(No Model.) 4 Sheets—Sheet 1.

J. C. THICKINS.

AUTOMATIC OILER FOR LUBRICATING WOOL.

No. 324,612. Patented Aug. 18, 1885.

Fig. 1.

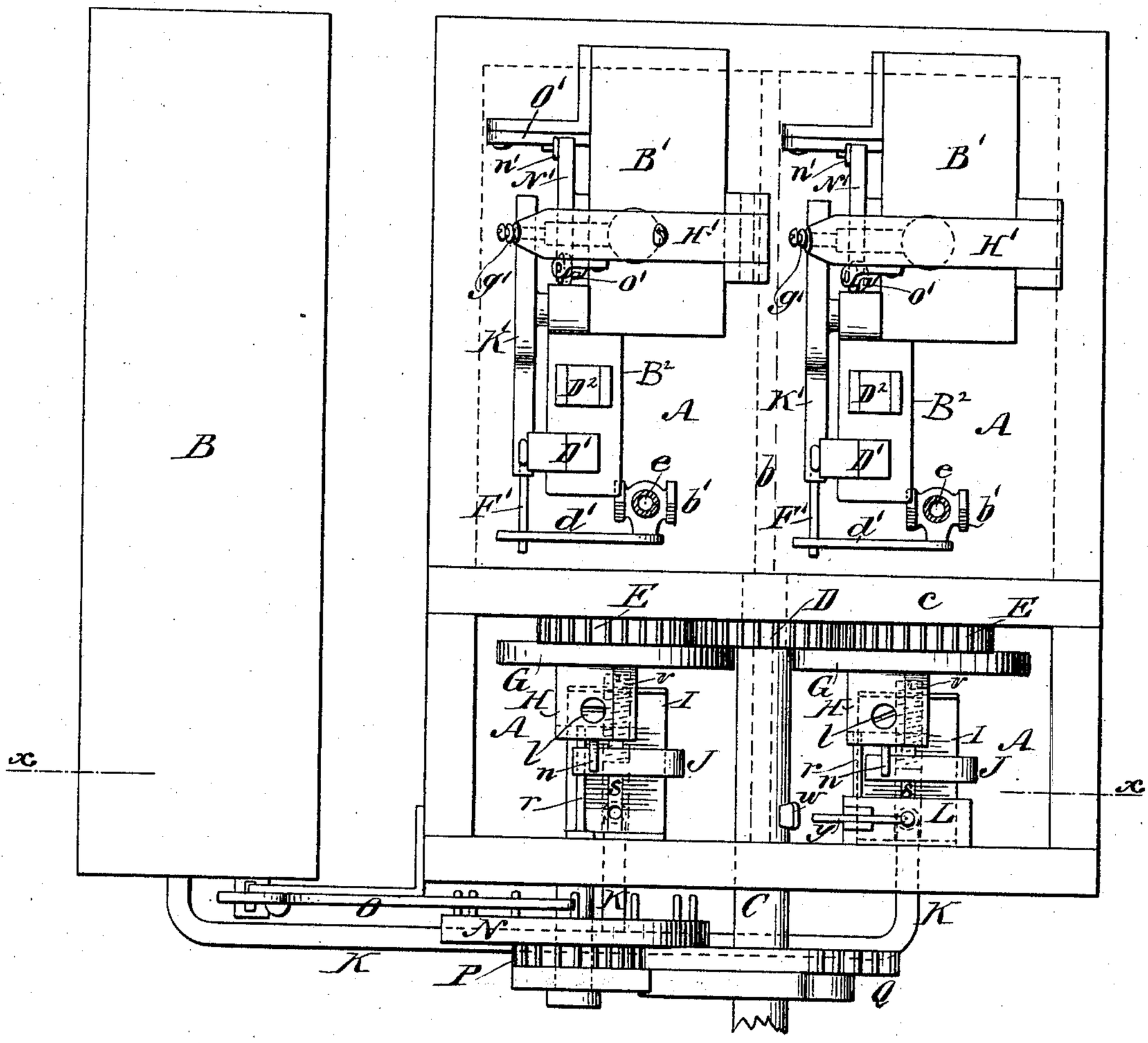
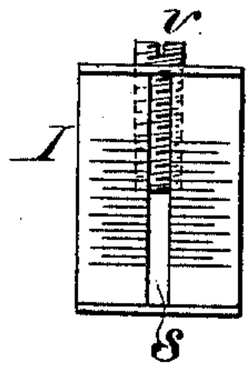


Fig. 6.



