(No Model.) 2 Sheets—Sheet 1.

S. HEVNER, Dec'd.

P. B. JOHNSON, Administrator.

STRAIGHTENING WALLS.

No. 377,940. Patented Feb. 14, 1888.

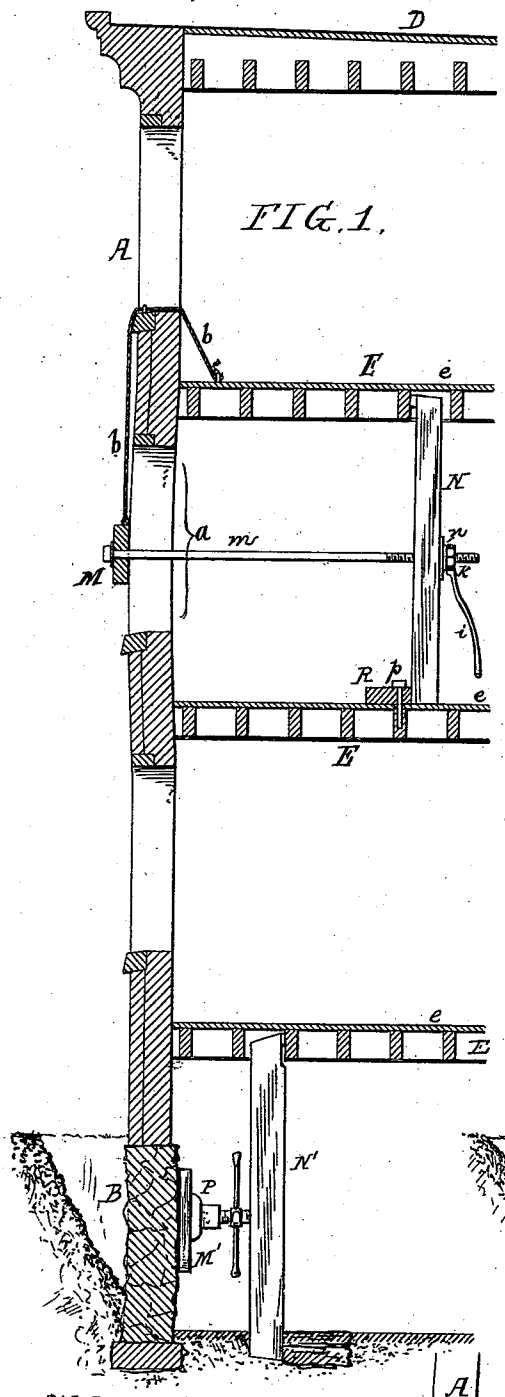


FIG. 1.

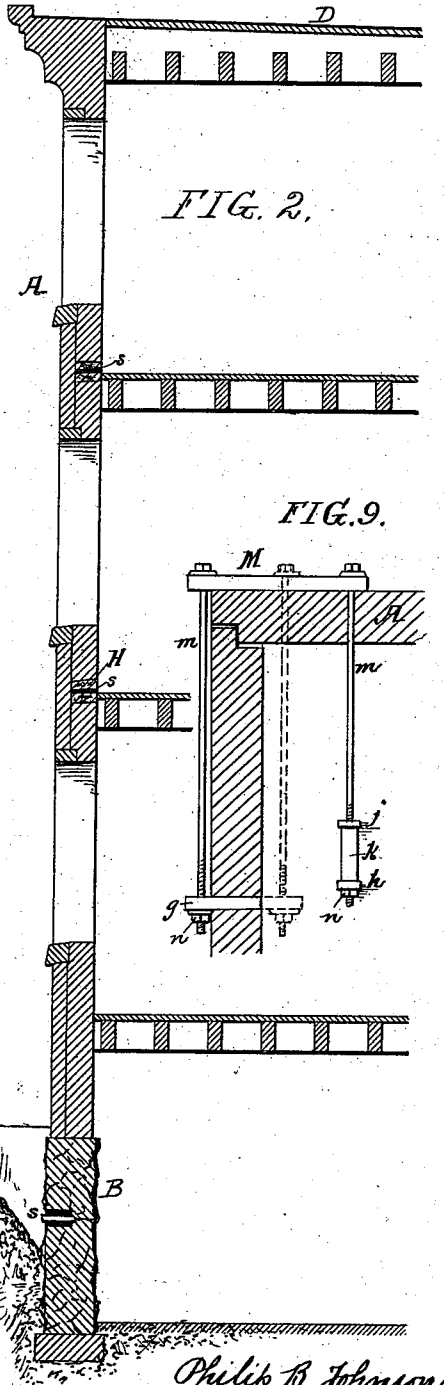


FIG. 2.

