

(No Model.)

2 Sheets—Sheet 1.

L. A. CONORD.

JET PUMP FOR HYDRAULIC ELEVATION; &c.

No. 592,561.

Patented Oct. 26, 1897.

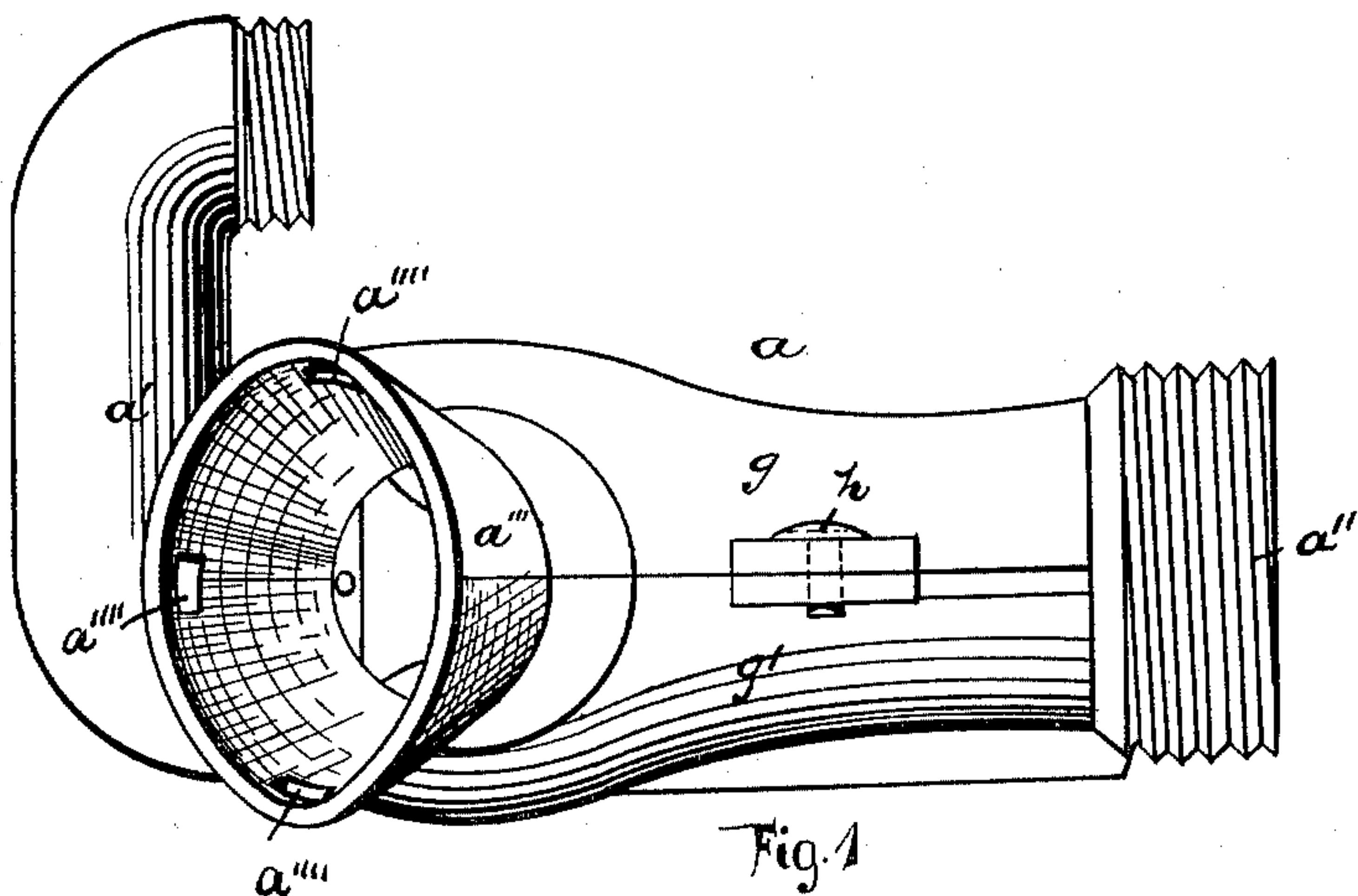


