No. 841,904. PATENTED JAN. 22, 1907.

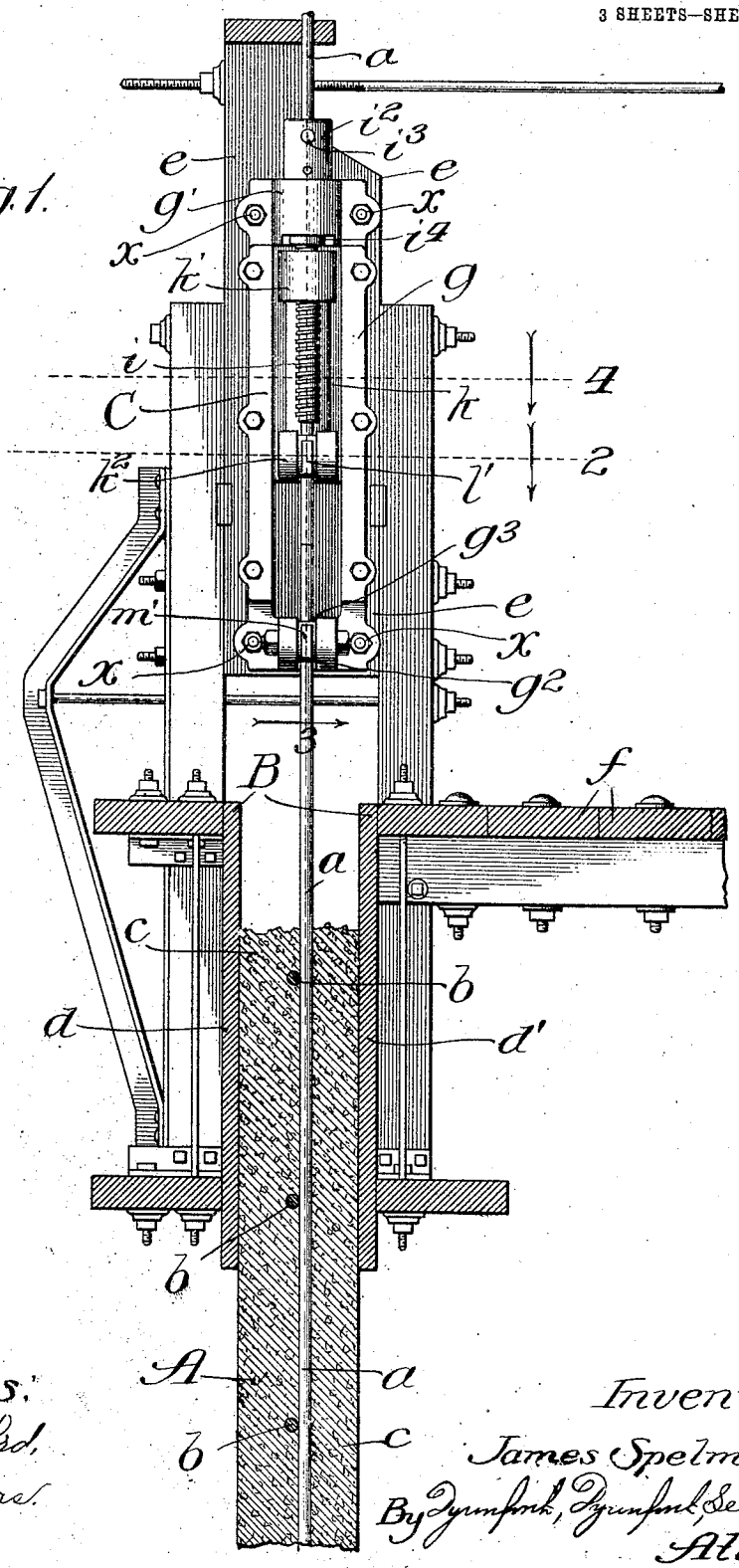
J. SPELMAN.

MEANS FOR USE IN ERECTING METAL CONCRETE STRUCTURES.

APPLICATION FILED NOV. 6, 1906.

3 SHEETS—SHEET 1.

Fig. 1.



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John Enders.

Inventor:
James Spelman,
By Dumford, Dumford, Seely & Wells,
Attys.