FIG. 9.

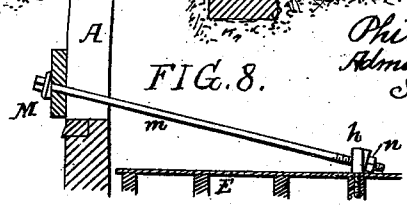


FIG. 8.

Witnesses;
David S. Williams
Harry Drury

Philip B. Johnson
Administrator of the Estate of
Samuel Hevner
deceased
by his attorneys
Howson & Sons

N. PETERS, Photo-Lithographer, Washington, D. C.

(No Model.) 2 Sheets—Sheet 2.

S. HEVNER, Dec'd.

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STRAIGHTENING WALLS.

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FIG. 3.

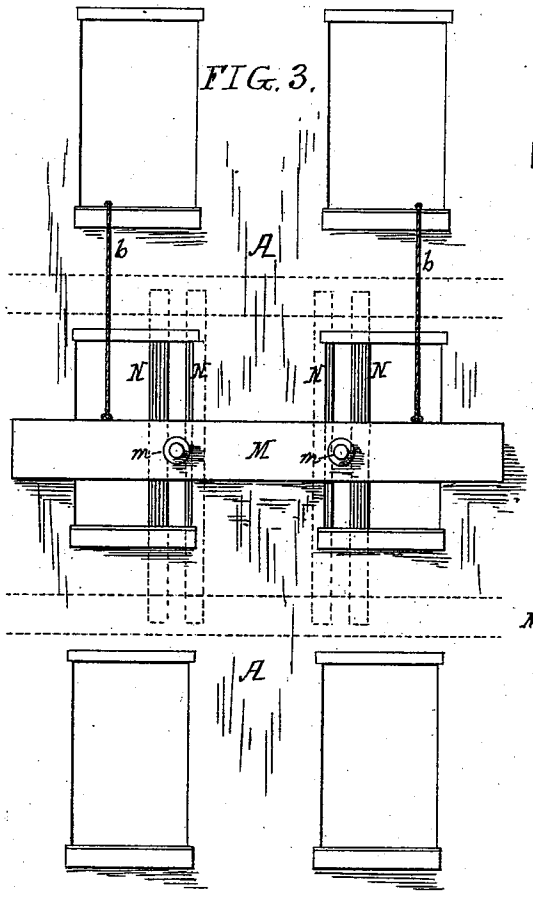


FIG. 4.

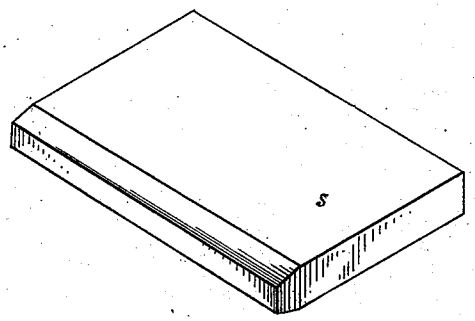


FIG. 7.

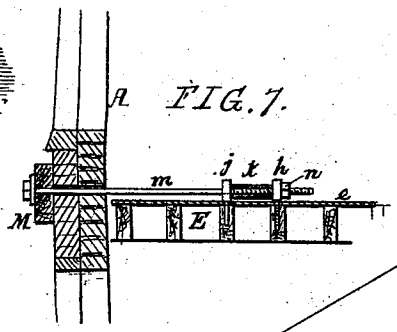


FIG. 5.

