

Dec. 18, 1951

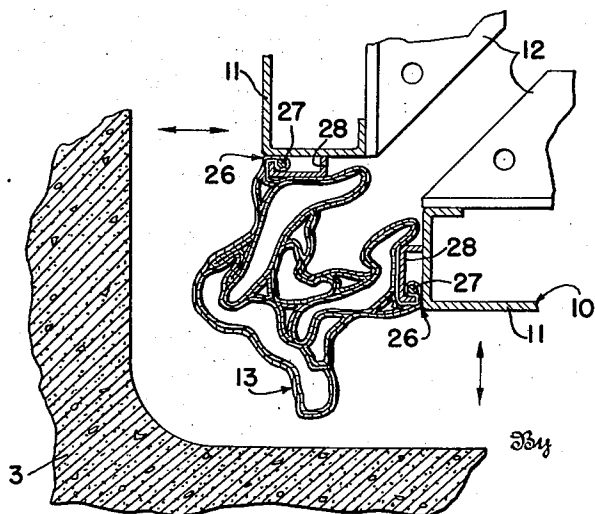
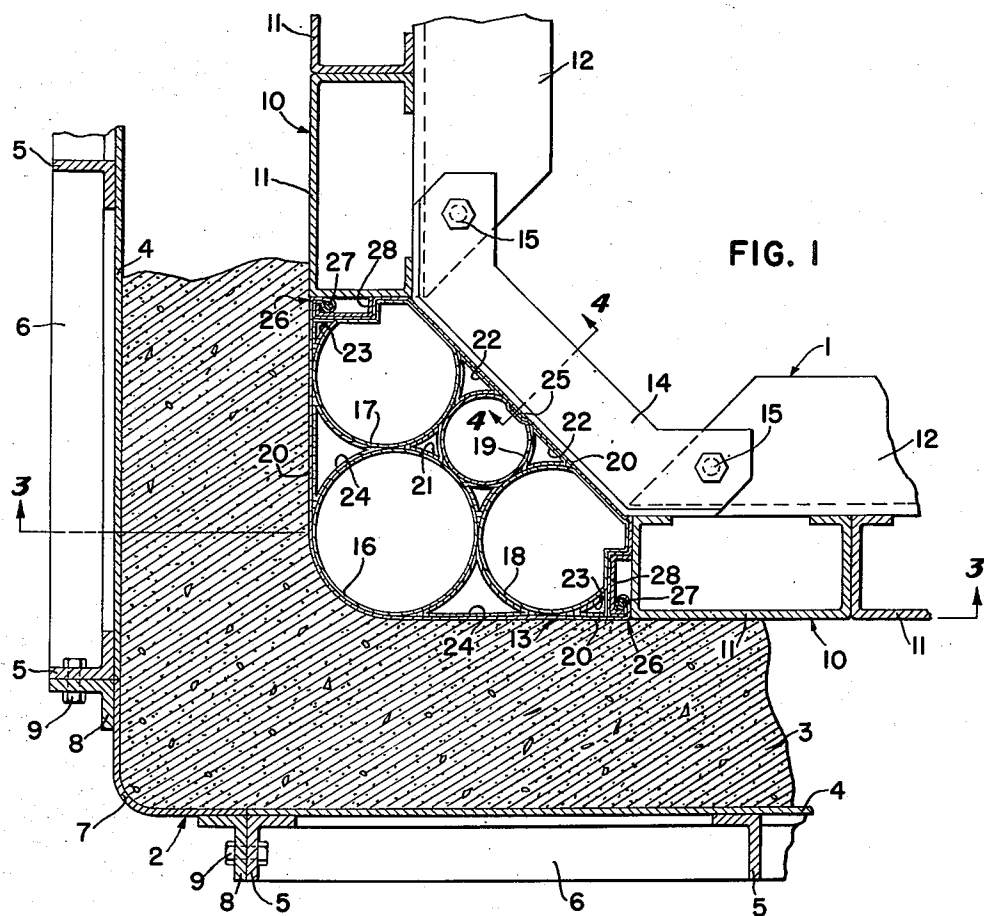
C. J. FORD

