

(No Model.)

2 Sheets—Sheet 1.

M. C. & C. E. BAKER.

APPARATUS FOR SINKING WELLS.

No. 350,339.

Patented Oct. 5, 1886.

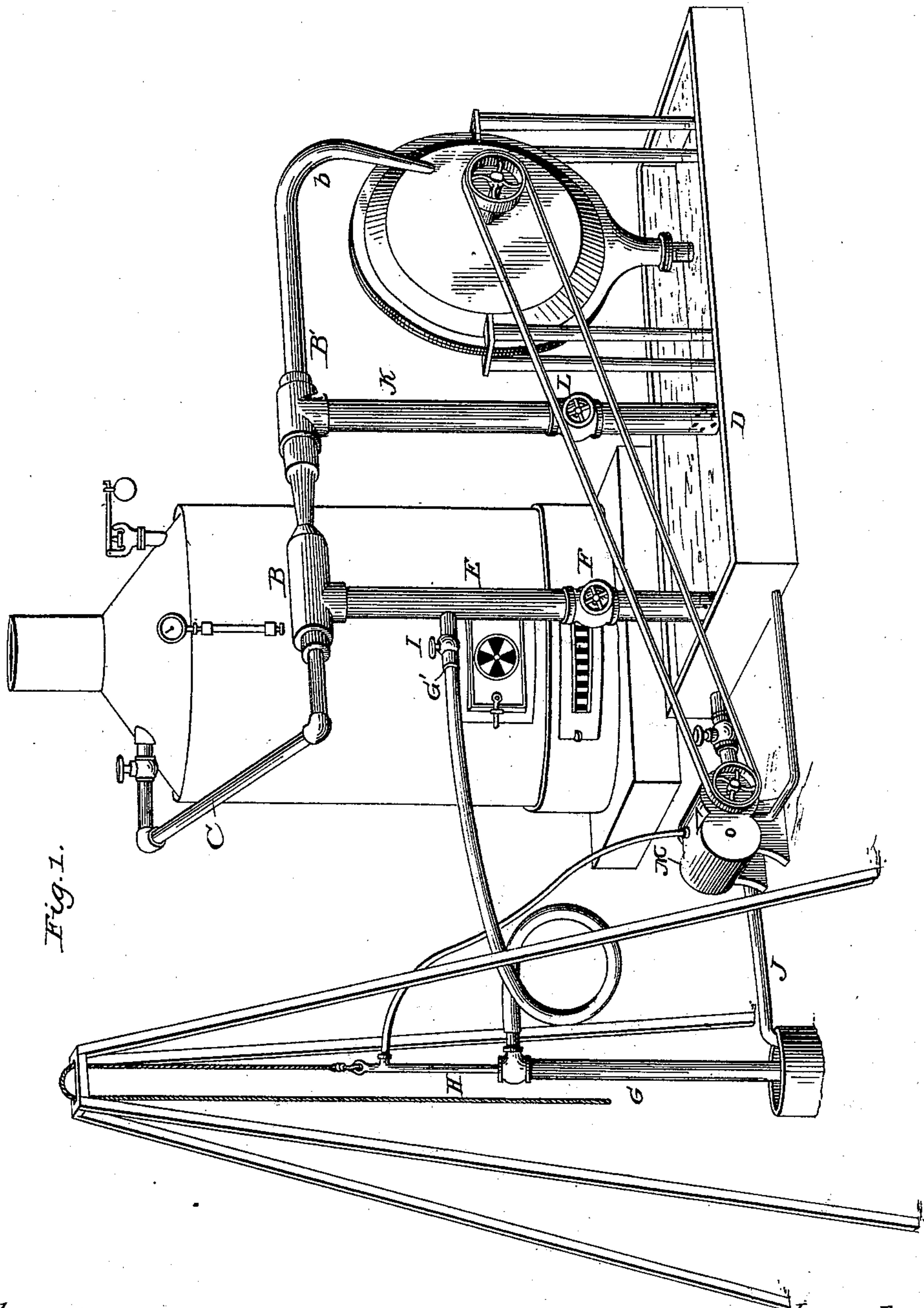


Fig. 1.

