

(No Model.)

E. L. RANSOME.
MOLD.

No. 515,014.

Patented Feb. 20, 1894.

Fig. 1.

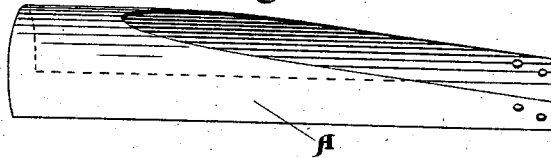


Fig. 2.

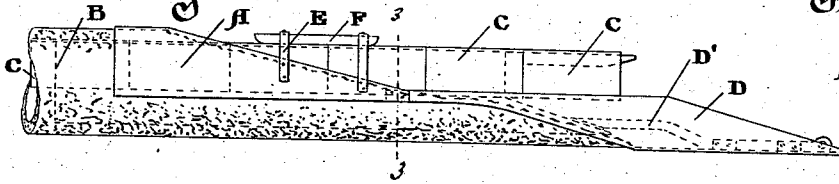


Fig. 3.

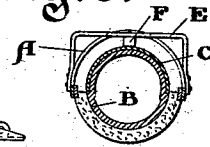


Fig. 4.

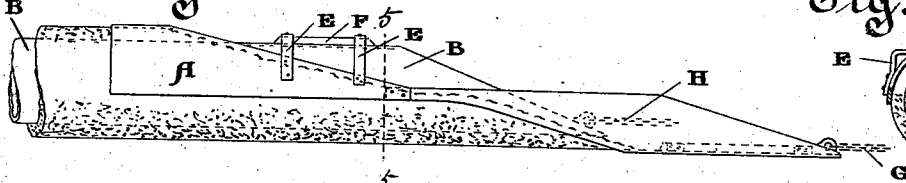


Fig. 5.

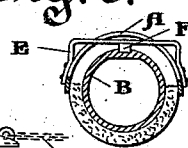


Fig. 6.

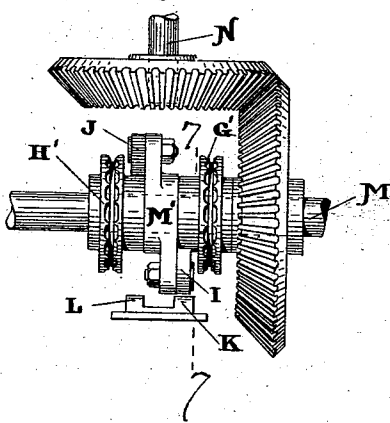
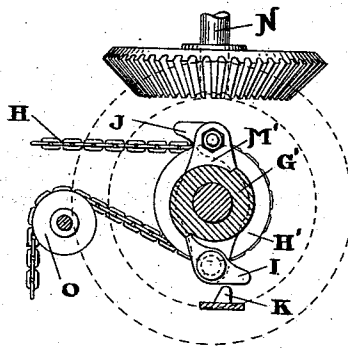


Fig. 7.



Witnesses,

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ERNEST LESLIE RANSOME, OF OAKLAND, CALIFORNIA.

MOLD.

SPECIFICATION forming part of Letters Patent No. 515,014, dated February 20, 1894.

Application filed February 24, 1893. Serial No. 463,659. (No model.)

To all whom it may concern:

Be it known that I, ERNEST LESLIE RANSOME, a citizen of the United States, residing at Oakland, in the county of Alameda and State of California, have invented certain new and useful Improvements in Moldings; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to, and is an improvement upon, the molds and methods of molding monolithic pipe *in situ* for which Letters Patent Nos. 353,500 and 424,656 were granted me upon the 30th of November, 1886, and the 1st of April, 1890, respectively.

Heretofore, in molding pipe by the molds and methods aforementioned, the thickness and outer surface of the upper portion of the pipe, from where it diverges from the sides of the excavation, has been formed by hand.

My improvement consists in combining with these molds an auxiliary cap mold, to control and determine the thickness and outer form of the upper portion of the pipe.

It consists further of a method of molding, necessitated by the use of the aforesaid auxiliary mold, and it consists yet further in means for carrying out this method.

To carry my invention into effect, I make and use a cap mold auxiliary to those already patented by me, the inner surface of which conforms generally in size and shape to the outer shape of the concrete work to be made. At any given distance from the rear end of the mold, it is bifurcated longitudinally at the top, and the branches created by the bifurcation are sloped or stepped on their tops from the crotch downward to their forward termination. The curvature or direction of the mold remains the same throughout, its surface only being decreased by the sloping of the branches. This auxiliary mold is, in some cases, fitted with stirrups and a runner, and rides over the main mold and is attached thereto, either directly or with the forward "shaper" or frame "H" of Patent No. 353,500 intermedial, or else it is drawn along with a limited independent movement, all as herein- after described. When the "plates" are used for holding up the top concrete as provided for in Patent No. 353,500, this auxiliary mold

