

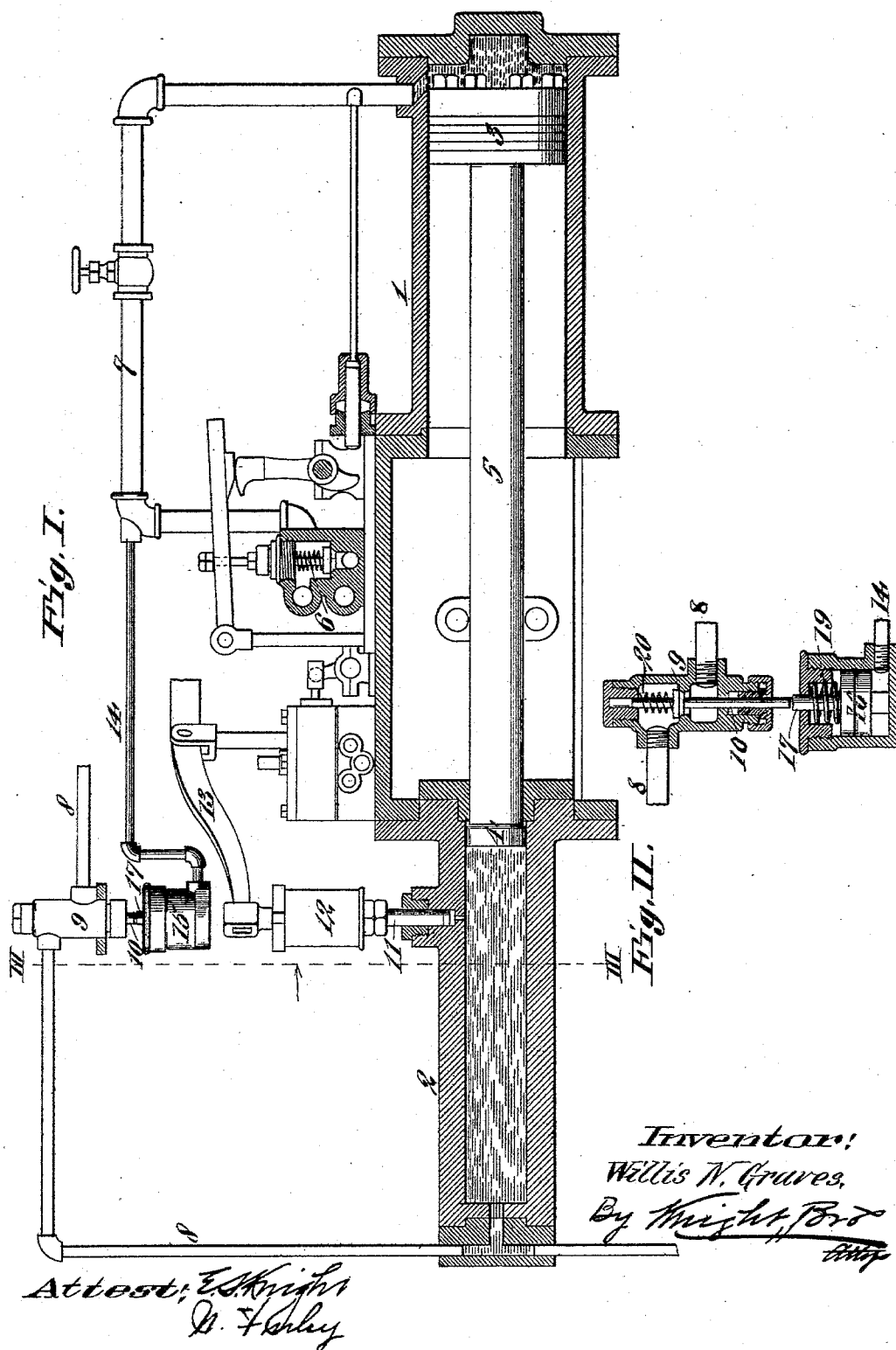
(No Model.)

2 Sheets—Sheet 1.

W. N. GRAVES.  
HYDRAULIC BRICK MACHINE.

No. 565,112.

Patented Aug. 4, 1896.



