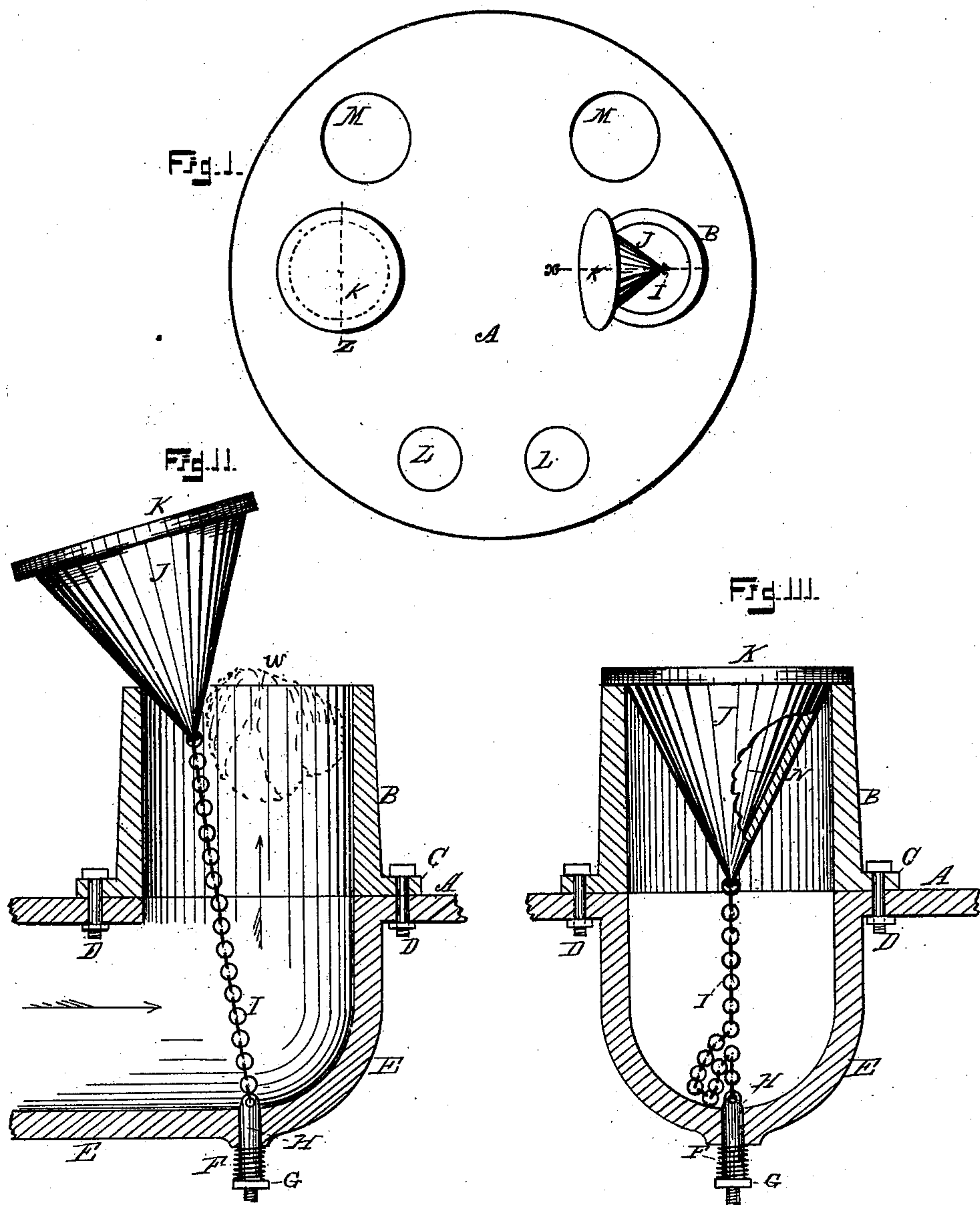


(No Model.)

G. H. NYE.
STEAM VACUUM PUMP.

No. 360,781.

Patented Apr. 5, 1887.