Fig. 1

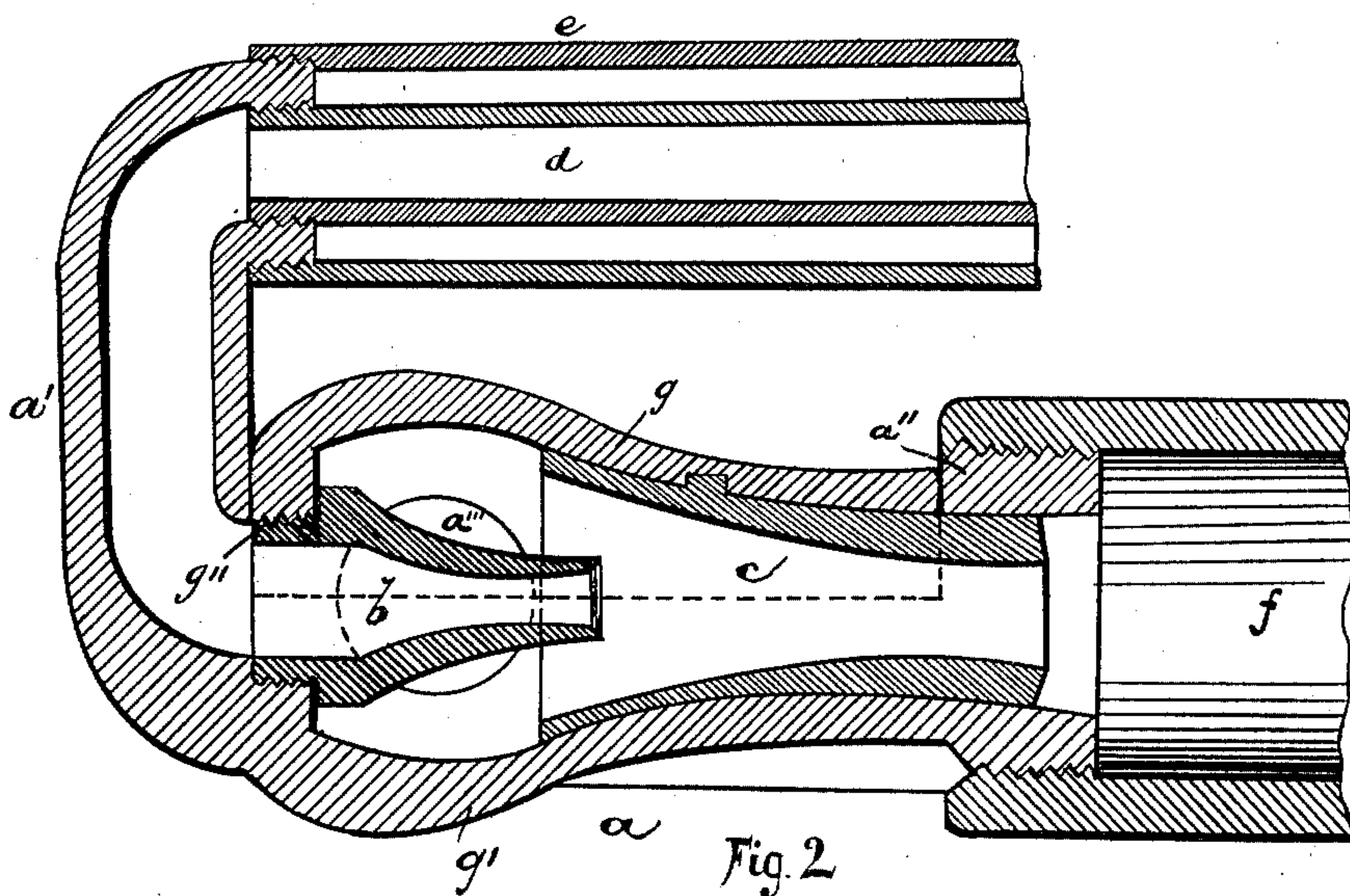


Fig. 2

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BY *Drake & Co.*

ATTORNEYS,

(No Model.)

