3 Sheets—Sheet 1.

T. G. MORSE.
Boring-Machine.

No. 208,030. Patented Sept. 17, 1878.

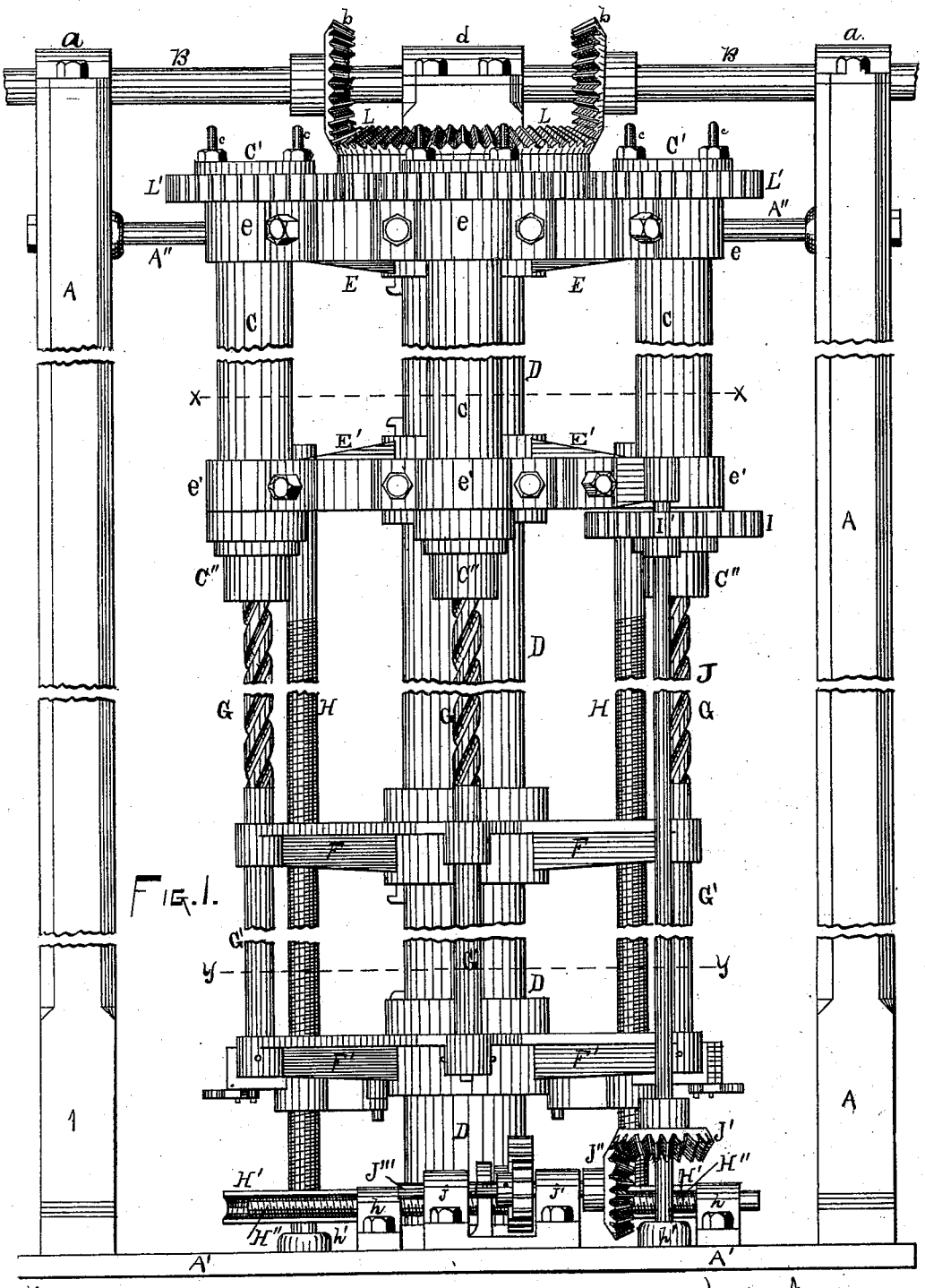

FIG. 1.

Witnesses.
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Inventor.
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by Geo. H. Hallock
atty.

