W. C. POLK.

CONCRETE CASTING MACHINE.

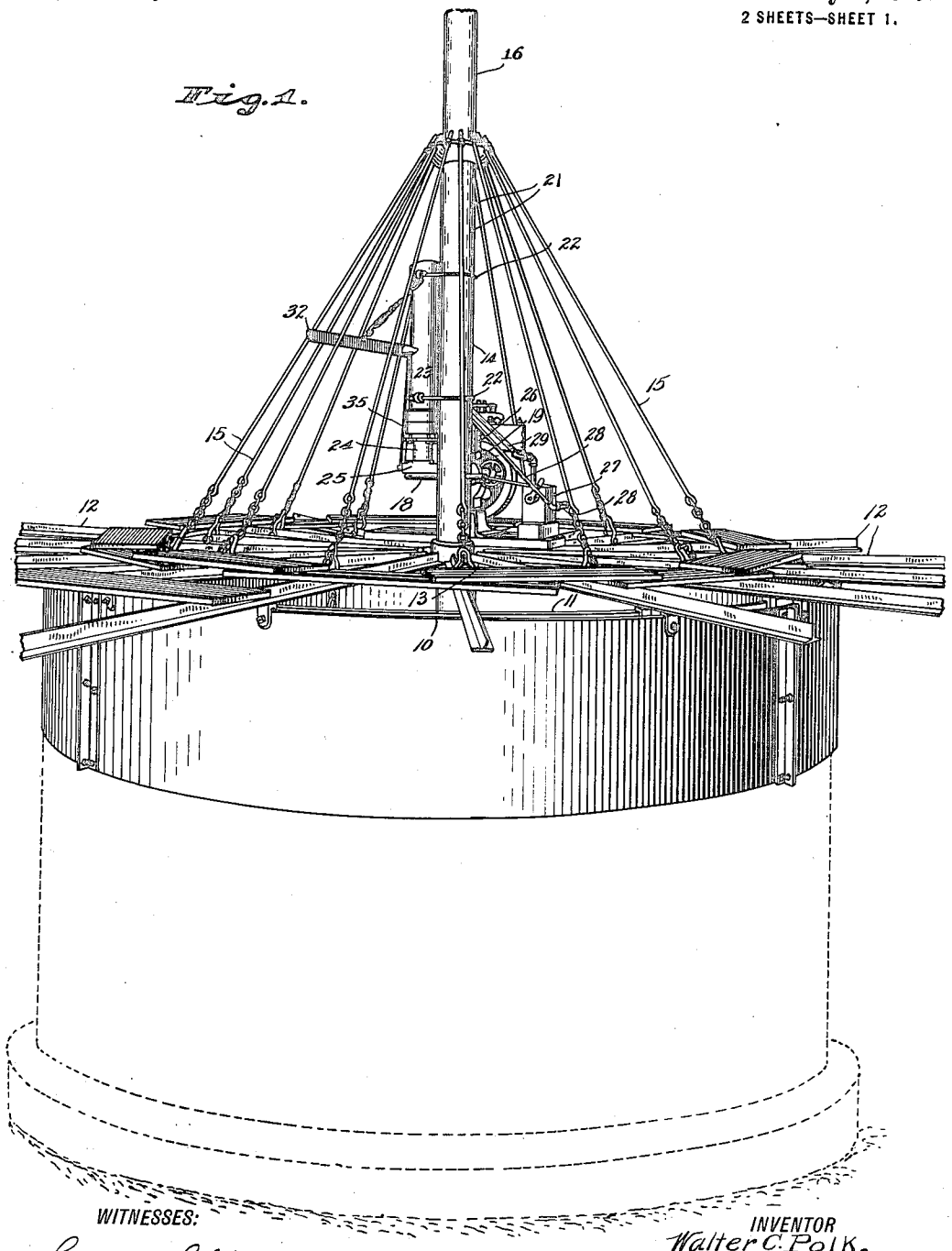
APPLICATION FILED SEPT. 7, 1916.

1,225,356.

Patented May 8, 1917.

2 SHEETS—SHEET 1.

Fig. 1.



WITNESSES:

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2 SHEETS—SHEET 2.

Fig. 2.