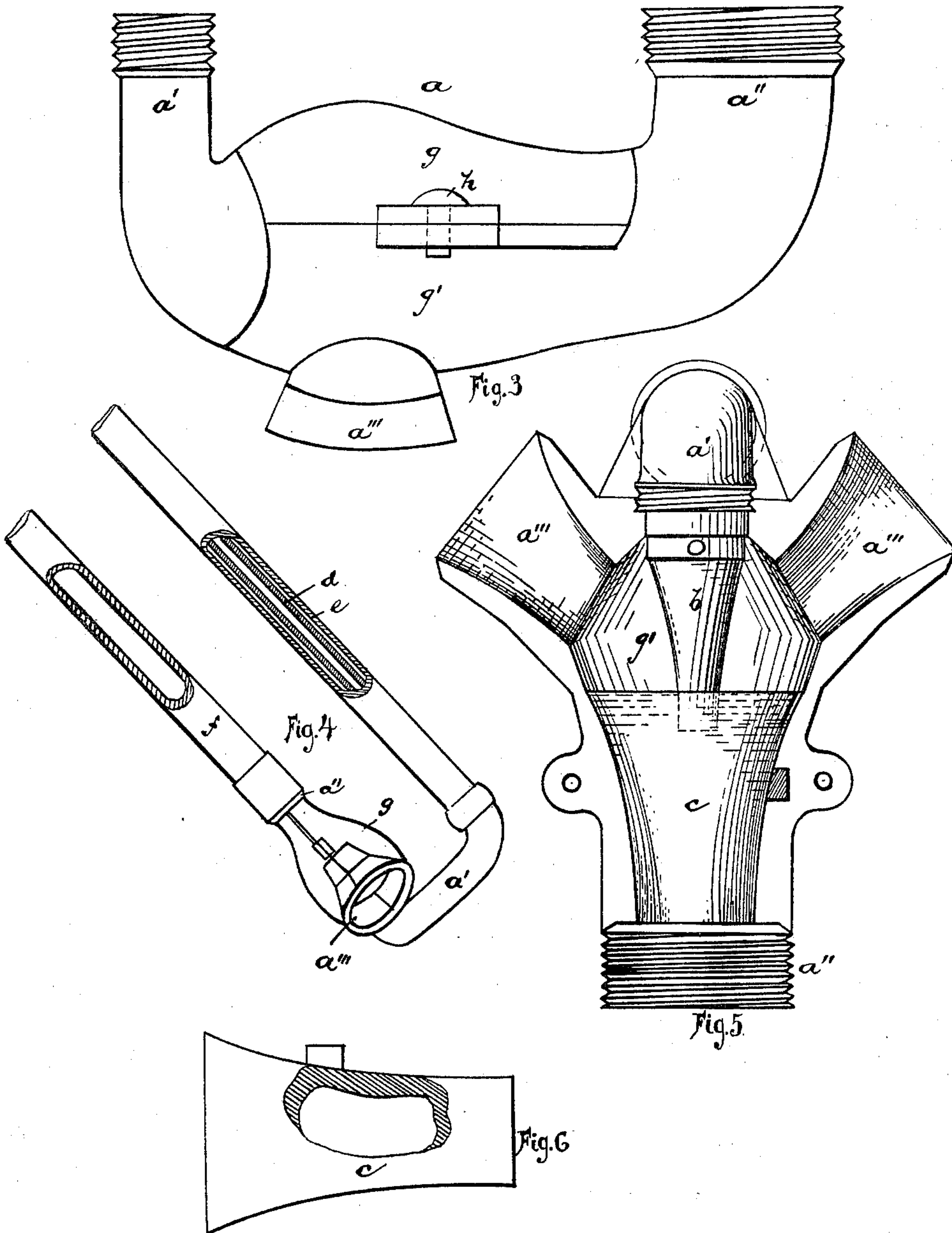
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UNITED STATES PATENT OFFICE.