3 Sheets—Sheet 2.

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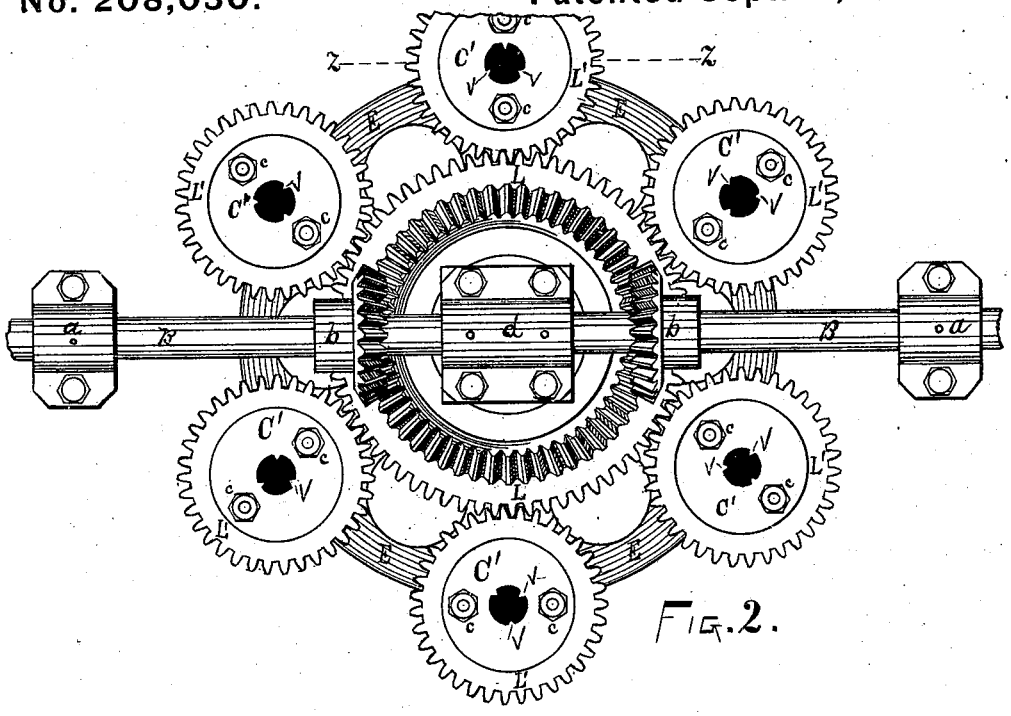

FIG. 2.

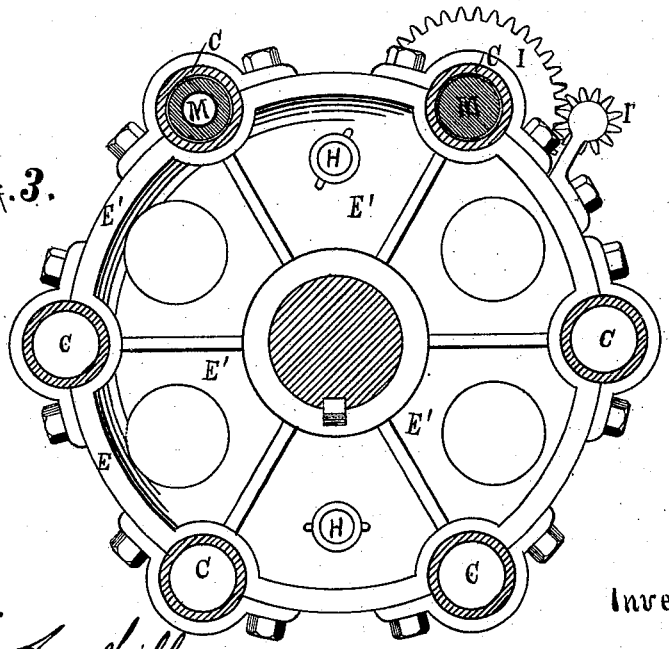

FIG. 3.

Witnesses.

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3 Sheets—Sheet 3.

T. G. MORSE.

Boring-Machine.

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FIG. 4.

