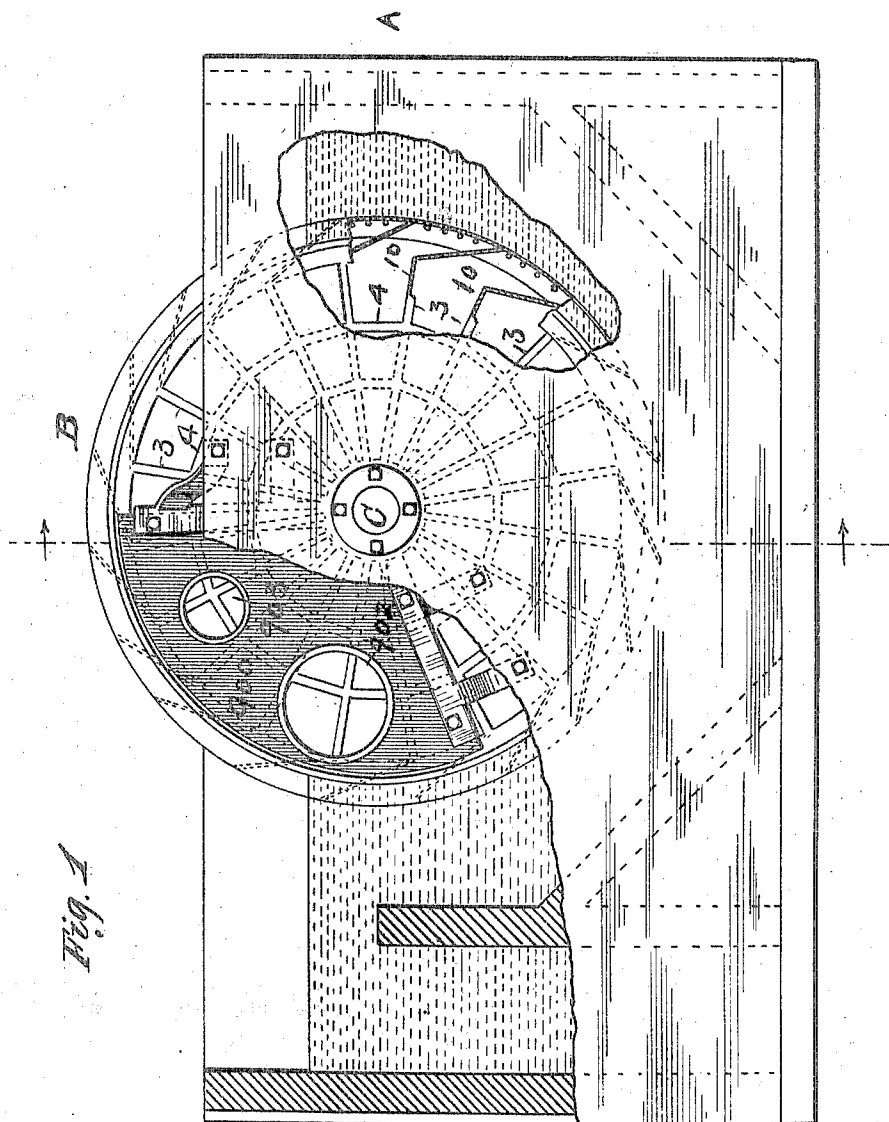


No. 811,660.

PATENTED FEB. 6, 1906.

