 4 and 5, rising from the carriage.

The two sprocket-wheels 21 are mounted on a transverse shaft which is in gear connection with a reversibly-driven driving shaft 24 by means of a spur-gear 22, Figs. 3 and 4, fixed to the first mentioned shaft and a driving pinion 23, Fig. 3, fixed upon the shaft 24. Shaft 24 is rotated first in one direction and then in the other by means of a reversible drive in connection with the said shaft. As shown, the reversible drive comprises a fast pulley 25, Fig. 4, on the shaft 24, loose pulleys 26, 27, on the said shaft at opposite sides of fast pulley 25, shippers 28, 29 for open and crossed belts (not shown) and an actuator 30 for the said shippers arranged to rock on a vertical axis and having one arm thereof connecting operatively with a rod 31 extending parallel with track-rail 14. The said rod is mounted in suitable guide-supports 32, 32, at opposite ends of the track-rail. It is moved endwise by the carriage, as the latter nears the end of its traverse in either direction, through the engagement of an ear 33, projecting from the carriage, with a spring 34 in connection with a collar 35, fixed on the rod. As the carriage approaches either edge of the accumulating or receiving apron 16, in nearing one end of the traverse, the ear or projection 33, through engagement with the spring 34 at the corresponding end of the rod 31, moves the rod endwise and causes it to actuate the rocker 30, which in turn actuates the shippers 28, 29, to transfer the open and cross belts aforesaid so as to bring about traverse of the carriage in the opposite direction. The ship-

pers are actuated in like manner, as the carriage arrives at the opposite side edge of the accumulating or receiving apron, to again reverse the direction of movement of the carriage, and so on.

The collars 35 are made adjustable along the rod 31, as by means of clamping screws, so as to enable the limits of the traverse to be adjusted.

It may be stated that the rod 31 is capable of being operated by hand to enable the drive belts to be shifted manually at the will of the operator, whenever such shifting is deemed to be necessary. To this end it is furnished at one end thereof with a handle 311 Figs. 1, 2 and 6.

I have shown shipper devices which are so constituted as to enable the operator to place the driving arrangements in neutral, with the crossed and open belts both on the loose pulleys 26, 27, and with the lapping machine standing still. As shown, the shippers 28, 29, are separately sleeved on a long rectangular guide-bar 300 projecting outward from a fixed support. The hub or sleeve of each shipper has an upstanding web which is curved so that when a given shipper is in the extreme position which it occupies when its belt is in the corresponding loose pulley the curve of such web is concentric with the vertical axis around which the rocker 30 swings. The inner portion of the web is shaped to form a notch or recess and an engaging projection. The rocker 30 carries oppositely located pins which respectively are designed to cooperate with the curved and notched portions of the webs of the respective shippers. In either extreme position of the rocker one pin occupies the notch of one shipper, the latter being thereby held in position to hold its belt on the fast pulley 25, while the other pin is alongside the curved portion of the web of the other shipper, the latter being in position to hold its belt on the corresponding loose pulley. If now the rocker is actuated, the pin first mentioned will act against one side of the notch which it occupies, to cause the corresponding shipper to move its belt over upon a loose pulley. Meanwhile the other shipper will remain at rest as the second pin moves along the curved web of such shipper, until such pin encounters the stop projection at the opposite side of the notch of such web, whereupon through pressure against such stop projection the rocker pin will actuate the second shipper to move its belt from the corresponding loose pulley to the fast pulley, thereby reversing the traverse of the carriage. From the preceding description it will be apparent that by moving the rocker far enough to shift one shipper from the intermediately located fast pulley to one loose pulley and then discontinuing the movement of the rocker before it has begun to move the other shipper the traverse may be arrested.

It is to be understood that the description thus far is chiefly introductory, and that the parts, etc., which have been referred to therein may in general be modified more or less in practice.

Reference will now be made to the main feature of my invention; namely, a take-up roll for the run-out apron, moving to take up slack of the apron as well as to pay out the latter, located normally adjacent the middle of the traverse, around and under which the run-out apron doubles back upon itself in the traversing movement toward the receiving portion of the apron. The illustrated embodiment of the invention comprises guide and tension roll *a*, which in practice is constituted of a set of sheaves located at convenient distances apart upon a supporting shaft. To provide for movement of the said roll or set of sheaves in the same general direction as the traverse, which is horizontal or substantially so, such roll or set of sheaves, is revolubly mounted on arms *b* mounted pivotally as at *c* on opposite stands *d* rising from and fixed to the rail 14 and a companion rail 141 located above rail 14. Also an overbalancing weight *e* is mounted upon an arm *f* projecting from the pivot or journal of each arm *b*. The intermediate portion of the return run of the run-out belt 4 passes over and around the said roll or set of sheaves *a*. The intermediate portion of the advancing or carrying-run of the said apron also passes over and partly around the roll or set of sheaves *a*, but is held out of contact with the return run by means of a set of separating rolls or sheaves *g* interposed between the said two runs. Thereby the two runs of apron 4 are held out of frictional engagement with each other, and the movement of the two runs in opposite directions with respect to each other is facilitated.