2,579,423

RETRACTABLE FORM STRUCTURE

Filed March 17, 1950

2 SHEETS—SHEET 1



Dec. 18, 1951

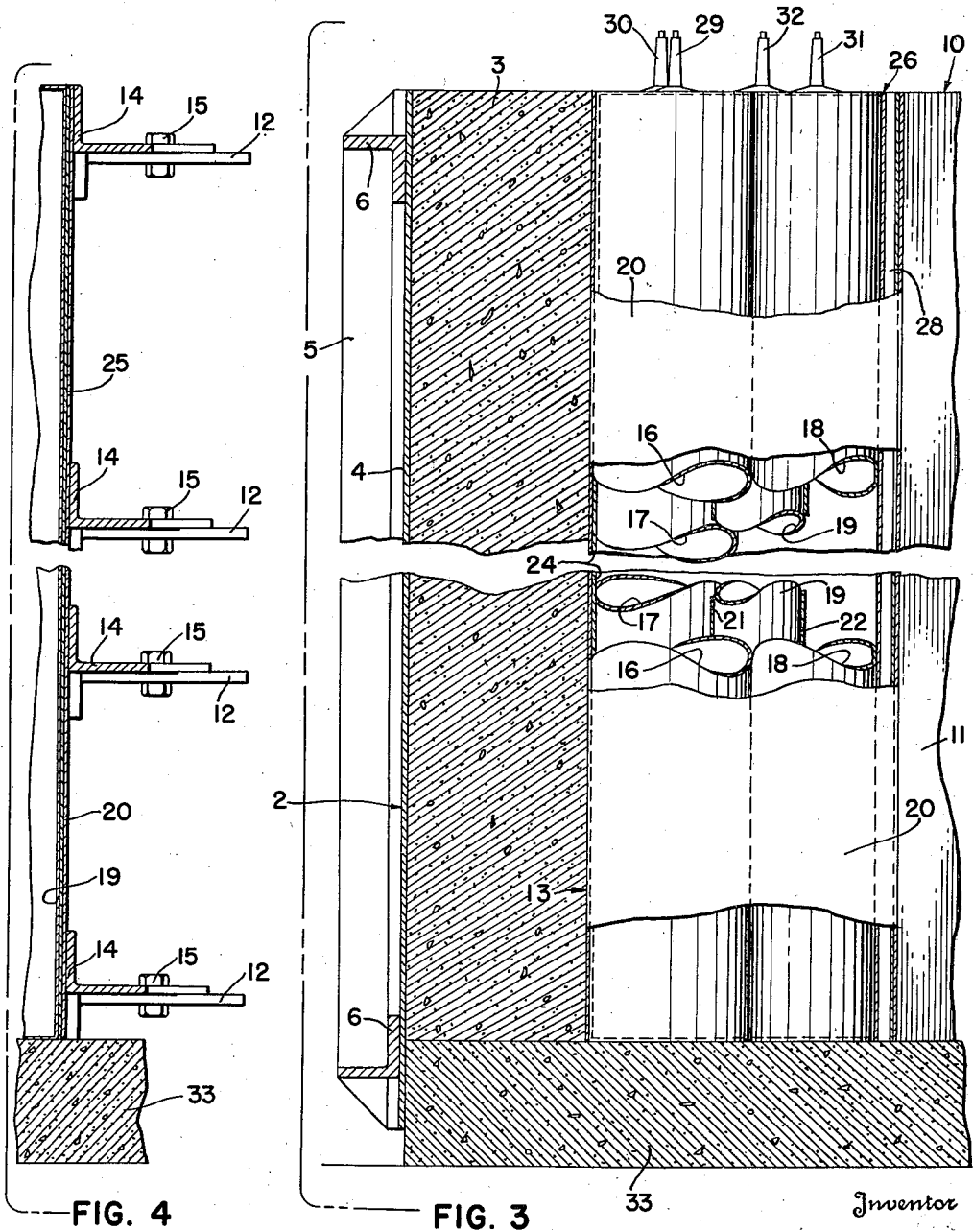
C. J. FORD

2,579,423

RETRACTABLE FORM STRUCTURE

Filed March 17, 1950

2 SHEETS—SHEET 2



UNITED STATES PATENT OFFICE

2,579,423

RETRACTABLE FORM STRUCTURE

Charles J. Ford, Akron, Ohio, assignor to Wingfoot Corporation, Akron, Ohio, a corporation of Delaware

Application March 17, 1950, Serial No. 150,311

6 Claims. (Cl. 25—131)

1

The present invention relates to an improved type of retractable form structure for supporting the poured concrete walls in a reinforced concrete building construction. More particularly, the present invention is concerned with a retractable form structure which embodies an inflatable member of compartmented rubberized fabric construction for rendering conventional rigid wall forms more readily flexible, especially in the corners of concrete wall construction where two such walls converge at an angle.

It is an object of the present invention to provide an inflatable form structure which will serve to render a rigid wall form unit capable of being readily removed or retracted from the body of the poured concrete after the material has set.

It is a further object of the invention to provide a replacement means for faulty hinged and plate construction customarily employed at the corners of the building in conventional form structures.

A still further object of the invention is the provision of a form structure which can be readily expanded and contracted by fluid inflation and yet will be sufficiently rigid to support and withstand the extremely high loadings created by poured concrete.