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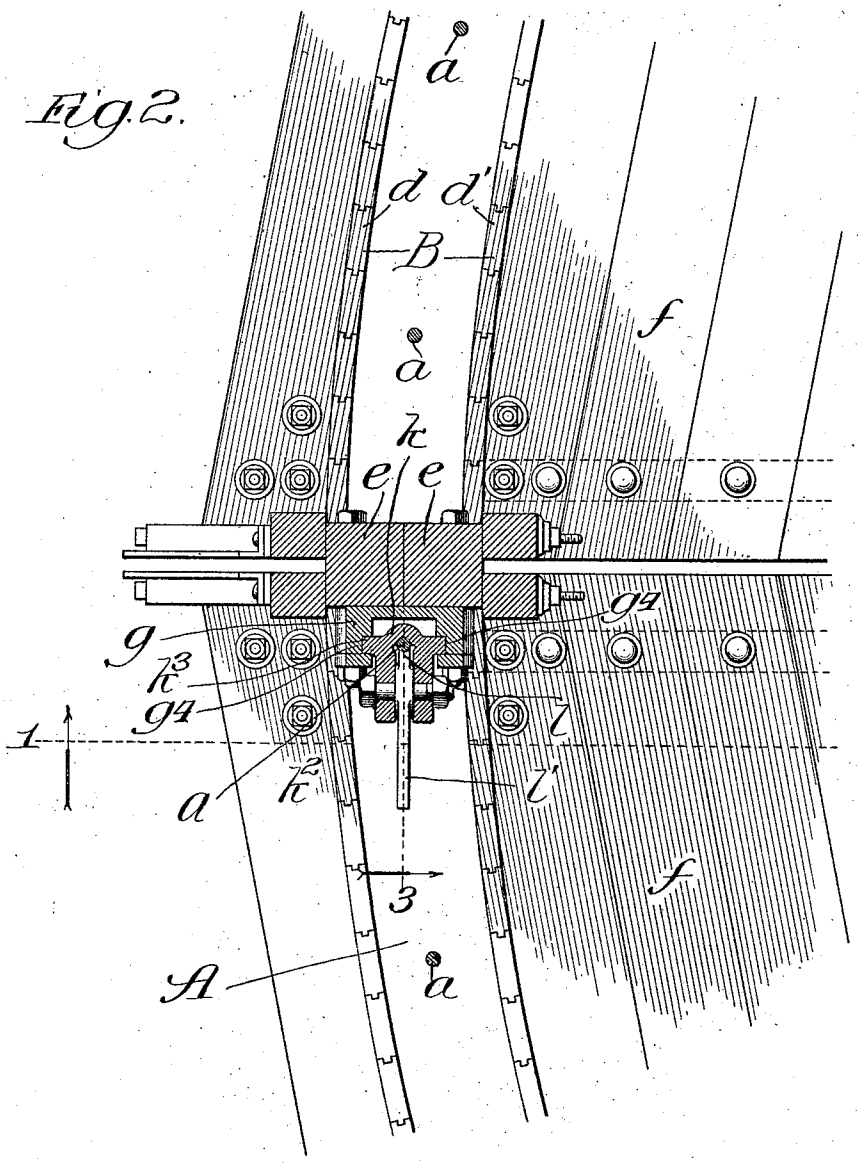
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APPLICATION FILED NOV. 6, 1906.

3 SHEETS—SHEET 2.

Fig. 2.



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No. 841,904. PATENTED JAN. 22, 1907.

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3 SHEETS—SHEET 3.

Fig. 3.