The rolls *g*, *g*, are kept spaced apart at proper distances from one another by means of spacing links *h*, *h*, located at opposite side edges of the apron 4 and in pivotal engagement with the ends of rolls *g*, *g*. They are kept in proper working relation with respect to roll or sheaves *a* by having the end-link engaged with the adjacent radius-arm *p* to which reference is made later herein.

The action of the weight *e*, which latter may be replaced by a spring or springs, is to cause the roll or sheaves *a* to keep the run-out apron 4 constantly taut. As the carriage 12 travels from its position in Figs. 1 and 3 adjacent the Garnett machine toward the opposite end of its traverse, the roll or sheaves *a* is actuated to travel in an approximately horizontal curved path in

the same general direction, so as to take up the amount of the run-out apron that is yielded up by the movement of the carriage from its position in Figs. 1 and 3 to its intermediate position shown in Figs. 2 and 6. As the carriage proceeds from the said intermediate position shown in Figs. 2 and 6 to the outer end of its traverse the roll or sheaves *a* will yield downward to pay out the run-out apron sufficiently to accommodate such portion of the traverse. As the carriage moves reversely from the outer end of the traverse, the weight *e*, it being at such time in a more or less raised position at the right of the pivot *c*, will actuate the roll or sheaves *a* to take up the slack of run-out apron yielded up by the first portion of the inwardly traveling movement of the carriage. As the carriage in its inward traversing movement passes the position occupied in Figs. 2 and 6, the tightening of the run-out apron 4 around the roll or sheaves *a* will draw the latter in the same general direction against the resistance of the weight *e*, or substituted spring or springs. The result will be that the run-out apron will be maintained at all times in a state of uniform tension by means of the roll or sheaves *a*, which will alternately take up and pay out the run-out apron as the carriage moves from one end of its traverse to the other, and vice versa. It will be observed that the pivotal mounting of the movable support for the roll or sheaves *a* is intermediate the opposite extreme of the traverse movements of the carriage, and that the roll or sheaves will move from one side to the other of said pivotal mounting, and vice versa, in unison with the movements of the carriage. One effect of weight *e* is to cause the carriage to reverse at either end of its traverse quickly and readily.

The positions of the roll or sheaves *a* are at all times much lower than the height of the apex of an ordinary camel-back. As a result of the location of the guide or take-up roll or sheaves *a* intermediately with relation to the opposite extremes of the traverse, the ingoing movement of the carriage takes the carriage, as in Figs. 1 and 3, directly under the portions of run-out apron 4 that extend between the Garnett machine and the roll or sheaves *a*.

As the carriage moves inward from its extreme outward position at the left, the portions of the run-out apron 4 which extend downward from roll or sheaves *a* to the carriage gradually assume a vertical position (Figs. 2 and 6) and then are carried in under the other portions of said apron as in Figs. 1 and 3. Hence, for the greater part of the movements of the carriage it is necessary to provide a surface in connection with the descending run of apron 4 to support and control the fleece intermediate the roll or sheaves *a* and the carriage and preferably assist in the feeding thereof. In present instance I have provided an auxiliary apron *k*, located close to and parallel with the said descending run, and in addition a supporting roll *l* for the upper portion of said apron adjacent the roll or sheaves *a*, and a guide-roll *h* for the lower portion of said apron. The roll *h* is mounted in bearings in connection with the carriage 12. The upper roll *l* is mounted in bearings in connection with the upper ends of side bars *n* which at their lower ends are hung in connection with the carriage 12 so as to swing concentrically with the said lower roll *h*. The said bearings of the upper roll *l* are provided in supporting pieces *o* that are adjustable longitudinally on the side bars *n* to suit the length of the auxiliary apron *k*.

