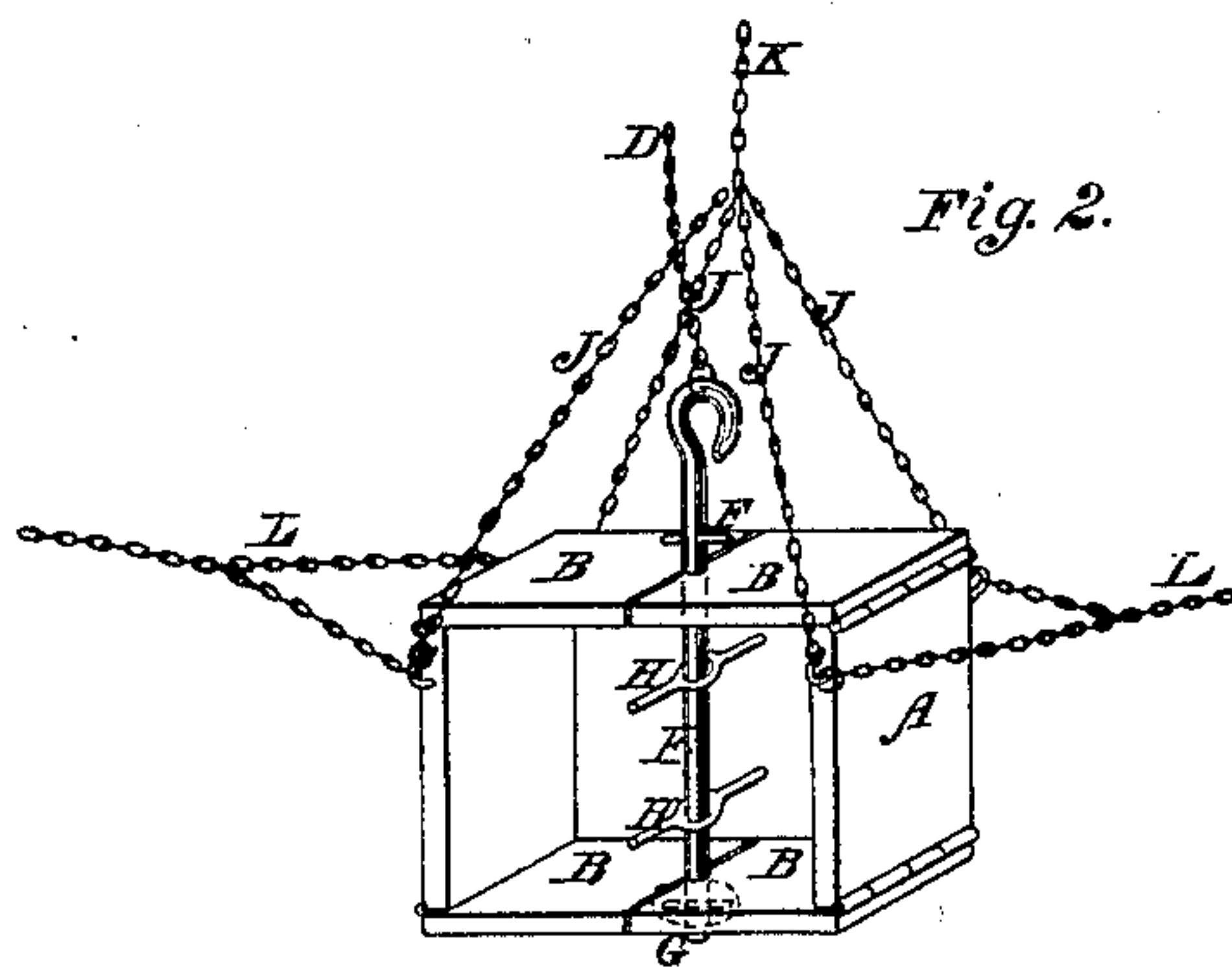
