(No Model.) 3 Sheets—Sheet 1.

W. S. JARBOE.

DEVICE FOR LIFTING PLATE GLASS.

No. 438,584. Patented Oct. 14, 1890.

Fig. 1.

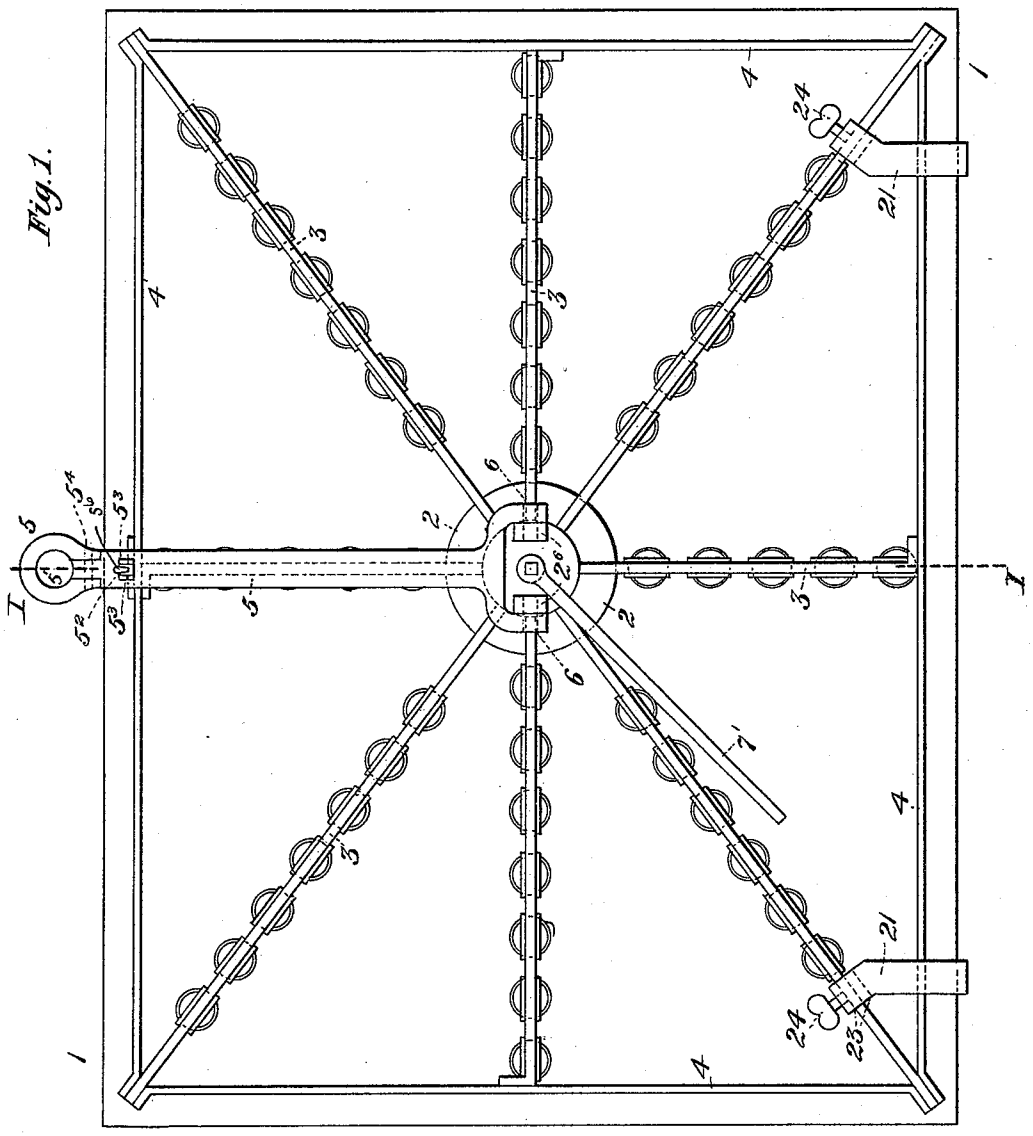
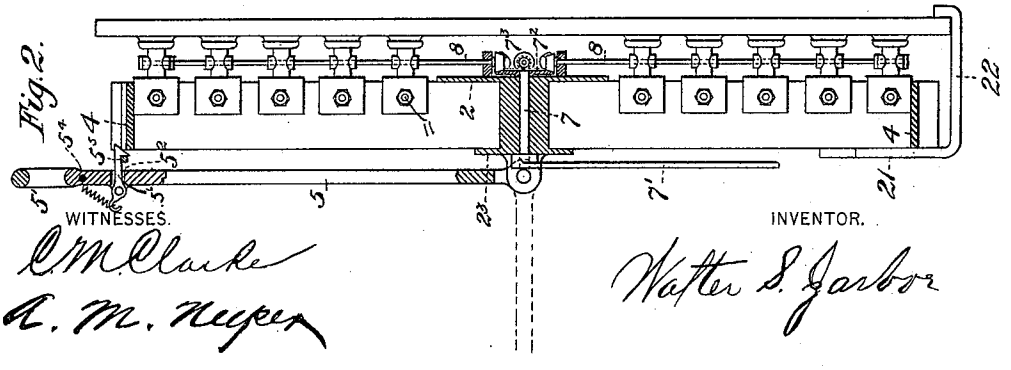