The apron *k* is maintained with one surface thereof in working relations with the descending portion of the carrying-run of the run-out apron 4 by means of radius arms *p* which are hung concentrically with the roll or sheaves *a* and formed with elongated guides *q* through which extend rods *r* held at their upper and lower ends by brackets *s*, *s*, that are attached to side bars *n*. The said surface of apron *k* holds the fleece close to and in contact with the descending run of the apron 4, keeping it in engagement with such run, preventing it from falling away therefrom and from slipping down, and safeguarding the fleece from breaking apart.

As the carriage 12 traverses from its position in Figs. 1 and 3 to its position in Figs. 2 and 6, and on to the opposite extreme of the traverse, and back again, the rods *r* slide endwise within the guides *q*, as the auxiliary apron shifts lengthwise relative to the adjacent portion of the carrying-out run of the run-out apron 4.

Having reference to Figs. 2 and 6, it will be understod that as the carriage 12 moves toward the right from its position in such figures the pull of the apron 4 will be exerted for a part of the time upon the roll or sheaves *a* in a line passing through or near the pivoted center *c*. That is to say: the said pull for a part of the time will be exerted on or approximately on dead center; hence, lagging or dwelling of the roll or sheaves *a* in the position shown in Figs. 2 and 6 might continue for a part of the movement of the carriage to the right from its position in Figs. 2 and 6. In order to obviate such dwell, I provide a helper in the shape of a collar *t* that is fixed on bar *r* by means of a clamping screw *u*, and that is designed to act against the lower end of a guide *q* in the endwise movement of bar *r* upward through the said guide. See Figs. 2 and 6. Thereby, the swinging supports

for the roll or sheaves *a* are moved upward around the pivotal center *c* so as to carry the axis of the roll or sheaves *a* past the dead center.

A further improvement consists in making the rails 14 and 141 of U-shape in cross-section. See Figs. 3 and 5. The open sides of these rails are turned downward. That is to say, the rails occupy in the machine the inverted positions shown in Figs. 3 and 5, one above the other. The upper and lower runs of the chain 19 are extended lengthwise under the U-shaped rails, within the latter, and are thereby concealed and protected from injury and from accumulation of lint, etc.

The trucks 13, 13, of the traverse carriage 12, as shown best in Fig. 5, rest and run upon the top of the lower rail 14. The lugs or projections 121, 121, with which the ends of chain 19 are engaged project upward from the carriage into the hollow of the upper rail 141. The edges of the upper rail are vertically over hubs upon opposite sides of the trucks 13, 13, so as to prevent the carriage from lifting. To afford clearance for the lug 33 projecting outward from the carriage 12 for engagement with the buffer-springs 34, 34, to actuate the rod 31 of the shipper mechanism, the foot portion of the standard *d* is formed with an outwardly curved portion *d'*, Fig. 5, having at its inner side a transverse recess through which the said lug is capable of passing as the carriage traverses back and forth.

What is claimed as the invention is:—

1. The combination with a receiver upon which a lap of fibrous material is formed of successive folds of fleece or sliver laid thereon, a run-out apron for said fleece or sliver located above said receiver and having a receiving portion thereof extended toward a source of supply at one side of the receiver, and means for traversing the delivery portion of the run-out apron back and forth above the receiver, of a take-up roll for the run-out apron, moving to take up slack of the apron as well as to pay out the latter, located normally adjacent the middle of the traverse, around and under which the run-out apron doubles back upon itself in the traversing movement toward the said receiving portion.

2. The combination with a receiver upon which a lap of fibrous material is formed of successive folds of fleece or sliver laid thereon, a run-out apron for said fleece or sliver located above said receiver and having a receiving portion thereof extended toward a source of supply at one side of the receiver, and means for traversing the delivery portion of the run-out apron back and forth above the receiver, of a guide or take-up roll for the run-out apron, movable in the same general direction as the traverse, to take up slack and to pay out, located adjacent the middle of the traverse and around and under which the run-out apron doubles back upon itself in the traversing movement toward the said receiving portion.

3. The combination with a receiver upon which a lap of fibrous material is formed of successive folds of fleece or sliver laid thereon, a run-out apron for said fleece or sliver located above said receiver and having a receiving portion thereof extended toward a source of supply at one side of the receiver, and means for traversing the delivery portion of the run-out apron back and forth above the receiver, of a guide or take-up roll for the run-out apron, means for guiding said roll in a curvilinear path in the same general direction as the traverse, located adjacent the middle of the traverse and around and under which the run-out apron doubles back upon itself in the traversing movement toward the said receiving portion.