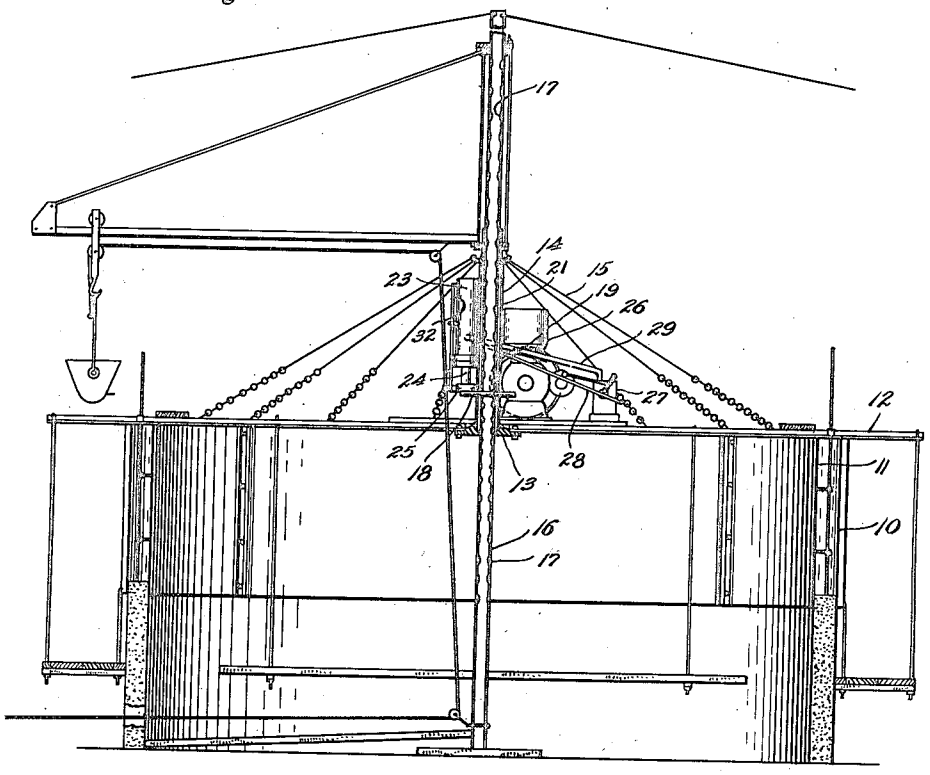


Fig. 3.

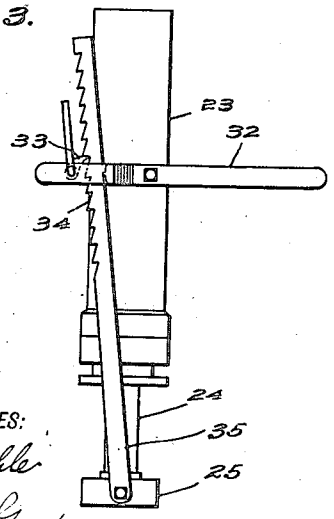
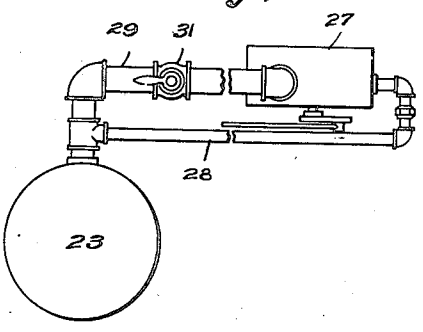


Fig. 4.



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UNITED STATES PATENT OFFICE.

WALTER C. POLK, OF FORT BRANCH, INDIANA.

CONCRETE-CASTING MACHINE.

1,225,356. Specification of Letters Patent. Patented May 8, 1917.

Application filed September 7, 1916. Serial No. 118,805.

To all whom it may concern:

Be it known that I, WALTER C. POLK, a citizen of the United States, residing at Fort Branch, in the county of Gibson and State of Indiana, have invented a new and useful Concrete-Casting Machine, of which the following is a specification.

In the construction of monolithic buildings, especially monolithic cylindrical silos, it has heretofore been customary to construct the same in annular sections within forms which had to remain in position until the concrete had properly set, whereupon the form sections were dismembered, or partially dismembered, and raised by a suitable central mast to a higher position ready to receive the material for the next ring. Such an operation not only produces horizontal joints which cannot be wholly obliterated in finish, but the withdrawal of the forms, generally taking place horizontally, or laterally from the concrete surface, results in defacements at various points where small portions of concrete sticking to the forms are drawn away from the main body.

The object of my present invention is to provide an improved method for handling the forms in the construction of buildings of this character, so that the said buildings may be erected practically continuously and left with a smooth finish.

The accompanying drawings illustrate my invention. Figure 1 is a perspective view of my improved apparatus in working position; Fig. 2 a vertical section on a slightly smaller scale; Fig. 3 a side elevation of a detail of the hydraulic jack; and Fig. 4 a fragmentary detail of the pump and cylinder of the hydraulic jack.

