July 14, 1931. A. J. PENOTE 1,814,738

MAN HOLE FORM OF ADJUSTABLE SECTIONS

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FIG. 1

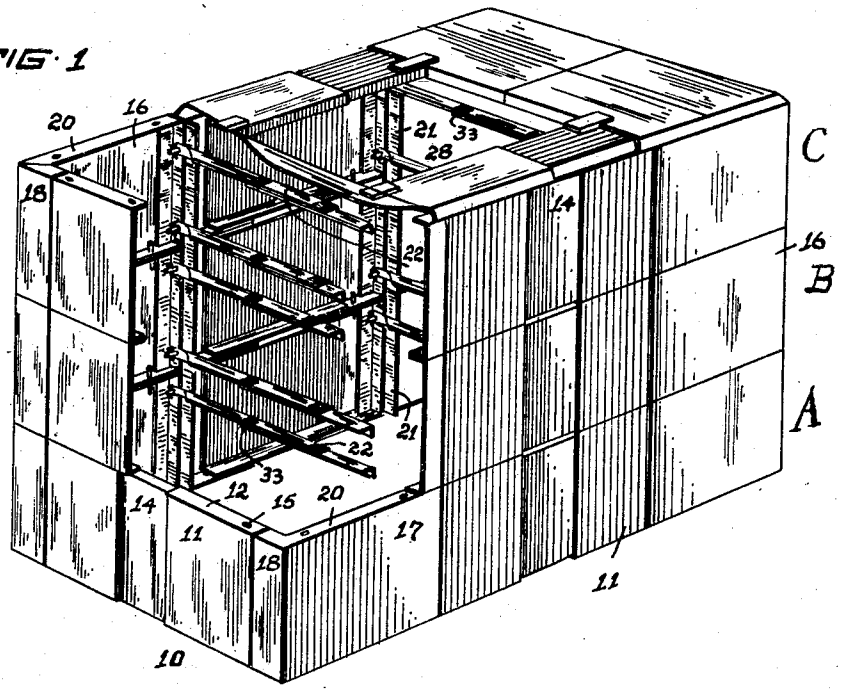


FIG. 2

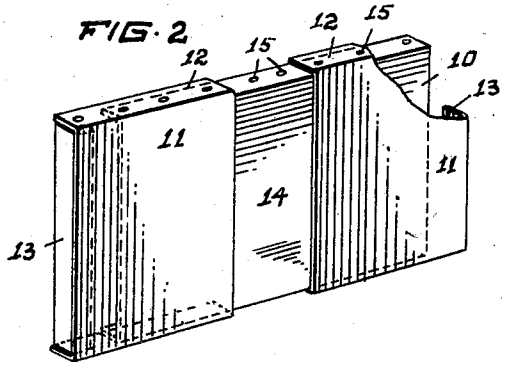


FIG. 3

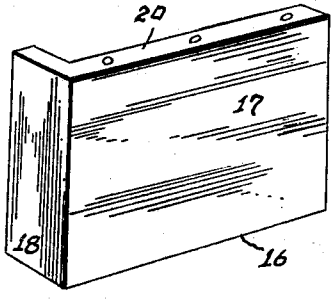
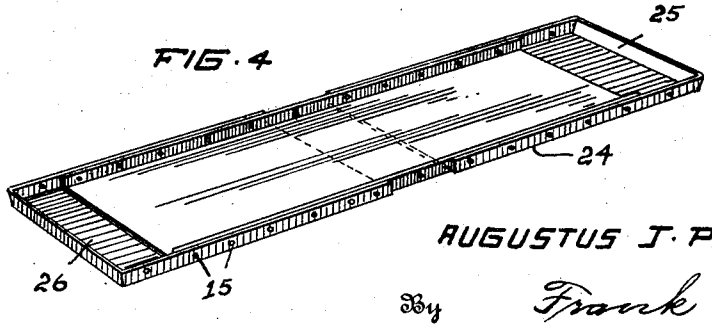


