

No. 840,638.

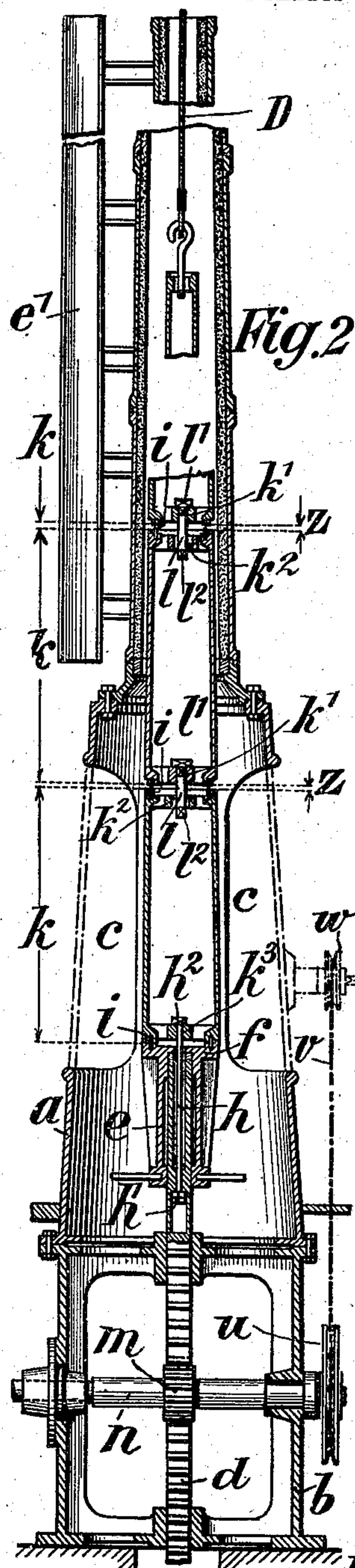
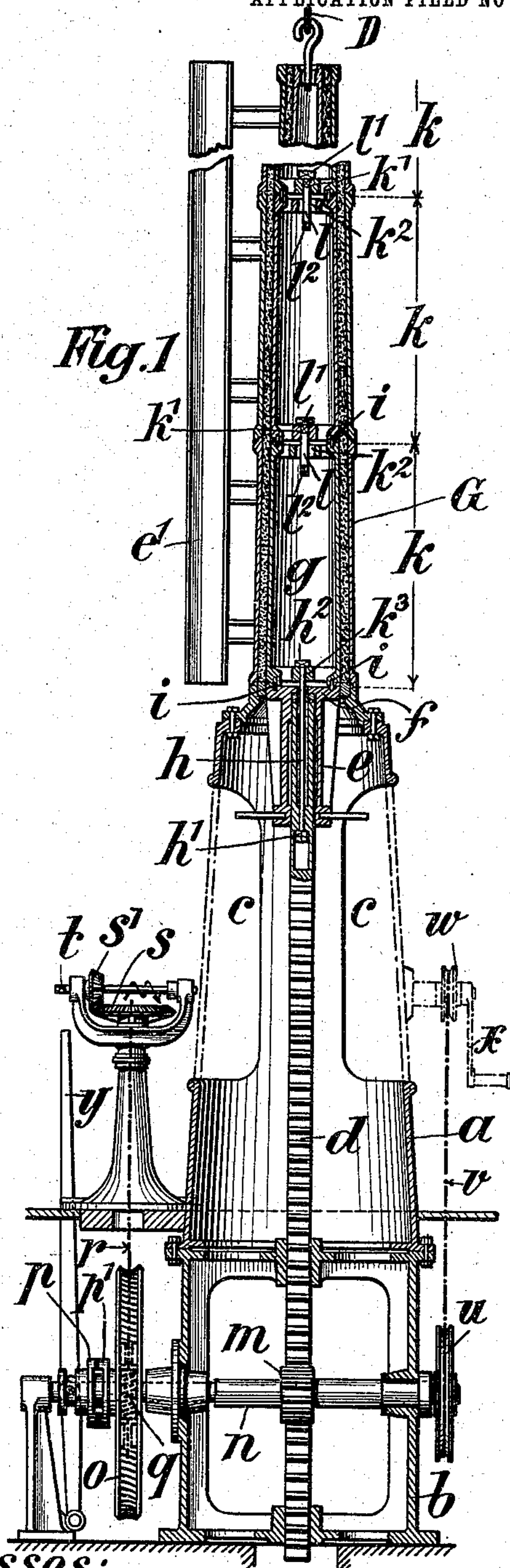
PATENTED JAN. 8, 1907.

