April 8, 1969 W. W. CURRY 3,437,305

SELF-RAISING CANTILEVER STEEL FORMS FOR MASS CONCRETE

Filed Sept. 11, 1967 Sheet 1 of 5

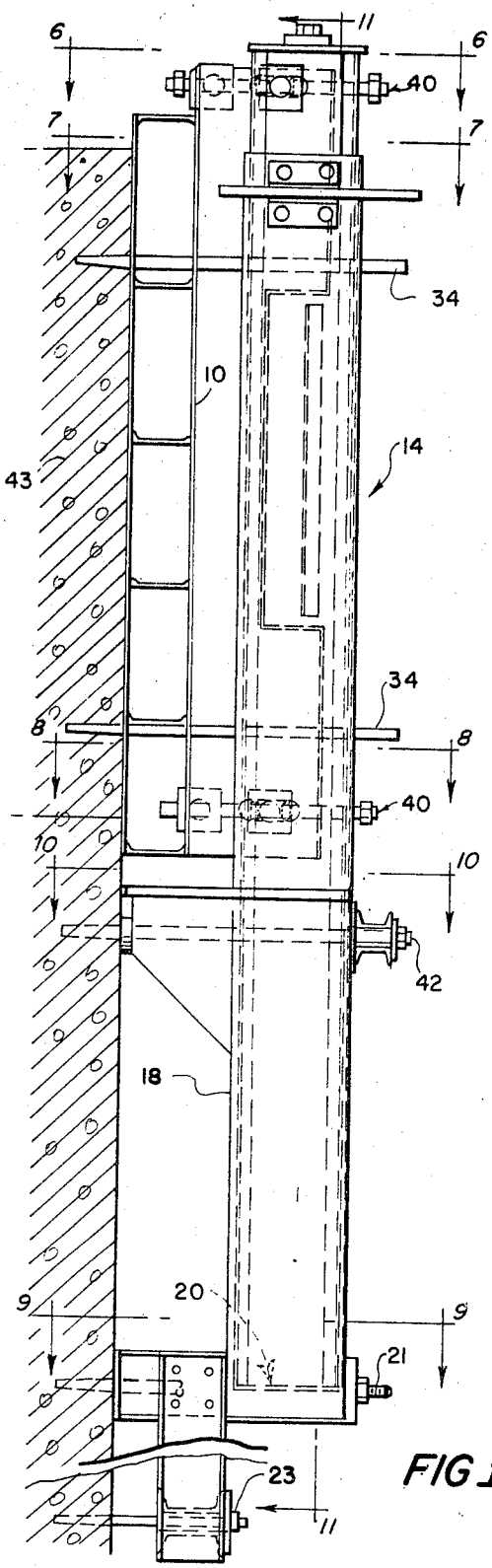