is attached to the main mold, and is drawn along with it as one piece. These plates upon which the runner of the auxiliary mold slides being stationary contact therewith prevents the concrete that is between them and the auxiliary mold from being drawn along by the latter. This auxiliary mold may also be directly and rigidly attached to the main mold and drawn along therewith in cases where no "plates" are used; but to do this satisfactorily, necessitates such a gradual slope to the molds as to render them for the most part of an impracticable length; therefore, to avoid this and to insure the concrete remaining in its proper place between the molds during their forward movement when no "plates" are used, and consequently when the concrete is subjected to the forward movement of both molds, I move the molds alternately forward, first the one and then the other, and this is the second portion of my invention. The auxiliary mold in this case rests upon the main mold and is sustained thereon by sliding contact, properly confined, so that the relative positions of the molds are duly retained. By this means, I prevent the combined action of the forward movement of the molds upon the concrete between them, and assist the concrete in retaining its position, by causing the molds in a measure to neutralize each other's movement; for under this reciprocal movement the mold that at the time is stationary, adequately supports, by surface contact, the concrete in its resistance to the forward movement imparted by the motion of the other mold. In drawing these molds along alternately, it is essential that at each alternate movement their forward progress should be the same, otherwise the relative positions of the molds would be varying too much; and in order to do this, I have invented a reciprocating windlass having two chains which are alternately drawn forward for a given distance. It is further necessary in carrying out this movement successfully that the chain connected with the mold whose turn it is to rest, should not have any strain upon it at the time strain is put upon its companion chain, otherwise, at the starting of the companion chain there would be a liability of both molds moving together and drawing the concrete between them sufficiently to strain or separate it from the rest,

and thus rendering the structure imperfect or useless. To meet this necessity, I have so arranged my windlass, that after every pull on any chain the chain is released sufficiently to permit it to free itself from any strain that may be upon it. In every case the concrete is supplied to the molds in any of the usual ways.

Figure 1 represents the auxiliary mold. Fig. 2 represents the auxiliary mold in connection with the shaper and main mold with top plates. Fig. 3 is a section of same on line 3—3 Fig. 2. Fig. 4 represents the auxiliary mold in connection with the shaper and main mold without plates. Fig. 5 is a section of same on line 5—5, Fig. 4. Fig. 6 is a side elevation of the reciprocating windlass. Fig. 7 is a section of same on line 7—7, Fig. 6.

Similar letters refer to similar parts throughout the several views, in which—

A is the auxiliary mold. B the main mold. C the plates. D the shaper. D' bar connecting main mold B and shaper D. E, E yokes. F the runner. G chain for shaper. G' chain wheel for same. H chain for main mold. H' chain wheel for same. I pawl for chain wheel G'. J pawl for chain wheel H'. K and L liberating studs. M and N driving shafts. O idler.

The auxiliary mold A is attached to the shaper D as shown, and is carried upon runner F by yokes E, which sustain the auxiliary mold A at the right distance above the main mold B. In Fig. 2 the runner F slides upon the plates C which are first coupled together by manual labor, and then inserted by the forward movement of the molds, between the main mold B and the runner F, at the front end of the runner. When no plates are used and both molds are drawn along simultaneously, the auxiliary mold A is attached in the same or any other convenient way, but the runner F now rests directly upon the main mold B, to which it may be bolted, as it no longer acts as a runner but simply as a chair or sleeper, the sole use of which is to sustain the auxiliary mold A at its proper height. When the molds are drawn along alternately, as in Fig. 4, the auxiliary mold A rests upon the runner F as in the first case (where plates are used) and is attached to the shaper D. The main mold B, having in this case no rigid connection with the shaper D, is free to move separately, and one chain H of the reciprocating windlass is attached to it, and the other to the shaper, as shown. However, the auxiliary mold A may be made independent, and the main mold and shaper connected together, as in Fig. 2 in which case the chain H, previously attached to the main mold, would be removed and attached to said auxiliary mold A. The runner F, sliding in a slot in the main mold B, prevents any side movement of the auxiliary mold A.

The reciprocating windlass, as illustrated in Figs. 6 and 7, consists primarily of shaft

M, chain wheels G' and H' with notched hubs, pawls I and J, and arms M' carrying pawls, all arranged in a suitable frame which is anchored convenient to the trench.

The driving shaft N is shown vertical, but may be placed so as to convey the power most conveniently.

Upon shaft M two chain wheels G' and H' which draw the chains G and H, turn loose, and are alternately engaged and moved by the pawls I and J respectively. The mechanism acts as follows:—When the pawl I reaches its liberating stud K, it releases the chain wheel G', which then turns backward, following the strain of the chain until the strain ceases; meanwhile the pawl I, in its constant forward movement, comes in contact with the other notch in chain wheel G' which it engages, and, continuing on its circuit, carries the wheel around with it until it again comes in contact with stud K. This movement is repeated regularly while the machine is in operation; thus each revolution of shaft M gives a permanent forward movement of the chain, of half the circumference of the chain wheel. Chain wheel H' acts in precisely the same manner, but as the pawls I and J are diametrically opposite, the pulling will be done while the other chain is slack and vice versa.

I do not limit myself in this application to any special way of attaching the auxiliary mold to the main mold, nor do I confine myself to any special form of runner or sleeper. In like manner, I do not confine myself to any special way of producing the limited sliding contact sometimes required between the molds, for there are many well known ways of doing this, and for the purposes of this invention, I regard rolling, or any other method of contact, giving the necessary freedom for forward movement, as the equivalent to the sliding contact continually referred to in this specification. Also in that part of my invention relating to a windlass, I regard ropes and drums as equivalents of chains and chain wheels, and while I have limited my description to the use of two chains and two wheels, it is obvious that these may be increased to as many as may be desirable, and the reciprocal movement increased into any number of desired parts. Also different means may be used to obtain the same movement of the chains,—I having described only the one that I think is the best for the purpose.

Having fully described my invention, what I desire to claim and secure by Letters Patent is—

1. A traveling mold bifurcated at the top, with branches sloping on their upper edges downward from the crotch toward their forward ends, such as described.

2. The bifurcated traveling mold A having yokes E and sleeper F. Substantially as described.

3. In combination with traveling mold B,

the auxiliary mold A rigidly attached thereto; substantially as described.

4. In combination with traveling mold B and its plates, the auxiliary mold A having
5 sliding contact with the plates; substantially as described.

5. In combination with traveling mold B,

the auxiliary mold A having reciprocating action therewith; substantially as described.

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