LEON A. CONORD, OF ELIZABETH, NEW JERSEY.

JET-PUMP FOR HYDRAULIC ELEVATION, &c.

SPECIFICATION forming part of Letters Patent No. 592,561, dated October 26, 1897.

Application filed February 27, 1897. Serial No. 625,329. (No model.)

To all whom it may concern:

Be it known that I, LEON A. CONORD, a citizen of the United States, residing at Elizabeth, in the county of Union and State of New Jersey, have invented certain new and useful Improvements in Jet-Pumps for Hydraulic Elevation and Excavation; 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.

The objects of this invention are to enable the interior throat-piece or lining of the jet-pump of an elevating or hydraulic excavating device to be renewed when worn without uncoupling the said jet-pump from the fluid-conducting pipes, to thus save the time and trouble expended in such operation, to reduce the cost of construction, to enable said jet-pump to be brought at its inlet-opening into a more intimate proximity to the heavy solid matter to be excavated and raised by and with the water, to increase the excavating capacity and the perfection or completeness of excavation, to obtain a greater elevating power, and to secure other advantages and results, some of which will be referred to hereinafter in connection with the description of the working parts.

The invention consists in the improved hydraulic excavation jet-pump and in the arrangements and combinations of parts, all substantially as will be hereinafter set forth, and finally embraced in the clauses of the claim.

Referring to the accompanying drawings, in which like letters of reference indicate corresponding parts in each of the views, Figure 1 is a side elevation of the jet-pump embodying my improvements. Fig. 2 is a central vertical section of the same. Fig. 3 is a side elevation showing a modification of construction. Fig. 4 is a view, on a reduced scale, showing the relation of the jet-pump to the steam and water pipes more clearly. Fig. 5 is a plan of the pump with the upper part or plate removed; and Fig. 6 is a detail side view, broken away, of a certain throat or lining piece.

In said drawings, *a* indicates the sectional body of the jet-pump, to the opposite ends of which the water and steam pipes are attached. In the chamber formed within said body is arranged the steam-injecting nozzle *b* and a removable throat-piece or lining *c*. At one end said body has a threaded boss or tubular extension *a'* to receive the steam-supply pipe *d* and the tubular jacket *e* therefor and at the opposite end another threaded tubular boss or extension *a''* to receive the larger water-pipe *f*. Said threaded bosses or extensions are preferably bent or the pipe couplings or connections attached thereto are bent or turned in direction, as shown, so that the exit-pipe and the steam and water pipes will lie substantially parallel with one another in their extension from a river-bottom, for example, to a float or vessel.

At the opposite sides of the hollow jet-pump *a*, in the preferred construction, are funnel-shaped or flaring inlet projections *a''' a'''*, the lower edges of which lie in or very near to the plane of the bottom of the pump, so that said flaring projections will lie at or can be brought down upon or close to the river-bottom and a greater suction power of the water entering the funnels drawn or driven by the steam be exerted upon the loose solid matter at said bottom. The said solid matter will thus be forced by the inflowing water into the pump and thence up through the water-pipe to the float or other receptacle, where it is separated from the water by gravity or otherwise. Much of the said solid matter entering the pump is forced into frictional contact with the walls of said pump and wears the same. To prevent a permanent injury to the pump, I provide the same with the interior throat-piece or lining *c*, which is removable, so that when worn it may be replaced by a new one.

To avoid the necessity of disconnecting the steam and water pipes *d f* from the jet-pump body when changing the throat-piece or lining *c*, I form the said pump-body in sections, the upper plate *g* of which lies between the tubular threaded projections or extensions *a' a''*, adapted to receive the steam and water pipes, and is separable from the lower section without interference with the pipes or connections screwed upon said extensions, as will be understood upon reference to Fig. 2.

Suitable screws *h* or other means are employed for fastening the two sections together. The lower section *g'* of the pump-body is in integral connection with the threaded extensions *a' a''* and is interiorly provided with a threaded seat *g''* for the injector or jet-nozzle *b*. Upon said seat is arranged the removable said injector-nozzle so that it lies axially in line with the throat-piece and is adapted to throw a jet of steam through the longitudinal center opening therethrough. The steam impels the water forward through the pump and thence through the water-pipe *f* with great power, so that said water with its contents are raised to enter the float or receptacle provided for the same.