FIG 1

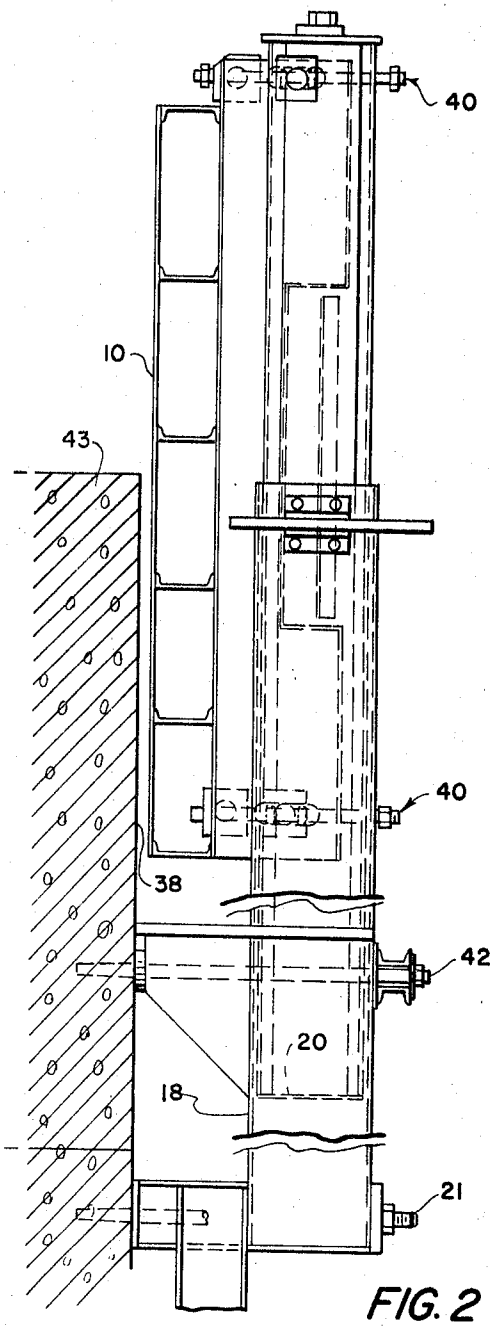


FIG. 2

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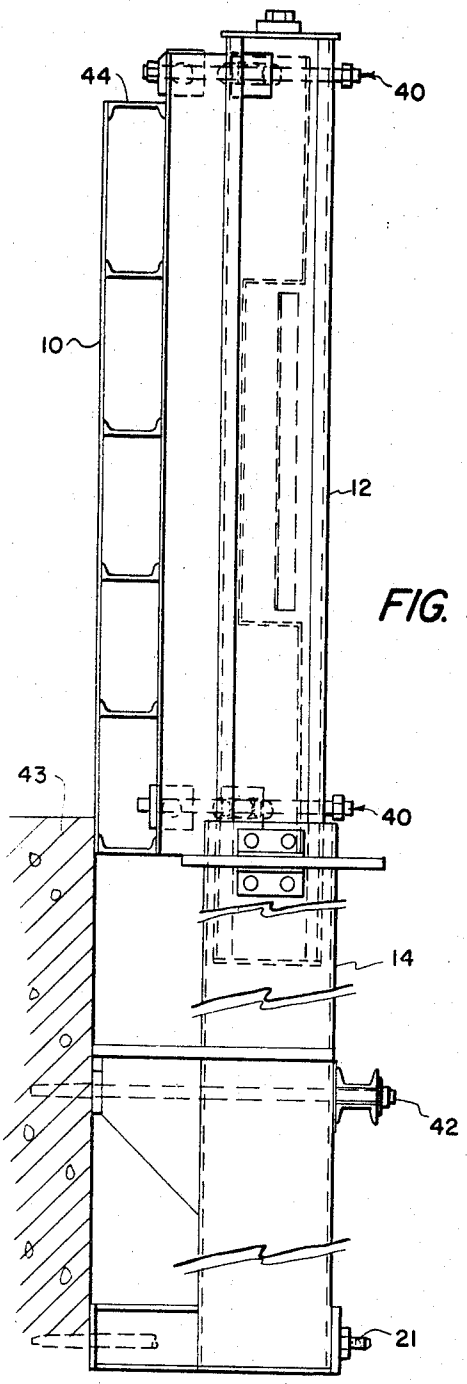


