A. H. BOELTER.

RUG AND CARPET CLEANING MACHINE.

APPLICATION FILED MAR. 17, 1919.

1,389,809.

Patented Sept. 6, 1921.

5 SHEETS—SHEET 1.

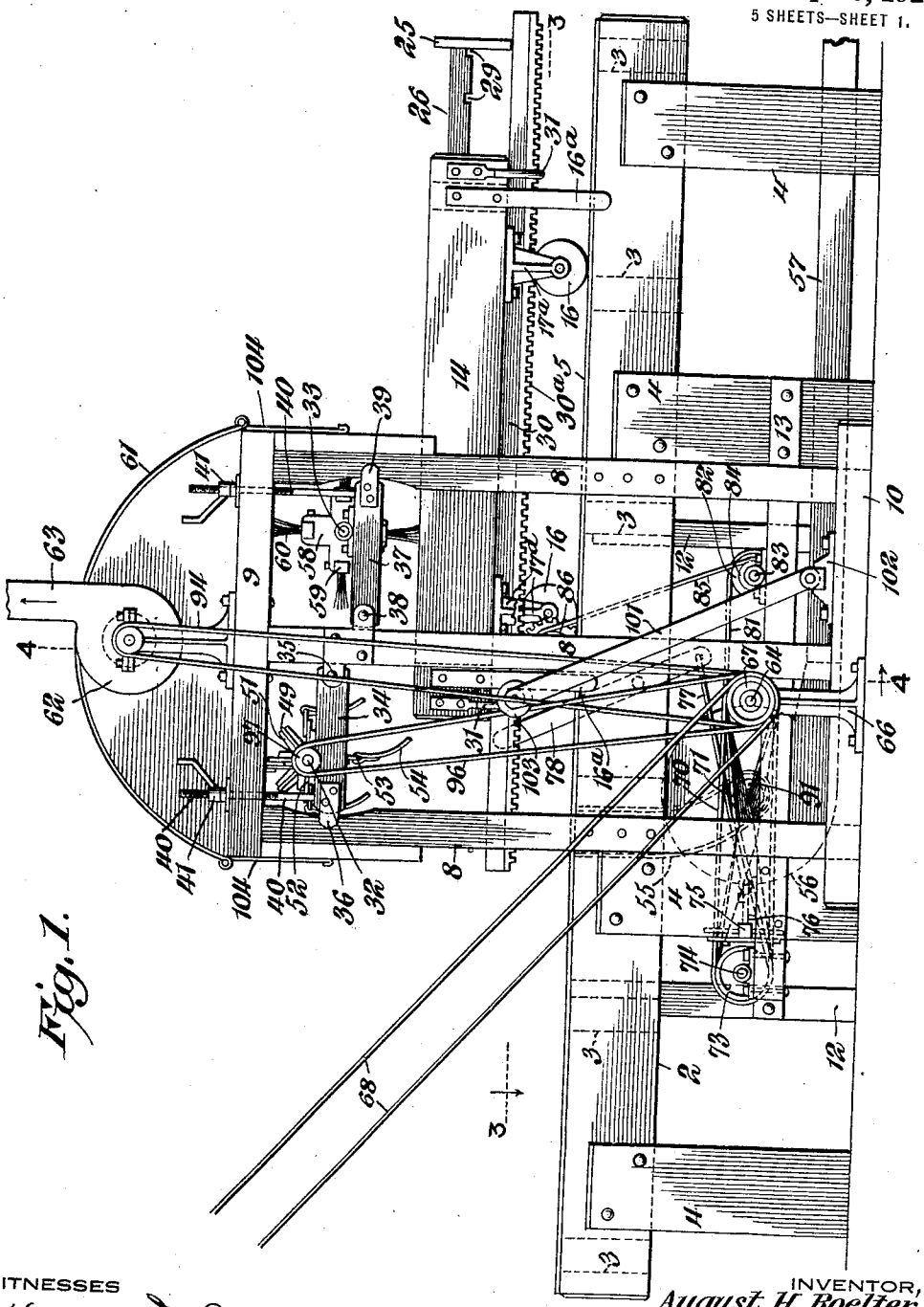


Fig. 1.