In the drawings, 10 and 11 indicate the outer and inner walls, respectively, of the forms which, in the present case, are indicated as cylindrical in form, and carefully spaced from each other in parallelism a distance equal to the thickness of the desired wall. These forms are suspended from radiating arms 12 which, at their inner ends are carried by a flange 13 at the lower end of a central tube 14, which at its upper end, forms a support for the inner upper ends of the stays 15, the outer lower ends of said stays being attached to the radiating arms 12 near their outer ends. The form structure thus far described is supported upon a central mast 16 which is provided at various points in its height with transverse perforations 17 into which a holding pin 18 may be passed through slots 19 formed through tube 14 near its lower end. Near the upper end tube 14 is provided with a series of perforations 21 which are also adapted to receive a pin like pin 18. Attached to tube 14 by any suitable means, such, for instance, as the clamps 22, 22, is the cylinder 23 of a hydraulic jack. Mounted in the cylinder 23 is a piston, not shown, which carries a piston rod 24 provided at its lower end with a foot 25 adapted to engage pin 18. Mounted upon the radiating arms 12 is a small motor 26 which operates a pump 27. This pump 27 is designed to deliver water or oil through a pipe 28 to cylinder 23. In order to hasten the return action, a return pipe 29 leads from cylinder 23 back to pump 27 and is provided with a valve 31 by means of which flow through pipe 29 may be stopped or permitted.

The piston 24 may be returned rapidly, if desired, by means of a lever 32 carrying a pawl 33 adapted to engage a ratchet 34 formed at the upper end of the bar 35 pivoted to the foot 25.

The motor 26 may be of any type which, in its normal operation, is capable of producing material vibrations, and for this purpose, the most convenient type of motor is probably an internal combustion engine, excellent results having been obtained by the use of such a motor.

In operation, after the space between the forms 10 and 11 has been filled with concrete and this concrete has been allowed to stand for a comparatively short time until crystallization has begun, I find that the motor 26 may be started. The operation of this motor will set up small vibrations in the entire form structure and these vibrations result in a loosening of the forms 10 and 11 from the fresh concrete. Thereupon, if the pump 27 be started so as to deliver oil or water slowly into the cylinder 23, foot 25 operating upon pin 18, will serve to very slowly raise the entire form, slipping the same upwardly along the concrete, thus smoothly troweling the surface and at the same time affording space for the introduction of additional concrete.

In practice I find that after the first ring of concrete has begun to set, while it is still so soft as to receive finger indentations, the raising operation of the forms may be begun and from that time forward

the forward movement of the forms may be practically continuous. When the limit of the stroke of the hydraulic jack has been approximately reached, the pump may be stopped, a second pin 18 passed through one of the perforations 21 and the alined perforation 17, so as to hold the parts in elevated position, whereupon, the jack may be returned to collapsed condition, pin 18 reset at a higher point in the slot 19, and the operation repeated.

It is readily apparent that many changes in the form and details of construction may be made without departing from the spirit of my invention, which resides primarily in the simultaneous vibration and lifting of the forms to permit practically continuous casting.

I claim as my invention:

1. That improvement in the art of casting monolithic structures, which comprises the substantially continuous vibration and vertical lifting of the forms during placing of the fresh concrete.

2. Apparatus for casting monolithic structures comprising a form therefor, a support for said form, and means for lifting said forms and for vibrating the form during the lifting operation.

3. Apparatus for casting monolithic structures, comprising a form therefor, a support for said form, a vibratory motor arranged to vibrate said form, lifting mechanism arranged between the form and the support, and means operated by the motor for operating said lifting mechanism.

4. Apparatus for casting monolithic structures, comprising a supporting mast, casting forms supported by said mast, an internal combustion engine mounted upon said forms, a hydraulic jack carried by said forms and engaging the mast, and a pump operated by said engine and connected to said hydraulic jack.

5. Apparatus for casting monolithic structures, comprising forms therefor, a support for said forms, an internal combustion engine mounted upon said forms so as to vibrate the same, a lifting jack arranged between said support and forms, and means operated by the engine for operating said lifting jack.

6. Apparatus for casting monolithic structures, comprising forms therefor, a support for said forms, means for vibrating said forms, and means arranged between the forms and support for lifting the forms.

In witness whereof, I WALTER C. POLK have hereunto set my hand at Fort Branch, State of Indiana, this 24th day of August, A. D. one thousand nine hundred and sixteen.

WALTER C. POLK.