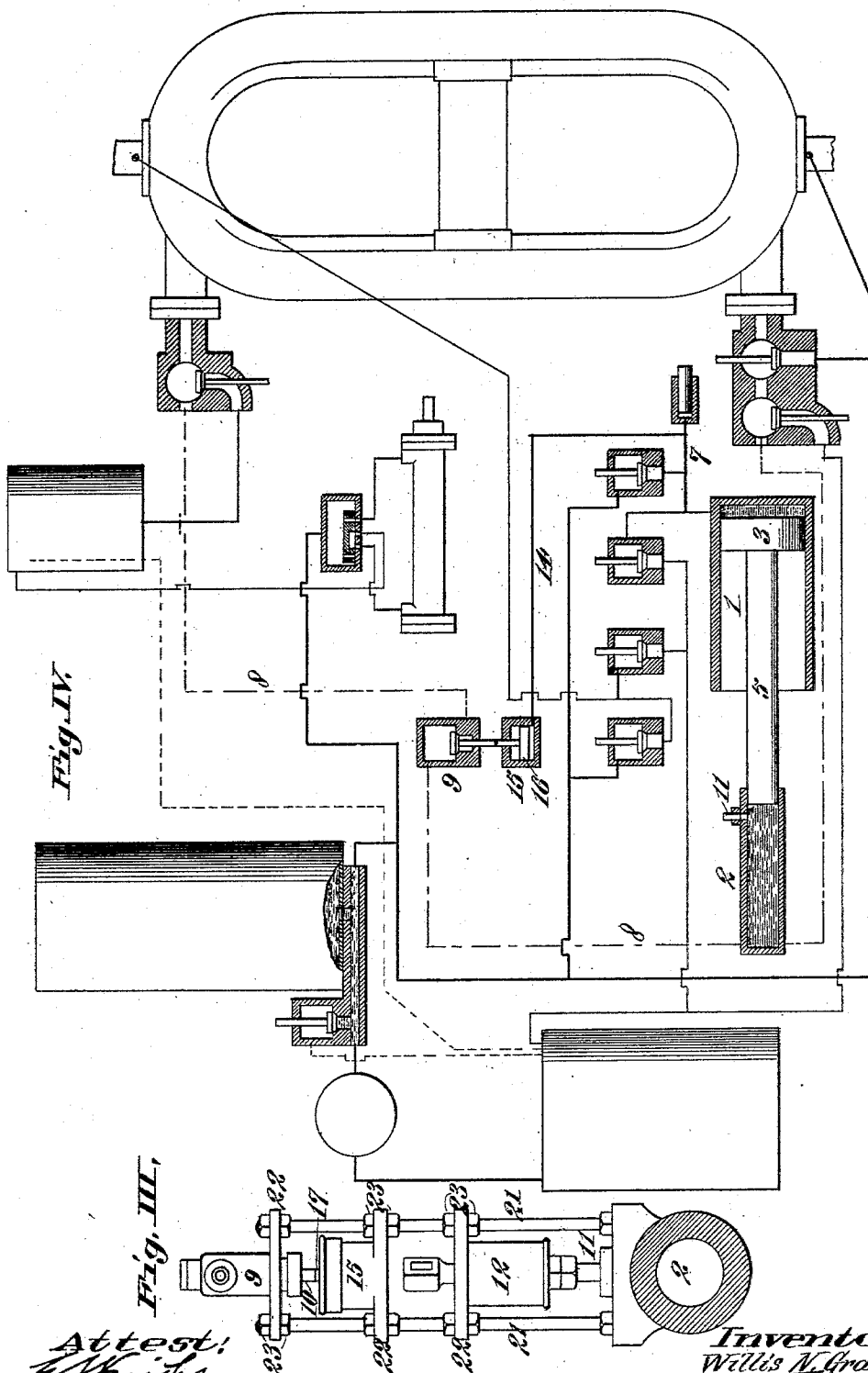
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Attest:  
*W. Knight*  
*A. Valley*

Inventor:  
*Willis N. Graves*  
By *Wm. H. Bond*

# UNITED STATES PATENT OFFICE.

WILLIS N. GRAVES, OF ST. LOUIS, MISSOURI, ASSIGNOR TO THE HYDRAULIC PRESS BRICK COMPANY, OF SAME PLACE.

## HYDRAULIC BRICK-MACHINE.

SPECIFICATION forming part of Letters Patent No. 565,112, dated August 4, 1896.

Application filed December 16, 1895. Serial No. 572,271. (No model.)

*To all whom it may concern:*

Be it known that I, WILLIS N. GRAVES, of the city of St. Louis, State of Missouri, have invented a certain new and useful Improvement in Hydraulic Brick-Machines, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification.