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C. Sedgwick

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J. C. THICKINS.

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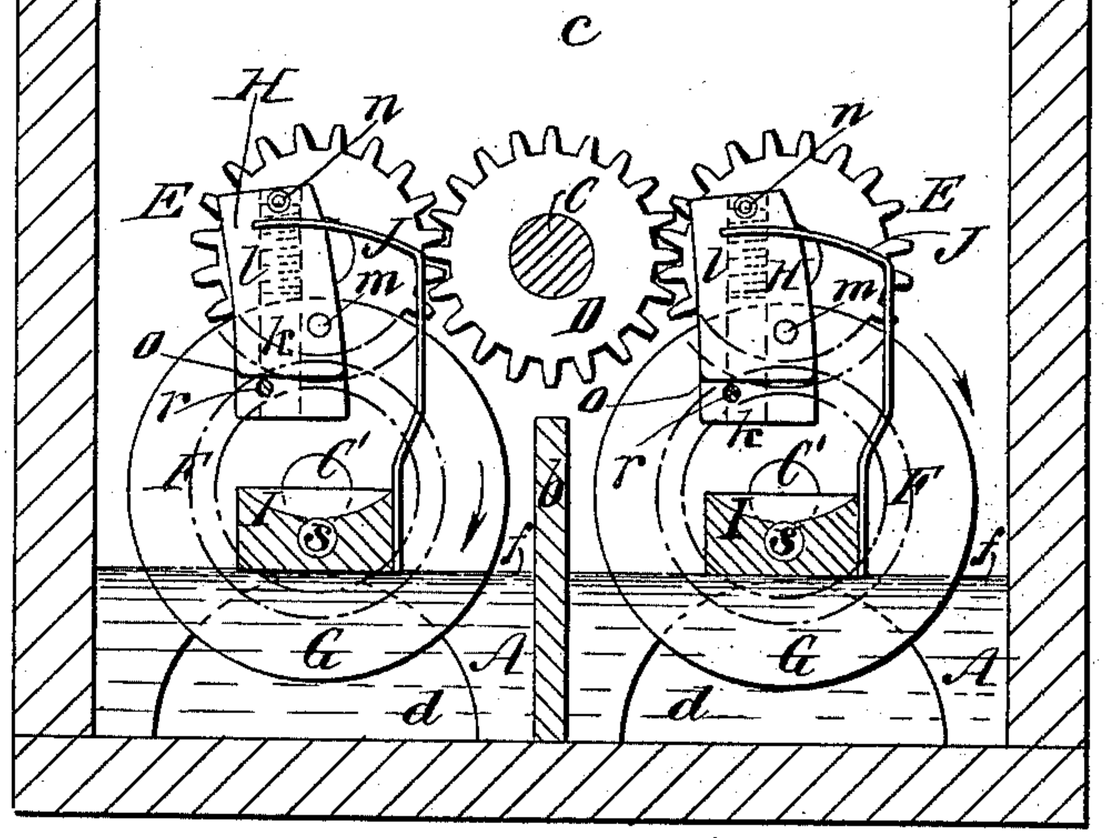
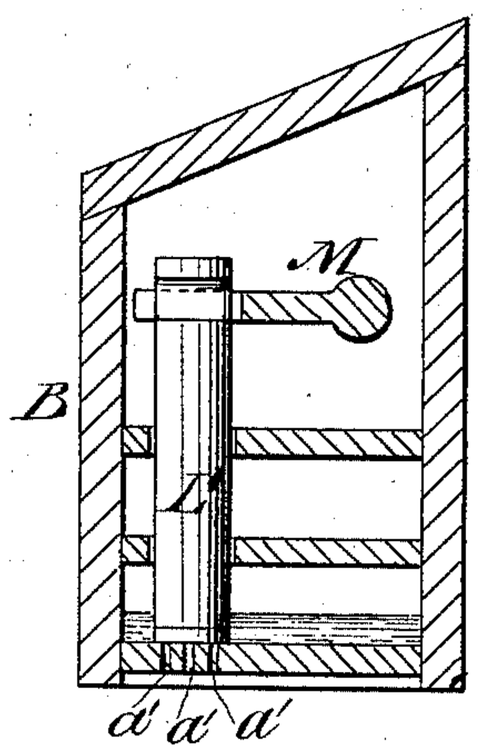
Fig. 2.