WITNESSES

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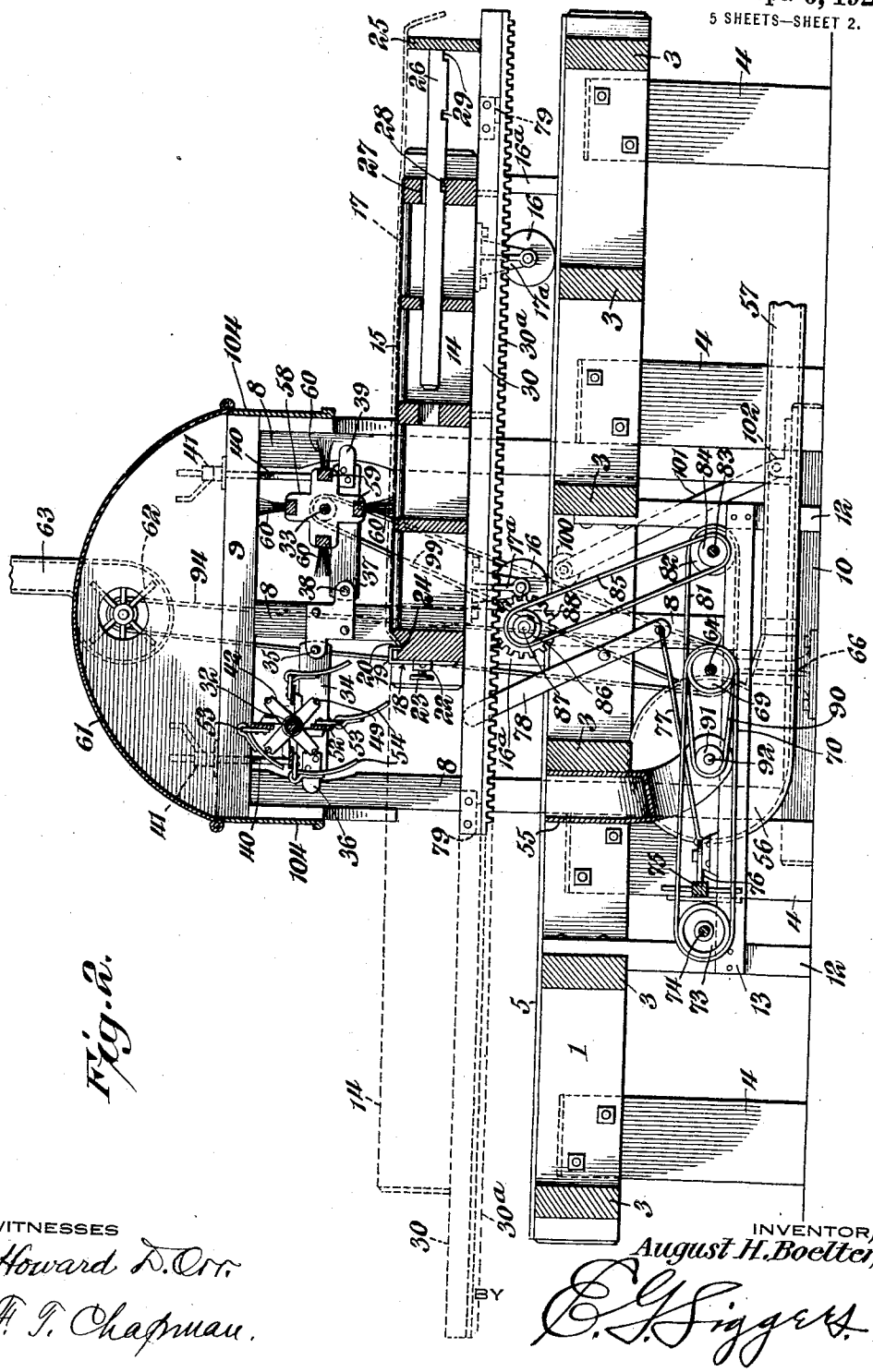


Fig. 2.

