

G. H. CORLISS.

STEAM PUMPING MACHINERY.

No. 185,390.

Patented Dec. 19, 1876.

Fig:1

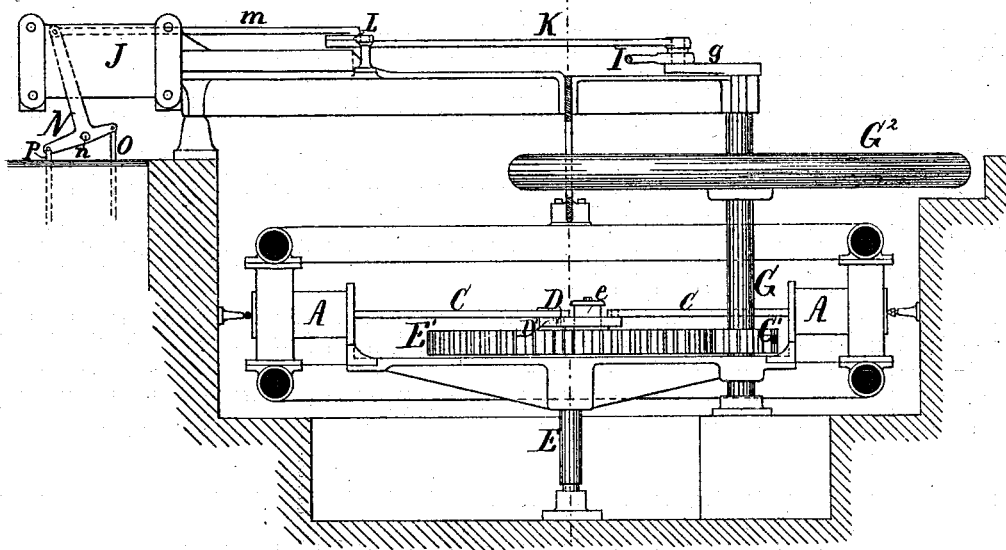
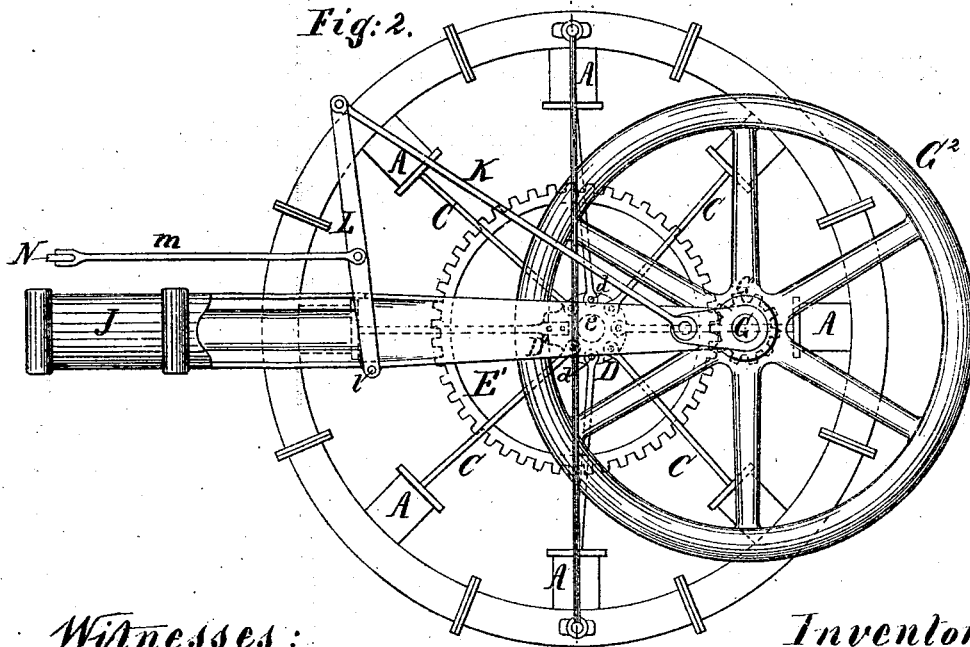


Fig:2.



Witnesses:

Henry G. ...  
Chas. G. Stetson.

Inventor:

G. H. Corliss  
by his attorney  
Thos. D. Stetson.

# UNITED STATES PATENT OFFICE.

GEORGE H. CORLISS, OF PROVIDENCE, RHODE ISLAND.