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(No Model.) 4 Sheets—Sheet 3.

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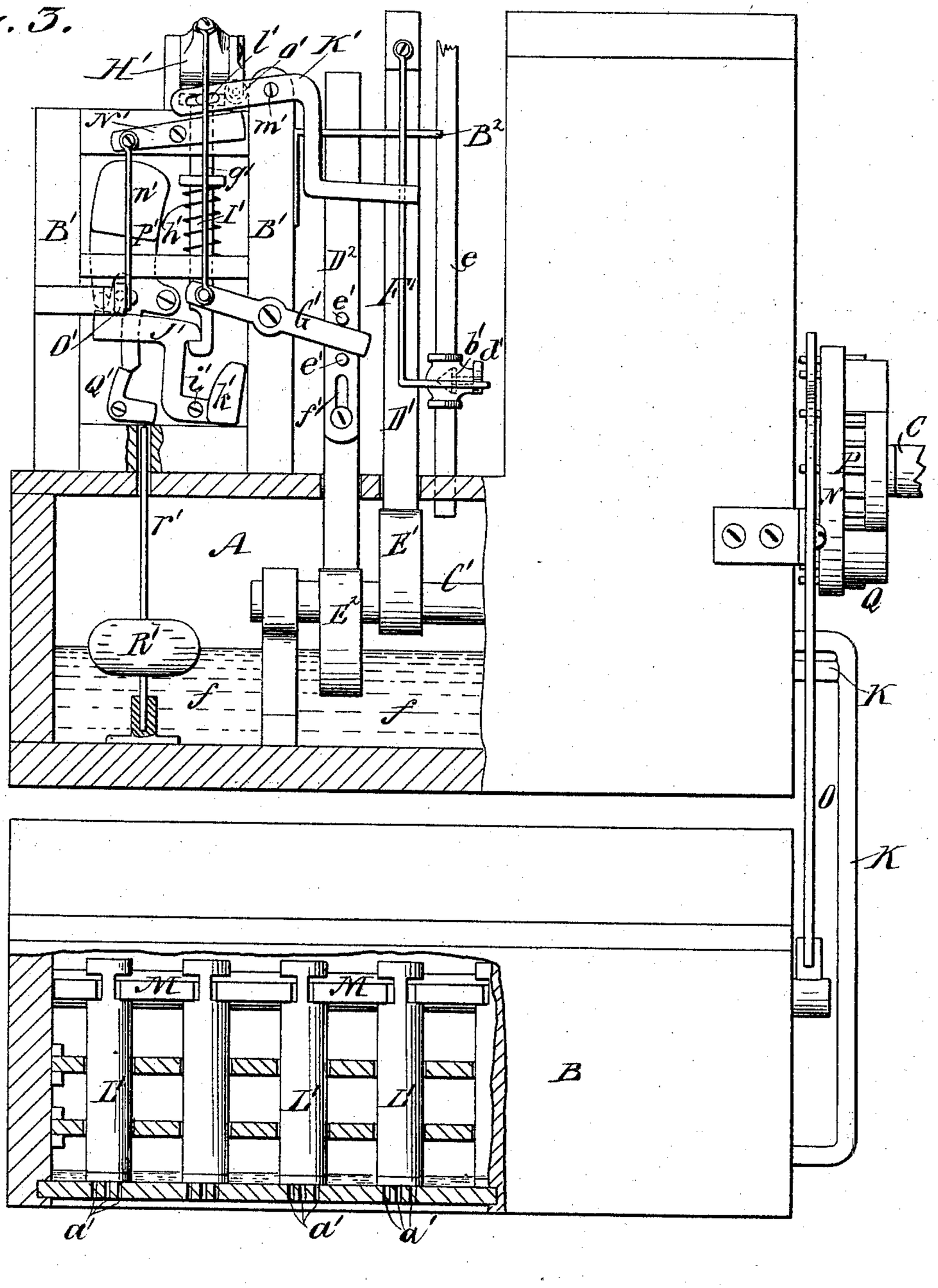
AUTOMATIC OILER FOR LUBRICATING WOOL.

No. 324,612. Patented Aug. 18, 1885.

Fig. 3.



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(No Model.)

4 Sheets—Sheet 4.

J. C. THICKINS.

AUTOMATIC OILER FOR LUBRICATING WOOL.

No. 324,612. Patented Aug. 18, 1885.