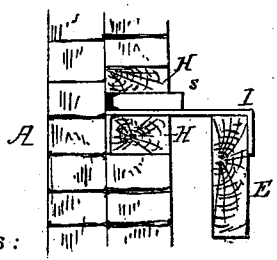
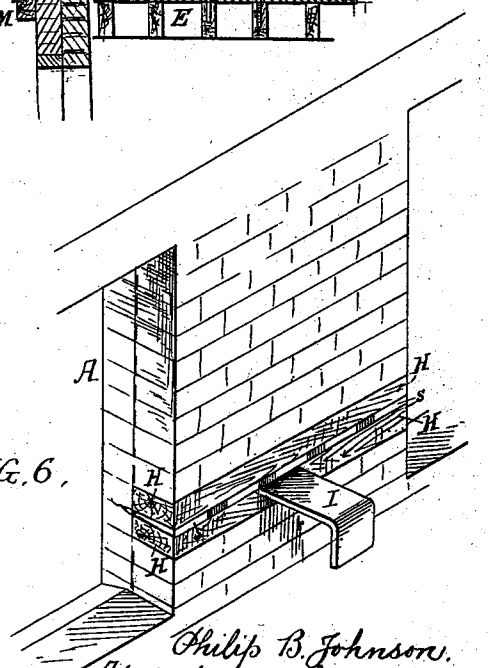


FIG. 6.



Witnesses:
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Harry Drury

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by his Attorneys,
Howson & Sons

N. PETERS, Photo-Lithographer, Washington, D. C.

UNITED STATES PATENT OFFICE.

PHILIP B. JOHNSON, OF BALTIMORE, MARYLAND, ADMINISTRATOR OF SAMUEL HEVNER, DECEASED.

STRAIGHTENING WALLS.

SPECIFICATION forming part of Letters Patent No. 377,940, dated February 14, 1888.

Application filed June 20, 1887. Serial No. 241,857. (No model.)

To all whom it may concern:

Be it known that SAMUEL HEVNER, deceased, late a citizen of the United States, residing in Baltimore, Maryland, did in his lifetime invent certain Improvements in Straightening Walls, of which the following is a specification.

The object of this invention is to straighten the walls of buildings when they become out of plumb; and this object is attained in the manner which will now be described, reference being had to the accompanying drawings, in which—

Figure 1 is a sectional elevation showing the bulged front wall of a building before being straightened. Fig. 2 is a sectional elevation of the front portion of the building after the wall has been straightened by this method. Fig. 3 is a front view of a portion of the building. Fig. 4 is a perspective view of the form of wedge which it is preferred to use in carrying out this invention. Figs. 5 and 6 are views illustrating the application of the wedge; and Figs. 7, 8, and 9 are views illustrating modifications of the invention.

A is the front wall of the building; B, the foundation-wall; D, the roof, and E the joists, having the usual flooring-boards, *e*, secured thereto.

The bulging out of the walls of buildings is caused generally by the difference in the settling of the facing bricks or stones and the soft bricks or backing, the facing-bricks being laid very carefully and with but little mortar in the joints, while less care is taken with the backing-bricks, more mortar being used between each layer than between the layers of facing-bricks. When the mortar shrinks, therefore, the backing-bricks will settle more than the facing-bricks, thus throwing the weight on the outside shell bricks, and in some cases said shell bricks cannot sustain the load, and consequently the wall bulges or is otherwise thrown out of plumb.

Piers have been held in position by means of a stay-rod passing through large washers on the outside of the building and through the wall, such rod being attached to one or more of the joists of the building; but the rod and large washers are permanent, and when, as is often the case, several rods are used, inconvenience and the marring of the appearance of the front of the building are the result.