FIG. 4



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FIG. 5

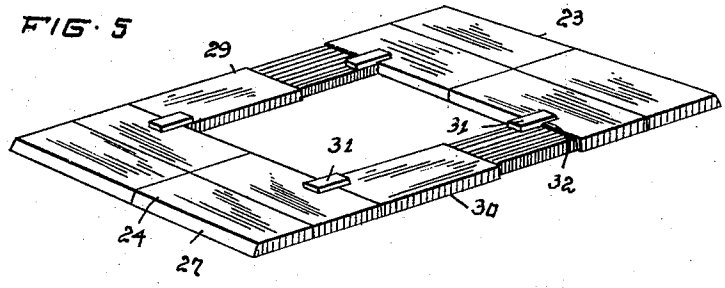


FIG. 6

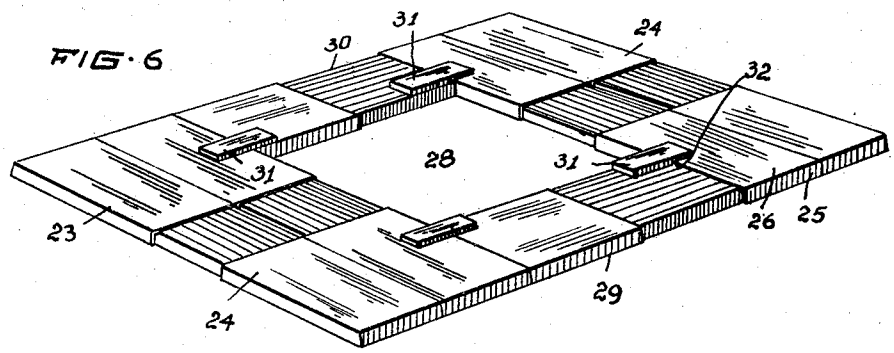
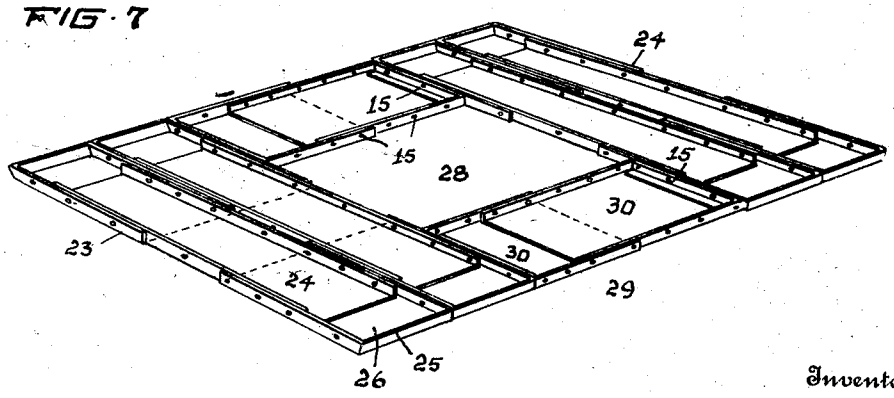


FIG. 7



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MAN HOLE FORM OF ADJUSTABLE SECTIONS

Application filed November 14, 1928. Serial No. 319,196.

This invention relates to man-hole forms used in construction work, and such as I prefer to use as forms polyhedral in outline especially in man-hole construction of concrete or other suitable cement material intended to be moulded about the form, ordinarily external of the latter.

These forms are usually rectangular in outline and are used to make man-holes of that outline, and my present invention is a further improvement on my former Patent No. 1,632,846, granted me June 21, 1927. It is further like that patented structure in that this form is to be built in adjustable sections, so that the latter may be adjusted for constructing man-holes of different lengths, widths and depths, in addition to possessing ease of withdrawal of the sections from the interior of the man-hole after the latter has been formed and even after the cement is set. All advantages claimed for my former patented construction are gained in the present improved structure now to be described.

My prior patented sectional form contemplated a series of sections having in-turned flanges intended to be brought into contiguous relation when the sections are set up, and with a removable thin plate applied between the flanges of separate sections, the number of sections in a given wall, determining the size of the latter. In my present improved structure, the several sections are each adjustable in size, so that the same number of sections may be used to form a man-hole of varying size by adjusting the size of the individual sections.

A still further object is attained by this improved sectional form, in that a horizontal and flat top cover for the man-hole form now contemplated, is itself made up of detachable sections, some or all of which may be adjustable in much the same manner that the side and end walls are. From this improved structure, it will be apparent that when the form is set up, including the application of the cover thereto, the entire form may be covered with the cement, both about the side and end walls and upon the said cover sections, until the entire cement form has set, after which the several form sections may be withdrawn from the inside of the form, as will be described in detail hereinafter.