Fig. 4.

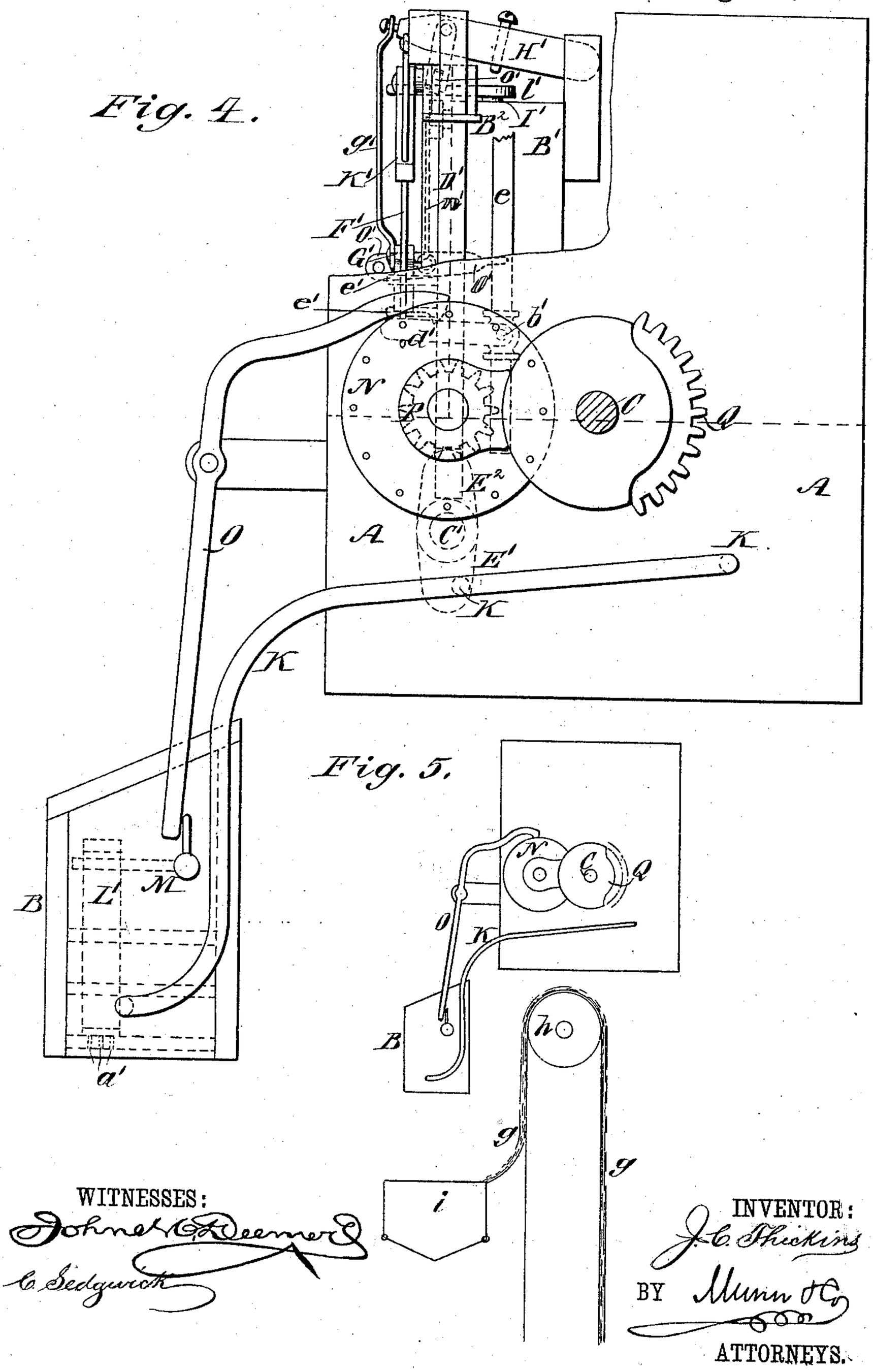

Fig. 5.

WITNESSES:

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UNITED STATES PATENT OFFICE.

JOHN C. THICKINS, OF HINSDALE, MASSACHUSETTS.

AUTOMATIC OILER FOR LUBRICATING WOOL.

SPECIFICATION forming part of Letters Patent No. 324,612, dated August 18, 1885.

Application filed October 3, 1884. (No model.)