FIG. 3

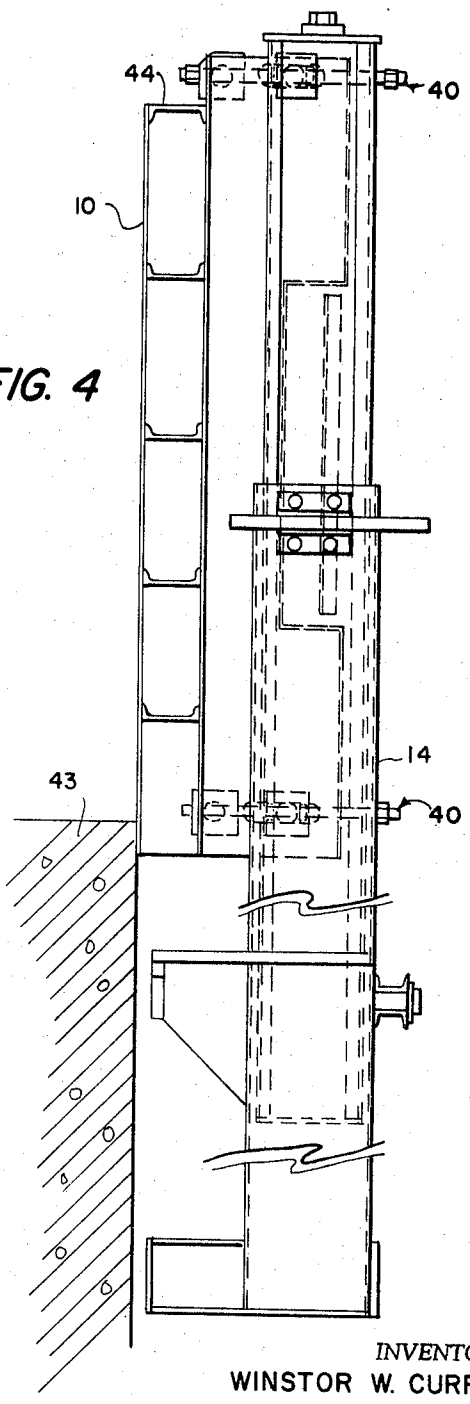


FIG. 4

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SELF-RAISING CANTILEVER STEEL FORMS FOR MASS CONCRETE

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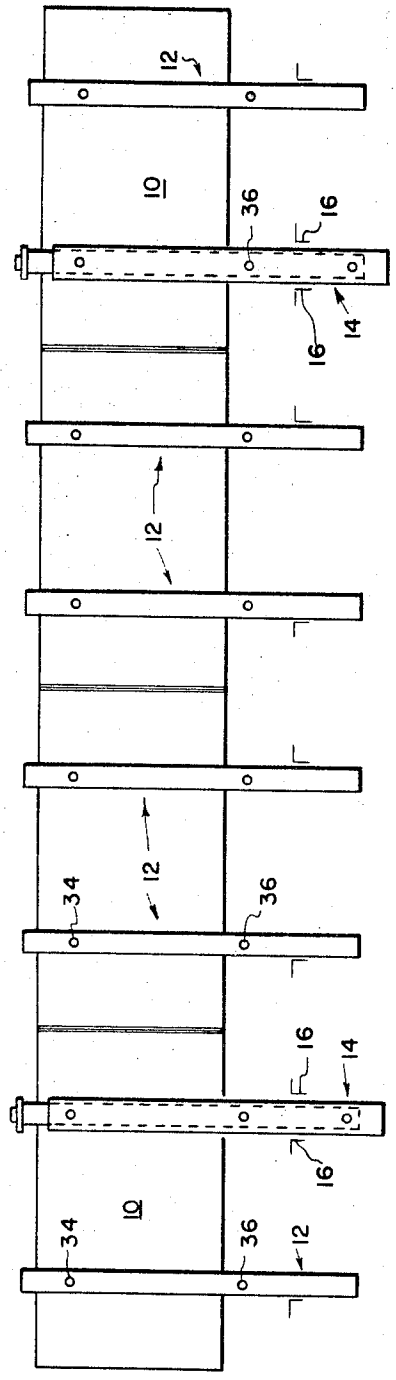


FIG 5

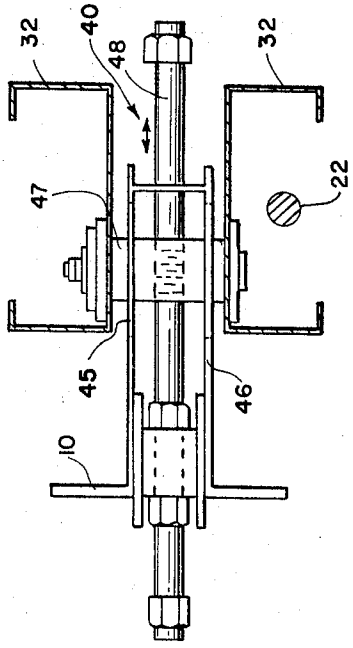


FIG. 6

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SELF-RAISING CANTILEVER STEEL FORMS FOR MASS CONCRETE

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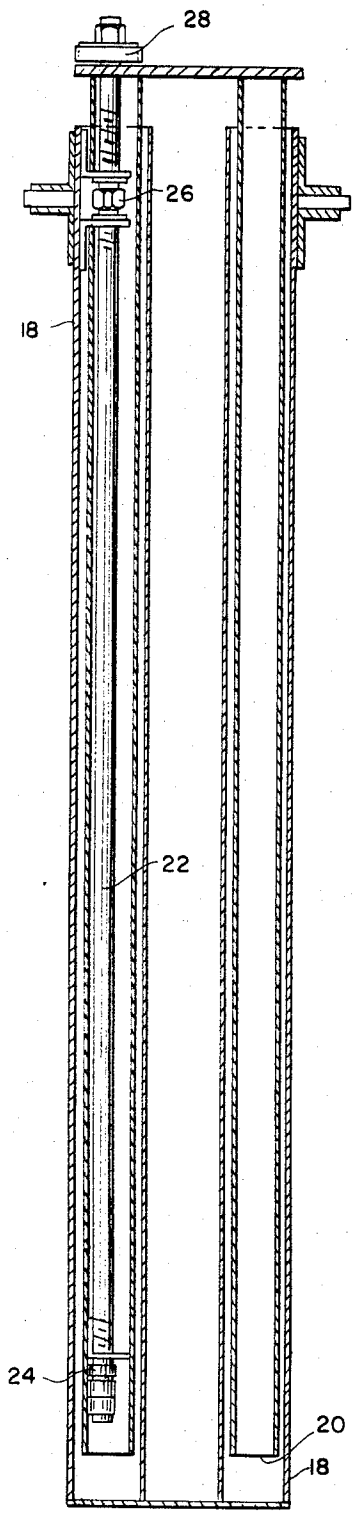