With these and other objects in view later to be set forth with more particularity, my invention consists in the described structure set forth in the appended claims and illustrated in the accompanying drawings, in which—

Figure 1 is a perspective view with a corner broken away, of a man-hole form of three courses and showing a portion of the cover, embodying my invention;

Figure 2 is a perspective view of a single adjustable section with a corner broken away;

Figure 3 is a perspective view of an L-shaped corner section of integral material;

Figure 4 is an inner view in perspective of a roof section shown extended in adjustment;

Figure 5 is a perspective view of a sectional and flat form cover opened longitudinally;

Figure 6 is a similar view with sections opened laterally and longitudinally, and

Figure 7 is an inverted perspective showing parts expanded.

My improved adjustable sectional form may be constructed in a plurality of vertical courses of substantially uniform size and character intended to be assembled one above another and connected together; and the form here illustrated represents three such courses A, B and C, respectively. Each of these courses is made up of rectangular adjustable sections four in number designated by numeral 10, and each said section comprising thin metal end plates 11 having flanges 12 on each of its sides and an end flange 13, all said flanges being inclined at right angles to the main plate. Each section further includes an intermediate plate 14 having in-turned side flanges similar to the side flanges of the end plates, but designed to be slidably mounted therein, so that the end plates may be adjusted upon the intermediate plate and toward and from each other.

The several flanges of the telescoping plates of a section are provided with suitable apertures 15 adapted to receive suitable fastening bolts or screws in the apertures as the latter are brought into register at different points of adjustment. The plates of the section are shown extended in Fig. 2, but the fastenings have not yet been applied.

Each of the courses includes not only the four or more adjustable sections before described, but also connecting corner sections or plates 16 each comprising a smooth main plate 17 and a shorter plate 18 integral therewith but at right angles thereto, the ends of the main and shorter plates having right angled flanges adapted to be attached to the flanges 13 of the adjustable sections 10.

These corner sections 16 have a general L-shape, whereby the shorter plate may be secured to end sections 10, while the main plate will be secured to a section 10 of the side wall of the form. In addition to these end flanges, side flanges 20 of corresponding L-shape are also provided for locking to other L-sections of other courses. By this construction, corner sections 16 of uniform size may be used in conjunction with adjustable sections 10 to build up forms of varying length or width. Various apertures 15 are provided in both the side and end flanges of all the sections to secure the several sections together in any number of courses and using sections variously extended or closed. These flanges will not however, be strictly 90° in cross section but will be at least 40′′ less than 90° and thereby the flanges of adjoining sections will not be strictly parallel, but the flanges will be slightly separated at their outer edges which results in a very effective tightening of the flanges by the short bolts passing through the apertures 15.

Between the several sections of a course, thin metal plates 21 are inserted if desired, and suitable adjustable cross braces 22 are also provided for strengthening the form when set up, these two parts being attached to the sections in the same manner as shown in my former patent above referred to.

Difficulty has sometimes been experienced in providing a suitable cover for a man-hole form, especially one that would have sufficient strength to bear the weight imposed upon it adjacent the four vertical walls of the form and should yet have a suitable opening near its center through which various tools and materials might be passed, and would still have the further advantage of being removable from the main part of the form after the cement had set. Such a mechanism I believe I have now provided, and one which is made up of detachable sections which are adjustable in size to correspond with the varying size of the vertical walls upon which they are to be supported. Such construction is especially shown in Figs. 4, 5, 6 and 7.

The flat cover is built up of two kinds of adjustable sections, the ends 23 being made up of sections 24 which will be of the same general character as the sections 10 of the vertical walls, except that the end flanges 25 will be bent somewhat oblique to the end plates 26 as will be one of the side flanges 27, so that when the cover sections are connected together, and the horizontal cover fully assembled, the outer flange will form an acute angle with the vertical walls. This condition will permit more readily the withdrawal of the horizontal cover sections from the finished manhole construction. The end plates 26 are adjusted upon the main plate of the section and secured thereto in adjusted position by suitable bolts or screws or pins passed through the registering apertures 15 in the side flanges. In many cases, two or more of such cover sections 24 may be secured together laterally by bolting the flanges of the two sections together, as shown clearly in Fig. 7, the attached pair extending the full width of the cover. More than two such cover sections 24 may be combined in this way.