Other objects and advantages will be apparent from the following detailed description of one highly advantageous form structure embodying the principles of the present invention.

In the drawings, Fig. 1 represents a horizontal cross section taken through the corner of a building formed of poured concrete and employing the retractable form structure of the present invention. Fig. 2 is a partial cross section corresponding generally to that of Fig. 1, but illustrating the form structure with the parts retracted ready for withdrawal from the case walls. Fig. 3 is a vertical cross section taken substantially along the line 3—3 in Fig. 1 with parts in section and broken away. Fig. 4 is a partial vertical section of the structure along the line 4—4 in Fig. 1 with parts broken away.

In conventional building construction where poured concrete is employed, an inner and an outer form structure is erected to confine the concrete mixture until it is set. Fig. 1 of the drawings illustrates one type of inside form structure indicated generally by the reference numeral 1 and a rigid outside form structure indicated generally by the reference numeral 2 disposed in spaced concentric relation to each other for the retention of a body of poured concrete 3. The inside form structure 1 is so constructed that it is capable of being retracted

2

inwardly for withdrawal from the innermost surface of the body of poured concrete after the material has set. The outside form structure 2 is completely rigid in its construction since it can readily be removed by disassembly when the body of the concrete 3 is set.

The rigid outside form 2 comprises a plurality of metal panels or plates 4 which are backed up by a plurality of vertically extending angles 5 and horizontally disposed angles 6 to afford the desired stiffness or rigidity to the several plates. The metal plates 4 are assembled with a corner plate 7 which is bent to conform to the desired outer corner detail of the building construction. The corner plate 7 is provided at its extremities with vertically extending angles 8 which serve not only to afford the desired rigidity to the corner plate 7, but also to provide a means of securing the several elements together. Thus, the angles 8 are secured to the vertical angles 5 on the metal plates 4 as by means of a plurality of bolts 9 inserted through drilled holes in the projecting legs of the angles in the manner illustrated in Fig. 1.

The inside form structure 1 includes a plurality of sections or wall forms 10. These wall forms 10 are fabricated from a number of metal panels or pans 11 which are stiffened by reason of their bent cross-sectional shape. These metal pans 11 extend in a vertical direction and in parallel contiguous relation to each other extending over the full height of the wall of the building construction which is being formed and are secured together by welding or other suitable means. The metal pans 11 are backed up by a plurality of spaced horizontally disposed angles 12 which are either welded to the metal pans or secured thereto by bolting or riveting to produce a rigid wall form 10.

In conventional building construction, the wall forms 10 are disposed in substantial right angular relation to each other at the corners, but difficulty has been experienced in the past in providing a satisfactory means of forming the actual corner or any other angular relation between converging wall forms. This problem has been solved by the present invention in the use of an inflatable rubberized fabric member or corner form 13. The corner form 13 is secured in place against vertical deformation by means of a plurality of bent angle iron stiffener elements or gusset members 14. These gusset members 14 are demountably attached to the angles 12 of the wall forms 10 as by means of a plurality of bolts 15 inserted through holes drilled in the

3

angles in the manner indicated in Figs. 1 and 2.

The corner form 13 includes an outside compartment or cylinder 16, two slightly deformed end compartments or cylinders 17 and 18 and a back compartment or cylinder 19. These cylinders 16, 17, 18, and 19 are capable of individual fluid inflation and cooperate to provide, when inflated, a substantially rigid member. When the corner form 13 is deflated in the manner illustrated in Fig. 2, however, the rigid wall forms 10 between which it is disposed are rendered highly flexible upon the removal of the gusset members 14. This flexibility greatly facilitates the retraction and complete removal of the inside form structure 1 as a unit from the body of poured concrete 3 when it is set without in any way disturbing the wall surface.

The several vertically extending cylinders 16, 17, 18, and 19 are advantageously completely encompassed by an envelope 20 which is held in place against either circumferential or longitudinal shifting with respect to the several cylinders as by means of a series of crotch tape fastenings 21, 22, 23, and 24 which are disposed in symmetrical relation in the construction in the manner indicated in Fig. 1 of the drawings. The envelope 20 is overlapped at its ends to form a joint 25 adjacent the gusset members 14. The envelope 20 also incorporates a portion of the anchoring means 26, namely, a pair of flexible bead portions or sealing elements 27. Each sealing element 27 coats with a vertically extending locking plate 28, forming the remainder of the anchoring means 26, secured to the end faces of the bent metal pans 11 of the converging wall forms 10.