4. The combination with a receiver upon which a lap of fibrous material is formed of successive folds of fleece or sliver, laid thereon, a run-out apron for said fleece or sliver located above said receiver and having a receiving portion thereof extended toward a source of supply at one side of the receiver, and means for traversing the delivery portion of the run-out apron back and forth above the receiver, of a guide or take-up roll for the run-out apron, movable in the same direction as the traverse, located adjacent the middle of the traverse, and around and under which the run-out apron doubles back upon itself in the traversing movement toward the said receiving portion and a yieldingly actuated supporting arm for said roll.

5. The combination with a run-out apron for fleece or sliver, and means for traversing the delivery portion of the run-out apron back and forth, of a horizontally movable guide or take-up roll for the run-out apron, located normally adjacent the middle of the traverse, and around and under which the run-out apron doubles back upon itself in the traversing movement toward the source of supply, and an auxiliary apron paralleling the delivery portion of said run-out apron from a point adjacent the said guide or take-up roll, and adapted to confine and support the fleece or sliver while said delivery portion is doubled back under.

6. The combination with a reciprocating carriage, guides on which the carriage travels in its reciprocating movement, and a run-out apron having its delivery portion engaged with said carriage, of a take-up roll for the intermediate portion of said apron, moving horizontally or substantially so to take up slack of the apron as well as to pay out the latter as the carriage

travels back and forth, and normally located adjacent the middle of the traverse.

7. The combination with a reciprocating carriage, guides along which the carriage travels in its reciprocating movement, and a run-out apron having its delivery portion engaged with the carriage, of a take-up roll for the intermediate portion of the apron, and a movable support providing for horizontal or substantially horizontal movement of said roll to take up slack in such apron or pay out the apron as the carriage reciprocates.

8. The combination with a reciprocating carriage, guides along which the carriage travels in its reciprocating movement, and a run-out apron having its delivery portion engaged with the carriage, of a take-up roll for the intermediate portion of the apron, a support for said roll, and means for actuating said support to take up slack in the apron by horizontal or substantially horizontal movement of the roll.

9. The combination with a reciprocating carriage, guides along which the carriage travels in its reciprocating movement, and a run-out apron having its delivery portion engaged with the carriage, of a take-up roll for the intermediate portion of the apron, a support for said roll providing for horizontal or substantially horizontal movement of said roll to take up slack in the apron or pay out the apron as the carriage reciprocates, an auxiliary apron, and supporting means therefor keeping it parallel with the delivery portion of the run-out apron, connected with the carriage and also with the movable take-up roll support.

10. The combination with a reciprocating carriage, and a run-out apron having its delivery portion engaged with the carriage, of a take-up roll around which the intermediate portion of the apron changes direction, swinging supports for said roll, movable to cause the latter to take up or pay out slack by movement in a horizontal or substantially horizontal direction, an auxiliary apron, and supporting means therefor keeping it close to the delivery portion of the run-out apron, connected with the carriage and also with the swinging take-up roll supports.

11. The combination with a reciprocating carriage, and a run-out apron having its delivery portion engaged with the carriage, of a take-up roll around which the intermediate portion of the apron changes direction, a roll-support movable to cause the take-up roll to take up slack or pay out apron by movement in a horizontal or substantially horizontal direction, an auxiliary apron, supporting means therefor keeping it close to the delivery portion of the run-out apron and connected with the carriage, and a radius arm connected with the axis of the take-up roll and with which the said supporting means is movably engaged.

12. The combination with a reciprocating carriage, and a run-out apron having its delivery portion engaged with the carriage, of a take-up roll around which the intermediate portion of the apron changes direction, a swinging roll-support movable to cause the take-up roll to take up slack or pay out apron by movement of the roll in a horizontal or substantially horizontal direction, an auxiliary apron, supporting means therefor connected with the carriage, and a radius arm connected with the axis of the take-up roll and with which the said supporting means is engaged with adaptability for relative sliding lengthwise of the auxiliary apron.

13. The combination with a reciprocating carriage, and a run-out apron having its delivery portion engaged with the carriage, of a take-up roll around which the intermediate portion of the apron changes direction, a roll-support movable to cause the take-up roll to take up slack or pay out apron by movement of the roll in a horizontal or substantially horizontal direction, an auxiliary apron, supporting means therefor connected with the carriage, and a guide for such supporting means connected with the said roll-support.

14. The combination with a reciprocating carriage, and a run-out apron having its delivery portion engaged with the carriage, of a take-up roll around which the intermediate portion of the apron changes direction, a swinging roll-support movable to cause the take-up roll to take up slack or pay out apron by movement in a horizontal or substantially horizontal direction, an auxiliary apron, supporting means therefor connected with the carriage, a guide for such supporting means connected with the said swinging roll-support, and means connected with such supporting means for helping the roll-support and roll around dead center.