Witnesses:
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Walter S. Dodge.

Inventors:
Morris C. Baker
Clarence E. Baker.
by Dodge & Son,
their Attys.

(No Model.)

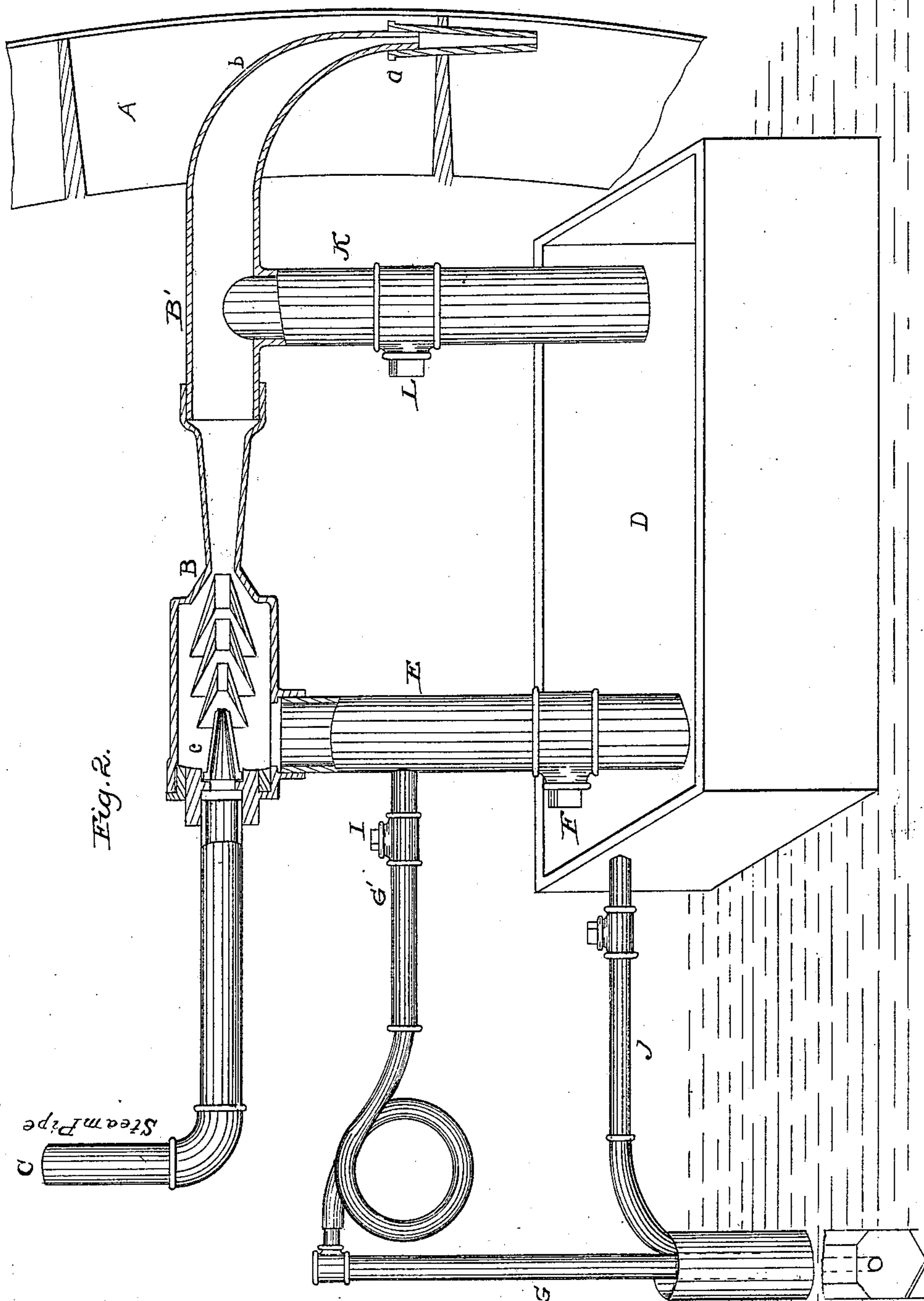
2 Sheets—Sheet 2.

