

March 23, 1954

R. L. SEARS ET AL
MASON'S ALIGNING FIXTURE

2,672,691

Filed Sept. 10, 1949

2 Sheets-Sheet 1

FIG. 1.

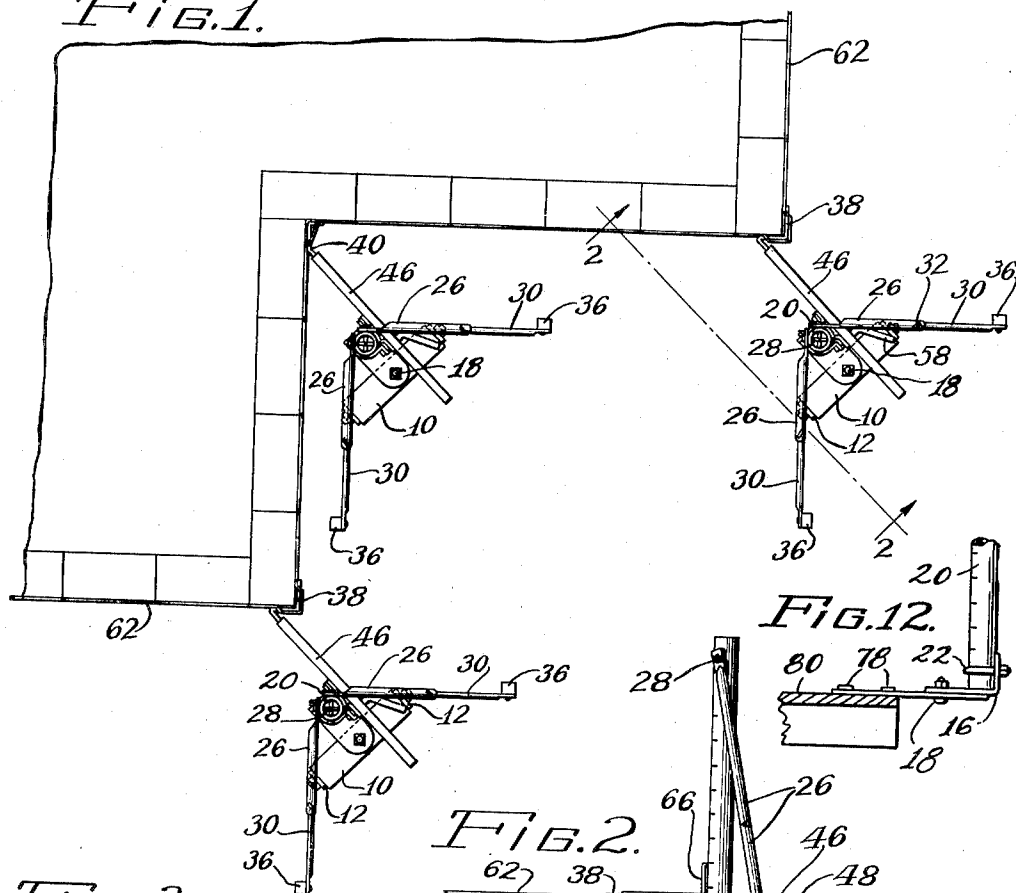


FIG. 12.

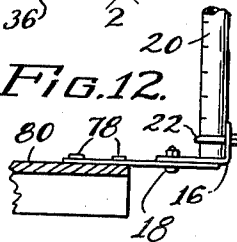


FIG. 2.

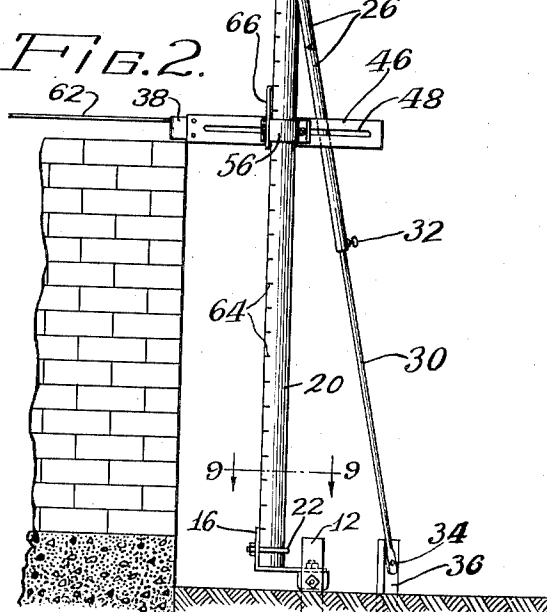


FIG. 3.