15. The combination with a reciprocating carriage, and a run-out apron having its delivery portion engaged with the carriage, of a take-up roll around which the intermediate portion of the apron changes direction, a swinging roll-support movable to cause the take-up roll to take up slack or pay out apron by movement in a horizontal or substantially horizontal direction, an auxiliary apron, supporting means therefor connected with the carriage, a guide for such supporting means connected with the said roll-support, and means connected with the said supporting means adapted to engage the said guide to actuate the swinging roll-support so as to help it and the take-up roll around dead center.

16. In a lapper, the combination with the reciprocating fleece-laying carriage, and

its actuating chain, of guide-rails of U-shape in cross-section, having their open sides facing downward, and within which the two runs of said chains are enclosed, hidden, and shielded.

17. In a lapper, the combination with the reciprocating fleece-laying carriage having trucks or rolls provided with projecting hubs, and its actuating chain, of upper and lower guide-rails of U-shape in cross-section having their open sides facing downward, and within which the two runs of said chains are enclosed, hidden, and shielded, the curved top of the lower rail constituting a track for the trucks or rolls of the carriage, and the edges of the upper rail cooperating with the said projecting hubs to prevent the trucks or rolls from rising from said track.

18. The combination with a reciprocating carriage, and a run-out apron having its delivery portion engaged with said carriage, of a take-up roll for the intermediate portion of said apron with which the return-run of the apron engages, a movable support for said roll, a series of sheaves loosely working between the two runs of the apron around the said roll, and means for keeping said sheaves properly spaced apart.

19. The combination with a run-out apron for fleece or sliver, and means for traversing the delivery portion of said apron back and forth, of a guide and take-up roll for the intermediate portion of the apron, movable in the same general direction as the traverse, and means paralleling the delivery portion of the run-out apron from a point adjacent the said roll and serving to confine and support the fleece or sliver while said delivery portion is doubled back under.

20. The combination with a run-out apron for fleece or sliver, and a reciprocating carriage with which the delivery portion of said apron is connected, of a take-up roll for the intermediate portion of said apron, moving horizontally or substantially so to take up slack of the apron as well as to pay out the latter as the carriage travels back and forth, a radius-arm extending from the axis of said roll, and means, connecting with the carriage and with said radius-arm, paralleling the delivery portion of the apron and operating to confine, guide and support the fleece or sliver while said delivery portion is doubled back under.

21. The combination with a receiver upon which a lap of fibrous material is formed of successive folds of fleece or sliver laid thereon, a run-out apron for said fleece or sliver located above said receiver and having a receiving portion thereof extended toward a source of supply at one side of the receiver, and means for traversing the delivery portion of the run-out apron back and forth above the receiver, of take-up means for the run-out apron, moving to take up slack of the said apron as well as to pay out the latter, located normally adjacent the middle of the traverse, around and under which the run-out apron doubles back upon itself in the traversing movement toward the said receiving portion, and retaining means having a surface paralleling the delivery portion of the run-out apron and adapted to confine and support the fleece or sliver while said delivery portion is doubled back under.

22. The combination with a receiver upon which a lap of fibrous material is formed of successive folds of fleece or sliver located above said receiver and having a receiving portion thereof extended toward a source of supply at one side of the receiver, and means for traversing the delivery portion of the run-out apron back and forth above the receiver, a take-up means for the run-out apron, movable in the general direction of the traverse, moving to take up slack of the said apron as well as pay out the latter, located normally adjacent the middle of the traverse, around and under which the run-out apron doubles back upon itself in the traversing movement toward the said receiving portion, and retaining means having a surface paralleling the delivery portion of the run-out apron and adapted to confine and support the fleece or sliver while said delivering portion is doubled back under.

23. The combination with a run-out apron for fleece or sliver, and means for traversing the delivery portion of the run-out apron back and forth, of a horizontally movable guide or take-up roll for the run-out apron, located normally adjacent the middle of the traverse, and around and under which the run-out apron doubles back upon itself in the traversing movement toward the source of supply, and retaining means having a surface paralleling the delivery portion of the run-out apron and adapted to confine and support the fleece or sliver while said delivery portion is doubled back under.

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

CHARLES E. T. SCRIBNER.

Witnesses:
CHAS. F. RANDALL,
ELLEN O. SPRING.