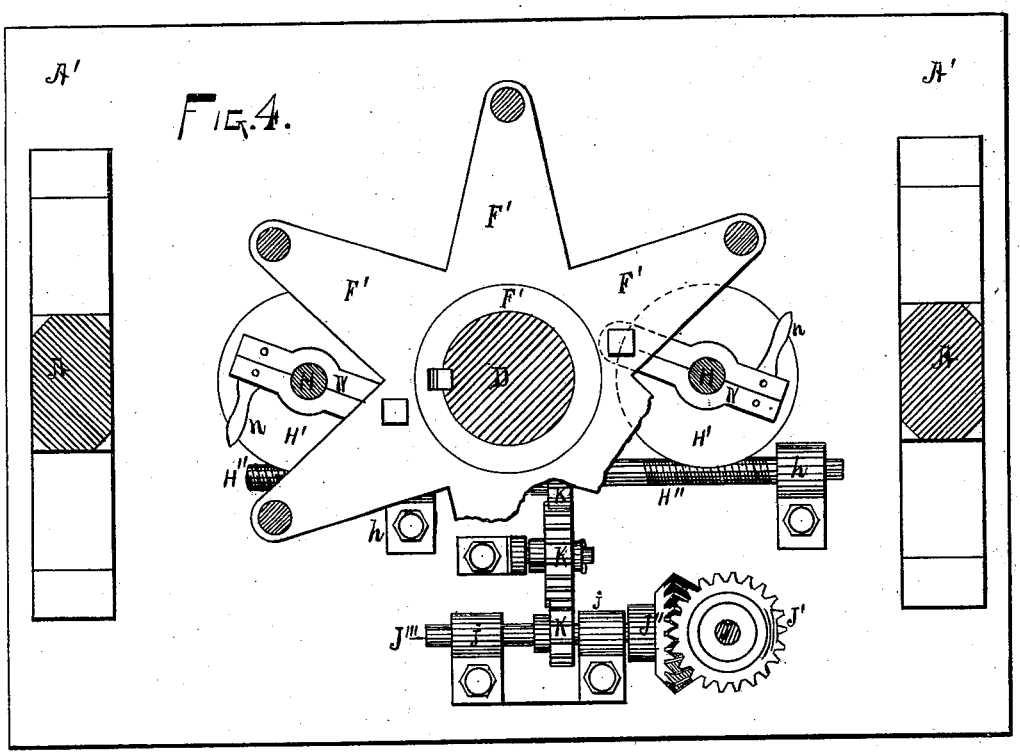
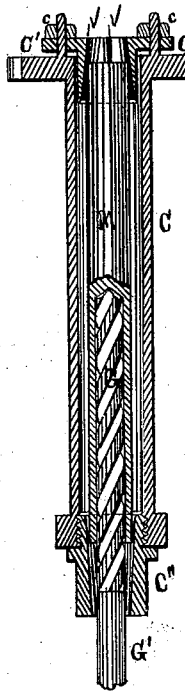


FIG. 5.



Witnesses.

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Inventor.

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UNITED STATES PATENT OFFICE.

THOMAS G. MORSE, OF ERIE, PENNSYLVANIA, ASSIGNOR TO THE JARECKI MANUFACTURING COMPANY, (LIMITED,) OF SAME PLACE.

IMPROVEMENT IN BORING-MACHINES.

Specification forming part of Letters Patent No. **208,030**, dated September 17, 1878; application filed February 23, 1878.

To all whom it may concern:

Be it known that I, THOMAS G. MORSE, of Erie, in the county of Erie and State of Pennsylvania, have invented a new and useful Boring-Machine; and I do hereby declare the following to be a full, clear, and exact description thereof.

The nature and purpose of my invention consist in providing a machine for drilling or boring out pump-barrels used in oil-wells, in such a manner that the caliber thereof shall be perfectly true and exactly central.

The secondary objects I have in view are, first, a machine so planned and constructed that a number of barrels can be bored at once; second, a machine in which the blank barrels can be adjusted quickly and with perfect precision, and will be firmly and exactly held during the operation of boring.

My machine is a vertical-drilling machine with stationary drill and rotating object, and with the drill fed to its work upward. Broadly, all these features are old.

My device is shown in the accompanying drawing as follows, there being three sheets: Figure 1 is a front elevation. Fig. 2 is a plan view of the top. Fig. 3 is a tranverse section on line *x x*, Fig. 1. Fig. 4 is a transverse section on line *y y*, Fig. 1. Fig. 5 is a vertical section on the line *z z*, Fig. 2.

My machine is to be set in a suitable frame, as A A′ A″. It is propelled from a driving-shaft, or rather two shafts, B B, to which power is communicated in any desirable way, not necessary to here describe or illustrate, and which, through the pinions *b b*, is communicated to all parts of the machine. D is a central stationary column or pillar, on which some of the parts of the machine are keyed, and others slide and others revolve.

E E′ are arm-plates, to which are journaled six perpendicular barrels, C. These arm-plates are firmly keyed to the pillar D, and they hold the six barrels C in the journal-boxes *e e′*, so they can revolve in a perfectly-vertical position. Each of the six barrels C is provided at its upper end with gears L′, which gear into a large gear, L, which revolves on the pillar D. This large gear L is a double gear. On its sides are cogs for the gears L′, and on top it has bevel-cogs for gearing with the pinions *b b* on the shafts B B. Now, it will be seen that as the shafts B B revolve the crown-pinion L is turned, and it causes the six barrels to revolve in their journal-boxes on the arm-plates E E′. Each of these revolving barrels C is intended to hold a blank to be bored.