FIG. 11

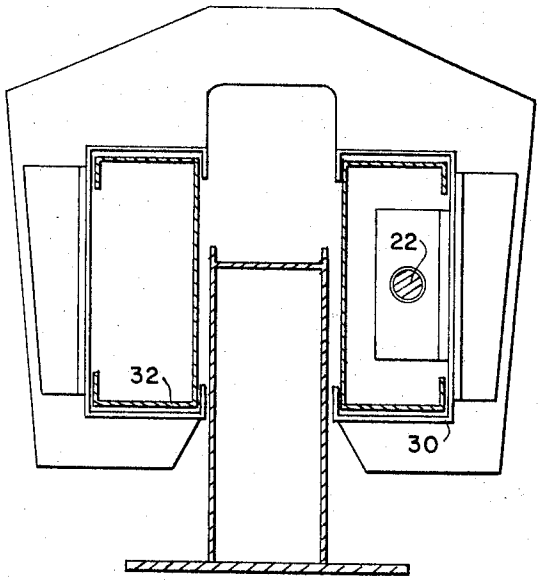


FIG 7

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SELF-RAISING CANTILEVER STEEL FORMS FOR MASS CONCRETE

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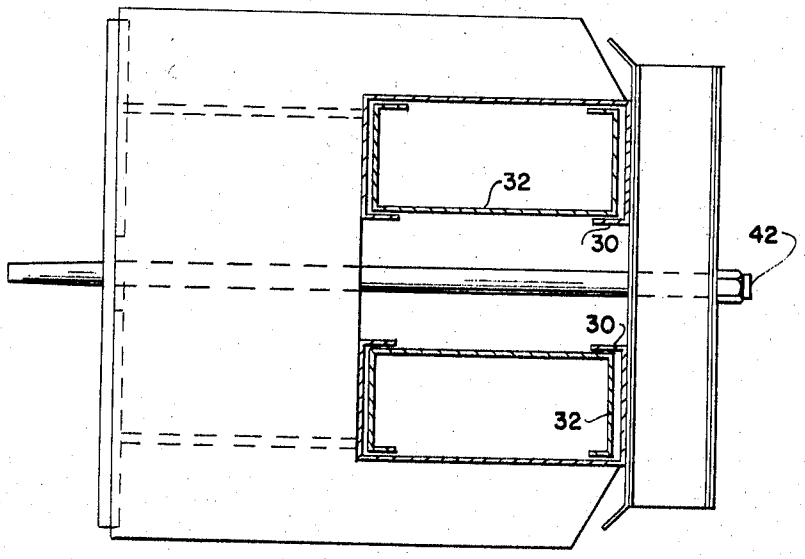