Fig. 2.



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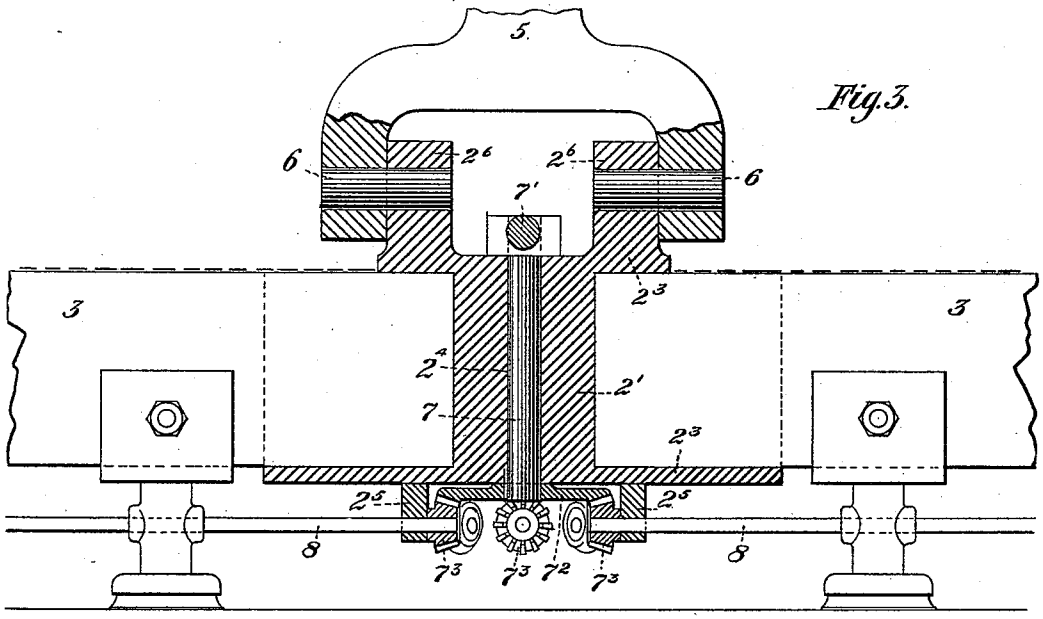


Fig. 3.

