(No Model.) 3 Sheets—Sheet 1.

J. ZACHERL.

CARPET CLEANING MACHINE.

No. 262,530. Patented Aug. 8, 1882.

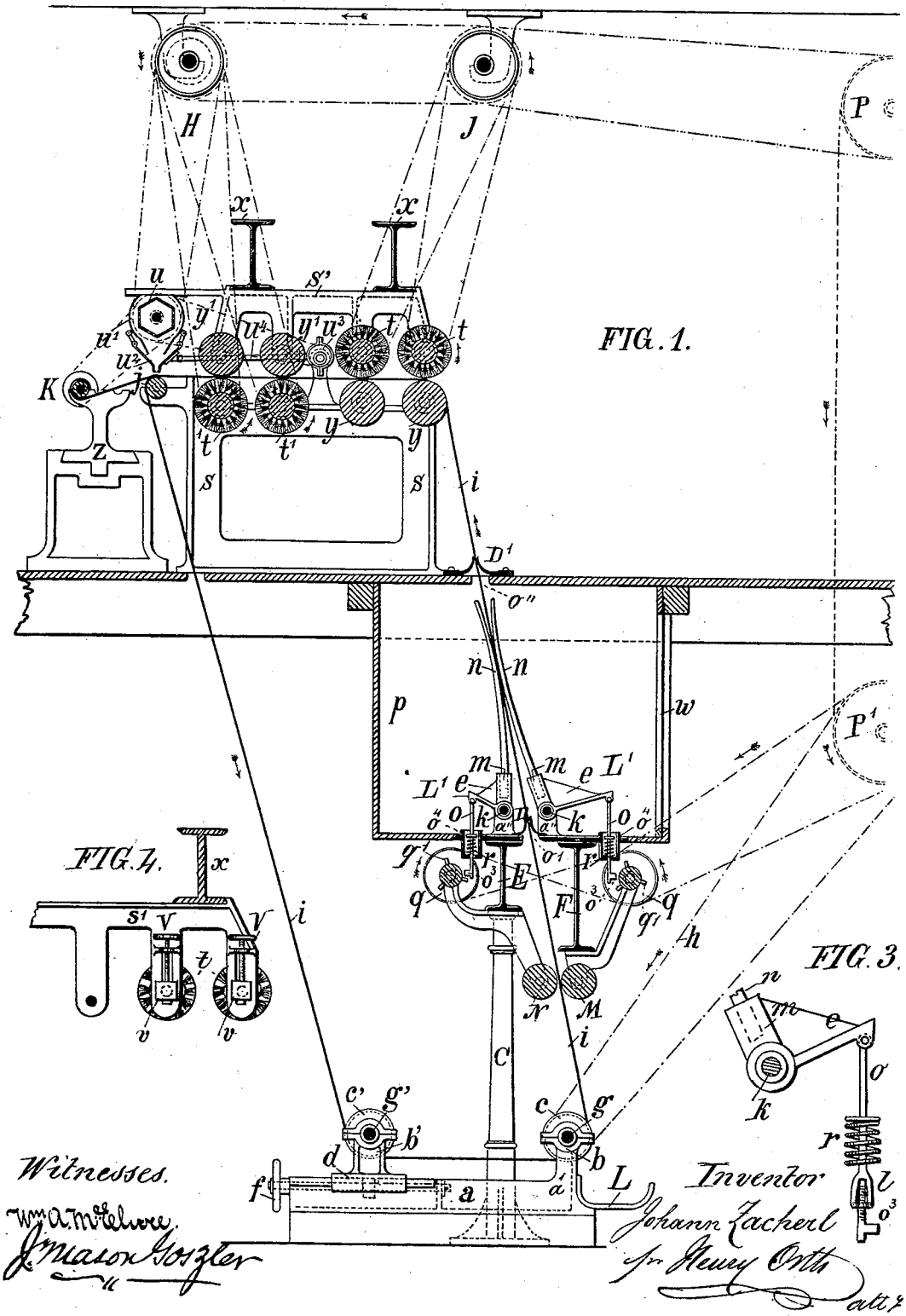

FIG. 1.

(No Model.) 3 Sheets—Sheet 2.