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APPARATUS FOR SINKING WELLS.

No. 350,339.

Patented Oct. 5, 1886.



Witnesses:

H. J. Bingham
R. N. Kratz

Inventors:

Morris C. Baker
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UNITED STATES PATENT OFFICE.

MORRIS CUTLER BAKER AND CLARENCE EDWARD BAKER, OF MITCHELL,
DAKOTA TERRITORY.

APPARATUS FOR SINKING WELLS.

SPECIFICATION forming part of Letters Patent No. 350,339, dated October 5, 1886.

Application filed March 19, 1885. Serial No. 159,497. (No model.)

To all whom it may concern:

Be it known that we, MORRIS CUTLER BAKER and CLARENCE EDWARD BAKER, residing at Mitchell, in the county of Davison, Territory of Dakota, have invented certain new and useful Improvements in Apparatus for Sinking Wells, &c., of which the following is a specification.

Our invention relates to apparatus for sinking wells and performing like work; and it consists in a motor of peculiar construction combined with a boring-mechanism operated thereby, the water or liquid used in the motor flowing continuously through the same, thence to and through the boring apparatus and well-casing, and back to the motor, whereby the movement of the liquid is utilized in several ways without extra expenditure of power or fuel.

The invention involves the use of a rotary disk or wheel, a steam-generator or fluid-pressure apparatus, a liquid-tank, a steam jet or nozzle for raising water and forcing it against the blades or buckets of the wheel, boring apparatus, and pipes for the liquid.

In operation, water or other liquid is permitted to flow from the tank into the well-casing, carrying off the chips and cuttings, and being raised by the steam jet or nozzle and projected against the blades or buckets of the wheel, and thus causing said wheel to be turned both by the weight and by the impact of the water. In this way the water is used continuously and a force is secured greater than that of either the falling water or the steam-jet acting alone.

Referring now to the drawings, Figure 1 is a perspective view of our complete apparatus; Fig. 2, an elevation of the principal parts thereof, partly in section.

A indicates the wheel of the motor, a portion only being shown in Fig. 2; B, a steam jet or injector nozzle of any approved pattern; C, a steam-pipe communicating with a generator and serving to supply steam to the jet or nozzle B, and D a water-tank from which water may be raised through a pipe, E. The nozzle B is provided with a reducing pipe or nipple, b, which causes the water to issue in a solid and compact stream under high pressure, and

consequently high velocity, in which condition it is thrown upon the blades or buckets of the wheel A. By varying the size of the nipple c of the injector B the apparatus may be adapted to operate with greater or less fluid pressure and to move a larger or smaller body of water or other liquid. Pipe E is furnished with a valve or stop-cock, F, and is connected at a point above said stop-cock with a pipe, G, through which the boring-rod H passes, the connecting-pipe G' being also furnished with a valve or cock, I.

J indicates a pipe connecting the well or well-casing and the tank D, and serving to convey water from the latter to the former to fill the same and aid in removal of chips, cuttings, sand, or matters loosened in the boring operation. This pipe is furnished with a valve or cock by which communication may be closed when desired. At a point in the pipe or nozzle B' between the wheel A and the injector B is placed an upright pipe, K, the upper end of which communicates with the nozzle or pipe B' and the lower end of which opens into the tank D. When this pipe is closed by the valve or cock L, with which it is furnished, the water raised and thrown into pipe or nozzle B' by the injector B will pass through the nozzle and be discharged through the nipple a upon the blades or buckets of the wheel; but when the cock is opened a part or the whole of the water will fall through pipe K, thus leaving the wheel unacted upon.

In connection with the foregoing apparatus we employ any suitable boring device, but preferably such as covered by Letters Patent granted to us on the 5th day of February, 1884, and numbered 292,888, designed to be rotated by the passage of a current of liquid through it. When such a boring device is used, the motor-wheel A is arranged to drive any suitable water-forcing machinery for supplying the necessary flow and pressure, a common form of rotary pump being shown in the drawings and indicated by the letter M. The water from this pump is carried through the tubular boring-rod H to the cutting-tool or its operating mechanism, and escapes therefrom through the space between said rod and the tube or pipe G.