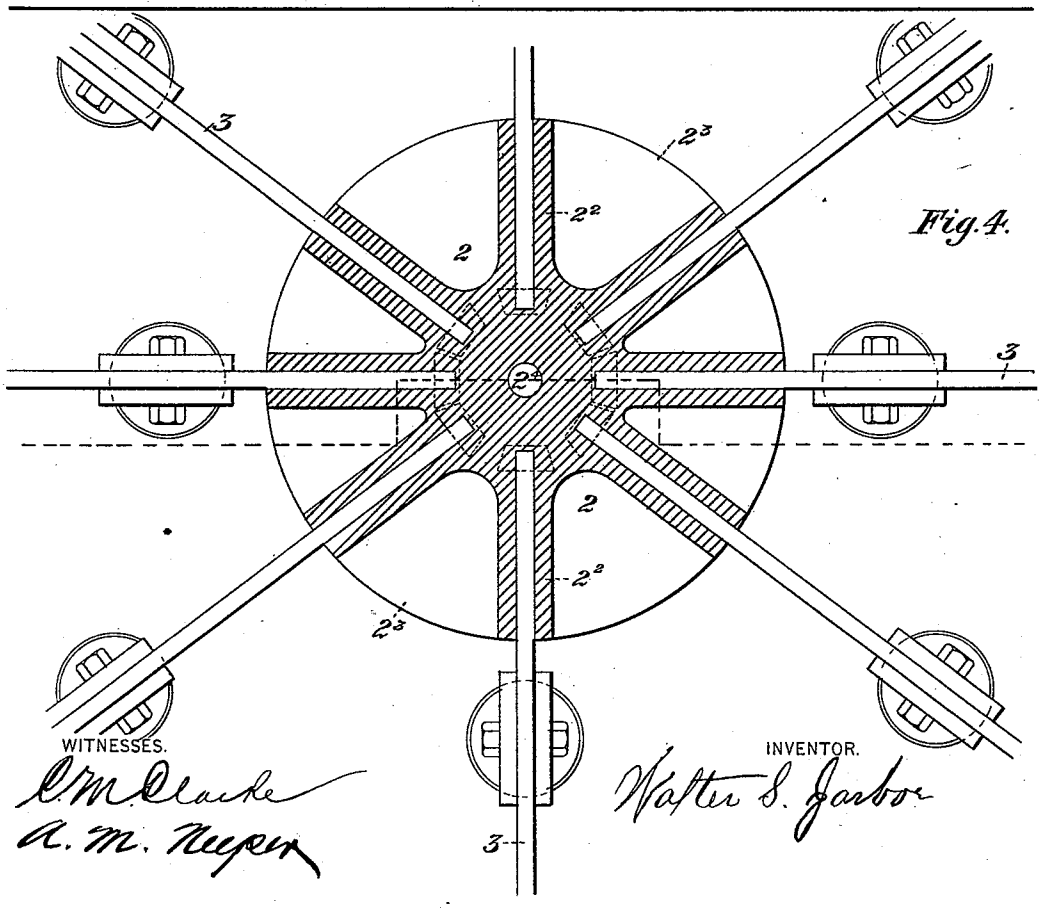


Fig. 4.

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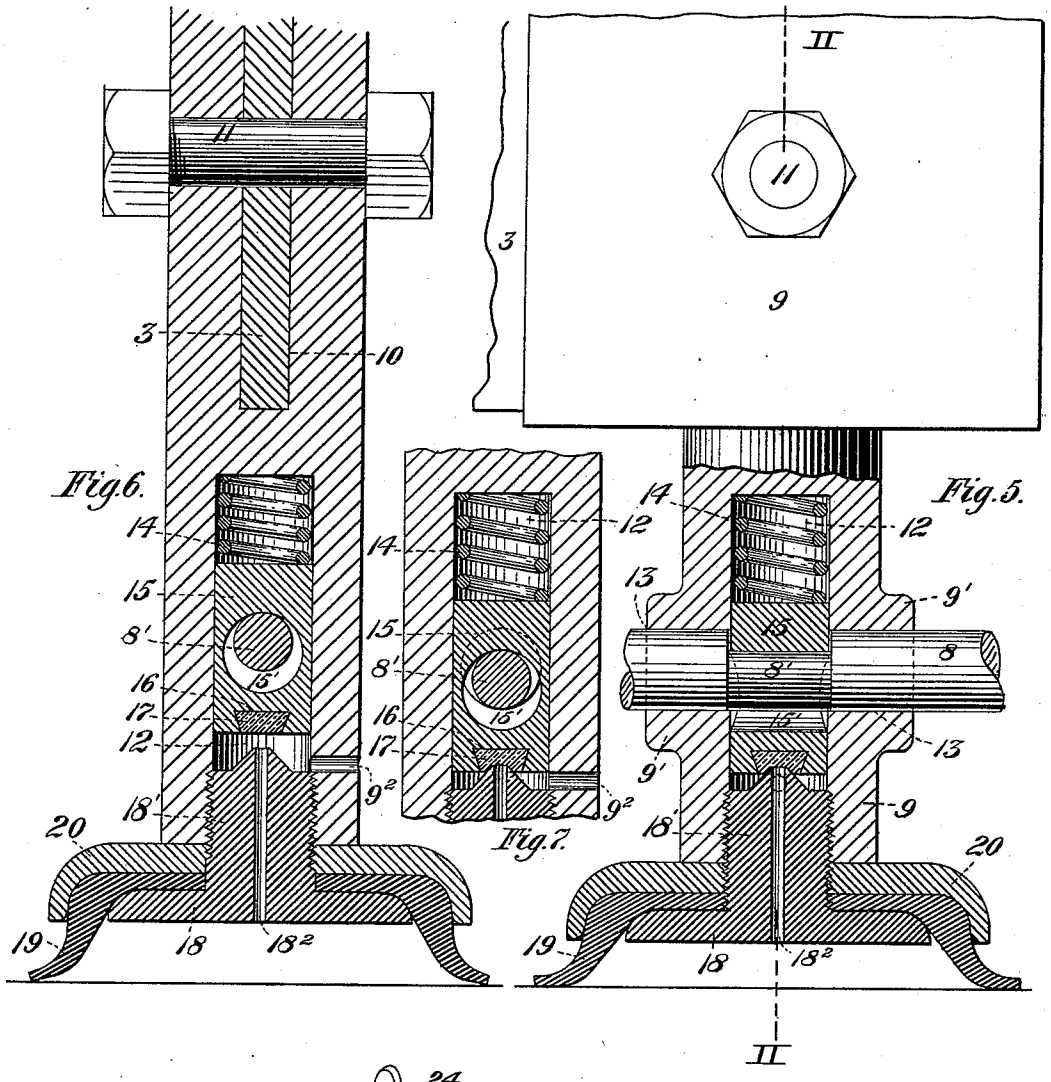
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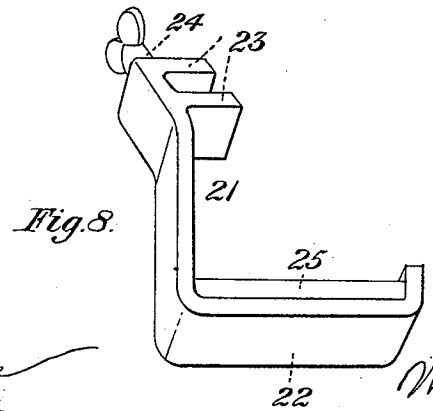
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UNITED STATES PATENT OFFICE.