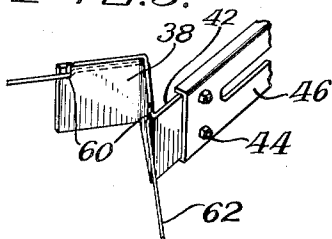
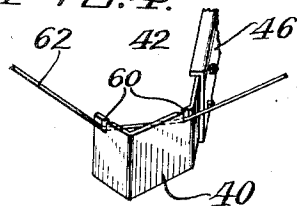


FIG. 4.



Inventors:
Adrian W. Craig
Robert L. Sears
By *Bair & Dreelman* Attys.

March 23, 1954

R. L. SEARS ET AL
MASON'S ALIGNING FIXTURE

2,672,691

Filed Sept. 10, 1949

2 Sheets-Sheet 2

FIG. 5.

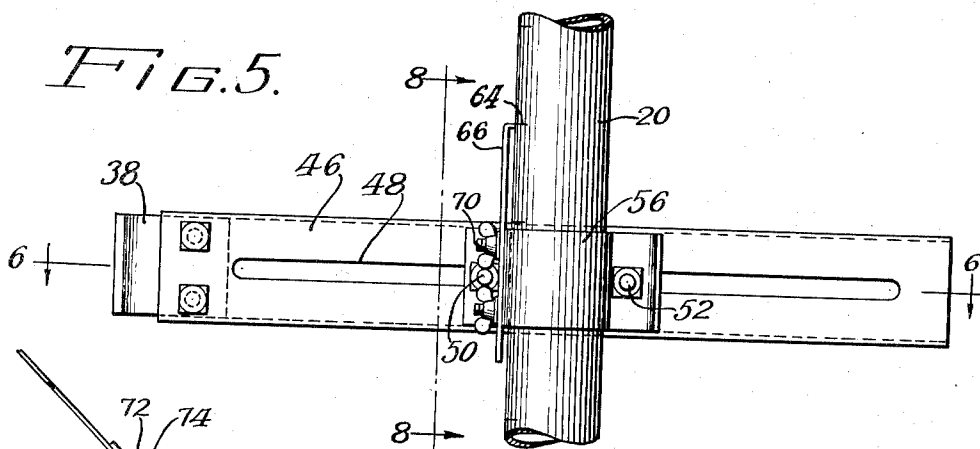


FIG. 6.

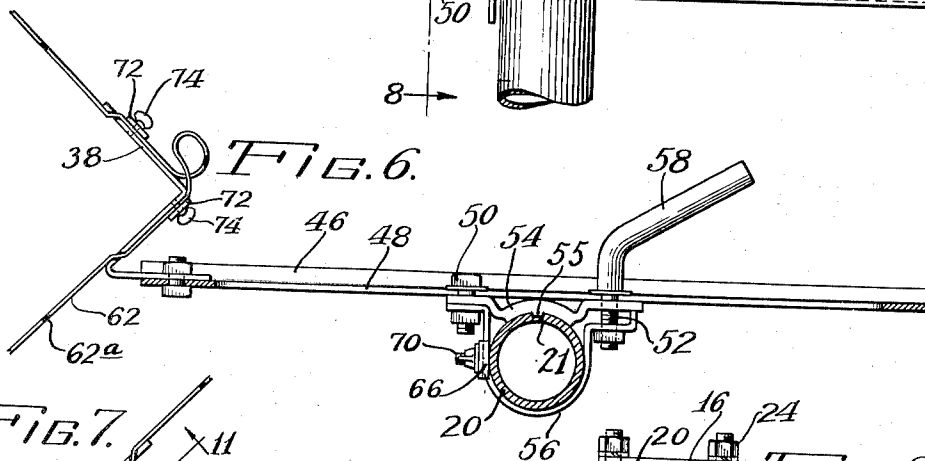


FIG. 7.