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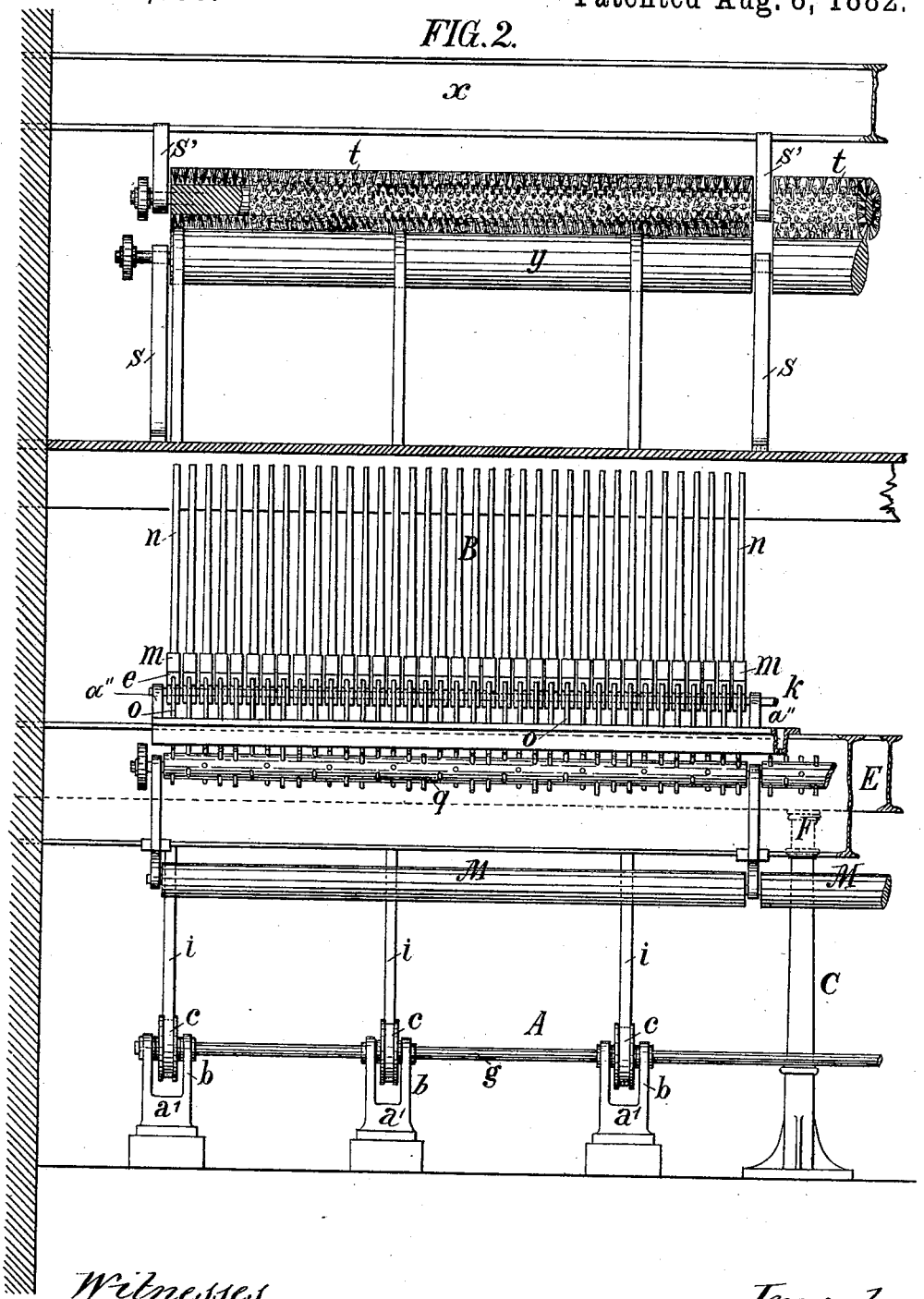
FIG. 2.



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(No Model.) 3 Sheets—Sheet 3.

J. ZACHERL.

CARPET CLEANING MACHINE.