F. LOCHER.

APPARATUS FOR CONSTRUCTING HOLLOW CONCRETE COLUMNS.

APPLICATION FILED NOV. 10, 1906.

2 SHEETS—SHEET 1.



Witnesses:

Jesse H. Lutton.  
B. Wommers

Inventor:

Fritz Locher  
by *Harry Orth*  
Att'y.

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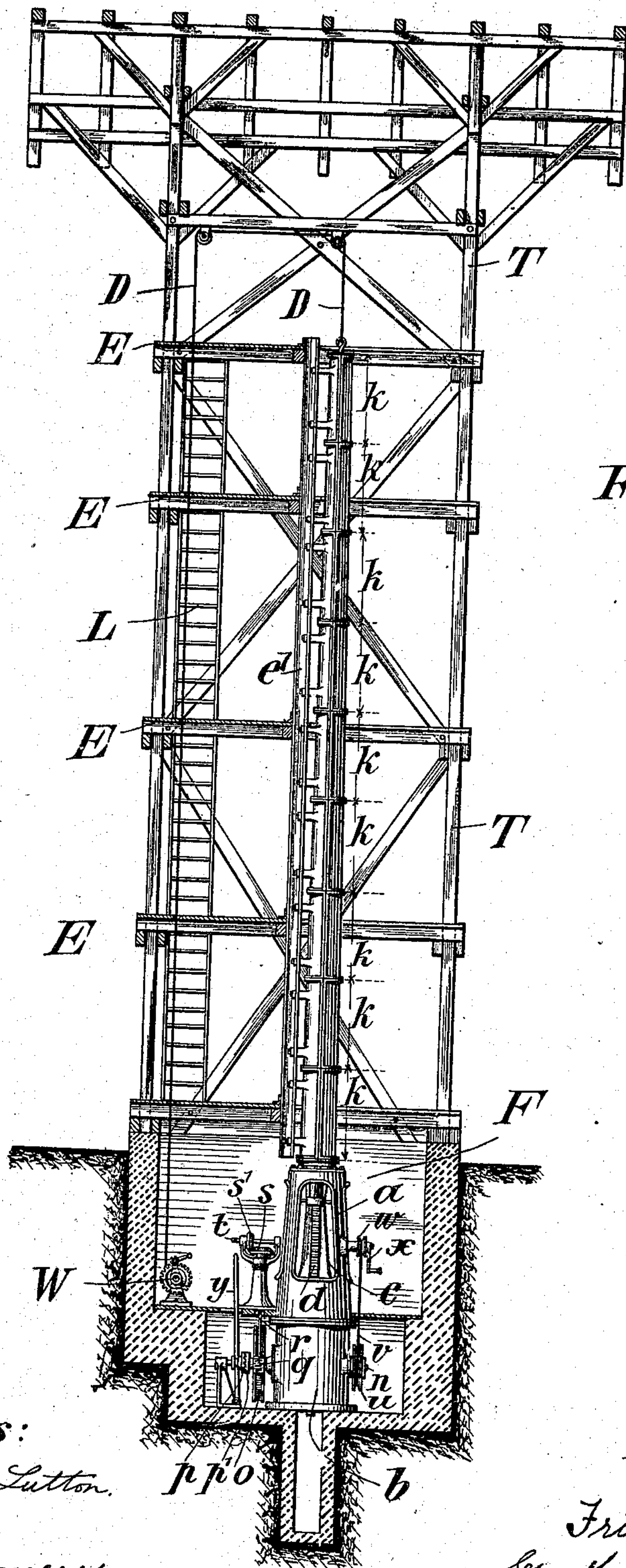


Fig. 3

Witnesses:

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# UNITED STATES PATENT OFFICE.