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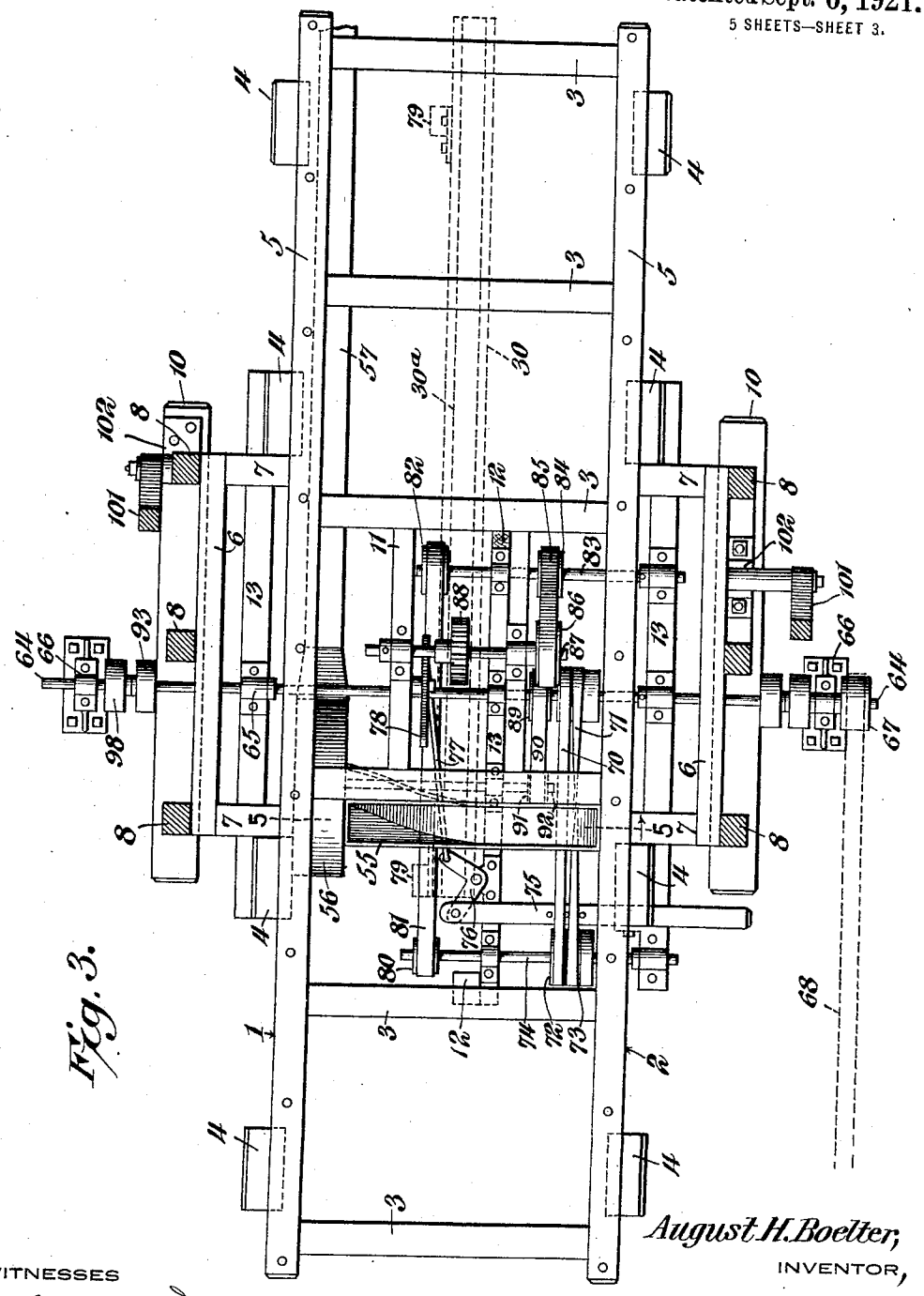


Fig. 3.

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5 SHEETS—SHEET 4.

Fig. 5.