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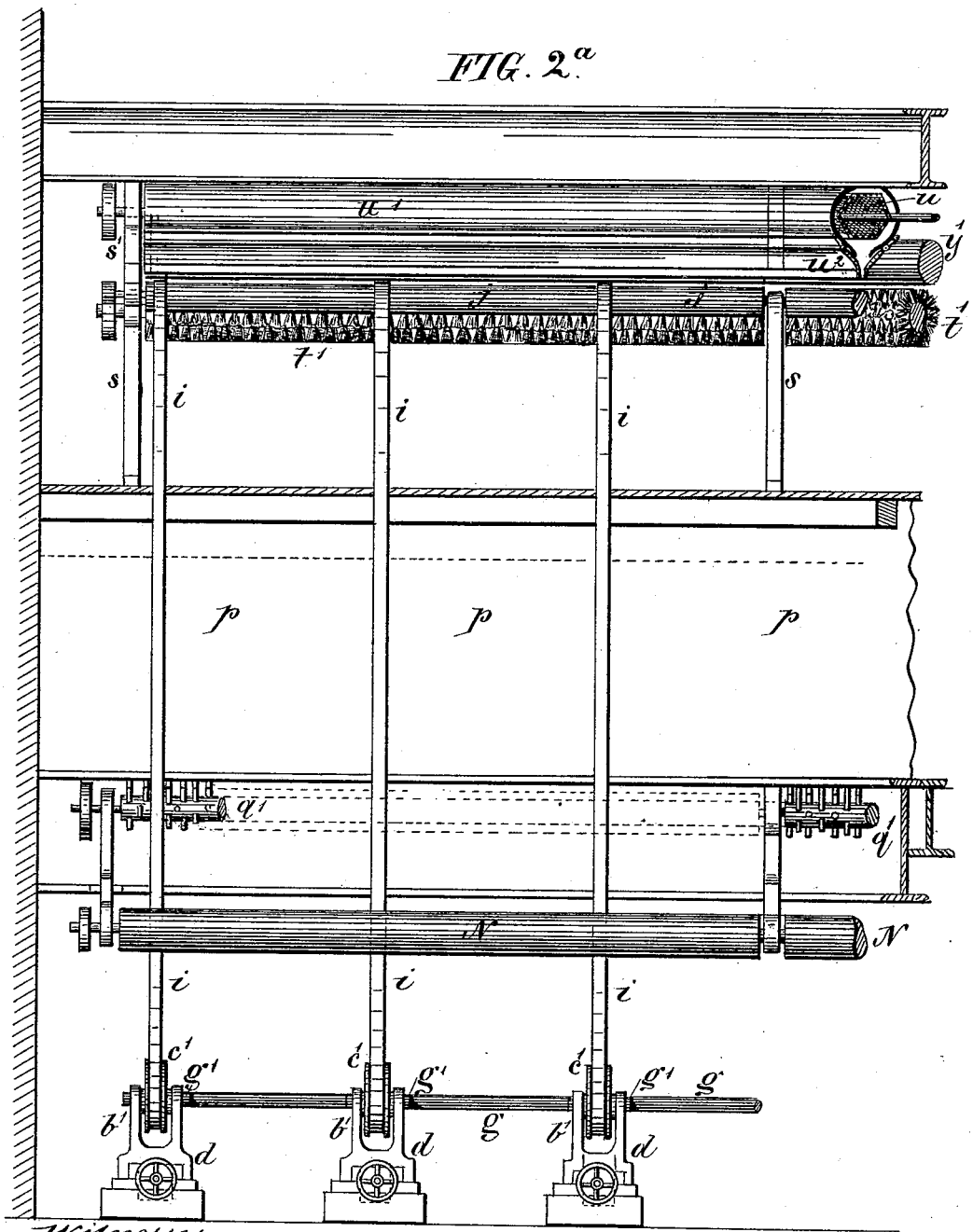
FIG. 2ª



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UNITED STATES PATENT OFFICE.

JOHANN ZACHERL, OF DÖBLING, NEAR VIENNA, AUSTRIA-HUNGARY.

CARPET-CLEANING MACHINE.

SPECIFICATION forming part of Letters Patent No. 262,530, dated August 8, 1882.

Application filed December 31, 1881. (No model.)

To all whom it may concern:

Be it known that I, JOHANN ZACHERL, a citizen of Austria, residing at Döbling, near Vienna, in the Crownland of Nether-Austria and State of Austria-Hungary, have invented certain new and useful Improvements in Carpet-Cleaning Machines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters or figures of reference marked thereon, which form a part of this specification.