H. PARKER.
PULP TREATING MACHINE.
APPLICATION FILED JAN. 8, 1903.

5 SHEETS—SHEET 1.



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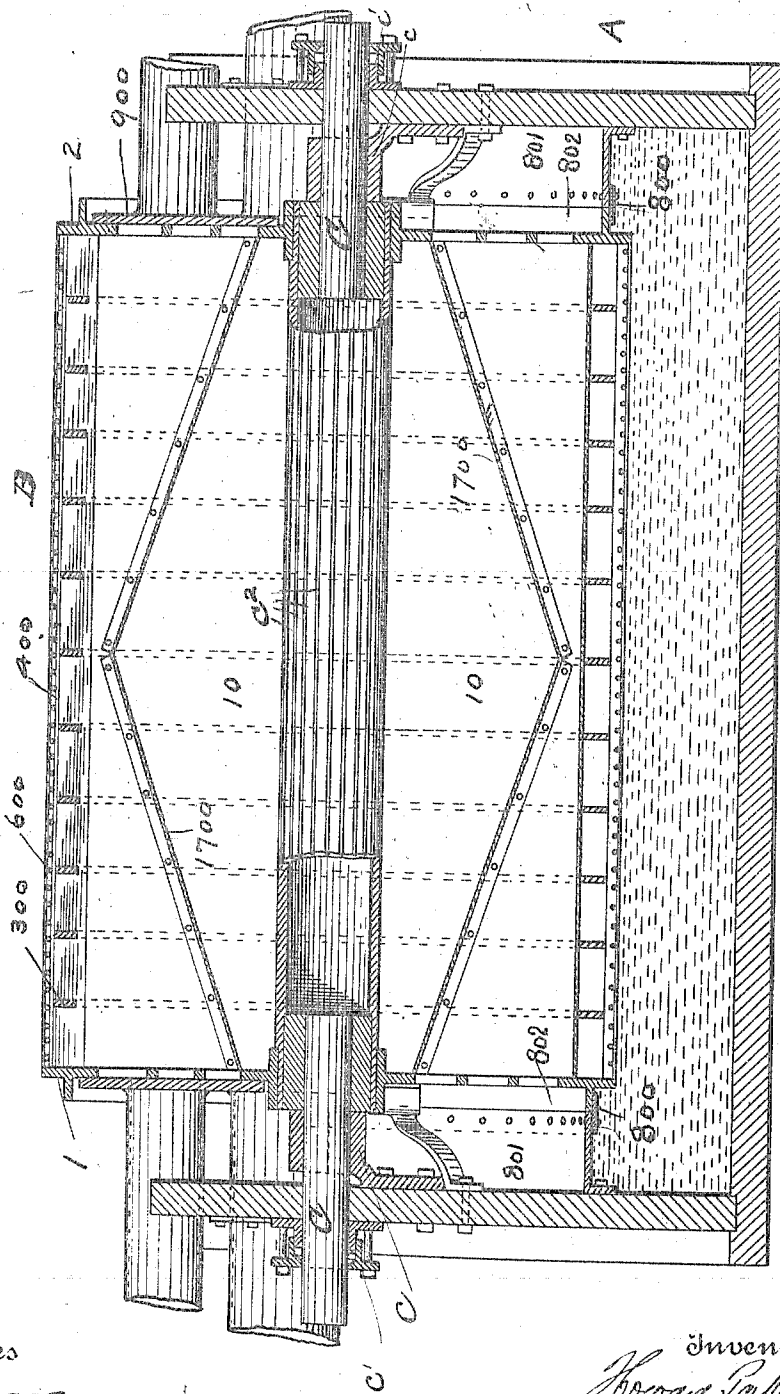
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5 SHEETS—SHEET 2.

Fig. 2.