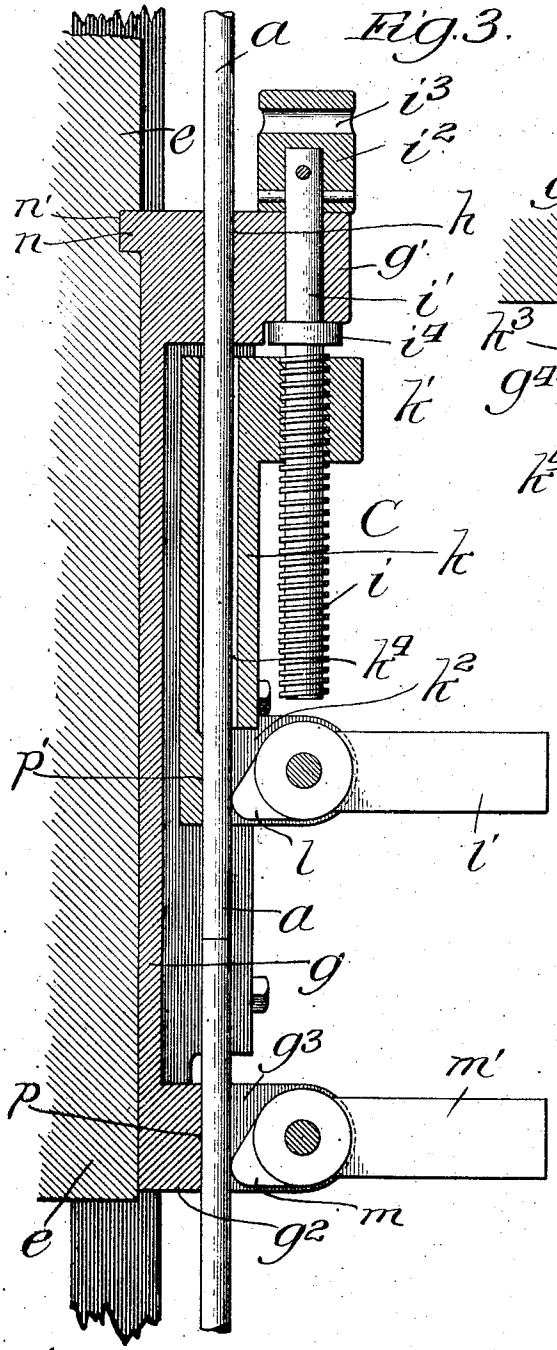


Fig. 4.

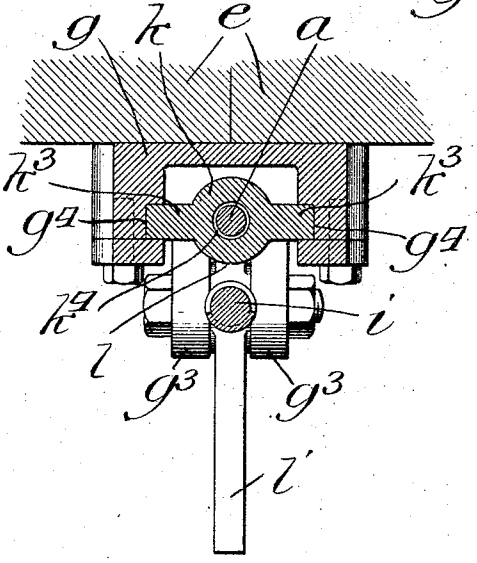
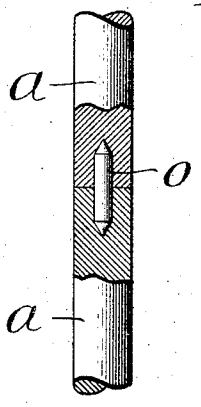


Fig. 5.



Witnesses:
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UNITED STATES PATENT OFFICE.

JAMES SPELMAN, OF CHICAGO, ILLINOIS, ASSIGNOR TO JOHN S. METCALF COMPANY, A CORPORATION OF ILLINOIS.

MEANS FOR USE IN ERECTING METAL-CONCRETE STRUCTURES.

No. 841,904. Specification of Letters Patent. Patented Jan. 22, 1907.

Application filed November 6, 1906. Serial No. 342,171.

To all whom it may concern:

Be it known that I, JAMES SPELMAN, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a new and useful Improvement in Means for Use in Erecting Metal-Concrete Structures, of which the following is a specification.

My invention relates to an improvement in means for rendering continuous the progress of erection of the wall or walls of a metal-reinforced molded concrete structure by raising the mold along the surfaces of its filling of concrete while the filling work is proceeding.

Means adapted for the aforesaid purpose form the subject of Letters Patent of the United States No. 790,007, granted to me May 16, 1905, and involve the use of scaffolding on which the outer and inner connected mold-sections are carried and lifting-jacks underneath the scaffolding for raising it to raise the mold as the work of erection progresses.

The primary object of my present invention is to enable the jacking operation to be employed for raising the mold without requiring scaffolding to be provided as the medium through which to effect the jacking action, since the scaffolding involves for each structure a large quantity of lumber, which is very expensive; and a further object is greatly to simplify the mold-raising operation. A still further and very important object of my invention is to provide for maintaining at all times thus continuously the support of the mold at every point of application to it of a jack for sustaining and lifting it, thereby to avoid at any time leaving the mold unsupported at any such point, since if left so unsupported its weight tends to sag it at that point, and thus to disorganize its required true position besides unduly straining the mold structure.

While my present invention is not limited in its use to connection with the particular mold construction disclosed in my aforesaid patent—in fact, it may be used not only with any other suitable mold construction, but also for raising and sustaining scaffolding, platforms, runways, and the like employed in the erection of metal-concrete structures—for the sake of convenience in explaining it I have selected for illustrating its application figures from the drawings of said patent, to which reference may be had for description of details of the patented mold construction.