My invention relates to an improved method of and apparatus for cleaning carpets or other like fabrics; and it consists, first, in the method of treating carpets or other like fabrics for removing therefrom the dust and dirt and for making them insect-proof by subjecting the fabric first to the action of beaters while traveling in or nearly in a vertical direction and upon both its surfaces simultaneously; secondly, subjecting the carpet to the action of brushes arranged to brush both its surfaces simultaneously, but successively—that is to say, by causing the upper surface to be brushed at a point in advance of that where it is brushed on the under side and while the carpet is traveling in a horizontal direction; thirdly, distributing over the cleansed carpet an insecticide to guard it against the attack of moth or analogous insects; and, lastly, rolling it into a roll for delivery or storage.

The invention further consists in the apparatus for carrying out the above-described method step by step and automatically, though it will be readily understood that any of the well-known carpet-cleaning machines or any preferred machines of this class may be employed in conjunction with mechanism for distributing the insect-powder over the upper or nap surface of the carpet.

In the accompanying two sheets of drawings, Figure 1 is a vertical transverse section of my improved machine. Fig. 2 is a front elevation thereof, the beater-housing being removed. Fig. 2^a is a rear elevation of the same. Fig. 3 shows a means for adjusting the blows of the beaters, and Fig. 4 shows in detail one of the well-known means for adjusting shafts.

Like letters of reference are employed to indicate like parts in the above described drawings.

In practice I preferably arrange the apparatus so that the beaters will be located in a room underneath that where the other cleaning and the insect-powder-distributing devices are located, though this is not absolutely necessary, as they may be located in the same room where the latter devices are located and isolated therefrom by a dust-partition. Of course it will be necessary that the brushes and powder-distributer be located sufficiently above the beaters to cause the carpet to travel in or nearly in a vertical direction. If the ceiling of the room is not sufficiently high for this purpose, the carpet may, however, be carried to a point as high as is necessary, and then caused to travel downward to the brushing mechanism. This may be readily effected by means of guide-rolls, over which the carpet travels on leaving the beater-chamber to cause it to travel horizontally through the brushing and powder-distributing mechanism after passing vertically through the beater-chamber.

The carpet is stretched upon a series of endless belts, *i*, that pass over a corresponding series of pulleys, *c c'*, between guide-rolls M N, thence through the beater-chamber over rollers *y y*, under rollers *y' y'*, and between them and the brushes *t t t' t'*, respectively, under the insecticide-distributer, and over the small roll *j* and back to the pulleys *c' c*. Each of the pulleys *c'* is made adjustable independently of the others, so that the slack of any one or more of the carrying-belts may be taken in or the tension of said belts *i* adjusted. As shown in Fig. 1, this is effected by mounting each pulley *c'* upon a sliding bearing, *d*, that is adapted to be moved toward or from the pulleys *c* upon its supporting frame or standard *a* by means of the set-screw *f*. The latter work in bearings in the standards, and pass through threaded blocks attached to the slides *d*. The pulleys *c* are all mounted upon a common shaft, that has its bearings in the frames or standards *a'*, as shown in Figs. 1 and 2.

The fabric to be cleaned is placed in a roll or folded on a shelf, L, or a trough. One end thereof is clamped or otherwise attached to as many belts *i* as the width of the carpet may require. The apparatus is then set in motion and the carpet conducted through the operat-

ing devices until its opposite end is between the pulleys *c* and the guide-rolls M N, when said carpet end is also attached to the belting, the apparatus having previously been stopped. From the guide-rolls M N the carpet passes into the beating-chamber *p*, where it is subjected to the action of a series of beaters, *n*, that operate upon both faces of the carpet. These beaters are constructed and arranged for operation as follows: A series of standards, *a''*, are arranged on the floor of the beating-chamber upon opposite sides of an opening or passage, *o'*, through which the carpet passes. The beating-chamber is connected on the one hand with the floor of the room above, and is supported on the other hand by columns C and cross-girts E F, to which latter are attached the bearings for the guide-rolls M N and the tappet-shafts *q*, presently referred to. Upon the standards *a''* are rigidly mounted the beater-shafts *k*, that carry a series of beaters, *n*, of cane, wood, or metal, or other suitable material. The beater ends are slightly curved to avoid the damaging effect resulting from the contact of their ends with the carpet. Each beater *n* is secured in a socketed arm of a two-armed lever, L', loosely mounted upon shaft *k*. To the arm *e* of the lever is pivoted a rod, *o*, that passes through a spring-housing, o^4, and has at its lower end a lug or nose, o^3, that lies in the path of the tappets *q'* on the tappet-shafts *q*. The spring *r* within the housing o^4 is so connected to the rod *o* as to force the latter upward when not acted upon by the tappets *q'*.