The devices for holding the blank firmly in the barrels are as follows: At the base of each of the cylinders C is a chuck, C″, which has a conical caliber, and the wide end of the caliber is placed up. (See Fig. 5.) The blank M enters the cylinder C from the top, and as the small end of the chuck C″ is of less diameter than the blank, it holds the blank at that end concentrically with the cylinder or barrel C.

At the upper end of the cylinder there is a chuck-cap, C′, made to slip into the caliber of the cylinder C. This chuck-cap, like the chuck below, has a conical bore, and is also provided with steel teeth V V V. When this cap is set over the blank M it holds it concentric with the cylinder C. This cap C′ is held down by nuts and screws *c*, and when thus firmly set the steel teeth V hold the blank M firmly in place.

G are the drills, and G′ the drill-stems. These are firmly set in the arm-plate F′, which is made to slide on the pillar D, and they pass through the arm-plate F, which is firmly set on the pillar D, and therefore serves as a guide and brace for the drill-stems.

By a feeding apparatus, hereinafter to be described, the plate F′, with the drill-stems G, is raised up, and the drills enter the cylinder C concentrically, and as the work goes on they pass through the blanks M, leaving a bore exactly through the center.

The feeding apparatus consists of the vertical screws H H and nuts N, and the means for operating the said screws, which are as follows: On one of the revolving barrels or cylinders is fixed a pinion, I, which communicates motion, through a companion pinion, to an upright shaft, J. On the lower end of this shaft J is a bevel-gear, J′, which, through its companion gear J″, revolves a horizontal shaft, J‴, which, by proper gearing-connection, revolves a horizontal worm-shaft, H″, by which, through a

worm-pinion, H′, on the screw H, the said screw is turned and the nut N is carried up. Nut N is attached to the sliding arm-plate F′, and as it goes up it carries the plate F′ with it, and thus feeds the drills to their work.

In order that the gigging back of the drills may be done quickly, I make the nut N in the form of a clasp, and when in use as a nut it is locked together by the catch-hook *n*. By unclasping the nut N the drills can at once be withdrawn by pulling down the arm-plate F′.

By the use of my machine six blanks can be bored at once. In Fig. 3 four of the cylinders C are shown empty, and two are shown with pump-barrels inclosed, one of which is shown as solid and the other as bored. In Fig. 5 the drill is shown as half-way through the barrel M.

While my machine is designed to act as a vertical drilling machine, and one in which the article to be bored revolves, and the drill is fed upward, it does not necessarily require that such be the case when many of my devices are used. The whole machine, as shown, would work if placed horizontal. The cylinders C will serve their purpose as perfectly in a machine that has a revolving drill, or one that is horizontal, or one where the drill is fed down. In some drilling-machines of this class the chuck is located above the drill—that is, at the top of the article to be bored—and the article is set in a centered socket at the bottom. In others the chuck is at the bottom, and, if necessary, a centering-socket is provided at the top; but by the use of the cylinders C I provide a chuck at each end—or, I might say, the whole object is inclosed in a chuck, for my cylinder C is, in effect, a long cylindrical chuck or an incasing-mandrel; hence the support of the article to be bored is not confined to either end, as in other machines, but at both ends simultaneously. Where the article to be bored is long compared with its diameter, as is the case in oil-pump working-barrels, the support I give it by my cylinder-chucks or incasing-mandrels is very beneficial, for it overcomes or provides against a vibratory motion resulting from the torsion incident to the operation of drilling at one end with the support at the other end.

What I claim is as follows:

1. In a boring-machine for making working cylinders or barrels, a receiving-cylinder, C, provided with chucks for concentrically retaining said object in said cylinder, substantially as set forth.

2. In a boring-machine for making working cylinders or barrels, a receiving-cylinder, C, provided with chucks to concentrically retain the object to be bored in said cylinder, in combination with mechanism for revolving said cylinder, substantially as and for the purposes described.

3. In a boring-machine which has a receiving-cylinder provided with chucks for concentrically retaining the object to be bored, the combination therewith of a drill and mechanism for advancing the same concentrically into said cylinder, substantially as set forth.

4. In a boring-machine in which there is a series of chucks adapted for concentrically retaining the objects to be bored, the combination therewith of the arm-plates F′, which bear, and F, which concentrically guide, a series of drills, substantially as set forth.

5. The combination, in a boring-machine for making working cylinders or barrels, of a stationary central pillar, D, with radiating arm-plates, central pinion, L, revolving chucks C′, and upward-feeding drills G, substantially as set forth.

6. The combination, with the cylinder C, of the chucks C′ and C″, and mechanism for clamping the blanks therewith, substantially as herein set forth.

In testimony whereof I, the said THOMAS G. MORSE, have hereunto set my hand.

THOMAS G. MORSE.

Witnesses:

JNO. K. HALLOCK,

S. S. SPENCER.