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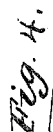
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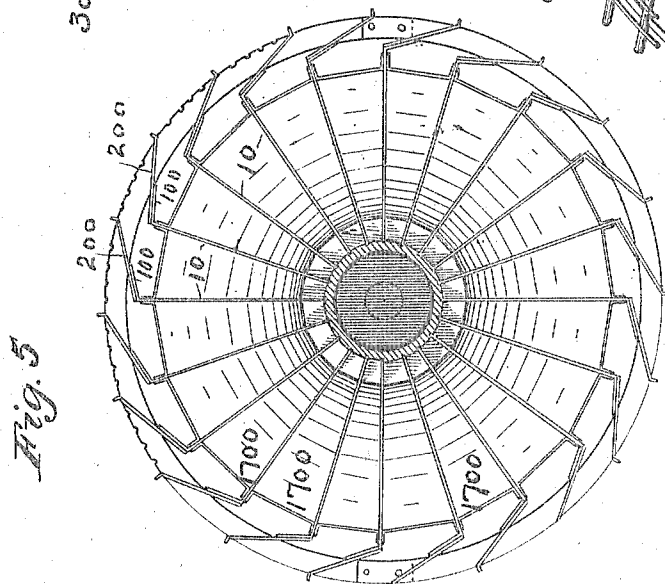
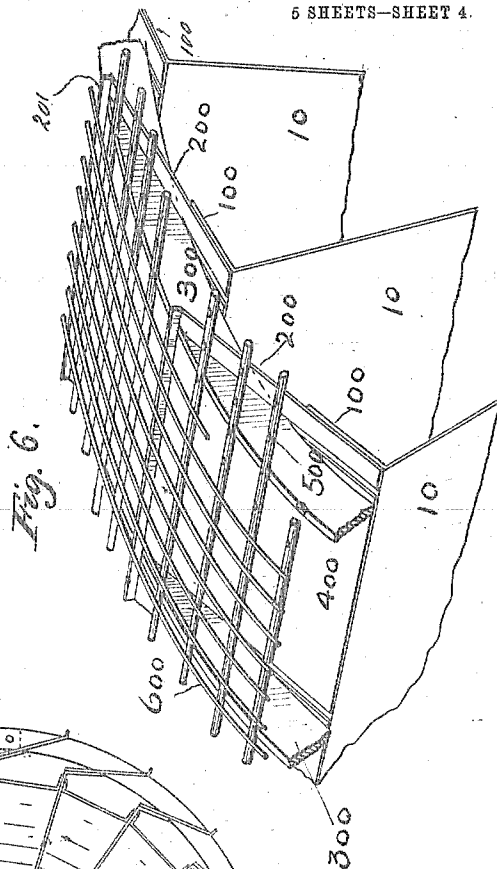
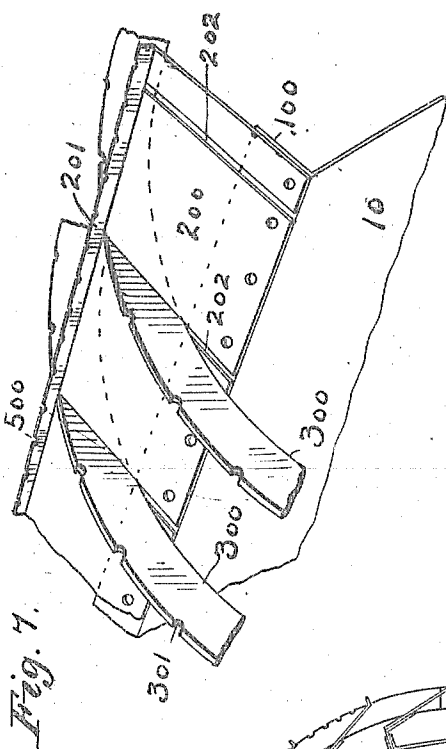
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5 SHEETS—SHEET 4.



B

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5 SHEETS—SHEET 5.

Fig 8.

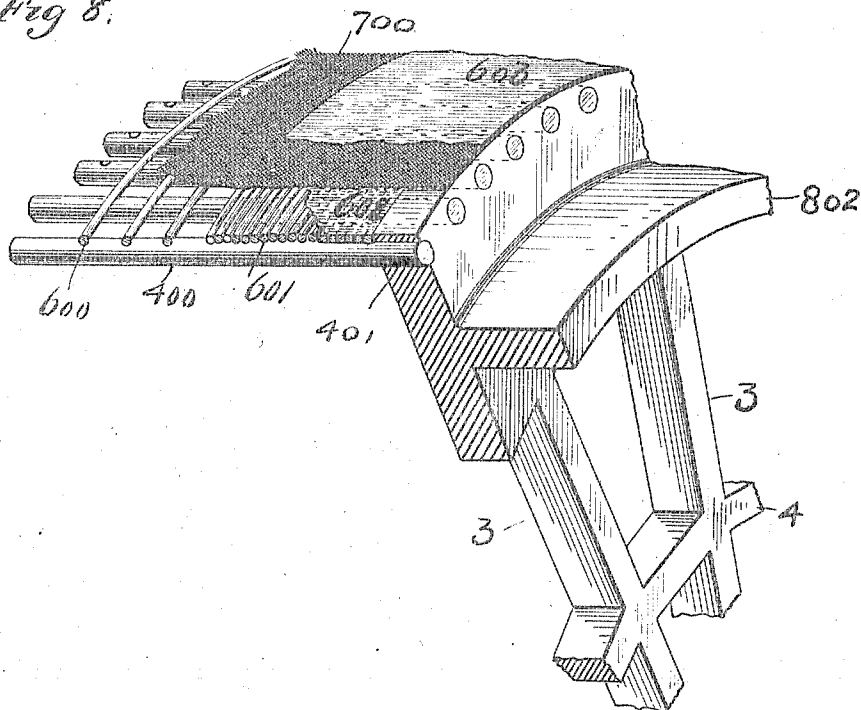
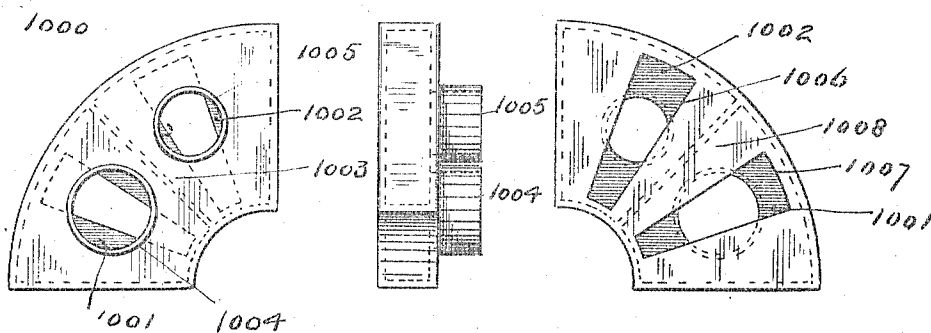