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## APPARATUS FOR CONSTRUCTING HOLLOW CONCRETE COLUMNS.

No. 840,638.

Specification of Letters Patent.

Patented Jan. 8, 1907.

Application filed November 10, 1906. Serial No. 342,922.

*To all whom it may concern:*

Be it known that I, FRITZ LOCHER, a citizen of the Republic of Switzerland, residing at Zürich, Switzerland, have invented certain new and useful Improvements in Apparatus for Constructing Hollow Concrete Columns; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters of reference marked thereon, which form a part of this specification.

My invention relates to the manufacture of hollow beton or concrete pillars or columns, and has for its subject apparatus for removing the mold-cores from the finished columns.

One form of construction of the invention is illustrated in the accompanying drawings, in which—

Figure 1 is a vertical sectional view of the apparatus, and Fig. 2 a like view of the same in another working position. Fig. 3 is an elevation and part section of the entire plant.

In the housing *a*, which rests upon the frame *b* and has a number of lateral apertures *c*, a vertical rack *d* is arranged. The housing *a* and the frame *b* are erected in the bricked pit *F* of the framework or scaffold *T*, which has a number of platforms or stages *E*, to which access can be had by means of ladders or steps *L*. The rack *d* is guided so that it may reciprocate vertically in the frame *b*. At the top of the rack is a support *e*, having a flat top or plate *f*. This support *e* is mounted on the rack and rotates about the axis of the vertical core *g* of the mold *G*, secured to the scaffold *T* by bars *e'* for constructing hollow concrete columns. The core *g* rests upon the plate *f* and is secured to the rack by means of a screw-bolt *h*.

*i* represents dowel-pins located in holes in the plate *f* and entering corresponding recesses in the core. The latter consists of a plurality of superposed sections *k*, detachably connected together by means of bolts *l*.

*m* is a pinion which meshes with the rack *d* and is mounted on the shaft *n*, journaled in the frame *b*. At one end of the shaft there is loosely mounted a worm-wheel *o*, and a clutch-half *p* is likewise mounted on the shaft, but only with capability of sliding in the longitudinal direction and not of rotating there-

on. The other clutch-half *p'* constitutes the boss of the worm-wheel *o*. With the latter there engages a worm *q*, mounted on a shaft *r*, the location of which is indicated by means of a broken line in the drawings. This shaft *r* can be rotated by gears *s s'* and shaft *t*. At the other end of the shaft *n* there is mounted a pulley *u*, which by means of a band or other power-transmitting member *v* is connected with the pulley *w*, mounted on a shaft provided with a crank-handle journaled in the casing *a*.

*y* is a lever fulcrumed to one of the bearing-standards of the shaft *n* and having a roller which engages in a groove in the clutch-half *p*, whereby on throwing the lever over the clutch can be thrown in or out.

The operation of the apparatus is as follows: The top core-section is hung upon a wire rope *D*, which can be drawn up and down by means of the winch *W*, whereupon the support *e* is lowered by means of the winch *t*, which actuates the rack *d* and cooperating parts. In this manner the core, owing to its being secured to the support *e* by the bolt *h*, will be partly drawn out of the column. Great force is required to thus draw out the core, since the concrete mass adheres to the latter. For this reason the winch parts *o q s s'* are selected to give a high ratio of transmission. For the downward motion of the rack with this transmission-gear the shaft *t* is rotated in the direction of the arrow in Fig. 1, (for which purpose the crank-handle *x* must be transferred to this shaft.) The shaft transmits its rotary motion, by means of the parts *s' s r q o n*, the clutch being in engagement, to the pinion *m*, whereby the rack is worked downward. The support *e* is sunk in this way until the bottom core-section *k* is opposite the apertures *c*, Fig. 2. The core-sections are connected together, as it were, in the manner of a chain. This concatenation of core-sections *k* is effected by the bolts *l* being furnished with head and tail pieces *l' l''*, which run transversely to the slots *k' k''* and which bear against the transverse members of the core-sections *k*. It will be seen from the drawings that when the parts are suspended as described the core-sections *k* have in so far changed their position relatively to each other that a space *z* is left between each two adjacent parts, whereby the parts *k* can be