My present invention relates to a certain improvement on the class of brick-machines shown and described in my application filed March 26, 1895, Serial No. 543,288. In this application referred to there is employed a valve for opening a communication between the upper-ram cylinder and the high-pressure pump, this valve being opened by high-pressure water. While this arrangement was found to give good results, and by much simpler and cheaper arrangement than had theretofore existed, still there was a defect, which, while not vital to the reasonably-successful operation of the machine, still nevertheless a defect which it was desirable to overcome. This defect was discovered by an extensive practical use of the machine or a number of the machines and consisted of a too-late application of high-pressure water to the upper ram relatively to the pressure upon and movement of the lower ram. It was found that the valve referred to would not be opened until the pressure in the high-pressure pump had reached a considerable proportion of its final pressure, and consequently there was too great a pressure exerted on the under side of the bricks in the mold by the lower ram before the high pressure was admitted to the upper-ram cylinder. To obviate this difficulty is the object of my present invention, and I accomplish this by an inexpensive and reliable arrangement that is not liable to get out of order.

My present invention consists in features of novelty hereinafter fully described, and pointed out in the claims.

Figure I is a view part in vertical section and part in elevation and illustrative of my invention. Fig. II is an enlarged vertical section of the valve referred to and the ram for moving the valve. Fig. III is a section taken on line III III, Fig. I, looking in the

direction of the arrow and showing only the parts of the machine immediately adjacent to the section-line. Fig. IV is a diagram view.

Referring to the drawings, 1 represents the large, and 2 the small, cylinder of the high-pressure pump of the machine. 3 represents the piston contained in the cylinder 1, and 4 the piston contained in the cylinder 2. 5 represents the connecting-rod. 6 represents the valve through which the low-water pressure is admitted to the cylinder 1 through a pipe 7. 8 represents the pipe leading from the cylinder 2 to the upper-ram cylinder, and in which is located a valve 9, having a stem 10. These parts are all arranged in the same manner as the corresponding parts in my application referred to and need no description here, as they form no part of my present invention. In said application the valve 9 was opened from the cylinder 2 through means of a rod-piston 11, carrying a spring 12, and which in this case as well as in said application is also used for moving a lever 13 to affect the operation of another part of the machine.

In my present application the movement of the rod-piston 11 has no effect upon the valve 9; but the movement of the valve 9 is effected through low-water pressure derived from the pipe 7, or from some other low-water-pressure pipe of the machine. I have shown the pressure derived from the pipe 7 through means of a pipe 14, forming a communication between the pipe 7 and the lower end of a cylinder 15, within which is contained a piston 16, having an upwardly-extending stem 17 protruding through the head of the cylinder, and which, when the piston is raised, comes against the downwardly-extending stem 10 of the valve 9 and raises the valve, permitting a flow of high-pressure water through the pipe 8 from the cylinder 2 to the cylinder of the upper ram of the machine. The area of the piston 16 is greater than the area of the valve 9, so that the low-water pressure opens the valve 9 against the high-water pressure above the valve. When the pressure is released from under the piston 16, the piston is lowered again by means of gravity, which may be assisted by a spring 19, (see Fig. II,)

and the valve 9 is also caused to close at this time by gravity, which may be assisted by a spring 20. By this means of opening the valve 9 the opening is effected almost as soon as the piston 3 commences to move to effect high-water pressure, whereas in my application mentioned the valve was not opened until the water-pressure in the cylinder 2 had reached a point that would cause the ascent of the rod-piston 11 against the pressure of the spring 12 and the weight of the parts carried by the rod, and thus a quicker application of high-pressure to the upper-ram cylinder is effected, which in practice has been found to be desirable.

In Fig. III, I have shown the manner of supporting the cylinder 15, the valve 9, and the rod-piston 11, with its spring 12, which consists of rods 21, mounted on the cylinder 2 and passing through lugs or cross-bars 22 on the said valve-cylinder and spring, the cross-bars or lugs being retained between nuts 23.

I claim as my invention—

1. In a hydraulic brick-machine, the combination of a high-pressure pump, a low-pressure pipe in communication therewith, a pipe forming a communication between the high-

pressure pump and the upper-ram cylinder of the machine, a valve in the last-mentioned pipe, a cylinder provided with a piston adapted to move said valve, and a pipe forming a communication between said cylinder and said low-pressure pipe, whereby when low pressure is admitted to the high-pressure pump the said valve will be simultaneously opened to admit high pressure from the high-pressure pump to the upper ram, substantially as set forth.

2. In a hydraulic brick-machine, the combination of a high-pressure pump, a low-pressure pipe, a pipe forming a communication between the high-pressure pump and the cylinder of the upper ram of the machine, a valve in the last-mentioned pipe, a cylinder having a piston and being located beneath said valve and adapted to move the latter, and a pipe forming a communication between said cylinder and said low-pressure pipe; said piston having a greater area than the area of said valve; substantially as set forth.

WILLIS N. GRAVES.

In presence of—

GEO. H. KNIGHT,

E. S. KNIGHT.