FIG. 10

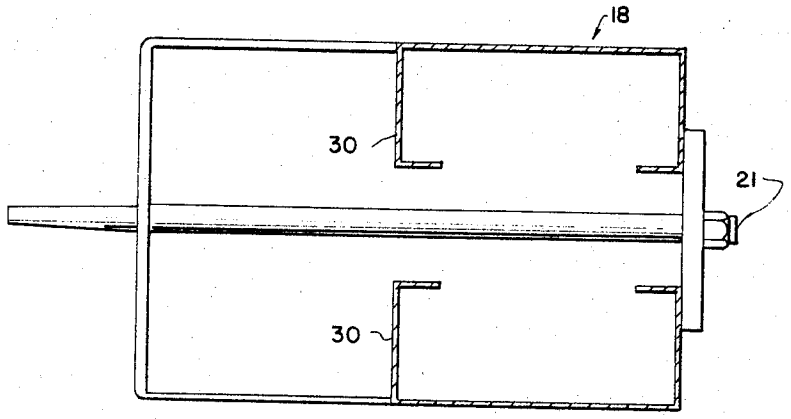


FIG. 9

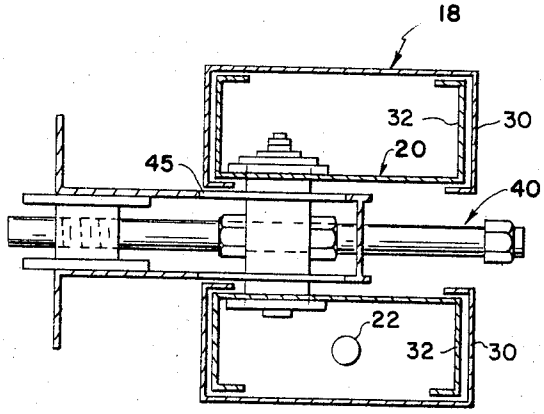


FIG. 8

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Patented Apr. 8, 1969

3,437,305

SELF-RAISING CANTILEVER STEEL FORMS FOR MASS CONCRETE

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Int. Cl. E02b 7/02
U.S. Cl. 249—10 7 Claims

ABSTRACT OF THE DISCLOSURE

Spaced, stiffened steel panel sections supported against concrete pressure by cantilever members anchored in the previous pour and telescoped to be raised by elevating jack drive connection and transversely by stripping and aligning jacks.

Background of the invention

Cantilever steel forms are used extensively in forming mass concrete dams and range from a five foot lift to as high as a ten foot cantilever section. Such forms, although constituting the most economical technique of forming mass concrete, are rather heavy frequently requiring contractors to use portable hydraulic cranes capable of lifting five to eight tons of form at a time. If such heavy cranes are being used at the job site, naturally they can also be used to handle the heavy cantilever forms. However, the high labor costs make it necessary for contractors to find ways to reduce the cost of handling these forms. Naturally, safety dictates that the structural members be in contact with or fastened to the concrete which has previously been poured and obtained the necessary strength.

Summary of the invention

The lower section of the form member, which is fastened firmly to the previous pour, provides the stability for the upper section which slides within the lower member. The form is stripped away from the concrete by means of horizontal jacks operated mechanically by screw jacks. The long threaded rod is operated and the form is raised to a new position. Then, it is pushed against the concrete and firmly clamped to the previous pour. Finally, the outer section is moved up to reinforce the section already in place and, of course, is located in the position for the next lift after the pour is made.

Description of the drawings

FIG. 1 is a side view illustrating the self-raising strongback in pouring position;

FIG. 2 is a side view illustrating the telescoped member beginning to extend;

FIG. 3 is a side view illustrating the self-raising member extended to the next pouring level;

FIG. 4 is a side view illustrating the self-raising strongback support system retracted for reanchor;

FIG. 5 is an elevation view illustrating the panels and standard strongbacks being raised at one time with the use of the self-raising strongbacks;

FIG. 6 is a cross-sectional view taken through the self-raising strongback along line **6—6** of FIG. 1;

FIG. 7 is a cross-sectional view taken through the self-raising strongback along line **7—7** of FIG. 1;

FIG. 8 is a cross-sectional view taken through the self-raising strongback along line **8—8** of FIG. 1;

FIG. 9 is a cross-sectional view taken through the self-raising strongback along line **9—9** of FIG. 1;

FIG. 10 is a cross-sectional view taken through the self-raising strongback along line **10—10** of FIG. 1; and

FIG. 11 is a vertical cross-sectional view taken along line **11—11** of FIG. 1.

Description of preferred embodiment

Illustrated in FIG. 5 are a series of form panels, designated by the reference numeral **10**, and standard intermediate strongbacks **12**, designed to be raised at one time by self raising strongbacks **14** which constitute the heart of the present invention. Walkway brackets **16** attached to form panels **10** are provided adjacent the self-raising strongbacks **14**.

FIG. 1 illustrates a typical self-raising strongback **14** in pouring position. The self-raising member **20** is telescoped within support guide **18** and arranged to be elevated and lowered within support guide **18** with the jack drive assembly illustrated in detail in FIG. 11. Specifically, jack rod **22** is mounted to self-raising member **20** through lower connection **24** while also being mounted to support guide **18** at upper connection **26**. Finally, power connection **28** is provided at the top of rod **22**. Thus, as power connection **28** is turned, self-raising member **20** and support guide **18** move relative to each other. The turning of rod **22** through power connection **28** may be accomplished, for example, by a portable drill or a permanently mounted air or electric motor fastened to the top of self-raising-member **20**.