Fig. 9.

Fig. 10.

Fig. 11.



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UNITED STATES PATENT OFFICE.

HOWARD PARKER, OF NASHUA, NEW HAMPSHIRE, ASSIGNOR TO IMPROVED PAPER MACHINERY COMPANY, OF CASTINE, MAINE, AND NASHUA, NEW HAMPSHIRE, A CORPORATION OF MAINE.

PULP-TREATING MACHINE.

No. 811,660.

Specification of Letters Patent.

Patented Feb. 6, 1906.

Application filed January 8, 1903. Serial No. 138,230.

To all whom it may concern:

Be it known that I, HOWARD PARKER, a citizen of the United States of America, residing at Nashua, in the county of Hillsboro and State of New Hampshire, have invented certain new and useful Improvements in Pulp-Treating Machines, of which the following is a specification.

The object of my invention is the production of a mechanism for treating paper-pulp and kindred materials, taking the pulp in its liquid form and forming it into a sheet, which may, if it is desired, be delivered directly upon the felt of a paper-making machine.

Figure 1 is an end view of a tank with my apparatus located therein, parts being broken away to show construction. Fig. 2 is a longitudinal sectional view of the cylinder and appurtenant parts. Fig. 3 is a perspective view of a cylinder with parts broken away. Fig. 4 is a detail view showing the troughs secured to partitions. Fig. 5 is a central vertical section of the cylinder. Figs. 6 and 7 are detail views in perspective of the preferred form of cylinder construction. Fig. 8 is a detail perspective view of the preferred form of construction of the cylinders at their ends. Figs. 9, 10, and 11 are detail views of the preferred form of suction plate or chamber.

A denotes the tank, to which the pulp is supplied in any suitable manner. In this tank there revolves a cylinder B, which is mounted on a shaft C, supported in suitable bearings *c c*, provided with stuffing-boxes *c'*, suitable means being provided for imparting a rotary movement to the cylinder. As the cylinder revolves in the pulp it takes a coating thereof upon its surface, which coating is subsequently pressed between the cylinder and a couch-roll, becoming thereby attached to a felt and traveling on its surface to some proper destination, which may, if desired, be any proper part of a paper-making machine.