turned with respect to one another. After such separation of the individual sections of the concatenation and descent of the lowest core-section into the position shown in Fig. 2 the nut  $h'$  of the bolt  $h$  is loosened, so that the bolt may be turned for the purpose of bringing the head  $h^2$  in line with the elongated slot  $k^3$ , which runs at right angles to the head  $h^2$ . When now the support is still further lowered, the head  $h^2$  will pass through the slot  $k^3$ , and the bottom or ultimate core-section now hangs freely suspended from the penultimate core-section. The ultimate core-section is next so turned that the tailpiece  $l^2$  of the bolt  $l$ , which connects the two bottom core-sections, can pass through the slot of the said ultimate or bottom core-section, whereby the latter can be detached from the next higher one and removed through one of the apertures  $c$  from the housing  $a$ . The core is now lowered by means of the winch  $W$  through the distance of one core-section, so that the next core-section hangs opposite the apertures  $c$ , whereupon this section is rotated, so that the tailpiece of the bolt which connects this section with the next higher one can pass through the slot  $k^2$  of the section which is at the level of the aperture  $c$ , whereby this section also can be detached from the remaining sections, and so on until all the sections of the core have been removed from the column through the apertures  $c$  of the housing  $a$ . If only small power is necessary to move the support  $e$ —*e. g.*, when the support is to be elevated—the shaft  $n$  can, if the clutch has been thrown out, be rotated by the parts  $u v w$  with small ratio of transmission. In order to prevent the concrete mass from adhering to the core during the process of making the column, the core must be turned from time to time. For this purpose the support is rotated, this rotary motion being then transmitted to the core by means of the dowel-pins  $i$ .

Having now particularly described and ascertained the nature of the said invention and in what manner the same is to be performed, I declare that what I claim is—

1. In apparatus for making hollow concrete columns, in combination, a core consisting of a concatenation of detachable sections; a support for the bottom section; means for moving the support in vertical direction; and means for detachably securing the core to the said support, substantially as described.

2. In apparatus for making hollow con-

crete columns, in combination, a core consisting of a concatenation of detachable sections; a support for the core; a rack carrying the support; a shaft; a pinion mounted thereon meshing with the rack; and a winch for rotating the shaft; substantially as described.

3. In apparatus for making hollow concrete columns, in combination, a core consisting of a concatenation of detachable sections; a support for the core; a rack, recessed at the top, carrying the support; a shaft; a pinion mounted thereon meshing with the rack; a winch for rotating the shaft; a cross-piece, having an elongated slot, located at the bottom of the lowest core-section; a screw-bolt passing through the slot and the rack-recess and securing the core to the support; and dowel-pins on the support entering recesses in the bottom of the core; substantially as described.

4. In apparatus for making hollow concrete columns, in combination, a core consisting of a concatenation of detachable sections, each having dowel-pins at one end and corresponding recesses at the other end; cross-pieces, having an elongated slot, at the bottom of the core-sections; cross-pieces having an elongated slot running at right angles to the slot in the said cross-pieces, located at the top of the core-sections; and bolts passing through the two slots in each two adjacent cross-pieces and presenting an elongated head and a like tailpiece disposed at a right angle to the head; substantially as described.

5. In apparatus for making hollow concrete columns, in combination, a core consisting of a concatenation of detachable sections; a support located below the core; a rack carrying the support; a pinion meshing with the rack; a shaft carrying the pinion; a winch, and gearing having respectively high and low ratios of transmission for driving the shaft; substantially as described.

6. In apparatus for making hollow concrete columns, in combination, a core consisting of a concatenation of detachable sections; a support for the bottom core-section; and means for operating the support in vertical direction; and means for rotating the support; substantially as described.

In testimony that I claim the foregoing as my invention I have signed my name in presence of two subscribing witnesses.

FRITZ LOCHER.

Witnesses:

ED LOCHER,

A. LIEBERKNECHT.