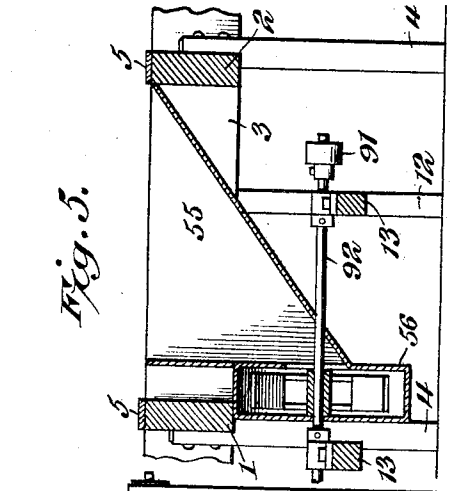
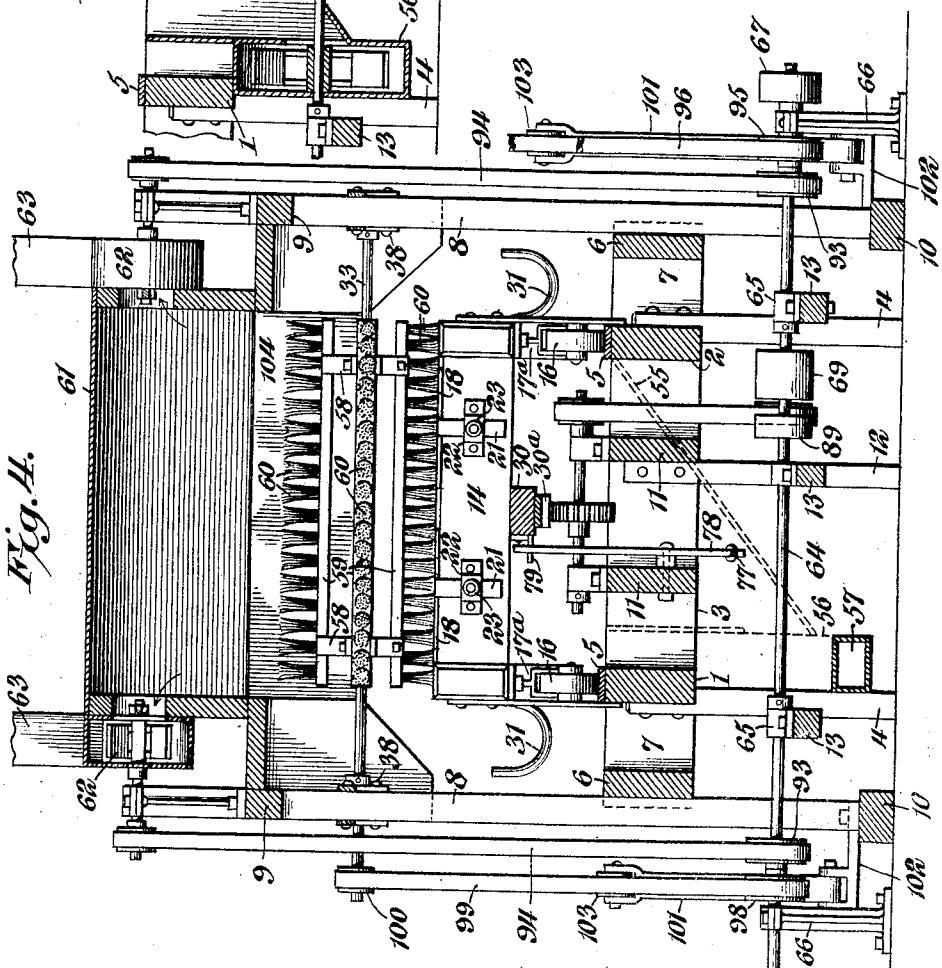


Fig. 4.



WITNESSES

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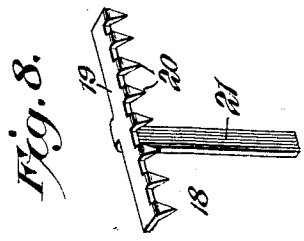


Fig. 8.

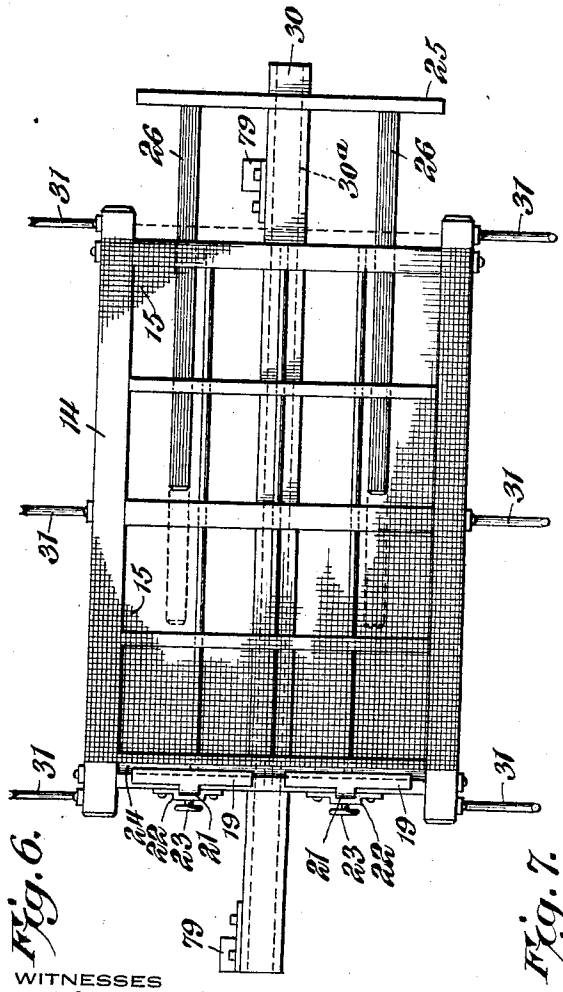


Fig. 6.