The rectangular opening 28 of the cover has its ends bounded by the end sections 24 as above described. The sides of this opening are however, bounded by adjustable sections 29 each of which comprises two flanged plates 30 connected in over-lapping relation as shown clearly in Fig. 7, and indicated in extended position in Figs. 5 and 6. These horizontal plates 30 are superposed in somewhat telescopic relation and their outer ends are provided with flanges having apertures 15 that may register with similar apertures in the side flanges of the sections 24, thereby connecting together the sides and ends of the flat cover.

A further manner of holding the parts of the horizontal cover in a common plane consists in providing certain of the plates 30 and 24 at their edges adjacent the corners of the opening 28 with over-lapping blocks or plates 31 which are secured to the outer surface of one such plate and designed to loosely overlap the surface of the adjacent plate, as shown in Figs. 5 and 6. Usually these blocks 31 will be spot welded to one of the plates for a part of its length and loosely extended over the other plate. If desired, the block may be cut out to form a shoulder, as at the point 32 to engage the upper edge of the adjacent plate. The sections 29 may be obviously extended or closed to lengthen the cover, just as are the sections 10 of the wall.

In operation, the first or lower course A is laid in the earth cavity provided for the

purpose by positioning the side and end sections 10 independently with the proper corner section 17 between, as shown in Fig. 1. The sections 10 are extended into proper position adjacent the ends of the corner sections and attached thereto, as well as secured in adjustment by suitable bolts 33 to lock the parts together.

Divider plates 21 are then forced into position at all the joints between sections of the course. Then, the sections of the braces 22 are adjusted to the desired length, and their ends secured by proper bolts to the suitable sections of the side walls. The parts of the other courses are then lowered down into the cavity within the first course and the various sections extended as needed to provide a form of the desired size, all its sections attached together and to the first course, after which the other courses to be made use of are superposed upon the second, and so on, successively. As many courses may be used as needed to attain the desired height of the completed form, and then a flat horizontal cover of the character heretofore described is applied over the walls of the form as described in detail above. The end sections 24 are first applied in proper position after which the extended sections 29 are applied at the sides between the ends of the plates 26, and the entire sectional cover attached together, but leaving the opening 28 in the center as before explained.

It is to be understood that the bolts 33 shown in Fig. 1, are intended to be used wherever flanges of any section or part of the structure is to be secured together by lock bolts passing through apertures 15 as shown in the sections to be locked together. Other conventional locking members such as screw bolts may also be used for such purpose and are contemplated, the particular lock elements to be used are not shown in detail and are not claimed.

In dismantling the structure (form), the bolts 33 are removed in proper order to release the sections of the braces 22 from each other and from the wall sections, after which the divider plates 21 are removed, loosening the adjustable sections 10 from the ends of the corner sections 17, thereby permitting the removal of the separated parts through the opening 28.

After the removal of the divider plates 21, the sections 10 and 17 of the upper course will ordinarily be removed first, although the sections of the top cover may be removed first in some instances by the closing in of the sections 30 of the side members after the bolts of these sections have been removed inwardly. After the removal of the sections of the cover and top course members, there will, of course, be no difficulty in removing the parts of the first two courses of the walls, or in withdrawing them out through the opening 28 of the form. In some cases, it may be found advisable to make use of the metallic sockets shown and described in my former Patent No. 1,632,846 for embedding permanently in the cement wall and thereby temporarily securing the form sections to the cement wall, but this is not regarded as wholly indispensable, though practicable.

While the structure described and shown in this application, make plain the use of adjustable sections in both the side and end sections of the vertical walls of the form, as well as in the construction of the cover sections, it is to be understood that certain of these sections may be used in adjusted form or in one course or more, without so using in the cover sections, and such selective use of the adjusted sizes of form members is contemplated. So also can the braces 22 be used or omitted without varying the manner or use of the other structure.