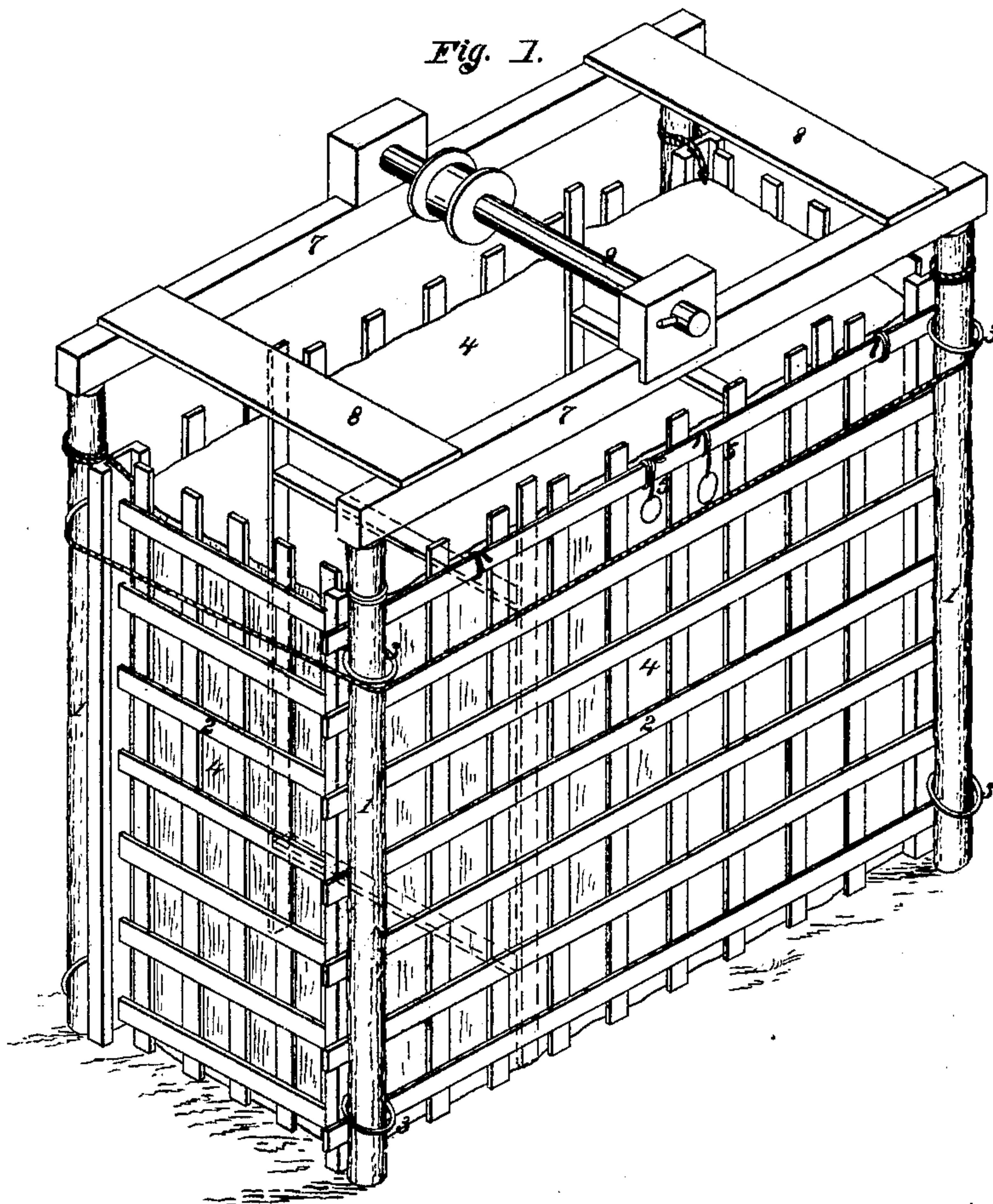