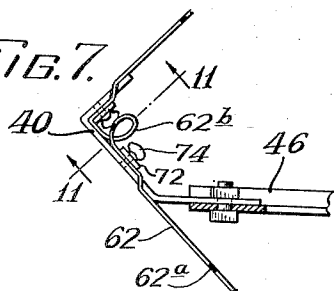


FIG. 8.

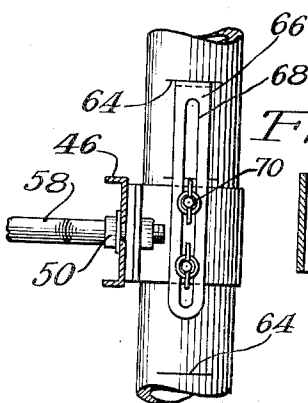


FIG. 11.

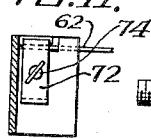


FIG. 10.

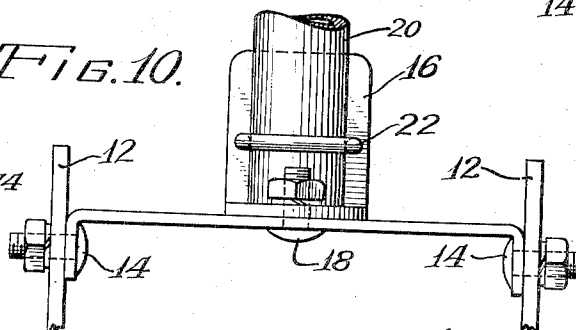
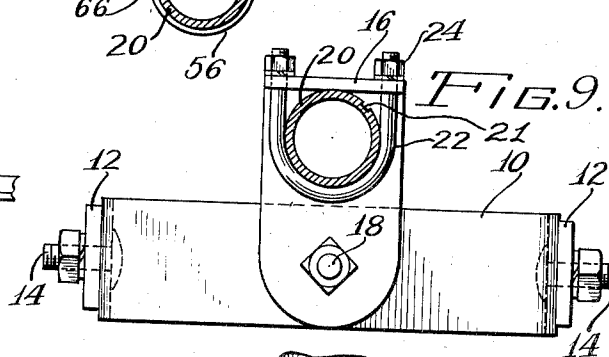


FIG. 9.



Inventors:
Adrian W. Craig
Robert L. Sears
By Bain & Dreeman Attys.

UNITED STATES PATENT OFFICE

2,672,691

MASON'S ALIGNING FIXTURE

Robert L. Sears and Adrian W. Craig,
Des Moines, Iowa

Application September 10, 1949, Serial No. 114,976

2 Claims. (Cl. 33—85)

1

Our invention relates to aligning fixtures suitable for use by a mason for the purpose of accurately leveling a first course of brick or other building units, and aligning the subsequent courses of a wall made from such units, which fixtures assure that all courses of the building units will be parallel to the first course and simplify the construction of the wall by eliminating the use of level and plumb line during such construction.

One object of the invention is to provide an aligning fixture which can be quickly erected at each outside corner (and each inside corner if any) of a building wall prior to building up the wall, the fixtures carrying a mason's line to which the bricks are set, the line being initially leveled and thereafter kept level as it is raised for each course of bricks, the fixture having vertical markings for insuring that each raising of the line will be the same distance at each fixture and the courses of brick thereby kept level throughout the entire building up of the wall.

More particularly, it is our object to provide an aligning fixture comprising an upright with means to readily mount it adjacent the corner of a wall to be built up and quickly adjusting it to a truly vertical position after which corner brackets are adjusted inwardly as necessary relative to the upright for defining the corners, both outside and inside, of the wall, the corner brackets having means to hold a mason's line so that the line completely around the wall is held in a level position and may be vertically raised step by step with respect to the uprights a distance equal to the thickness of one course of building units so that all courses may be kept truly level.

