

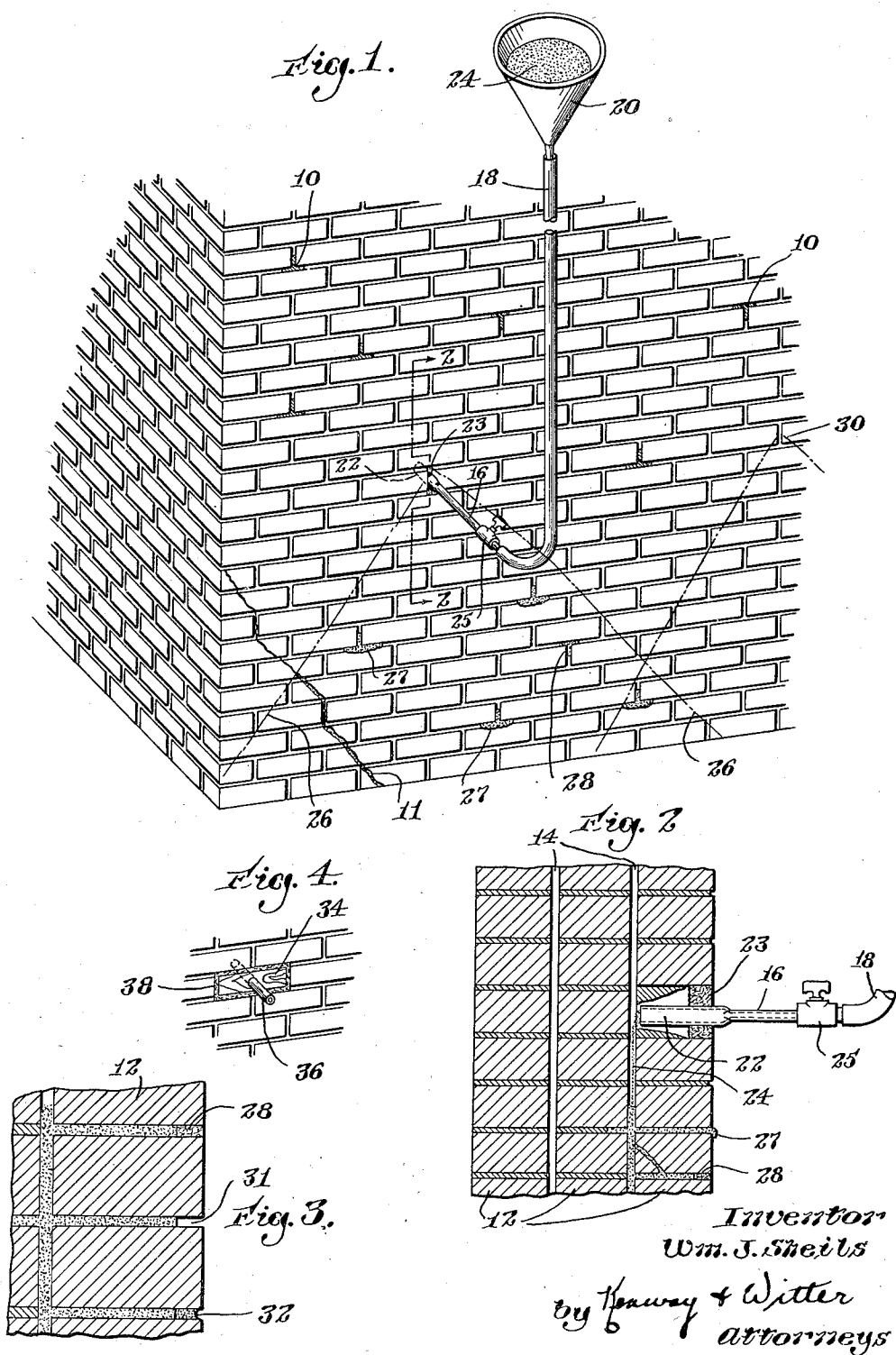
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REPAIRING DEFECTIVE MASONRY WALLS

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## REPAIRING DEFECTIVE MASONRY WALLS