It will be seen that by this arrangement of devices the beater-rods are depressed each time the tappets engage the lugs o^3, thereby retracting the beaters *n*, which are thrown forward again by the force of the spring as soon as the lever is released by the tappet, thus subjecting the carpet passing between the two series of beaters to a beating upon both surfaces simultaneously.

In their normal position the beaters are held in a nearly-vertical direction, the carpet traveling in the same direction to the brush mechanism. In this manner no dust or dirt beaten out of the carpet can settle upon it, as is the case where the carpet travels in or nearly in a horizontal direction. The force of the blows delivered by the beaters is preferably made adjustable either by making the tappet-shafts adjustable toward and from the rods *o*, or, as shown in Fig. 3, by making the rods adjustable vertically. This may be effected by means of a coupling, *l*, or by any other preferred means. In either case the extent of the depression of the rods *o*, consequently the force of the blows delivered by the beaters, is regulated.

To prevent dust and dirt falling through opening *o'*, through which the carpet passes, or through the opening *o''* in the ceiling of the chamber, I apply flexible dust-guards D D' to said openings, as shown in Fig. 1.

The dust is removed from the chamber *p* by means of a suitable blowing or exhaust apparatus and carried through a chimney to the outer air.

I have not deemed it necessary to illustrate any particular apparatus for removing the dust from chamber *p*, the construction and application of such being so well known that any intelligent mechanic can adapt the same to my beating-chamber.

In order to enable the attendant to watch the progress of the beating, I provide the chamber *p* with sliding sash *w*, through which the operation of the beaters may be observed, and through which ingress may be had to and egress may be bad from the beating-chamber.

From the chamber *p* the carpet passes through *o''* over two rollers, *y y*, above which are located two brush-cylinders, *t t*, whereby the upper face of the carpet is brushed as it travels over the rollers. From the rolls *y y* the carpet passes under rollers *y' y'*, below which are located two brushes, *t' t'*, that brush the under side of the carpet.

It will be seen that both faces of the carpet are brushed simultaneously, but at different points. The upper face is brushed first, so that any dust that may sift through or adhere to the under side of the carpet while passing over rollers *y y* and being acted on by the brushes may be removed by brushes *t' t'*.

The carpet, after leaving the brushes *t' t'*, passes over a small roll, *j*, that serves to open or divide the nap and guide the carpet to the winding-roll.

Above the roll *j* is located the insect-powder distributer, composed of a bolt or screen, *u*, of fine wire-cloth or other suitable material, through which the powder is sifted. The bolt is preferably of hexagonal form, though it may be made cylindrical or of other form in cross-section. The bolt *u* is surrounded by a casing, *w'*, to prevent the powder from flying over the room. Said casing is open at bottom, and has a distributer, u^2, attached thereto. The distributer is preferably made of cloth, felt, or other like material, and is made in two parts, which parts are arranged to leave a narrow opening between their lips.

The distributer u^2 may, if desired, be made of some rigid material, such as thin boards or sheet metal. In either construction a reciprocating movement is imparted to the distributer-spout u^2 by means of the eccentric w^3 and the connecting-rod w^4, Fig. 1, to more evenly distribute the powder delivered thereto from the bolt.

As will be seen, the rolls *y y* serve not only as supporting and guide rolls, but also as a means to hold the carpet to the brushes.

Either the rolls *y* or *y'* or the brushes *t t'* are made adjustable vertically, preferably the latter, (the brushes,) to adjust their action upon the carpet and compensate for wear.