As clearly shown in Figs. 1, 4, and 9, the heads 1 2 of the cylinder are cut away, leaving the radial webs 3 and the stiffening-bars 4 5 between the webs, giving them the appearance of a spider-web or grid. This construction permits of access to the compartments within the cylinder from the ends of the cylinder and provides a light but sufficiently strong support for the cylinder. The cylinder is divided interiorly and longitudi-

nally by a series of radial partitions into compartments isolated one from the other. These partitions are clearly shown at 10 in Figs. 1, 3, 4, 5, 6, and 7, the partitions of Figs. 3 and 4 being of old form. The inner edges of these partitions are inserted in grooves *c'* in the shaft, and at each end they are secured to the webs 3 in the cylinder-heads 1 2. Their preferable construction at their outer edges is shown in Figs. 6, 7, and 8, where it will be seen that their ends are bent, as at 100. To these bent ends are secured plates 200, the outer edges of these plates being turned up, as at 201. These plates 200, with the exception of the upturned edge 201, are slotted, as shown at 202, to receive the rings 300. These rings are notched, as shown at 301. In these notches are laid the rods 400, whose ends are secured in recesses 401 in the heads 1 2. The upturned edges 201 of the plates 200 stiffen the upper edges of the partitions very materially. They are substantially flush with the rods 400, and both the outer surfaces of the rods 400 and the edge of the part 202 bear grooves or notches 500 in a spiral relation to each other, and in these notches the wire 600 is laid. 700 denotes a wire screen, such as cylinders for like purposes are often surfaced with, which is laid upon the exterior of the spirally-wound wire 600 and forms the superficial part of the cylinder.

Referring particularly to Fig. 9, the construction of the cylinder at its ends is illustrated in detail, the object being to make the cylinder near its ends impervious, so that it may act as a deckle. This is done in the following manner: It will be seen that the wire 600 is wound close together, as indicated at 601. This closely-wound portion is then covered with solder, (indicated by 602,) after which the wire screen is secured in place. To the wire screen is applied a coating of waterproof paint 603 of a width sufficient to cover the closely-wound wires 601. Each end of the cylinder is constructed as set forth, and these impervious portions of the cylinder act as deckles.

Referring to Figs. 3, 5, and 6, it will be seen that the spaces between the partitions are bridged by suitably-shaped troughs 1700, preferably U-shaped in cross-section, which, beginning at the ends of the cylinder near the bottom of the partitions, extend upwardly to

the top thereof until they meet at about the center of the cylinder. These troughs carry the water which is sucked from the pulp through the perforated shell of the cylinder toward the ends of the cylinder, where it is discharged.

800 denotes a packing between the tank and the perforated cylinder-head. It is fastened to a parti-annular flange 801 on the inside of the tank and presses against an annular flange 802, projecting from the cylinder-head. Its purpose is to prevent the escape of the pulp into the chamber which receives the water which escapes through the cylinder-head.

In order to extract the water from the pulp after it is formed on the surface of the cylinder, the exterior of the cylinder or of certain compartments is subjected to a suction action of some sort. In Figs. 1, 2, 3, 4 there is shown a flat plate 900, which is held against the end of the cylinder by the springs 901. The plate, as shown, has two openings 902 903, to which pipes leading to a suction apparatus are attached; but the preferred form of the device for subjecting the interior of the cylinder to the action of the suction is illustrated in Figs. 10, 11, and 12 and is what I will call a "suction-cap." It comprises a casting 1000, which is designed to be substituted for the plate 900. This casting has two chambers 1001 and 1002, separated by the partition 1003. On the outer side of the casting are the hubs 1004 1005. It will be noticed that the hub 1004 is substantially larger than the hub 1005. In the rear face of the casting are openings 1006 1007, the space 1008 between the openings being large enough to cover the end of a single compartment in the cylinder. To the larger hub 1004 is secured a pipe, which is connected with a fan. This fan will create a suction of considerable volume, but not of great intensity. To the hub 1005 is secured a pipe, which is connected with a pump which will create a suction of great intensity. It will be seen that as the cylinder revolves and a compartment registers with the chamber 1001 in the rear of the cap that compartment will be subjected to a suction action of considerable volume, but not great intensity. This suction extracts the moisture from the pulp to a slight degree; but more particularly it lays the pulp or felts it, or as it is said in the trade "makes the paper." As this section travels around and registers with the chamber 1002 the surface of the cylinder embraced between the partitions is subjected to a suction action of considerable intensity, which extracts pretty thoroughly the bulk of moisture in the pulp. If the compartments were subjected to a suction action of considerable intensity immediately after the cylinder with its accumulated pulp left the solution, the tendency would be to draw the air

through the pulp and make it porous and full of holes. To obviate this difficulty, I employ the above-described construction and arrangement, which accomplishes the desired results and produces a firm and well-made sheet.