To all whom it may concern:

Be it known that I, JOHN C. THICKINS, of Hinsdale, in the county of Berkshire and State of Massachusetts, have invented a new and Improved Automatic Oiler for Lubricating Wool, of which the following is a full, clear, and exact description.

It is usual to soften and lubricate the fibers of wool before carding, so that in the operations to which the wool is subjected the fibers may not by abrasion and friction injure the natural barbs with which they severally are armed. This preservation of the delicate barbs is not only important when the wool has to be worked up into fulled goods, but also when it is manufactured into goods which require little or no fulling; otherwise the fibers, by becoming interlocked in passing through the cards, will destroy each other. Various kinds of oil, or oil or saponifying agents mixed with water, and sometimes water alone, have been used for the purpose; but, apart from water being an inferior agent, the rapid evaporation renders it much less desirable than oily or fatty materials with or without an admixture of water.

Many attempts have been made to oil the wool as or just before it enters into the carding-engine, and there are many objections and much risk in oiling it in large quantities beforehand, conspicuous among which are the greasy walls and oil-saturated floors—as for instance, when oiling at the picker—besides which it is practicable to oil at the carding-engine much more evenly and in a more controllable manner. This has been very imperfectly accomplished by oiling the wool after being spread upon the feed-table and flattened thereon in a compact mass.

My invention has for its object the production of an oiling and measuring apparatus whereby all the fibers shall receive proportionate or equal lubrication, the amount of which shall be under perfect control by the carder, and be applied at the carding-engine or immediately before the wool passes thereto; and conspicuous among its novel features are means for oiling the wool as or after it has been passed in weighed quantities by any suitable automatic weigher and feeder for the first breaker-cards; also means for automatically shutting off the lubricating material whenever the card is stopped, and supplying it again simultaneously with the starting up of the card. It also embraces various details for perfecting the general and special action of the apparatus, substantially as hereinafter described.

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

Figure 1 represents a plan view of the main or leading features of an apparatus embodying my invention; Fig. 2, a vertical section of the same, on the line *x x* in Fig. 1; Fig. 3, a partly broken front elevation, and Fig. 4 a partly broken side view thereof. Fig. 5 is a diagram illustrating the arrangement of the apparatus relatively to the weighing-box of an automatic weigher and feeder of the wool to a carding-engine. Fig. 6 is a detail view of a measurer of the lubricating agent.

In the drawings, the apparatus is represented as provided with two tanks or receptacles, A A, arranged side by side for reception of different lubricating or softening liquids—as, for instance, oil and water, or oil or a saponifying agent in the one tank and water in the other—according to the requirements of the manufacturer; but only one tank containing a single lubricating agent may be used, if desired, or the two tanks containing different agents be used either separately or collectively, as desired, like means being employed in connection with both tanks for regulating and supplying the lubricating or softening agents which they contain.

These tanks A A are separated longitudinally by a vertical partition, *b*, and are each divided transversely near their delivery ends by a wall or partition, *c*, at the bottom of which are passages *d d*, for the free circulation of the lubricating or dampening and softening agents throughout the whole length of the tanks. Said tanks are supplied with their respective liquids or mixtures by pipes *e e* from suitable upper supply-tanks, and to secure a proper operation of the apparatus means are provided, substantially as hereinafter described, for maintaining the liquids or mixtures *f f* in the tanks A A at fixed or uniform levels.

The whole apparatus is designed to be arranged in the upper part or immediately over an automatic feeder of the wool to the first

breaker-cards, such as shown in the patent of Bramwell, No. 216,373, dated June 10, 1879, and in which the stock to be fed into the card is accurately weighed, and the weighed stock evenly distributed over a portion of the feed-apron, the wool *g* (see Fig. 5) being passed by the automatic feeder over a roller, *h*, from which it passes down into a weighing-box, *i*, provided with an opening and closing bottom, that after a certain weight of wool has been fed into the box opens and discharges the weighed wool onto the feed-apron.

My oiler and measurer is so arranged that the sprinkling-chamber B of it, which is connected, as hereinafter described, with the tanks A A, is immediately over or in the weighing box or receptacle *i*, to distribute the liquid or mixture in measured quantities over and among the wool in said box, thus securing a uniform and exact distribution.