The fluid inflation of the cylinders 16, 17, 18, and 19, of the corner form 13 is accomplished by means of the valve stems 29, 30, 31, and 32 for each of the cylinders, respectively. When inflated, the several cylinders 16, 17, 18, and 19 cooperating with the envelope 20 encompassing them will form a smooth contour exactly mating with the outermost surface of the several metal pans 11 of the wall forms 10. When deflated, the corner form 13 is materially reduced in volume as indicated in Fig. 2 of the drawings. This deflated configuration of the corner form 13 readily permits the converging ends of the metal pans 11 of the wall forms 10 to be drawn in or retracted toward each other to enable the withdrawal of the entire inside form structure 1 as a unit from the body of the poured concrete 3.

In setting up the inside form structure 1 and the rigid outside form structure 2, the elements are mounted in position on a precast floor slab 33 in the manner shown in Fig. 3 of the drawings. The inside form structure 1 and the rigid outside form structure 2 are thus enabled to be quickly assembled for the immediate reception of a body of poured concrete 3 which will readily surround strategically placed reinforcing elements extending through the floor slab 33 and projecting into the space between the inside form structure 1 and the rigid outside form structure 2. This reinforcing material may take any suitable form depending upon the nature and design of the building construction being built. No reinforcing is illustrated in the drawings since it forms no part of the invention.

While certain representative embodiments and details have been shown for the purpose of illustrating the invention, it will be apparent to those skilled in this art that various changes and modifications may be made therein without de-

4

parting from the spirit or scope of the invention. I claim:

1. A retractible form structure for use in supporting poured concrete wall construction, said form structure comprising at least two rigid wall forms disposed in angular relation to each other and corresponding generally in their dimensions to the walls to be cast; an inflatable rubberized fabric member connecting the rigid wall forms, said inflatable member being substantially coextensive with at least the vertical dimensions of the wall forms; and rigid stiffener elements for supporting the inflatable member in contact with the concrete and detachably connecting the ends of the wall forms.

2. A retractible form structure for use in supporting poured concrete wall construction, said form structure comprising at least two rigid wall forms disposed in angular relation to each other to define a corresponding angle in the finished walls; a plurality of gusset members demountably attached to the proximate converging ends of the wall forms; an inflatable member of rubberized fabric material disposed adjacent to and extending transversely of the gusset members between the wall forms; and anchoring means for securing the inflatable member to the proximate ends of the wall forms.

3. A retractible form structure for use in supporting poured concrete wall construction, said form structure comprising at least two rigid wall forms disposed in angular relation to each other to define a corresponding angle in the finished walls; a plurality of gusset members demountably attached to the proximate converging ends of the wall forms; an inflatable member of rubberized fabric material disposed adjacent to and extending transversely of the gusset members between the wall forms, said inflatable member embodying a plurality of generally cylindrically shaped compartments enclosed in a fabric envelope having preformed sealing elements attached thereto; and anchoring means on each of the wall forms for engaging the sealing elements of the inflatable member and forming a watertight joint with the proximate ends of the wall forms.

4. A retractible form structure for use in supporting poured concrete wall construction, said form structure comprising a pair of rigid wall forms disposed substantially at right angles to each other to define a corner between the converging walls of the concrete construction; a plurality of gusset members demountably attached to the proximate ends of the wall forms; an inflatable rubberized fabric member of vertically compartmented construction disposed transversely of the several gusset members and between the wall forms; and anchoring means on the wall forms for securing the inflatable member to the proximate ends of said wall forms.

5. A retractible form structure for use in supporting poured concrete wall construction, said form structure comprising a pair of rigid wall forms disposed substantially at right angles to each other to define a corner between the converging walls of the concrete construction; gusset members demountably attached to the proximate ends of the wall forms and disposed in spaced relation to each other intermediate the top and bottom of said wall forms; an inflatable rubberized fabric member disposed substantially transversely of the gusset members, said inflatable member embodying a plurality of vertically disposed, generally cylindrically shaped compartments en-

5

closed by a fabric envelope having sealing elements formed thereon; and anchoring means on the wall forms for securing the sealing elements on the envelope of the inflatable member to the proximate ends of said wall forms.

6. A retractible building construction form for use in supporting a body of poured concrete, said form comprising a pair of rigid wall forms arranged in contractible relation to the body of the poured concrete; a rigid stiffener element joining the wall forms and being disposed substantially normal thereto, said stiffener element retaining said wall forms in expanded relation and in contact with the body of the concrete; an inflatable member of rubberized fabric construction disposed between the wall forms and extending transversely of the stiffener element; and means embodying a fabric envelope secured

6

to each of the wall forms, said fabric envelope encompassing the inflatable member and securing it in place between the wall forms and against the stiffener element.

CHARLES J. FORD.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
1,600,353	Nose	Sept. 21, 1926
2,485,898	Mathews et al.	Oct. 25, 1949

FOREIGN PATENTS

Number	Country	Date
54,199	Denmark	Jan. 17, 1938