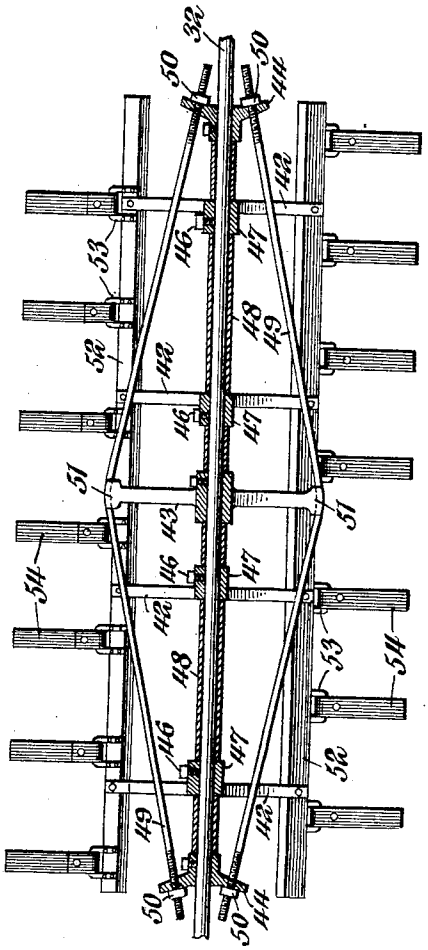


Fig. 7.

WITNESSES

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UNITED STATES PATENT OFFICE.

AUGUST H. BOELTER, OF CHICAGO, ILLINOIS.

RUG AND CARPET CLEANING MACHINE.

1,389,809. Specification of Letters Patent. Patented Sept. 6, 1921.

Application filed March 17, 1919. Serial No. 283,092.

To all whom it may concern:

Be it known that I, AUGUST H. BOELTER, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a new and useful Rug and Carpet Cleaning Machine, of which the following is a specification.

This invention has reference to rug and carpet cleaning machines, and its object is to provide a machine which will effectively remove dust and dirt from rugs and carpets, and particularly from rugs, even though the latter be larger than the machine, folding or creasing of the rug or carpet being avoided.

In accordance with the invention, there is provided a reciprocatory carriage or traveler upon which the rug (which term is intended to include carpets as well as rugs) may be secured in a flat or spread-out condition, the rug support being of open or reticulated construction to permit dislodged dirt to fall through it. The dislodging of the dirt is facilitated by beaters positioned to engage that surface of the rug which is uppermost when carried by the support. An exhausting mechanism is associated with the support for withdrawing dirt driven from the rug by the beaters and falling through the reticulated or open surface. Also associated with the carpet support are brushes engaging that surface of the rug, which is uppermost when on the support, to remove dust or dirt clinging thereto and such dust is withdrawn by suitably disposed exhausting devices.

Provision is made by the invention for permitting the rolling up of the edge portion or portions of a rug too wide for the machine so that the whole surface may be thoroughly cleaned upon a comparatively narrow machine. Furthermore, provision is made for securing the rug upon the carrier so that the latter may be reciprocated without liability of displacing the rug.

The machine is designed to be driven by power and consequently appropriate shafting is provided with interconnecting belts or strands, and other mechanical devices, such as belt tighteners, are provided.

The invention will be best understood from a consideration of the following detailed description taken in connection with the accompanying drawings forming part of this specification, with the understanding, however, that the invention is not confined to any strict conformity with the showing of the drawings, but may be changed and modified so long as such changes and modifications mark no material departure from the salient features of the invention as expressed in the appended claims.

In the drawings:—

Figure 1 is a side elevation of the machine.

Fig. 2 is a longitudinal vertical section through the machine.

Fig. 3 is a section on the line 3—3 of Fig. 1.

Fig. 4 is a section on the line 4—4 of Fig. 1.

Fig. 5 is a section on the line 5—5 of Fig. 3.

Fig. 6 is a plan view of the carriage.

Fig. 7 is a longitudinal diametric section of the rotary beater.

Fig. 8 is a perspective view of the gripping end of one of the rug clamps.

Referring to the drawings, there is shown a main frame made up of longitudinal side beams 1 and 2 respectively, connected at intervals by cross-pieces 3 and mounted upon legs or supports 4. The side beams 1 and 2 are protected on their upper surfaces by strips 5 of metal to constitute tracks. It will be understood that any other suitable construction may be employed to answer the purpose.

On opposite sides of the main frame are longitudinal beams 6 similar to the main beams 1 and 2 but of less length and confined to the intermediate portion of the frame. These beams are offset from the corresponding main beams, which constitute the side beams 1 and 2, by spacing blocks 7. Fast to the beams 6 are upright strips 8 joined at top and bottom by strips 9 and 10 respectively, thus providing a frame to carry certain structures. In the particular structure shown there are three strips 8 on each side of the machine and equidistantly spaced lengthwise of the machine.