C is a rotating main or operating horizontal shaft arranged to extend outward from the one side or end of the tanks A A and to project within the delivery portion of the same over the dividing-partition *b*. On the inner end portion of this shaft C is a spur-wheel or pinion, D, having in gear with it on opposite sides of its axis spur-wheels or pinions E E, which in their turn gear with lower pinions, F F, arranged on shafts C′, and having connected with them disks G G for operating buckets H H, that serve to lift the lubricating or liquid agents from the delivery ends of the tanks A A, and to deliver the same into measures I I, arranged to occupy positions within the delivery portions of the tanks A A above the level of the lubricating or liquid agents therein or with their upper surfaces above the level thereof. As each of these buckets and measurers and means for operating and adjusting them are or may be the same, it will be sufficient to describe the one of them. Each bucket H, which is of elongated form, has the bottom of its chamber *k* closed by a regulating-screw, *l*, to vary the capacity of the bucket, and so provide for determining or assisting in regulating the volume of the lubricating agent supplied each rotation of the disk G, is eccentrically pivoted on the one side of it and to one side of the chamber *k* at a point, *m*, nearer to its delivery than to its opposite end, to the disk G, and is provided with a side roller-stud, *n*, near its closed end, also constructed with a transverse side ledge or shoulder, *o*, near its delivery end. By this construction as either disk G is rotated in the direction indicated by arrow in Fig. 2 the pivoted bucket H, which in its travel with the disk moves around or outside of the measurer I, will assume a horizontal or scooping position in its lower course of travel beneath the measurer I, and by reason of its top-heaviness on its closed end, due to the arrangement of the pivot *m*, will rise out of the liquid in the tank A, with its open or delivery end uppermost, till its ledge or shoulder *o* strikes a fixed stud, roller, or pin, *r*, when, by the continued rotation of the disk G, the bucket will be gradually turned by the guiding action of said fixed stud or roller on the ledge *o* to occupy an inverted or emptying position over the measurer I, and as or before said bucket leaves said stud its side roller-stud, *n*, passes on and over a fixed guide, J, which restrains the bucket by its top-heaviness from swinging back on its pivot after its ledge *o* has left the fixed stud *r*, and serves to keep the bucket properly inverted to fully empty its contents into the measurer I, and as said roller-stud *n* subsequently passes down a crook side arm of the guide J causes the bucket to be gradually adjusted into its filling position again as it enters the liquid in the tank A.

The fixed measurer I, into which the lubricating-liquid is passed from the bucket, is adjustable as regards its capacity to insure the liquid being supplied to the wool in properly-measured quantities. To this end said measurer, which is of concave or open receiving shape on its top, is constructed in and along its base with a lower cavity, *s*, in communication with said open top, and fitted with an adjustable end screw, *v*, that, accordingly as it is screwed in or out, serves to regulate the capacity of the measurer I to hold a proper or measured quantity of the lubricating agent. The upper receiving-space of each measurer I may be graduated, as shown in Fig. 1, to determine the proper adjustment of the regulating-screw *v*. Any surplus liquid passed into said measurer from the bucket will flow back over the sides of the measurer into the tank A again.

The lubricating agent or agents is or are passed from the measurer or measurers I to the sprinkling-chamber B by opening a valve or valves for the purpose at suitable intervals, the liquid, when allowed to flow from the measurer or measurers, passing by pipes K to the sprinkling-chamber.

The measurer I, as shown to the right hand of Fig. 1, is provided with a valve-box, L, in which is a discharge-valve that is operated by a wiper, *w*, on the shaft C, striking a valve-lifting lever, *y*.

The sprinkling-chamber B, into which the lubricating agent or agents is or are passed from the measurer or measurers I, as described, has a series of fine perforations, *a′*, in its bottom, through which the liquid is forced intermittently by weighted or weighty vertically-sliding plugs or plungers L′, arranged so that when down they act as valves to close the orifices *a′*, but which, and as they fall after being lifted, force out the liquid through the orifice *a′* onto the wool as it is being collected in the weighing-box *i*. These plugs or plungers L′ are thus repeatedly operated during each filling operation of the weighing-box *i* with wool, by means of a pivoted lifting-board, M, actuated by a revolving sprocket-wheel, N, and lever O. This sprocket-wheel has an intermittent motion, and is so timed with respect to the feeder that whenever the weighing-box

i is opened to discharge its load, and the feeder is stopped, the sprocket-wheel will be at rest, thus only supplying the lubricating agent in measured quantities as needed, and giving time, when the plugs or plungers L′ are at rest and close the orifices *a′*, for the necessary accumulation of the lubricating agent in the sprinkling-chamber B, to repeat in due course the sprinkling action on a succeeding supply of wool to the weighing-box *i* of the feeder. This intermittent action of the sprocket-wheel N is produced by a pinion, P, on the shaft of said wheel, arranged to gear, only during a portion of each revolution of the shaft C, with a toothed driving-segment, Q, on said shaft C, and of larger radius than the pinion P.