As seen in FIGS. 6–9, support guide **18** is provided with suitable stiffening members such as flanges **30**, for example, which are configured to enclose corresponding flanges **32** of self-raising member **20**.

As seen in FIG. 1, support guide **18** is attached firmly to the previous pour with anchor bolt **42**. Possible reanchoring on the face may be accomplished by bolt **23** and/or **21**.

The operation of the present invention is initiated by removing the dummy template bolt **34** of the lifter strongback **14** shown in FIG. 1. Then, the anchor bolts **36** are removed at the standard intermediate strongbacks **12** shown in FIG. 5. The form panels **10** and standard intermediate strongbacks **12** are stripped clear of the concrete surface **38**, as seen in FIG. 2, by use of the stripping bolt assemblies **40**. The power connection **28** is then turned clockwise rotating jack rod **22** raising member **18** until the forms **10** are raised to the correct elevation, illustrated in FIG. 3. The forms **10** are then cleaned and oiled before proceeding to the next stage. Stripping bolt assemblies **40** are extended until the bottoms of the form panels **10** contact the previous poured concrete **43**, as seen in FIG. 3. Then, anchor bolts **36** are secured in the standard intermediate strongbacks **12** (FIG. 5) after which anchor bolts **42** are removed at the self-raising strongbacks **14**. The stripping bolt assemblies **40** are then used to move self-raising strongbacks **14** out to clear concrete **43**. Jack rod **22** is then rotated in a counter-clockwise direction until support guide **18** is raised, as seen in FIG. 4, to the correct height for entering anchor bolts **42** after which they are secured on the self-raising strongbacks **14**. Finally, the tops **44** of form panels **10** are aligned.

The details of construction of aligning and stripping assemblies **40** are shown in FIGS. 6 and 8. Support **46**, to which the form panel **10** is attached, is arranged to move horizontally in relation to element **47** connecting the sides of self-raising member **20**. As can be seen in FIG. 1, the sides of support **46** are provided with slots **45** within which element **47** fits. Thus, the movement of rod **48** strips the form panel **10** from the concrete and provides accurate alignment of forms.

I claim:

1. A lifter strongback, comprising:

(A) a support guide;

(B) means rigidly attaching said support guide to poured concrete;

(C) a member;

(D) means telescopically mounting said member within said support guide;

(E) means moving said member relative to said support guide;

(F) a form panel; and

(G) means associated with said member for supporting said form panel and retracting same from the face of the poured concrete during movement of said member while said support guide remains rigidly attached to the poured concrete, said means for retracting said form panel from the face of the poured concrete includes a support, means attaching said form panel to said support, means permitting said support to move horizontally in relation to said member telescopically mounted within said support guide including a single screw within said support guide and member for stripping the form panel from the poured concrete.

2. A lifter strongback as in claim 1, including slot means within said support.

3. A lifter strongback as in claim 2, said member telescopically mounted within said support guide including two separate components, each being generally U-shaped in cross-section and spaced apart from each other, and plural elements connecting said separate components at pre-selected points, one of said elements passing through said slot means contained within said support.

4. A lifter strongback, comprising:

(A) a support guide;

(B) means rigidly attaching said support guide to poured concrete;

(C) a member;

(D) means telescopically mounting said member within said support guide;

(E) means moving said member relative to said support guide;

(F) a form panel; and

(G) means associated with said member for supporting said form panel and retracting same from the face of the poured concrete during movement of said member while said support guide remains rigidly attached to the poured concrete, said means moving the member and support guide relative to each other includes a jack rod located within said support guide and telescopically mounted member and connected at one end to said support guide and at the other end thereof to said member, means threadedly encompassing said jack rod and secured to said support guide and a power connection for rotating said jack rod to raise said member in relationship to said support guide and raise said support guide in relationship to said member, as desired.

5. A lifter strongback as in claim 4, said member including two separate components spaced apart to provide a large opening, and wherein said support guide includes two separate components spaced apart to provide a large opening, each guide component being gradually U-shaped in cross-section and encompassing preselected portions of said two separate components of said telescopically mounted member.

6. A lifter strongback as in claim 5, wherein the means for anchoring the support guide to the poured concrete includes at least one anchor bolt passing through the large openings defined by the spaced apart components of said support guide and member.

7. A lifter strongback as in claim 6, wherein the means for anchoring the support guide to the poured concrete also includes at least one dummy template bolt used as a form for casting said anchor bolt connection within the poured concrete.

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