The object of this invention is to straighten walls and keep them straight without the use of permanent stay-rods and washers. If, for instance, a pier forming part of a wall is bulged or out of plumb, as shown at *a*, Fig. 1, the procedure is as follows: A heavy beam, M, is first hung from the windows or other available points above the bulge by means of ropes *b*, and so adjusted that it will rest across the breast of the bulging portion of the pier. Two or more long rods, *m*, are then passed through each end of the beam and preferably through the window-openings, each rod passing through a plate, *n*, supported by two upright beams, A, which have their upper bearings against the joists of the floor above and their lower bearings against a plank, P, secured to the floor-joists by pins *p*, as shown in Fig. 1. The rods *m* have threaded ends, to which are adapted nuts *k*, by turning which the beam M is drawn in, carrying with it the bulged wall. It is preferred to use a large wrench-bar, *i*, to turn the nuts, as shown in Fig. 1. When the beam M is drawn in to such an extent that the original truth of the wall is restored, one or more rows of backing-bricks are removed from the wall at a suitable point or points, and two well-seasoned planks or other bearing-bars are inserted in place of the bricks so removed, said planks being preferably secured in place by means of cement, as shown in Figs. 5 and 6. A series of wedges, *s*, such as shown in Fig. 4, are then driven between the planks H H, thereby raising the backing-bricks to their original position, this being done in two or more places, as circumstances require. This wedging up of the backing-bricks enables them to assume their supporting duty and relieve the facing-bricks from excessive strain, so that when the retaining-bar and straining-rods are removed the wall will remain true and the strain is distributed throughout both the facing and back of the wall.

In some cases an anchor-plate, I, which is secured to the wall and extends and is secured to the first or second joist, (see Fig. 5,) is used with the planks H and wedges *s*.

It has been found in practice that the forcing

in of the foundation-walls B will often cause the walls to bulge; and these walls B are straightened by placing the bar M′ across the breast of the bulge and placing upright beams N′ against the floor-joists above and against a temporary foundation, N^2, in the cellar below. A screw-jack, P, is then placed between the two bars H′ and beams N′, and by turning the screws the wall B is forced to its true line, the earth in front of the foundation-walls being first removed, as shown in Figs. 1 and 2. Wedges are then inserted in the openings in the front of the wall, or some of the foundation-stones removed and bearing-bars H, of flagstone, metal, or well-seasoned timber, inserted, and the wedges driven, which may be of iron or wood, when the wall has been straightened.

All the crevices are cemented, and when the cement is set the jack and timbers are removed. Any suitable jack can be used to force the wall out; but the usual screw-jack is preferred, as it is easily manipulated.

Where the breast of the bulge is near the floor, the wash-board is removed and holes cut through the wall, as shown in Fig. 7, the straining-rods being passed through the holes and through an eye-bar, *h*, which is screwed into the joist, the nut *n* being applied to the bar *m* back of the eye-bar.

When necessary to distribute the strain, eye-bars are secured to successive joists and fillers *k* inserted, so that a series of joists are available to resist the strain. Straining-bars can then be passed through the windows and connected to eye-bars *h* on the floor, as shown in Fig. 6, where circumstances permit.

In drawing corners the beam M is taken and a rod passed through the beam and along the side of the building, as shown in Fig. 9, the rod passing through an eye-bar, *g*, which is inserted in the side wall. Another bar is passed either through the window-opening or through a hole in the wall and through an eyebolt in the floor, or, as shown by dotted lines in Fig. 9, through an extension of the eye-bar *g* on the outside of the wall, the straining devices being removed after the wall has been trued up and wedged, as before described. In this case it is preferred to use an anchor-plate, I; but instead of anchoring it to the joists it is anchored to the side walls.

What is claimed is as follows:

1. The mode herein described of straightening walls, said mode consisting in imparting pressure to the wall on one side until the truth is restored, then wedging up the other side of the wall until the strain is equalized, all substantially as set forth.

2. The mode herein described of straightening walls, said mode consisting in imparting pressure to the wall on one side until its truth is restored, then wedging up the other side of the wall until the strain is equalized, and, finally, removing the pressure devices, all substantially as specified.

3. The mode herein described of straightening walls, said mode consisting in applying pressure to the bulging side of the wall until it is brought into line, and then wedging supporting materials into crevices or channels and against the bearing-faces naturally or artificially formed on the opposite side of the wall, all substantially as specified.

In witness whereof I, PHILIP B. JOHNSON, administrator of the estate of SAMUEL HEVNER, deceased, have signed my name to this specification in the presence of two subscribing witnesses.

PHILIP B. JOHNSON.

Witnesses:
MURRAY HANSON,
WILLIAM H. BERRY.