Instead of the boring-machinery mentioned, I

a mechanism adapted to reciprocate the rod vertically may be employed, or any other common form of boring device.

The apparatus being constructed and arranged as above set forth, the operation is as follows: Steam being raised in the generator is allowed to pass over to and through injector B, in passing through which latter it raises water through pipe E or G, or both, according to the adjustment of the cocks of the two, though while the boring operation is in progress it is customary to draw at least a portion of the water through the pipe G. The water thus raised is forced through nozzle B' and thrown with force upon the blades or buckets of wheel A. The steam gives its motion to the water, which, by reason of its greater weight and momentum, acts upon the wheel with far greater effect than would the steam alone, a fact that is demonstrated by the operation of the well-known Giffard injector, as well as by practical use of this apparatus. The water or liquid falling from the buckets of the wheel flows into the well and serves to raise the chips, cuttings, sand, &c., loosened by the boring-tool as the water is drawn up through the pipe G. The movement of the water keeps the loose particles in a state of agitation, prevents their settling, and insures their removal, and the strong inward flow induced by the steam-jet materially adds to the effectiveness of the down-going stream through the boring-rod in driving the boring device. By proper adjustment, opening or closing of the respective cocks, the water may be made to circulate merely through the tank, the pipe E, nozzle B, and pipe, thus performing no work, but rendering it necessary to shut off the steam, thereby avoiding delay in starting the apparatus again when required. So, too, the water may be made to flow merely from the tank through pipe E, nozzle B B', wheel A, and back to the tank without drawing water through pipe G, or the water may be drawn wholly or partially from pipe G, and either discharged directly into the tank or directly upon the wheel A. In case of quicksands or caving in, the water is drawn wholly from the pipe G and discharged directly into the tank in order that the greatest clearing action within the well may be secured.

Instead of steam, any other fluid or a gas under pressure may be employed, and instead of water, oils, glycerine, or other liquids may be used, preferably such as will not freeze except at a very low temperature, water, of course, being used where the apparatus is employed for boring, and oils, &c., only where the motor alone is used. So, too, instead of an injector, other water-forcing devices may be employed, but not to so good advantage.

The tank may be omitted in some cases and the water or liquid conveyed from the casing of the wheel directly back to the well.

Having thus described our invention, what we claim is—

1. The herein described well-sinking apparatus, consisting of a reservoir or generator containing fluid under pressure, an injector connected with said reservoir, a boring-rod, a pipe surrounding said rod and communicating with the injector, a tank containing liquid, a pipe connecting the injector with the tank, a second pipe connecting the tank with the well, a wheel provided with blades or buckets and arranged to receive the liquid thrown from the injector, and a boring device actuated by said wheel.

2. The herein-described apparatus for sinking wells, consisting of a generator or reservoir, an injector, B, communicating therewith, a nozzle, B', tank D, pipes E K, connecting the tank with the injector and nozzle, wheel A, pipe G, connected with pipe E and extending down into the well, pipe J, connecting the well and tank, and cocks arranged in the several pipes, as explained, whereby liquid may be caused to travel through the tank and injector only, through said parts and against the wheel, and through the bored shaft or well.

3. In combination with a generator or reservoir, an injector connected therewith, a pipe extending from a well or shaft in progress of boring to the injector, a motor arranged to be operated by the liquid raised and projected by the injector, and a pipe or conductor arranged to convey the waste liquid from the motor back to the well or shaft, whereby the liquid is caused to actuate the motor and to carry off the cuttings, sand, &c., from the well or shaft.

4. In combination with a well, shaft, or other boring, a pipe arranged to deliver water thereto, a second pipe communicating with the shaft or boring and serving to conduct water and sediment therefrom, a jet nozzle or injector connected with said second pipe, and a reservoir containing fluid under pressure communicating with and supplying said nozzle or injector, whereby a continuous flow of water to and from the shaft or boring may be secured.

5. In combination with motor A, injector B, having changeable nipple c, and nozzle B', having changeable nipple a.

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Witnesses:

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