To secure a proper supply of the lubricating agent to the measurer I in each tank A, and proper action of the filling-bucket H therein, it is necessary that said agent should be kept at as nearly a uniform level as possible in said tank. This may be done automatically by means of a ball and lever float of ordinary construction, arranged to open or shut off the supply as needed by opening and closing a valve, *b′*, in the pipe *e*, which keeps the working-tank A supplied with the lubricating agent from an upper tank or reservoir; but where the tank A will not admit of a large or long lever float, the following means, which will also be found more accurate, may be used instead:

Mounted upon each tank A, where more than one tank is used, is a fixed frame, B′, having an attached upper side bracket, B², which latter serves as a guide for two vertically-sliding bars, D′ D², that, free to fall by their own weight, are lifted by cams E′ E² on either revolving shaft C′. To the upper portion of the one, D′, of these bars D′ D² is pivoted a rod, F′, crooked at its lower end, and which, when in the pendent position, (shown more clearly in Figs. 1 and 3,) with its lower crooked end under the lever *d′* of the valve *b′* in the supply-pipe *e*, serves, as the bar D′ is raised by the cam E′, to intermittently lift the valve-lever *d′* and open the valve *b′* to supply the lubricating agent to the lower tank A said supply being cut off each time the valve-lever *d′* falls. The other sliding bar, D², which has its lifting motion given it by the cam E², has an intermediately-pivoted lever, G′, engaged at its one end with or between pins *e′ e′* on it, the lower one of which may be carried by an adjustable carrying-plate, *f′*, on said bar. The other end of said lever G′ is connected by a rod, *g′*, with an upper lever, H′, arranged over a vertically-sliding rod, I′, pressed upward by a spring, *h′*, and having its lower end constructed to form a hook, which engages with and disengages from a crooked holder, J′, pivoted at *i′*, and carrying a weight, *k′*, to keep said holder engaged with the hook on the rod I′, for the purpose of holding said rod down against the pressure of the spring *h′*. Connected by an arm, *l′*, with the upper end of this spring lifter or rod I′ is a crooked lever, K′, pivoted at *m′*, and apertured to receive the valve-operating rod F′. Pivoted also to frame B′, or to brackets thereon, are two levers, N′ O′, connected by a rod, *n′*. The upper one, N′, of these levers is arranged for action on or under a projection, *o′*, on the lever H′, while the other lever, O′, rests on the crooked holder J′, and is arranged for action against or under a pivoted weight, P′, of greater power than the weight *k′* of the holder J′. This superior weight P′ is held up by a weighted pivoted catch, Q′, acting on or under a toe on said weight, and arranged over a vertically-sliding rod, *r′*, of a float, R′, which rests on or in the lubricating-liquid in the tank A.

When the parts are in the position represented in Figs. 1 and 3, each tank A has nearly the proper quantity of lubricating-liquid in it, and it is desirable or necessary for the proper working of the bucket H and measurer I that said liquid should be kept uniformly at such level or thereabout. The weight P′ will then occupy its raised position and be supported by the pivoted catch Q′, and the spring-rod I′ will be held down by the hooking weighted holder J′. In such positions of said parts the sliding bars D′ D² will continue to rise and fall as the rotation of the shaft C′ is kept up without having any shifting action on the rod F′, which will continue to intermittently open and close the valve *b′* to maintain the supply of lubricating-liquid to the tank A as against draft therefrom by the sprinkler B. In case, however, the supply of liquid to the tank A should be too free and the liquid should unduly rise therein, then the float R′ in rising would trip the catch Q′ and allow the weight P′ to drop, which weight in falling acts upon the back part of the holder J′ and tilts said holder. The tilting of the holder J′ releases the spring-rod I′, which flies upward, and, acting through its arm *l′* on the crooked lever K′, draws the valve-operating rod F′ to one side and from under or out of engagement with the valve-lever *d′*, and said valve-operating rod will remain thus disengaged, and the valve *b′* keep closed during the further continuous rotation of the shaft C′ and up-and-down movements of the sliding bars D′ D², so long as the float R′ maintains an unduly elevated position. When, however, by the draft on the sprinkler B, the lubricating-liquid falls again to its proper level, and the float R′ and its rod *r′* drop to their former positions, then the lever H′, as worked by the sliding bar D², will act upon the raised spring-rod I′ to depress it, and also to lower the back end or arm of the lever N′, and to raise the lever O′ and weight P′, so that said weight will be caught and held up again by the pivoted catch Q′, which, by reason of the dropping of the float-rod *r′*, will have resumed its former holding position on said weight. This action will also cause the weighted holder J′ to engage itself again with the hook on the spring-rod I′ and to hold it down as before; likewise,