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This invention relates to the repairing of defective walls of brick, tile, hollow tile, concrete blocks and the like and has for its primary object a novel and effective method for waterproofing, weatherproofing and strengthening such walls. Old masonry walls frequently sag or settle thereby producing cracks, cleavages and voids and loose material therein which weaken the wall and permit the entrance of water, freezing temperatures and other destructive elements, and occasionally new walls turn out to be defective due to the porosity or other failure of the material or design to withstand the passage of moisture therethrough. Defective or insufficient mortar, incompetent labor and conditions incidental thereto usually lead to defective joints in the masonry, whereby the wall is weakened and permits the ingress of water and destructive elements, not only rendering the wall ineffective and unsafe but also leading to its rapid deterioration. The object of my invention herein is the production of a relatively simple and economical method of repairing such walls in a manner correcting these defects and bonding the wall with the loose material therein into a solid and substantial unit, whereby the wall becomes impervious to the passage of moisture and relatively safe against further deterioration and possible danger of collapsing.

Masonry walls are commonly built in sections or courses, two or more of such sections or courses constituting the wall, and these walls frequently are or become defective in one or more respects, as above pointed out. Attempts have been made to correct defective joints, cracks and cleavages by repointing the same with mortar at the exposed face of the wall, but such treatment requires a considerable amount of labor and is ineffective for the reasons that all defective joints are not apparent from the appearance of the outer face of the wall, and furthermore the pointing up of the outer face is only a relatively superficial and temporary repair since it does not reach into the interior of the wall. I have discovered that all the above-stated defects can be effectively and economically cured by the application of grout in liquid form to the interior of the wall and that the defective joints can be located and permanently and effectively repointed in conjunction with this treatment.

My invention contemplates the projecting of grout in a flowing condition and under confined pressure into the interior of the wall to be treated, whereupon the grout passes into the space between the wall sections and along the inner sur-

faces of said sections and seeks out and fills all voids and bonds all units and loose portions into a single unit with the wall. The manner of projecting the grout into the wall is of secondary importance only although the same must, by means of its own weight or otherwise, provide or be provided with sufficient confined pressure within the wall to flow laterally into all cracks and voids.

These and other features of the invention will be best understood and appreciated from the following description of a preferred embodiment thereof, selected for purposes of illustration and shown in the accompanying drawing, in which

Fig. 1 is an elevation of a wall being repaired in accordance with my invention;

Fig. 2 is an enlarged sectional view taken on line 2—2 of Fig. 1;

Fig. 3 is a fragmentary sectional view showing the completion of the repair in accordance with my invention; and

Fig. 4 is a fragmentary perspective view illustrating a modified form of the treatment.

Referring now more particularly to the drawing by reference characters, I have in Fig. 1 illustrated one exposed face of a defective brick wall being treated in accordance with my invention. The wall has several defective joints 10, some apparent and others hidden, a crack 11 caused by sagging of the wall, and various other weak spots including voids and loose pieces within the wall. The wall, as illustrated in Fig. 2, comprises three sections or columns 12 with a relatively narrow air space 14 between adjacent sections. It is apparent that the wall cannot be effectively repaired against the passage of rain and weather conditions by pointing up the holes which are apparent from the exposed face thereof, and furthermore that such pointing treatment can, at best, be only of a temporary nature because of its superficial character. On the other hand, the treatment comprising my invention goes basically to the interior of the wall and thus provides a complete and thorough repair.

My invention contemplates the projecting of grout in flowing condition and under confined pressure into the spaces 14, whereupon the grout flows therethrough in contact with the adjacent faces of the sections 12 and laterally into all voids in communication with the spaces. In treating a wall from the exposed face thereof, I employ a pipe 16 and means connected therewith for flowing grout therethrough. This means, as illustrated in Fig. 1, may be a hose 18 and a hopper 20, the hose permitting the hopper to be ele-

vated to a position providing a desired amount of pressure. In proceeding with the treatment, an opening is made through a joint, the flattened nozzle end 22 of the pipe is projected there-  
 5 through, and the joint is calked with oakum, jute or other suitable material 23 around the pipe. Grout 24 is then flowed through the nozzle and into the space 14, a valve 25 being provided for stopping the flow if such control is required.