It is also evident that when a plurality of courses are used in the vertical walls, they need not be of the same height, though they are so shown in this application. Further, in dismantling the sectional cover inwardly, the removal of the lock bolts from the flanges of the sections, make possible closing of the parts of the sections so that the latter may be drawn from the top ends of the vertical walls and thereafter drawn outward thru the opening 28, as in other sections.

While it is evident that the size of the completed form may be varied in multiples of the intermediate sections 10, both as explained in my former Patent No. 1,632,846, and by varying the sizes of the sections themselves, it is clear that all of the advantages enumerated in the former patent are attained in the present construction, but in my present improved form, the adjustment of the side walls and of the sectional cover may be slight or of greater amount, as may be found desirable. Thus the length or width of the intermediate sections 10 may be advantageously adjusted without multiplying the number of sections in a given course.

It is evident that changes may be made in the details of my construction, such variations and modifications that fall well within the spirit and scope of the disclosed invention are intended to be covered in the appended claims, and I do not wish to be limited to the precise details of construction set forth.

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

1. In a form for molding concrete construction, vertical wall members and an adjustable substantially flat cover member for resting upon said vertical members and comprising cross end members each having

slidably adjustable over-lapping plates, and adjustable side members each being longitudinally adjustable by over-lapping end plates contacting the sides of the said end members, the ends of the side members being provided with metal blocks having a portion fixedly secured to the extreme end of the said side members, and the outer end of the said blocks over-lapping in detachable connection with the said end members.

2. In a form for molding concrete construction, an adjustable substantially flat cover member comprising cross end members each having longitudinally adjustable end plates having side flanges and an intermediate plate upon which the end plates are slidably adjustable, and longitudinally adjustable side members spacing the said end members, the side members being themselves spaced laterally apart to provide an opening in the central portion of said cover, and connecting blocks over-lapping the side and end members, being fixedly secured to one of the same and detachably applied to the other.

3. In a form for molding concrete construction, vertical wall members and an adjustable cover member for resting upon said vertical members and comprising cross end members, each having over-lapping plates which are slidably adjustable to vary its length, each of said cross end members comprising a plurality of longitudinally adjustable, flanged sections adapted to be fastened together side by side by means of locking bolts inserted in a series of spaced apertures in contiguous flanges of the said sections, and adjustable side members for said cover, each being longitudinally adjustable by overlapping plates contacting the sides of the said end members, the ends of the side members having overlapping means for detachable connection with the said end members, the side members being themselves spaced laterally apart to provide a central opening in the said cover.

4. In a form for molding concrete construction, vertical wall members and an adjustable cover member for resting upon said vertical members and comprising cross end members each having slidably adjustable over-lapping plates, and adjustable side members each being longitudinally adjustable by comprising over-lapping flanged plates whose ends contact the sides of the said end members, the outer edges of the entire cover member having downwardly bent flanges contacting the said wall members, and the side members being themselves spaced laterally apart to provide an opening in the central portion of said cover.

5. In a form for molding concrete construction, vertical wall members each comprising a plurality of superposed courses, each course of the entire form comprising four counterpart corner sections and four counterpart intermediate sections, each intermediate section being longitudinally adjustable and having side flanges integral therewith, and an adjustable cover member for resting upon said vertical members and comprising cross end members, each having over-lapping plates which are slidably adjustable to vary its length and comprising a plurality of longitudinally adjustable, flanged sections adapted to be fastened together side by side by means of locking bolts inserted in a series of spaced apertures in contiguous flanges of the said sections, and adjustable side members for said cover each being longitudinally adjustable by the provision of over-lapping plates whose ends contact the sides of the said end members and having over-lapping means for detachable connection with the said end members, the side members being themselves spaced laterally apart to provide a central opening in the said cover.

6. In a form for molding concrete construction, a substantially flat and adjustable cover member comprising cross end members each having slidably adjustable over-lapping plates provided with downwardly bent side flanges, and spaced apart side members each being longitudinally adjustable and provided with both side and end flanges, the end flanges of the side members and the side flanges of the end members being detachably connected by the provision of spaced apertures therein for receiving lock bolts therein, the spaced side members and end members providing a rectangular central opening in the said cover, and the adjustability of the several cover members adapting the cover to hollow forms of varying size.

In witness whereof I have hereunto affixed my hand this 1st day of November, 1928.

AUGUSTUS J. PENOTE.