the lowering of the said rod I′ will operate the crooked lever K′ to again shift the valve-operating rod F′ back to its normal position, and so that its crooked lower end will again pass under or engage with and remain engaged with the valve-lever *d′* to work the valve *b′* for keeping up the supply to the tank A, as before.

When the lubricating agent is a compound one, it may be stirred or mixed in the main tank or reservoir before passing to the working tank or tanks A; or it may be stirred in the working tank or tanks by any suitable agitating means—as, for instance, by the cams E′ E² on the shaft C′ or by separate paddles on said shaft.

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

1. The combination, with a tank for holding a lubricating agent, of a sprinkler connected therewith, and a measuring device arranged in said tank for supplying the lubricating agent in measured quantities to the said sprinkler, substantially as herein shown and described.

2. The combination, with a tank for holding a lubricating agent, of a sprinkling-chamber having a series of apertures in its bottom and connected to said tank, a bucket in the tank, a measuring device for receiving the liquid from the bucket, and means for operating the bucket and intermittently opening and closing the apertures in the said sprinkling-chamber, substantially as herein shown and described.

3. The combination, with tank A, of the disk or bucket-carrier G, means for revolving the same, the tilting bucket H, eccentrically pivoted at *m* to said carrier and constructed with a transverse shoulder or ledge, *o*, the fixed stud or roller *r*, the pin or roller guide *n*, carried by the bucket, the fixed guide J, and the measurer or receiver I, substantially as specified.

4. The combination, with the disk G, the tilting bucket H, measurer I, and means for rotating said disk, of the outlet-pipe K, valve-box L, a delivery-valve therein, the shaft C, the wiper *w*, the valve opening or lifting lever *y*, and means for operating said shaft, substantially as described.

5. The combination, with the tank A for holding the lubricating agent, a tilting bucket or lifter of said agent, and means for operating said bucket, of the open-topped measurer I, arranged to occupy a position above the level of the agent in the tank, and provided with a lower opening, *s*, and adjusting-screw *v*, for regulating the capacity of the measurer to receive or hold fluid delivered by the bucket, substantially as specified.

6. The sprinkler B, having a series of discharge-apertures, *a′*, in its bottom, in combination with a series of plungers, L′, therein, and means for intermittently operating said plungers for forcing out the lubricating agent through the apertures *a′*, and serving when at rest to close said apertures, essentially as described.

7. The combination of the rotating segment Q with the pinion P, the sprocket-wheel N, the lever O, the lifter M, the rising and falling plungers L′, and the sprinkler B, having perforations *a′* in its bottom, substantially as and for the purpose herein set forth.

8. The combination, with the tank A, the supply-pipe *e*, valve *b′*, and valve-lever *d′*, of the float R′, the reciprocating rods D′ D², the pivoted rod F′ on rod D′, means for operating the said rods D′ D², and intermediate mechanism for operating the rod F′ by the rise and fall of the float, substantially as herein shown and described.

9. The combination, with the tank A and a supply-pipe, *e*, for supplying said tank with said fluid, of the rising and falling bars D′ D², the rotating cams E′ E², the crooked pivoted rod F′, the valve-lever *d′*, and valve *b′*, the lever G′, arranged to engage with the bar D², the rod *g′*, the lever H′, the hook-rod I′, with its lifting-spring *h′*, the crooked pivoted holder J′, having a weight, *k′*, the arm *l′*, the lever K′, constructed to engage with the rod F′, the connected levers N′ O′, the projection *o′* on the lever H′, the pivoted weight P′, the pivoted catch Q′, and the float R′, with its attached rod *r′*, substantially as shown and described.

JOHN C. THICKINS.

Witnesses:
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GEORGE LANG.