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DEVICE FOR LIFTING PLATE-GLASS.

SPECIFICATION forming part of Letters Patent No. 438,584, dated October 14, 1890.

Application filed May 5, 1890. Serial No. 350,566. (No model.)

To all whom it may concern:

Be it known that I, WALTER S. JARBOE, a citizen of the United States, residing at Allegheny, county of Allegheny, and State of Pennsylvania, have invented a new and useful Plate-Glass-Lifting Device, of which the following is a specification.

My invention consists in the hereinafter described and claimed device for lifting plate-glass; and the object of it is to afford a means for more safely and efficiently lifting and transporting large sheets of plate-glass or similar material.

In the accompanying drawings, Figure 1 is a plan view of my invention. Fig. 2 is a section of same on line I I, showing, however, only the middle rib of the frame with the suction-disks thereto to be attached and the center casting. Fig. 3 is an enlarged sectional view of center casting and surrounding parts. Fig. 4 is a partial plan of Fig. 3. Fig. 5 is a detail of the suction-disk, partly in section. Fig. 6 is a section of Fig. 5 on the line II II. Fig. 7 is a detail of the valve of the suction-disk. Fig. 8 is a perspective view of detachable hook 21.

The frame 1 of my invention is constructed of a central steel casting 2, in which are inserted ribs of plate metal 3, having their ends joined by plates 4, thus forming a rectangular frame having a hub.

The casting 2 is made with a hub 2′, Fig. 3, and radiating spokes 2^2, each of which has a recess to form a socket to take the ends of ribs 3 of the frame 1. Spokes 2^2 are strengthened and re-enforced by circular plates 2^3, which are cast on the upper and under sides of said casting 2. On the upper side are cast two lugs 2^6, each of which is bored to take pin 6 of bar 5. Said casting is also provided with a hole 2^4 at its center, for a purpose hereinafter described.

To each of the spokes 2^2 a lug 2^5 is cast and provided with a hole for the reception of shafts 8.

A bar 5, forked at one end with forks drilled for the reception of pins 6 and at the other end having an eye 5′, is attached to casting 2 by inserting pins 6 through the holes in its forks and in lugs 2^6 of the casting 2. Near the eye 5′ is a hole 5^2, having lugs 5^3 on each side. Mounted on lugs 5^3 is a latch 5^6, having a hook at one end.

A keeper 5^5 for latch 5^6, made of plate metal, is fastened to plate 4 in such position that the latch 5^6 will be engaged and held thereby.

Bar 5 has a swivel-joint at 5^4, by which the frame when suspended may be turned in any desired direction.

In hole 2^4 of casting 2 a shaft 7 is placed in such manner as to revolve freely therein. At its upper end a handle or lever 7′ is fixed, and at its lower end a bevel-wheel 7^2 in such position that the bevel-pinions 7^3 on shafts 8 will engage the same.