WITNESSES:
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GEORGE H. NYE, OF CHICAGO, ILLINOIS, ASSIGNOR TO THE NYE STEAM VACUUM PUMP COMPANY, OF ILLINOIS.

STEAM VACUUM-PUMP.

SPECIFICATION forming part of Letters Patent No. 360,781, dated April 5, 1887.

Application filed August 23, 1886. Serial No. 211,694. (No model.)

To all whom it may concern:

Be it known that I, GEORGE H. NYE, a citizen of the United States, and a resident of Chicago, county of Cook, and State of Illinois, have invented new and useful Improvements in Steam Vacuum-Pumps, of which the following is a specification, reference being had to the accompanying drawings, illustrating the invention, in which—

Figure I is a plan view of the upper side of the lower head to one of the cylinders of a steam vacuum-pump patented to me on September 5, 1882, No. 263,803. Fig. II is a vertical section through Fig. I on line *x*. Fig. III is a vertical section on line *z*, Fig. I.

The purpose of this invention is to so improve the pump patented to me, as aforesaid, as to make it more efficient in elevating gravel and solid material from the bed of the stream.

The pump as formerly constructed and operated by me served a good purpose for elevating sand with water; but it was defective in that, when a bed of gravel and small stone was reached, this coarser material would interfere with the working of the valves, and therefore render the pump inoperative for this purpose. Careful experiments, made for the purpose of perfecting this pump for elevating the ordinary coarse material composing the bed of a stream, has demonstrated that the passage-way through the base of the pump to the inside of the cylinder should be formed on such curves that no débris will lodge therein, and that the valve, when elevated, shall be free to move to any point within its seat that it may not check the upward movement of the solid matter entering the cylinder. I have embodied these improvements in my said pump, as follows:

A represents the top surface of the lower head to one of the cylinders of my aforesaid pump.

B B represent the upward extensions to the inlet-pipes E E, which are iron cylinders secured by means of flanges C C and bolts D D to the head A.

At Fig. II it will be seen that the pipe E terminates in a curve near its upper end, and that the cylinder B forms a continuous passage upward from the head A. The cylinders B not only serve as seats for the valves J K, but they provide room for said valves to have vertical reciprocating movements, and, further, serve the purpose of bringing the seats

of the valves so far above the lower heads of the cylinders as to bring the gravel and coarse material below the seat of the valve at each time the cylinder is charged.

The importance of the elevated cylinders B will be comprehended when twenty-five per cent. bulk of gravel is elevated with the water. In such a case, which is not beyond the fact, the valve-seats would have to be at least one-fourth the height of the cylinders, or the valves would become choked with solid material elevated. The conical valves employed are shown at J K, and to hold them in place they are connected by chains I, whose lower ends are fastened to the bottoms of pipes E, the chains being long enough to allow the valves to have the movement shown at Fig. II.

To prevent the valves from jerking suddenly the chains when struck by solid matter, as indicated by dotted lines *w*, Fig. I, the chains are attached to pistons H, which pass through seats formed in the bottoms of pipes E, and have placed on their lower ends coil-springs F, or other suitable springs, and collars G, whereby the chains may somewhat yield and relieve the valves from sudden shocks, as they would be subject to, if the chains had non-yielding attachments. The pump with these attachments will be operated the same as with the old valves, the superior results, however, being as stated, as shown by the working of the pump with these improvements in various places in this country. One of the valves at N is broken away to show that the valves are preferably made hollow.

It will be understood that each pump has two vacuum-cylinders and one valve, K J, to each cylinder.

I claim as new and desire to secure by Letters Patent—

1. As an improvement in steam vacuum-pumps, the lower cylinder-heads, combined with the upwardly-projecting cylinder, valve-seats B B, the conical valves J K, chains I, and inlet-pipes E, as specified.

2. The combination of the lower cylinder-heads, A, with the upwardly-projecting cylinder-seats B, valves J K, chains I, pipe, and piston H, which is provided below the pipes E with the spring F, as specified.

GEORGE H. NYE.

Witnesses:

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ANNA D. JOHNSON.