## IMPROVEMENT IN STEAM PUMPING MACHINERY.

Specification forming part of Letters Patent No. **185,390**, dated December 19, 1876; application filed October 27, 1875.

*To all whom it may concern:*

Be it known that I, GEO. H. CORLISS, of Providence, in the State of Rhode Island, have invented certain Improvements relating to Steam Pumping Machinery, of which the following is a specification:

I have in the patent issued to me, dated June 2, 1857, No. 17,423, set forth an arrangement in which a number of pumps are distributed in radial lines, and in equidistant positions, around a common crank, so that the crank shall regulate the extent of their motion, and secure a practically uniform flow of water. In that description a corresponding number of steam cylinders and pistons were employed to give motion to a series of connected pumps.

The present invention is designed to accomplish substantially the same end, with the same arrangement of pumps, by a smaller number of engines.

One prime object in the construction is to employ a sufficient number of large pumps to pump the required quantity of water with a slow motion of each pump, allowing ample time for the capacity of each to be filled with water, and for the several induction and education valves to open and close properly and quietly; but in order to secure efficient and economical results, the piston of the steam-engine should move rapidly. I fix a large gear-wheel on the shaft of the crank referred to, and in a convenient position place a small gear-wheel, meshing into the same. The small gear-wheel is driven by a single engine, or by a pair of engines, the engines being compound, if desired in any case. My preferable plan is to drive the small wheel with a single engine, and to employ a sufficient fly-wheel to give a steady motion.

The following is a description of what I consider the best means of carrying out the invention.

The accompanying drawings form part of this specification.

Figure 1 is a side elevation, partly in section; and Fig. 2 is a plan view.

Similar letters of reference indicate like parts in all the figures.

A A, &c., are the barrels of a series of pumps, firmly mounted on a rigid framing,

and provided with the proper water-connections, pistons, valves, &c. C C are the connections from the buckets to a piece, D, which is carried on the crank-pin *e*. The piece D has an arm, D', connected to one of the pistons. The other connections C are pivoted to the piece D by means of the pins *d*. The crank-pin *e*, which controls the motion of the whole, is carried on a crank on a stout shaft, E, supported in a suitable framing, and having firmly keyed thereon a large gear-wheel, E'. A small gear-wheel, G<sup>1</sup>, on an upright shaft, G, and having a crank, *g*, and a fly-wheel, G<sup>2</sup>, is driven by a piston and piston-rod, working in a steam-cylinder, J, by a connecting-rod, I, of the ordinary character, and performing its ordinary functions. (Only partly represented.)

This steam apparatus is a steam-engine provided with the necessary steam-connections, valves, valve-gear, &c., and properly supplied with steam from a steam-boiler. (Not represented.) Instead of one engine, there may be two, working compound, if preferred. The engine or engines driving the small gear-wheel G<sup>1</sup> may be regulated by any suitable means, either to give a uniform rate of rotation per unit of time, or to be revolved more or less rapidly, according as the demand for water shall vary. I allow the fly-wheel to revolve over some of the other parts, while the connection from the primary crank to the steam-cylinder extends over the principal shaft and its connections. This arrangement allows the extended apparatus to be contained in a comparatively small pumping-house, while all the parts are sufficiently separated to allow ready access for repairs or renewals.

The air-pump is reciprocated with each stroke of the engine, but to a much less extent. A light connection, K, leads from the engine-crank *g* to a lever, L, turning horizontally on a fixed center, *l*. A link, *m*, leads from a point in this lever L to a T-shaped upright lever, N, turning on a fixed center, *n*. The air-pump rod O is worked by one of the lower arms, and the feed-pump rod P is worked by the other arm. The air-pump lever L, by extending across the engine-connections, just in front of the engine, occupies little room, and that over the pumps, where

plenty of room can be afforded. The connections of both ends of the rod *m* should be universal joints, to allow for the swinging of the levers L and N in different planes.

The peculiar means employed for working the air-pump I propose to make the subject-matter of a separate patent.

I claim as my present invention—

The combination of the shafts E G and the gear-wheels E' G<sup>1</sup>, the connected pumps, and

the engine or engines, for the purposes specified.

In testimony whereof I have hereunto set my hand this 6th day of October, 1875, in the presence of two subscribing witnesses.

GEO. H. CORLISS.

Witnesses:

GEORGE G. PHILLIPS,  
ED. W. RAYNSFORD.