The steam-supply pipe *d*, through which the steam passes to the nozzle, is screwed to the female threads of the extension *a'*, and the said steam-pipe is jacketed by the larger pipe *e*, screwed upon the male screws of said extension, a space or chamber being formed between the large and small pipes to prevent a quick radiation of heat and condensation of steam.

The funnel-shaped portions of the pump-body are sectional, one part being cast on the section *g* and the other on the section *g'*, the joint formed by said sections passing longitudinally through said funnels, as shown in Fig. 1, so that the upper part of each funnel-section lifts off from the lower part. Recesses or sockets *a'''* may be formed at or near the outer ends of said funnels, in which may be held suitable removable screens, which prevent the entrance of stones into the pump, such as would clog the same. These screens are removable when the upper section of the pump is removed.

I am aware that various modifications may be made in the construction of the pump without departing from the scope and spirit of this invention. For example, the oppositely-disposed funnels, such as are shown in Fig. 5, may be dispensed with, and in lieu thereof I may form a single funnel or opening at the bottom of the pump, as in Fig. 3, which will bring the inlet-opening for the water into closer relation to the solid matter to be raised under certain conditions. Again, the inlet-openings may be without funnel-shaped openings. The threaded coupling extensions may also be changed in shape or relation to the pump-body and be turned, as shown in Fig. 3. Other changes may be made without departing from the invention.

To remove the throat or lining *c*, I simply raise the pump out of the water and remove the top plate or section *g*, after which the screens may be lifted out, if necessary, and the worn throat or lining removed and replaced by a new one. Suitable means, such as the retaining-lug *i*, are provided to hold the throat in fixed relation to the body.

The new throat or lining being adjusted

and the sections again fastened together by the screws *h* or the like, the pump and its pipes are lowered, preferably in an inclined direction, to the bottom of the river or stream into contact with the matter to be raised. When the construction of Fig. 3 is used, the pipes may be lowered vertically to the bottom. The steam of a boiler or compressed air or the like is then turned on and forced through the ejecting - nozzle. The water within the pump is thus forced forward to and through the water-pipe and a suction produced of great power, capable of raising substances—such as gravel, ores, precious metals, &c.—of great specific gravity, and the smallness of the pump enables the operators to guide it into the small depressions and recesses of the river-bottom and between the large rocks, &c., so that the heavy settlings, such as of gold, may be obtained.

Having thus described the invention, what I claim as new is—

1. The combination with the pump-body having at opposite sides funnel-like openings, and an interior nozzle and throat or lining and at its opposite ends having pipe extensions, the said pump-body being in sections, one section having the said extensions and the other being removable from the first and adapted to allow an easy removal of the throat or lining, a jacketed steam-pipe and a water-pipe arranged in connection with the said extensions, all substantially as set forth.

2. The combination with the parallel steam and water pipes, of a sectional pump-body having an inlet for the water to be pumped, said body being in longitudinal sections one of which has a threaded and turned pipe-receiving boss or extension to receive a steam-pipe and a jacket therefor, and at the opposite end another tubular boss or extension for the large water-pipe, and the other of which lies between said bosses, a throat-piece having a retaining-lug and adapted to be lifted from its seat in the pump-body and means for holding said parts together, substantially as set forth.

3. The combination with the pump-body section *g'*, having integral extensions *a', a''*, suitably turned or formed to receive parallel steam and water pipes, a removable section *g*, arranged between said extensions, and independent thereof, a removable nozzle, and lining or throat-piece, a jacketed steam-pipe and a water-pipe parallel therewith, all said parts being arranged and combined, substantially as set forth.

In testimony that I claim the foregoing I have hereunto set my hand this 20th day of February, 1897.

LEON A. CONORD.

Witnesses:

CHARLES H. PELL,
C. B. PITNEY.