A further object is to provide aligning fixtures which are applicable for basement construction, solid masonry, masonry and steel or masonry veneering types of walls.

Still a further object is to provide a special line that can be used in place of the usual mason's line and which special line is made of wire or the like and has markings thereon to indicate the vertical mortar joints so that these joints from bottom to top of the wall will also be vertical, thus making possible the construction of a wall by relatively unskilled labor which will have a mathematically correct appearance comparable with brick walls laid by skilled brick layers in accordance with present-day methods.

With these and other objects in view, our invention consists in the construction, arrangement and combination of the various parts of our mason's aligning fixture, whereby the ob-

2

jects contemplated are attained, as hereinafter more fully set forth, pointed out in our claims and illustrated in the accompanying drawings, wherein:

5 Figure 1 is a plan view of a portion of a brick wall showing two outside corners and an inside corner with one of our aligning fixtures at each corner, and illustrating the mason's line extending between them.

10 Figure 2 is a vertical view on the indicating line 2—2 of Figure 1 showing details of one of the fixtures.

Figure 3 is an enlarged perspective view of an outside corner bracket used in connection with the fixture.

15 Figure 4 is a similar perspective view of an inside corner bracket.

Figure 5 is a front elevation of a corner bracket support.

20 Figure 6 is a plan view thereof showing it connected with an upright (shown in section).

Figure 7 is a detail of the inside corner bracket, whereas Figure 6 illustrates the outside corner bracket.

25 Figure 8 is a detailed sectional view on the line 8—8 of Figure 5.

Figure 9 is an enlarged sectional view on the line 9—9 of Figure 2, the parts being turned a quarter-turn clockwise.

30 Figure 10 is an elevation of Figure 9.

Figure 11 is a detailed sectional view on the line 11—11 of Figure 7; and

Figure 12 is a sectional view showing second story construction.

35 On the accompanying drawings we have used the reference numeral 10 to indicate a base plate and 12 a pair of stakes therefor. The parts 10 and 12 may be made of mild steel or similar metal and the plate 10 is pivoted to the stakes 12 as by bolts 14.

40 An angle bracket 16 is pivoted to the base plate 10 by means of a bolt 18 that can be tightened after pivotal adjustment and supports an upright 20 which may be formed of pipe or the like. The upright is secured to the vertical flange of the bracket 16 by a U-bolt 22 and nuts 24 as shown in Figures 9 and 10.

45 The upright 20 is braced by a pair of tubular braces 26 pivoted thereto at right angles to each other as indicated at 28. Rods 30 telescope into the tubes 26, the two being retained in any desired telescopic relation by wing set screws 32. The lower ends of the rods 30 are provided with openings through which nails 34 may be driven into wooden stakes 36.

50 For each outside corner, we provide an outside

corner bracket 38 and for each inside corner, an inside corner bracket 40. Each of the brackets 38 and 40 has an attaching flange 42 adapted to be bolted as at 44 to a corner bracket support 46. The bolts permit ready interchangeability of the inside and outside corner brackets as required for any given job.

The support 46 is channel shaped in cross section as illustrated and provided with a longitudinal slot 48. Bolts 50 and 52 extend through the slot to connect a clamp plate 54 and a clamp strap 56 to the support 46. The bolt 50 is loose enough to permit free sliding and the bolt 52 has an extended handle 58 for convenience in clamping the bracket 54 and the strap 56 tightly around the upright 20 in any desired vertical or rotational position.

Each corner bracket 38 and 40 is provided with line notches 60 in its upper edges to receive a mason's line 62. This line may be cotton twine as ordinarily used or may be wire or the like. In Figures 1 to 4, we illustrate the ordinary line and in Figures 6 and 7 a special line of wire having mortar joint markings 62a every 4" which corresponds to one half the length of a brick. These marks are preferably about 3/8" long and may be etched into the metal wire, the 3/8" representing the thickness of the mortar joint.