I claim as my invention—

1. In combination, in a machine of the class specified, the tank, the cylinder revolvably mounted therein, compartments formed in the interior of the cylinder, and the suction-cap located in operative relation to the cylinder, and having independent suction-chambers.

2. In combination, in a machine of the class specified, the tank, the cylinder revolvably mounted therein, compartments formed in the interior of the cylinder, the suction-cap located in operative relation to the cylinder, independent chambers in the cap, inlet-ports through the rear wall of said cap into each chamber, said ports forming communication between the chambers and the compartments in the cylinder, and outlet-ports through the front wall of the cap from each chamber.

3. In a machine of the class specified, the tank, the pulp-forming cylinder revolvably mounted in the tank, compartments arranged in the interior of the cylinder, and means for subjecting each compartment to suction action of varying intensities.

4. In a machine of the class specified, the tank containing the solution, the cylinder revolvably mounted in the tank partly immersed in the solution, compartments arranged in the interior of said cylinder, and means for subjecting each compartment, first, to the action of a suction of considerable volume but slight intensity, and subsequently subjecting each compartment to a suction action of considerable intensity, substantially as described and for the purposes set forth.

5. The cylinder comprising in its construction suitable heads, and rods extending from end to end of the cylinder and having their ends located in the heads, wire wound spirally on said rods, a coating of solder or similar material applied to the wire for a short distance from each end of the cylinder, the sieve or screen applied over the whole surface of the cylinder, and an impervious coating applied on the screen at each end of the cylinder over the solder, substantially as described and for the purposes set forth.

6. The cylinder comprising in its construction suitable heads, and rods extending from end to end of the cylinder and having their ends located in the heads, wire wound spirally on said rods, said wire being wound more closely at the ends of the cylinder than in the center, a coating of solder or similar material applied to each end over the closely-wound wire, the sieve or screen applied over the whole surface of the cylinder, and an im-

pervious coating applied on the screen at each end of the cylinder over the closely-wound wire, substantially as described.

7. In a cylinder in combination the shaft, the heads, partitions supported along their inner edges by the shaft and at their ends by the heads, notches in the upper edges of the partitions, the circumferential rings located in the notches, the lengthwise rods supported on the rings, the upturned stiffening-flange secured to the upper edges of the partitions, notches formed in the rods, and in the stiffening-flanges, wire wound about the cylinder and resting in the notches in the rods and flanges, and a sieve or screen applied over the whole to form the surface of the cylinder.

8. In a cylinder, in combination, the shaft having lengthwise grooves in its surfaces, the heads supported on the shaft and having peripheral rims, spokes, and lateral braces from spoke to spoke, partitions having their inner edges located in the grooves in the shaft and their outer edges slotted to receive the framings and their ends secured by the spokes, said rings and a pervious shell, substantially as described.

9. In a machine of the class specified, the cylinder having a perforated shell, radial partitions extending from the shaft to the shell forming compartments within the cylinder, and U-shaped troughs secured at each side to adjacent partitions, substantially as described.

10. In a machine of the class specified, the cylinder having a perforated shell, radial partitions extending from the shaft to the shell

forming compartments within the cylinder, and U-shaped troughs secured at each side to adjacent partitions; said troughs being inclined downwardly toward the ends of the cylinder, substantially as described.

11. A cylinder having heads, a shell, radial partitions extending lengthwise of the cylinder and having upwardly-extending continuous stiffening-flanges along their outer edges.

12. A cylinder having heads, a shell, radial partitions extending lengthwise of the cylinder having their edges slotted for the reception of rings, said rings, and an upstanding continuous flange secured to the outer edges of said partitions.

13. In a cylinder comprising heads, a shell, and radial partitions for supporting said shell, plates secured to the outer edges of said partitions at an angle thereto, and upstanding continuous stiffening-flanges secured to the edges of said plates.

14. A cylinder having heads, a shell, and radial partitions for supporting said shell, plates secured to the outer edges of said partitions at an angle thereto, said plates being slotted, and an upwardly-extending continuous stiffening-flange secured to the edge of said plate, substantially as described and for the purposes set forth.

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

HOWARD PARKER.

Witnesses:

B. A. PEASE,
L. H. OTIS.