In the accompanying drawings, Figure 1 is a broken view in elevation, partly sectional, showing a mold applied to the wall of a metal-concrete structure undergoing erection and equipped with my improved mold raising and sustaining device, the view being taken at the line 1 on Fig. 2 and regarded in the direction indicated by the arrow; Fig. 2, a broken plan section taken at the line 2 on Fig. 1 and viewed in the direction of the arrow; Fig. 3, a view showing my improved lifting and sustaining device in vertical sectional elevation, the section being taken at the line 3 on Fig. 2 regarded in the direction of the arrow and enlarged; Fig. 4, a section taken at the line 4 on Fig. 1 viewed in the direction of the arrow and enlarged; and Fig. 5, a broken view in elevation of one of the vertical metal reinforcing-bars, showing a desirable splicing detail.

A denotes the wall of a metal-concrete structure in process of erection and constructed of a skeleton framework of upright metal bars *a*, surrounded at intervals by annular metal bars *b* and embedded in concrete *c*, which is filled in the space between the outer and inner sections *d* and *d'* of a mold B, respectively surrounding the said skeleton structure and extending about the inner side thereof. The mold illustrated is of the construction of that shown and described in my aforesaid patent and involves, therefore, one or more spacing-timbers *e*, provided at intervals between the mold-sections and a working platform *f*, extending inwardly from the inner mold-section and which may be braced for sustaining it by any suitable means. (Not shown.)

The principle underlying my invention is that of carrying the mold on a desired number of the upright metal reinforcing-bars through the medium of my improved raising devices; and my invention consists in the general as also the more specific construction of the raising device and its operative combination with a mold, scaffold, platform, runway, and the like used in the erection of a structure of the character referred to.

The raising and sustaining device is represented at C and involves the following-de-

scribed construction: A substantial metal frame g of general U-shape in cross-section is provided at its ends with heads g' and g^2, extending at a right angle from it, the upper head being provided with a vertical aperture h and the lower head being bifurcated, as represented at g^3. A screw i passes at its unthreaded stem portion i' through and is there rotatably confined in the frame-head g', above which it has fastened to it a head i^2, provided with an opening i^3, into which to insert a suitable implement, such as an iron bar, for turning the screw, on which is also provided a collar i^4, and the screw is confined against longitudinal movement in its bearing g' between the collar and the head i^2. A frame k, similar to the frame g in having an upper head k' and a lower bifurcated head k^2, is reciprocably supported within the frame g, being confined by longitudinal guide-flanges k^3, extending from its opposite sides in longitudinal guide-grooves g^4, provided in the inner sides of the outer frame. Alining with the aperture h in the head g' is a bore k^4, extending lengthwise through the body of the frame k, of slightly-greater diameter than the aperture h, with the diameter of which, however, it corresponds at the portion extending through the head k^2. The threaded portion of the screw i works in the head k'. In the bifurcated head k^2 is journaled a pawl l, shown to be provided with an arm l', and a similar pawl m is journaled in the bifurcated head g^2 and is also shown to be provided with an arm m'.

To utilize, as hereinbefore suggested, the upright metal bars a for supporting the mold, a frame g is connected with a face of each spacing-timber or pair thereof, if two be employed, as represented, by letting into a recess n' in the timber a tongue n, projecting from the head g' and bolting the frame to the timber or timbers at different points, as represented at x in Fig. 1, and the device C is hung on an adjacent bar a, which passes through the openings k^4 and h by clamping engagement with the bar of the cams or pawls l and m, as represented in Fig. 3, this engagement being maintained to resist the gravity of the mold, tending to drop it by the weight of the arms l' and m', which may be supplemented, if required, by weights (not shown) hung or otherwise provided upon them. As will be understood, a plurality of the devices C are employed, preferably one on each upright bar a adjacent to a spacer e, whereby the mold is supported at as many points about the structure undergoing erection as may be required.

As the work of molding the concrete progresses in the erection of the structure the upright bars a are lengthened by splicing in any suitable manner, which may depend upon the character of the bar employed, such as a T-bar, a cylindrical bar, as shown, or a tubular bar. A suitable splice may be made with a dowel-joint o, as represented in Fig. 5.