10 The grout may be projected into the wall under sufficient pressure to force the same into all cracks and voids, the pressure being provided by gravity, by a pump, air pressure or any suitable and convenient means. As illustrated in the  
 15 drawing, the grout projected into the space 14 flows downwardly and laterally by gravity between and substantially as illustrated by the lines 26 of Fig. 1, and the pressure thereon causes the grout to flow outwardly through all defective  
 20 joints and openings, as indicated at 27. As such openings become apparent, they are calked, as illustrated at 28, whereby to stop outward flow of grout therefrom. As each portion treated be-  
 25 comes filled, the nozzle is moved to and an adjacent portion treated, as indicated at 30 in Fig. 1. It should be noted that the moisture from the grout passes outwardly through the joints, and also through unglazed bricks or like units, suffi-  
 30 ciently to moisten the outer face of the wall, as between the lines 26, and thus at all times indicates the extent of the interior of the wall which is being treated. When the grout within the wall has become set, the calkings 28 are removed, as  
 35 indicated at 31, and the openings filled and pointed up with mortar, as indicated at 32. It will be apparent that this surface-pointing mortar bonds directly to and forms a mechanical unit with the grout within the wall.

Another method of procedure which is fre-  
 40 quently employed to advantage involves the removal of a brick from the wall and substituting therefor a wood block 34 having a nozzle pipe 36 extending therethrough, the space around the block being calked, as illustrated at 38. It may  
 45 also be stated that in some cases where the condition of the wall is in doubt, water is first applied to the wall for the purpose of observing the interior condition. Passage of water into the wall indicates voids. If this preliminary treat-  
 50 ment indicates that the wall is defective and contains voids, the grouting treatment is applied.

It will now be apparent that the grout 24 entirely fills the spaces 14 and seeks out and fills any and all voids. Thus such defects as cracks,  
 55 cleavages, defective joints, voids within the wall, etc., are completely filled and sealed from exposure. Furthermore, the grout provides a protective layer throughout the spaces 14 and bonds the wall and all loose material therein into a unit,  
 60 whereby the wall becomes impervious to the passage of moisture and relatively safe against further deterioration and possible danger of collapsing. The protective layer is a permanent

remedy for porous or semi-porous walls and serves to prevent the entrance of moisture and other weather conditions, thereby eliminating efflorescence and other deteriorative effects  
 5 caused by exposure. It will furthermore be apparent that in waterproofing a wall in accordance with my invention, it is not necessary to point up all joints, but only the defective joints and these defective joints are all apparent be-  
 10 cause in the grouting operation the grout with the pressure existing on it leaks through all defective joints and shows a stain on the face of the wall. The pointing up material bonds direct-  
 15 ly to and cooperates with the grout within the wall, whereby the surface pointing becomes an integral part of the wall. Where the mortar between the individual units does not extend the full depth of the unit, and does not show a leak when the grout is forced in, this new grout fills  
 20 the voids around these joints deficient in depth and mechanically bonds these joints to the entire wall. In this manner all existing joints, whether defective to the exterior face of the wall or only  
 25 interiorly defective, become an integral part of the wall.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent is:

1. A method of locating and repairing defective joints in old walls of brick and the like, consisting of projecting a nozzle into an opening  
 30 through an exposed face of the wall, forcing grout through the nozzle and into the wall and along the inner surfaces thereof, whereupon the grout is flowed under confined pressure outwardly  
 35 through and exposes the defective joints, and surface pointing the defective joints at said exposed face by applying plastic pointing material thereto and in contact with the grout therein.

2. A method of locating and repairing defective joints in old walls of brick and the like, consisting of projecting a nozzle into an opening  
 40 through an exposed face of the wall, forcing grout through the nozzle and into the wall and along the inner surfaces thereof, whereupon the grout is flowed under confined pressure outwardly  
 45 through and exposes the defective joints, calking said joints at said exposed face to stop the flow of grout, removing the calking when the grout has set, and applying plastic pointing material in lieu of the calking.

3. A method of repairing defective spots in old walls of brick and the like, consisting of removing a brick from an exposed section of the wall, substituting therefor a filler block having a grout  
 55 conveying nozzle therein, and forcing grout through the nozzle and into the wall and along the inner surfaces thereof under sufficient confined pressure to cause the grout to seek out and fill said spots and voids in the wall and bond into  
 60 a unit with the wall all loose material therein.

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