Extending between the intermediately located cross-strips 3 are longitudinally disposed strips 11 for supporting certain mechanisms. Other upright strips or posts 12 and longitudinal strips 13 are also provided.

It will be understood, however, that these various beams, timbers and strips, which may be conveniently made of wood, may be

in the form of a frame of one or more parts of metal designed to receive and support the various mechanisms.

Mounted to travel on the strips or tracks 5 on the beams 1 and 2 is a carriage made up of a frame 14, shown in the drawings as of rectangular shape, and separately illustrated in Fig. 6. The frame or carriage 14 has a surface covering 15 of open or reticulated material such as wire netting. The frame or carriage 14 is provided with supporting rollers 16 carried by brackets 17^a fast to the underface of the frame, and in order to keep the carriage on the track, fingers 16^a are made fast to the side of the carriage and drop into side-engaging relation with the main longitudinal beams or timbers 1 and 2.

The carriage 14 is designed to support the rug to be cleaned, a rug 17 being shown in dotted lines thereon in Fig. 2. In order to hold the rug on the carriage while being cleaned, one end member of the frame of the carriage 14 is provided with clips 18, one of which is shown separately in Fig. 8. Each clip comprises a cross-head 19 with a longitudinal row of teeth 20, along one edge, of a character to engage and hold the rug without tearing it and on the other edge of the head there is a stem 21 movable through a guide 22 fast to the end member of the frame 14 and provided with a thumb screw 23 by means of which the clip 18 may be suitably adjusted and fastened in position. Along that end member of the frame 14 provided with the clips 18 there is formed a groove 24 shown in Figs. 2 and 6 to receive the teeth 20 of the clip and seat the edge portion of the rug 17, thus locking said edge of the rug to the carriage.

At the other edge of the carriage there is provided a cross strip or support 25 carried by other strips 26 extending through passages 27 in the corresponding end member of the frame of the carriage 14 so that the strip 25, which is of a size to constitute a false end to the said end of the carriage frame 14 will support one end of a rug of greater length than the carriage. Each of the passages 27 has a tooth 28 and the strips 26 have notches 29 therein to permit adjustment of the false end to determined extents and temporarily lock the false end in such adjusted positions. Fast to the underside of the carriage 14 about midway of its length and extending lengthwise of said carriage is a beam 30 carrying a rack bar 30^a by means of which latter reciprocatory movements are imparted to the carriage. Furthermore, the rack bar may serve as a support for the false end 25 when extended.

On opposite sides of the carriage 14 there are provided below the plane of the top a series of U-shaped brackets 31 shaped to receive rolled-up portions of the sides of a rug too wide to be wholly supported by the carriage. This avoids any folding or creasing of the rug and still permits the entire surface of the rug to be presented to the cleaning devices.

Extending crosswise of the machine above the path of the carriage 14 are two shafts 32 and 33 respectively. The shaft 32 is journaled at each end on a bar 34 having a hinge or pivot connection 35 at one end on the intermediate one of the posts 8. The other end of the bar 34 is provided with guide plates 36 embracing a corresponding outer one of the posts 8, the arrangement being such that the bar 34 may be moved on the hinge 35 about a horizontal axis, the bar being held against side play by the plates 36 embracing the corresponding post 8. Similarly the shaft 33 is journaled at each end upon a bar 37 having a hinge or pivot connection 38 to the intermediate post 8 and guide plates 39 embracing the outer post 8. The outer end of each bar 34 and 37 is carried by a threaded rod 40 extending upwardly through the top cross strip or beam 9 and provided with a handled nut 41 by means of which the rod may be raised or lowered to correspondingly raise or lower the shaft 32 or 33 as the case may be.

The shaft 32, which constitutes a beater shaft, carries a series of spiders 42, as best shown in Fig. 7, an intermediate spreader or truss spider 43 and terminal spiders 44, each spider being secured to the shaft by a set screw 46 extending through a hub 47 constituting part of the spider. Surrounding the shaft 32 between the hubs of the spiders are spacer sleeves 48 also contributing to the strength and stiffness of the shaft.

Traversing the spiders 44 are truss rods 49 having threaded ends extending through the arms of the spiders 44 and there receiving nuts 50 by means of which the truss rods are put under appropriate tension. The arms of the spider 43 have their outer ends 51 shaped to receive and hold the intermediate portions of the truss rods. The beater built as described is particularly strong and necessarily so because of the strains to which it is subjected.