On each upright 20, we provide a plurality of index marks 64 spaced the thickness of a brick plus the thickness of a mortar joint and cooperating therewith we provide an indicating pointer 66 which is adjustable on the clamp strap 56 by means of a slot and clamp bolt arrangement shown at 68 and 70. To prevent the supports 46 from turning on the uprights 20 the brackets 54 are provided with keys 55 that slide in keyways 21 of the uprights. (See Figures 6 and 9.)

Practical operation

In the use of our aligning fixtures, the corners of the wall are first accurately marked on the corners of the foundation and a fixture is set up adjacent each corner after chalk lines are snapped joining the corners. The fixture is set approximately 45 degrees from the marked corner so that when the corner brackets 38 and 40 are adjusted, they will just fit around the outside and into the inside corners of the wall.

The base plates 10 are first set up by driving the stakes 12 at approximately the proper position and leveled by the relative elevations of the stakes. The base plates 10 are located as close to each outline corner on the foundation as the footing will permit. The top of the base plate should be 2 1/2" or more below the top of the first course of masonry to be laid in order to allow room for the supports 46 which carry the line 62. The upright 64 may then be clamped to the angle brackets 16 by the U-bolts 22. The pivotal connections 14 and 18 permit slight repositioning of the upright in a horizontal plane and permit the upper end to be swung toward or away from the wall to plumb it. The stakes 34 and 36 are driven and the rods 30 nailed to them after which the upright may be plumbed to a level or plumb line and the set screws 32 tightened to retain the upright in plumbed position.

After all uprights have been set and plumbed, the corner brackets 38 and 40 may be adjusted while the clamp bolts 52 are loose and these clamp bolts then tightened when the supports 46 are at the right height for a course of brick. After the right height is determined at one corner, the corner bracket at the next corner is

then adjusted to that height by leveling the line 62 extending from the first bracket to the second one and so on around the wall.

The pointers 66 may then be adjusted to the nearest index mark 64 as the supports 46 are not always exactly at an index mark after the leveling operation just described. Thereafter, there is assurance each time the corner bracket is raised for the next course of brick, such as one index mark for ordinary brick, two for tile, and three for concrete blocks, that the top of each course when laid to the mason's line will be level and parallel to all the proceeding courses.

Instead of building up the corners of the wall and then filling in between as in the usual manner, each course is laid all the way around the wall and by using the mortar joint marks 62a, the vertical mortar joints will all be accurately aligned. The wall can be toothed out if desired however which method is usually preferred by a skilled mason.

In connection with the special wire line having the marks 62a, we illustrate in Figures 6 and 7 and 11, clamp plates 72 and wing clamp screws 74 for clamping the wire to the corner plate. One of these is provided adjacent each line notch 60 and between the clamp plates the line may be looped as at 62b so that the markings 62a may start the desired distance from the corner which is the width, or half the length, of a brick. In this way our method eliminates the necessity of cutting any bricks short to fill in at the end of a course and also locates all window and door openings to eliminate fill-ins except of course half bricks where needed. By locating the wall openings in reference to the marks 62a on the line 62, the sides of the openings will be plumb because of the guide marks on the wire rising in a true vertical direction because the wires are suspended from the uprights 20 which are, of course, vertical.

Using present-day methods, it is necessary to have considerable skill in order to lay up a brick wall which is true and in which all courses are level throughout. By using our fixtures, and properly plumbing and leveling at the beginning of the operation, relatively unskilled labor can lay up a wall which is equal to or superior to walls laid by experienced brick layers without such fixtures. The first course is laid up to the mason's line 62 and the markings 62a thereon indicate the brick spacing and thickness of vertical mortar joints without having to rely on skill for this. The markings 64 on the uprights also contribute to horizontal mortar joints of equal thickness.

The brick layer's helper may raise the line at successive corners after the course ahead of that corner has been completed by the brick layer and the brick layer thus can work steadily around the wall, building it up one complete course at a time, with assurance that when the wall is built up to the proper height the top will be accurately level with respect to the bottom because the mason's line at that time is the same number of index marks above the line at the beginning of the operation since the index marks 64 on all uprights are of course the same.