This may be effected, as shown in Fig. 4, where the brush-shafts are mounted in sliding bearing-blocks *v*, made adjustable vertically by means of the set-screws V, that work in

bearings formed on or attached to the hangers s', which latter are supported from cross-girts x. The brushes t' are made adjustable by like devices, which I have deemed unnecessary to illustrate, they being fully shown as applied to the brushes t.

The carpet, after leaving the insecticide-distributer, passes to a winding-roll, K, mounted on supports Z, where it is wound into a roll for delivery or storage after being thoroughly cleaned and protected against the ravages of insects. Under some circumstances it may be necessary to pass the carpet more than once through the machine, and to avoid the loss of the insect-powder the driving-belt for the eccentric is shifted from the driving-pulley thereof onto an idle-pulley to throw the eccentric out of operation.

The apparatus is driven from any suitable prime motor through the driving-pulleys P P'. The former communicates motion to roll K, the brushes, the eccentric u^3, and the bolt u through pulleys J H, and the latter to the tappet-shafts and the pulleys c, as plainly shown in Fig. 1—that is to say, the pulley J, through the medium of auxiliary pulleys, communicates motion to the two brush-cylinders t t and the pulley H to those t' t', to the bolt u and eccentric u^3, and the winding-roll K.

Of course it will be understood that the insect-powder distributer may be applied to any of the well-known carpet-cleaning machines, and it is not absolutely necessary that the cleaning mechanism described should be employed in conjunction therewith.

Instead of the trough L, a delivery-roll may be employed, upon which the carpet is first wound.

As will be seen, by the means employed for adjusting the actuating-rods, or in case the tappet-shafts are made adjustable toward or from said rods, the operator is enabled to throw the beaters out of operation, if desired.

Having now described my invention, what I claim is—

1. The herein described method of mechanically treating carpets and analogous fabrics, which consists of the following automatic and successive steps—to wit: first, subjecting the carpet to the action of beaters; secondly, brushing its upper and lower surfaces; and, thirdly, distributing on the nap of the carpet an insecticide, substantially as described.

2. The herein-described method of treating carpets, which consists in the following successive steps—to wit: first, beating the carpet upon both sides simultaneously; second, brushing it in a like manner successively—that is, first its upper, then its under side—and, lastly, distributing over the nap-surface of the carpet an insecticide, substantially as and for the purpose specified.

3. In a machine for cleaning carpets, an insecticide-distributer arranged to distribute the insecticide over the nap-surface of the carpet after being acted on by the cleaning devices, as set forth.

4. In a carpet-cleaning machine, the combination, with the endless carrier-belts i, the pulleys c c', the rolls y y y' y' j, and the brushes t t t' t', of the insecticide-distributer consisting of a bolt or screen and a reciprocating distributing-spout, substantially as and for the purposes specified.

5. In a carpet-cleaning machine, the combination, with the belts i, pulleys c c', rolls y y y' y' j, brushes t t t' t', and the beaters n, of the insecticide-distributer composed of a bolt or screen and a reciprocating distributing-spout, all arranged to operate substantially as and for the purpose specified.

6. In a carpet-cleaning machine, the combination, with the cleaning mechanism, of the insecticide-distributer composed of the bolt u, its inclosing case u', and distributing-spout u'', the eccentric u^3, and connecting-rod u^4, all arranged to operate as and for the purpose specified.

7. In a carpet-cleaning machine in which is employed a series of independent endless belts for carrying the carpet, the combination, with each of said belts, of an adjustable tightening-pulley, c', whereby the tension of one or more of the series of belts may be adjusted independently of the remaining belts, substantially as and for the purpose specified.

8. In a carpet-cleaning machine, the combination, with the carrying devices for the carpet, of beating mechanism and a dust-chamber inclosing the same, said chamber having openings for the passage of the carpet, provided with dust-guards D D', substantially as and for the purpose specified.

9. In a carpet-cleaning device, the combination, with the endless belts i, pulleys c c', rolls N M y y y' y' j, the brushes t t', and devices for distributing an insecticide over the nap-surface of the carpet when cleaned, of the chamber p, constructed as set forth, and the beating mechanism, all arranged for operation substantially as and for the purpose specified.

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

JOHANN ZACHERL.

Witnesses:
HANZ KOTTAS,
VICTOR KARMIN.