To raise the mold B from time to time in the progress of the work of erection, each device C is actuated, usually in turn, to lift the mold slightly at that point—say to the extent of about one-eighth of an inch, more or less—and this is accomplished by turning the implement engaged for the purpose with the head i^2 toward the right through a portion of a complete turn. The effect of thus turning the head is to unscrew the screw i in its bearing k', which acts as a stationary nut, by reason of the frame k being held against depression by engagement of the pawl l with the bar a, so that thus turning the screw jacks up the mold B at the point of application on the device C, the frame g of which rises on the respective bar a, carrying with it the mold, which cannot yield downwardly after the turning operation is completed by reason of the continued clamping engage ment with the bar of the pawl l on the frame k. Thus the screw i of each device C is actuated in turn throughout the progress of erection of the structure until the latter has attained the predetermined height, when the mold is removed and the devices C are taken off, as by raising them off the upper ends of the upright metal bars, or the upper projecting portions of these bars may be disjointed and removed.

Each frame g may be thus repeatedly raised without disturbing its coöperating frame k until the head g^2 encounters the head k^2, whereupon to permit the described screw action to further lift the frame g and the mold the frame must be raised to a higher position fom which to perform its stationary-nut function. This may be accomplished by turning the screw i in the direction contrary to that described, whereby since the frame g is held and the mold is thus sustained by the clamping engagement with the bar a of the pawl m, the frame k is screwed upward along the bar to or toward the position represented in Fig. 3, the pawl l slipping along the bar to release thereon the frame provided with it.

The purpose of providing the two coöperating frames g k, each equipped with a clamping-pawl, is to afford the two gripping-points against the bar to the device C, and thus insure their required stability of sustainment of the mold. It would be within my invention, however, to provide only one frame with its clamping-pawl and any other suitable means to support the screw device for intermittently raising the frame and the mold carried by it along the respective bar a.

It will be observed that the bar upon which my improved lifting and sustaining device is hung finds in the latter bearing-points against the tendency to bend, and thus distort it of the pawls engaging with it.

These bearing-points exist at p and p', (see Fig. 3,) and all binding strain upon the screw is avoided by the guiding confinement in the grooves g^4 of the flanges k^3 on the frame k.

It has hereinbefore been suggested that my invention may be used for performing its described function upon scaffolding, platforms, runways, and the like, besides molds employed in the erection of metal-concrete structures, so that, while a "mold" alone is specified in the appended claims, that term is intended to include such other paraphernalia as suggested.

What I claim as new, and desire to secure by Letters Patent, is—

1. In a structure of the character described, the combination with an upright metal bar thereof, of a mold, a frame movable on said bar and fastened to the mold and provided with frame-supporting means releasably engaging said bar, and a second frame movable on said bar and adjustably connected with said first-named frame and provided with frame-supporting means releasably engaging said bar, for the purpose set forth.

2. In a structure of the character described, the combination with an upright metal bar thereof, of a mold, a frame movable on said bar and fastened to the mold and provided with a pawl releasably engaging said bar, a second frame movable on said bar and provided with a pawl releasably engaging it, and a screw device connecting said frames, for the purpose set forth.

3. In a structure of the character described, the combination with an upright metal bar thereof, of a mold, a frame movable on said bar and presenting thereto a bearing-point and fastened to the mold, a pawl journaled on the frame to releasably engage said bar adjacent to a bearing-point, a second frame movable on said bar and presenting thereto a bearing-point and having journaled upon it a pawl releasably engaging the bar adjacent to said last-named bearing, and a screw device connecting said frames, for the purpose set forth.

4. In a structure of the character described, the combination with an upright metal bar thereof, of a mold, a frame movable on said bar and fastened to the mold and provided with upper and lower heads, a pawl journaled on the lower head to releasably engage said bar, a second frame movable on said bar, provided with upper and lower heads and with a pawl journaled on the lower head to releasably engage the bar, and a screw device having a stem rotatably supported and confined against longitudinal movement in the upper head of said first-named frame, with its threaded portion working in the upper head of said second frame.

5. In a structure of the character described, the combination with an upright metal bar thereof, of a mold, a frame movable on said bar and fastened to the mold and provided with upper and lower heads, a pawl journaled on the lower head to releasably engage said bar, a second frame movable on said bar, having a guiding connection with said first-named frame and provided with upper and lower heads and with a pawl journaled on the lower head to releasably engage the bar, and a screw device having a stem rotatably supported and confined against longitudinal movement in the upper head of said first-named frame, with its threaded portion working in the upper head of said second frame.

JAMES SPELMAN.

In presence of—
J. H. LANDES,
C. W. WASHBURNE.