The fixtures are so designed that a minimum of time is required for setting them up and they can be easily leveled without any complicated operations. Thereafter it is a relatively simple matter to shift the supports 46 upwardly, one, two, or three index marks at a time which carries the mason's lines with it and keeps it level at all

times. Our fixtures therefore speed up the construction of the wall while at the same time insure that it will be perfect as to the levelness of all courses and that each corner will be truly vertical.

As to the marks 62a on the wire 62, "modular" masonry units are $\frac{3}{8}$ " less than 8" so that a brick and a bond is equal to 8". Accordingly, by making each mark 62a $\frac{3}{8}$ " in length and the marks $3\frac{3}{8}$ " apart, two of the marks are equal to one brick and a $\frac{3}{8}$ " bond. All modular units in masonry are made to this same scale so that the bricks and brickbats used to build up the wall are the only units necessary when making the length of the wall an even number of modular units and the openings in the wall spaced an equal number of modular units. Thus the special marker wire 62 automatically establishes the bonds for either standard or modular masonry when used in lieu of a mason's line. This is especially useful in that it automatically establishes position, length, and plumb of all openings thereby eliminating the use of a level.

The vertical marking 64 on the uprights are preferably $2\frac{2}{3}$ " apart when laying modular or standard brick, tile or blocks. For other building units of course, uprights with different scales could be provided if desired. By practicing a method that uses our aligning fixtures as herein disclosed, all wall units are laid to an exact line including corners and all joints and bonds are exactly the same size. All bonds are plumb and the finished wall is automatically perfectly level at the top.

For two (or more) story construction, the stakes 12 and the base plates 10 may be replaced by a strap 76 shown in Figure 12 which is nailed at 78 to the sub-floor and projects through the masonry joint at the corner to approximately 8" beyond the masonry. The upright 20 is remounted on the strap 76 by bolting the angle bracket 16 thereto and mounting the upright on the bracket by the U-bolt 22 as before. The braces 26-30 may then be attached inside the building to the floor and the work progresses to the next floor. By repeating this process any number of stories may be built.

Some changes may be made in the construction and arrangement of the parts of our mason's aligning fixture without departing from the real spirit and purpose of our invention, and it is our

intention to cover by our claims any modified forms of structure or use of mechanical equivalent which may be reasonably included within their scope.

We claim as our invention:

1. A mason's aligning fixture of the character disclosed comprising a base plate, a pair of spaced stakes pivoted thereto, an upright bracket pivoted to said base plate, an upright connected therewith, telescoping angular braces for said upright, a lateral support on said upright, means for clamping the same to the upright in various vertical positions, and a corner bracket carried by the outer end of said lateral support and having means for carrying a mason's line.

2. A mason's aligning fixture of the character disclosed comprising a base plate, a pair of spaced stakes pivoted thereto, an upright bracket clampingly pivoted to said base plate, an upright connected therewith, telescoping angular braces for said upright having their lower ends staked, a lateral support on said upright, said support being longitudinally slidable, means for clamping the same to the upright in various vertical and lateral positions, interchangeable inside and outside corner brackets carried by the outer end of said support and having means for carrying a mason's line, a mason's line cooperating therewith having vertical joint indicating means, and means for securing the line to the corner plate in adjusted positions relative thereto.

ROBERT L. SEARS.
ADRIAN W. CRAIG.

References Cited in the file of this patent

UNITED STATES PATENTS

Number	Name	Date
322,563	Reymond	July 21, 1885
458,464	Kelley	Aug. 25, 1891
713,789	Newman	Nov. 18, 1902
736,100	Hostettler	Aug. 11, 1903
875,034	Wright	Dec. 31, 1907
1,296,060	Ferguson	Mar. 4, 1919
1,783,883	Larrison	Dec. 2, 1930
1,824,321	Baker	Sept. 22, 1931
1,872,860	Winter	Aug. 23, 1932
1,897,682	Souders	Feb. 14, 1933
2,023,155	Turner	Dec. 3, 1935
2,084,798	Gabriel	June 22, 1937
2,143,237	Byrnes	Jan. 10, 1939