The spiders 42 are spaced along the shaft 32 and at their outer ends carry bars 52 in turn carrying loops 53 fixed to the bars and having attached thereto straps 54. These straps may be of flexible material, such as leather, or cloth, or the like, and are free to swing in the supporting loops 53. When the beater is rotated the straps tend to stand radially from the axis of rotation but their outer free ends will yield to the impact of the straps upon the rug being beaten, thereby delivering a strong, sweeping blow upon the rug. The latter is backed up by the reticulated covering or support 15. This action is particularly efficacious in driving the

heavier particles of dirt in the rug through the latter and through the support 15 to fall below the carriage. Immediately beneath the rotary beater is a funnel 55 leading into the casing of an exhaust fan 56 having an outlet duct 57 which may be carried to any desired point of disposal.

The shaft 33 carries a suitable number of spiders 58 which in turn carry and are connected by strips 59 in parallel spaced relation to the shaft 33 and these strips are provided with bunches 60 of bristles, whereby the shaft 33 and the parts which it carries constitute a rotary brush which is softer and much less vigorous than the rotary beater. The purpose of the rotary brush is to remove dust and other like particles from that part of the rug constituting the uppermost surface when in the machine. The bristle brush serves to thoroughly clean the nap side of the rug and raise the nap, thus most effectively brightening the rug, while beater disposes of the heavier dirt container in the rug.

Carried by the uprights 8 and overriding that portion of the machine containing the rotary beater and brush is a hood 61 of arch form and at the crown portion of the hood at opposite sides thereof are exhaust fans 62 having outlet ducts 63 which may lead to a suitable point of disposal.

Journaled in and extending crosswise of the lower portion of the main frame of the machine is a main or drive shaft 64 having journal bearings 65 wherever needful and extending beyond the sides of the main frame where the shaft may be further supported and journaled in pillow blocks 66. The shaft 64 may be driven by any source of power and a pulley 67 on the drive shaft and a belt 68 engaging the pulley may be taken as indicative of a suitable source of power for driving the machine.

Fast on the main shaft 64 is a pulley 69 from which extend plain and crossed belts 70 and 71 respectively. These belts extend to tight and loose pulleys 72 and 73 respectively, on a counter-shaft 74 suitably journaled in the lower portion of the main frame. Engaging the belts 70 and 71 is a belt shifter 75, of any suitable construction, slidably mounted in the main frame. Controlling the belt shifter is a bell crank lever 76 connected by a link 77 to another lever 78 extending upwardly into the main frame into the path of stop fingers 79 on the beam 30 carrying the rack bar 30^a.

The countershaft 74 carries a pulley 80 connected by a belt 81 to another pulley 82 on another countershaft 83 in turn carrying a pulley 84 connected by a belt 85 to still another pulley 86 on a countershaft 87 suitably journaled in the main frame. On the shaft 87 there is secured a gear wheel 88 meshing with the rack bar 30^a.

The main or drive shaft 64 carries still another pulley 89 connected by a belt 90 to a pulley 91 upon a shaft 92 constituting the drive shaft of the suction fan 56. Fast on the main shaft 64 on opposite sides of the main frame are pulleys 93 each connected by a belt 94 to a respective suction fan 62. Near one end of the power shaft is another pulley 95 connected by a belt 96 to a pulley 97 on the beater shaft 32. Near the other end of the power shaft 64 is a pulley 98 connected by a belt 99 to a pulley 100 on the shaft 33 of the rotary brush. Each belt 96 and 99 is under the control of a belt tightener which may be in the form of an upstanding bar 101 pivoted at the lower end to a bracket 102 at a low point on the main frame and at the upper end the bar 101 carries a roller 103 engaging the respective belt 96 or 99 as the case may be. The belt tightener may be of the gravity type or of any form which will automatically maintain the respective belt 96 or 99 sufficiently taut.

Assuming that a rug 17 has been secured upon the reciprocatory carriage and that the machine is in operation, the main shaft 64, which rotates constantly in one direction, transmits motion by way of one of the belts 70 or 71 to the shaft 74 driving the latter in a direction depending on which of the two belts 70 and 71 is at the time upon a tight pulley 72 on the shaft 74. Motion from the shaft 74 is transmitted through the belt 81 to the shaft 83 and by the belt 85 to the shaft 87, thereby rotating the gear wheel 88 in one direction or the other, as the case may be, and the rack bar 30^a propels the rug carriage 14 in the appropriate direction. As soon as the limit of travel of the rug carriage is reached the appropriate finger on the beam 30 engages the lever 78, actuating the belt shifter to change the relation of the belts 70 and 71, thereby reversing the carriage 14.