W. H. Horstmann.
Bridge Pier.

N^o 21,498.

Patented Sep. 14, 1858.



UNITED STATES PATENT OFFICE.

W. H. HORSTMANN, OF NEW YORK, N. Y.

METHOD OF BUILDING WALLS UNDER WATER.

Specification of Letters Patent No. 21,498, dated September 14, 1858.

To all whom it may concern:

Be it known that I, WILLIAM H. HORSTMANN, of the city, county, and State of New York, have invented a new and useful Apparatus for Building Walls Under Water, Especially Serviceable in Currents or Moving Waters; and I do hereby declare and ascertain my said invention, referring to the accompanying drawing, in which—

Figure 1, is an isometrical projection of the general apparatus. Fig. 2, is a detached view of the cement feeder with one side removed to show the interior.

My invention is intended to prevent the necessity of a coffer-dam or other like device to build walls under water, by which the cement is wholly retained and prevented from wasting or being removed from its proper position until it is set and becomes hard when laid in running streams or other moving waters that tend to remove the plastic cement before it becomes solid, by which I save great expense consequent upon constructing and removing coffer dams as well as the waste of cement above spoken of, and secure the advantage of building under water and in still water without a complex apparatus, by a simple and cheap structure.

My apparatus consists of the following parts in whole or in part according to the nature of the work to be done—I first drive four or more spiles 1, at the corners or sides around the place to be built upon and I then form a framework of latticed panels 2, that fill the spaces between the spiles, then panels are confined to the spiles by rings 3, that attach the panels to the spiles so as to form an open work inclosure. A bag or sack 4, is made of cloth or some other suitable material large enough to fill the inclosed area and sufficiently strong to prevent the motion of the water from destroying it, and it may be made an entire bag formed receptacle or in some cases the four walls alone without a bottom may be used and found sufficient in which latter case it is confined at the bottom by a packing of earth of some kind to hold it in position. It may be found that in some cases the panels 2, can be omitted and the bag 4 affixed to the spiles only will be sufficient; but generally the panels will be necessary to resist the force of the current. The spiles are united longitudinally by timbers 7, which give them the necessary support and strength and upon them there can be a platform 8, laid crosswise which braces them

in that direction. The derrick or windlass 9, is supported upon the timbers and serves to hoist and lower and remove and place the stones and cement. The cloth may be confined to the panels by ropes and weights 5, so that when the pressure is too great the weights will yield without injuring the cloth, which is safer than stretching it permanently on the panels to keep the cloth walls distended. It may in some cases be desirable to put bracing frames 6, inside that will keep the cloth walls in place, should the cord and weights be insufficient in rapid currents.

The effect of this apparatus is to make a slack water reservoir in which the building proceeds, without the possibility of washing away or removing the cement or any portion thereof before it sets while at the same time the fresh cement is at once exposed to the water in the most efficient manner to harden it during the operation of building, an advantage not attained where coffer-dams are used.

In building a wall on my plan under water the stones are placed in any of the usual methods or any other that may be found most efficient. The cement is deposited by a peculiar apparatus which I denominate a cement feeder. It consists of a box formed reservoir A with two covers B hinged so as to be readily opened to fill with cement. The bottom is also composed of two hinged traps C opening at the center.

D is a chain or cord connected with a metal bar E which is suspended in an upright position in the center of the reservoir by means of bearings H H across the center. This bar E has a sliding motion up and down. Its lower end projects below the hinged traps C and a key G and washer are then put on it so as to support the edges of the traps that are inward so that by drawing up the bar E the traps are closed and by lowering it they are opened. Another key F is put through the bar above to determine the distance it shall drop. The lower traps and opening are thus controlled by the chain D. It is obvious that other arrangements might be made to effect the same purpose—namely opening and closing the bottom of the cement feeder by attachments above. The feeder is suspended by four chains J attached to its four corners which chains are united to a chain K extending up to a windlass or derrick 9 supported on the timbers 7,

that connect the spiles at the top and on which the platforms 8 are fastened to work on, as well as serving the purpose of braces.

L L, are guide chains affixed to the top of the feeder to serve as guides for moving the feeder laterally to properly spread the cement and deposit it on the desired spot. This whole operation is performed under water in a quiescent state and the cement is completely protected and secured from destruction until it has hardened.

Having thus fully described my invention what I claim as new and for which I desire to secure Letters Patent is—

1. The sack or compartment formed by cloth or some equivalent thereof to produce slack water in a current or other movable

water and protect the cement from being washed away and wasted before it is hardened as herein fully set forth.

2. I also claim in combination with a flexible inclosure the panels as above specified and supporting the same by spiles in the manner and for the purpose set forth.

3. I also claim the cement feeder constructed and arranged substantially as and for the purpose specified.

In witness whereof I have hereto set my hand.

WILLIAM H. HORSTMANN.

In presence of—

EDWIN F. COREY, Jr.,
ALEX. HENSCHEL.