The suction-disks affixed to the frame 1 in the manner and number shown, or in any convenient manner, are constructed as follows: A casting 9 is cast solid, having a flat head with a cylindrical projection from one side. The head has a slot 10 milled into it of sufficient size to fit closely on ribs 3, to which the castings are bolted by bolts 11. In the cylindrical projection of the casting a hole 12 is bored, which is threaded at its opening. It is also bored transversely through lugs 9′, making hole 13 therein. A small hole 9^2 is bored in 9. In hole 12 is first placed a spiral spring 14, then a cylinder of metal 15, preferably a piece of cold-rolled shafting, which has a hole 15′ bored therein. At its lower end a small dovetailed opening 16 is placed, into which a piece of india-rubber 17 is forced. A metal disk 18, having a threaded lug 18′ is fitted in hole 12, the disk 18 having a small hole 18^2 drilled therein. An india-rubber cup 19, having a hole of such size as to admit of the passage of lug 18′ is made in the shape shown on the drawings. A cup-shaped disk 20 is made with a hole, which is threaded to receive lug 18′ of disk 18. The cup 19 is placed over lug 18′ of disk 18, and disk 20 is then screwed down on lug 19 until the face of disk 18 is in the same plane as the edges of the flange of 20, so that when the rubber cup is extended by pressure or otherwise the edges of cup 19 will form an air cushion-under the edges of the flange of disk 20.

Shaft 8 is made of cold-rolled shafting, and

is placed through the openings 13 of the castings 9 and the opening of lug 2^5 of casting 2, these openings forming the bearings therefor. The beveled pinion 7^3 is fixed to shaft 8, so as to be meshed in bevel-wheel 7^2. At those points on shaft 8 where it encounters cylinders 15 in the castings 9 it is turned so as to form a crank-pin 8′, so that when the shaft revolves cylinders 15 will be depressed by action of spring 14 and raised on 8′ being turned to top position.

Hook 21 is made with a hooked shank 22, having jaws 23, which permit of its being placed over rib 3 of the frame and clamped thereon by thumb-screw 24. In the bottom of the hook a piece of wood 25 is placed to form a cushion.

To use my invention, the same should be suspended over the plate of material to be lifted and transported. The lever 7′ should be operated so that the revolution of bevel-wheel 7^2 will cause the pinions 7^3 meshing in it to turn shafts 8, so that all of the openings in disks 18 shall be open and communicate with the atmosphere through openings 9^2 in casting 9. The device is then lowered upon the plate to be raised and its weight will distend the rubber cups 19 and drive all of the air out from between them and the plate to be lifted. When the frame has firmly settled down, the lever 7′ is again operated, so that in the manner above described shafts 8 will revolve and leave cylinders 15 free to descend, which they are compelled to do by the action of spring 14. Cylinders 15 having thus been pressed down, the india-rubber cushion 16 stops the hole or air-passage in disk 18 and preserves the vacuum formed by the expulsion of the air from between cups 20 and plate of material to be lifted. A vacuum being thus formed at the points where cups 19 come in contact with plate to be lifted, a firm grip is taken upon the same, which will allow the plate to be raised and suspended.

The bar 5 is by means of its eye attached to means suspending the frame, and, when desired, the plate lifted may be tilted from the horizontal plane from which it is first lifted to a plane at a slight angle from the vertical.

When the device is to be loosened from the plate to which it has been attached, the lever 7′ is again operated, so as to open the air-passage in disk 18, when, the air entering the same, the vacuum is destroyed and the hold of the device broken, and the same is easily taken away from the plate.

Hook 21 supports plate lifted by frame.

Among the advantages which may be claimed for my invention the following are important and useful—viz., that it affords a means of conveniently and safely lifting large sheets of fragile and brittle materials. That while it is acting as a lifting device it also braces and stiffens such sheets, so as to prevent to a great degree their fracture caused by vibration arising from the motion imparted to them by the present manual lifting and transporting methods.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. In a device for lifting sheets of fragile material, the combination of a frame having vacuum-disks, with a bar hinged to said frame, and having a spring-latch to engage and hold said frame, substantially as and for the purposes described.

2. In a device for lifting sheets of fragile material, the combination of a frame having a hub, ribs radiating therefrom, vacuum-disks attached to said ribs, shafts parallel to said ribs and supported by said hubs and vacuum-disks, and the means for simultaneously revolving said shafts, substantially as and for the purposes described.

3. In a device for lifting sheets of fragile material, the combination of a frame having a hub, and ribs radiating therefrom, vacuum-disks attached to said ribs, shafts parallel to said ribs and supported by said hub and vacuum-disks, and each having a beveled pinion meshing into a beveled gear-wheel mounted on said hub, substantially as and for the purposes described.

4. A vacuum-disk having a cylinder open at one end, and an air-passage, a movable plunger having a pad at its lower end, a flexible suction-cup supported by suitable disks, one of which has an air-passage communicating with said cylinder, in combination with a shaft passing through said plunger eccentrically with the perforation in the same, said cylinder forming bearings for said shaft, substantially as and for the purposes described.

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Witnesses:

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