If it be further assumed that the rug is receiving a preliminary treatment by the machine to remove the heavier dirt, this treatment is given to the back of the rug where the heavy dirt usually settles so that the rug is upside down on the carriage. Under these circumstances the rotary brush on the shaft 33 is lifted by a suitable manipulation of the crank nut 41 controlling it so that the brush is out of action with respect to the rug while the rotary beater has been lowered to engage the rear face of the rug. The reciprocations of the carriage and the rug thereon under the beater are continued as long as may be deemed necessary to remove all the heavy dirt from the rug, such heavy dirt falling to the exhaust fan 56 and so being removed from the machine. Such light dust as may arise from the rug finds its way into the hood 61 and is removed therefrom by the exhaust fans 62.

When the rug has been cleaned from the

heavy dirt the rotary beater is lifted out of action and the rotary brush is lowered into active position, the rug having in the meantime been removed from the carriage and turned over and re-secured thereto. Now the bristles of the rotary brush engage the nap side of the rug, lifting the nap and disturbing the dust which may be therein so that the suction of the fans 62 is sufficient to thoroughly clean the rug from all the lighter dirt in the form of dust.

The operation is performed expeditiously and the cleaning of the rug is thorough. In order to prevent the rotary beater and brush from scattering dust and dirt and yet render these instrumentalities readily accessible when necessary, the hood 61 is provided with pendent side wings 104 which may be lifted out of the way when desired.

What is claimed is:—

1. In a machine for cleaning rugs and the like, a support for the rug, cleaning devices associated with the support, carrying means for the rug on opposite sides of the support, and extensible carrying means for the rug at one end of the support.

2. In a machine for cleaning rugs and the like, a reciprocatory carriage, means at one end of the carriage for securing one end of a rug thereto, and an extensible support for a rug too long for the carriage located at the other end of said carriage.

3. In a machine for cleaning rugs and the like, a reciprocatory carriage, and means at one end of the carriage for securing the corresponding end of the rug thereto, comprising a toothed cross-head with a stem, and a guide for receiving the stem and provided with clamping means, the carriage having an extended seat for the toothed cross-head and portion of the rug engaged thereby.

4. In a machine for cleaning rugs and the like, cleaning devices, a reciprocatory carriage associated therewith, said carriage comprising a frame with a supporting surface for the rug, said frame having at one end holding means for one end of the rug and at the other end an extensible means for supporting the other end of a rug too long for the carriage frame, and a rack member secured to the carriage for reciprocating the same and extending from the ends of the carriage, said rack supporting said extensible means when extended.

5. In a machine of the class described, a rotary beater comprising a shaft, a series of spiders secured to the shaft, said spiders including an intermediate or truss supporting spider, a pair of terminal spiders, and beater supporting spiders, truss rods supported by the intermediate spider and connected under tension to the terminal spiders, said truss rods passing through but having no connection with the beater supporting spiders, means on the shaft for spacing the spiders from each other, the beater supporting spiders comprising a series of radial arms, longitudinal bars connecting the arms at their outer ends, and beaters carried by said bars.

6. In a machine for cleaning rugs and the like, a rotary rug cleaning device, hinged supports therefor, adjusting means for the hinged supports engaging the latter at points distant from the hinges, guide means on said supports to prevent side play thereof when adjusted to position, a shaft carrying said rotary cleaning device mounted on said supports between the guide means and the hinges, a drive belt for the shaft of said rotary cleaning device, said belt being of sufficient length to allow for the adjustment of the cleaning device about the pivotal axis of the hinged supports, and means for maintaining the belt taut.

7. In a machine for cleaning rugs and the like, a support for the rug provided with a groove for seating an edge portion of the rug, and a clip structure having a cross-head with a longitudinal row of teeth along one edge entering the groove and engaging the rug where lodged within the groove to hold the rug without tearing it and locking the edge of the rug to the support.

8. In a machine for cleaning rugs and the like, a reciprocatory carriage having an end member provided with a guide, in combination with a cross head provided with a longitudinal row of teeth along one edge, a stem extending from the head and sliding in the guide, and means for adjustably fastening the stem in said guide.

9. In a machine of the class described, a rotary beater comprising a shaft, a series of spiders secured to the shaft, said spiders including an intermediate spider, a pair of terminal spiders and a series of other spiders, the intermediate spider being of greater diameter and the terminal spiders being of less diameter than the other spiders, truss rods traversing all the spiders except the intermediate spider and being supported at their mid-points upon the latter, said truss rods being connected under tension to the terminal spiders, spacer sleeves on the shafts between each spider, and bars secured to said other spiders and carrying beaters.

In testimony that I claim the foregoing as my own, I have hereto affixed my signature.

AUGUST H. BOELTER.

Witnesses:
RUDOLPH G. BOELTER,
JOHN PETERS.