J. SWAN.
Boring-Machine.

No. 210,220. Patented Nov. 26, 1878.

Fig. 1

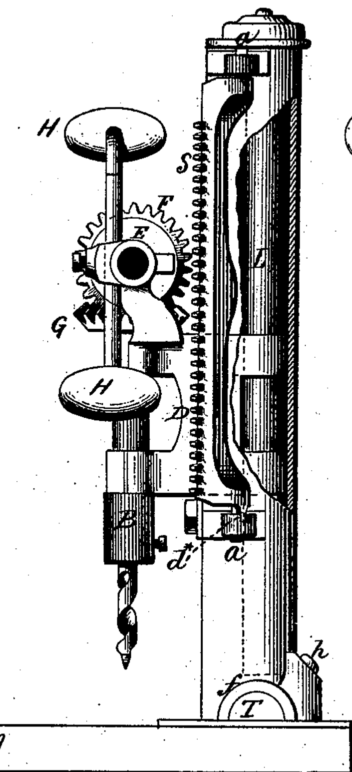


Fig. 2

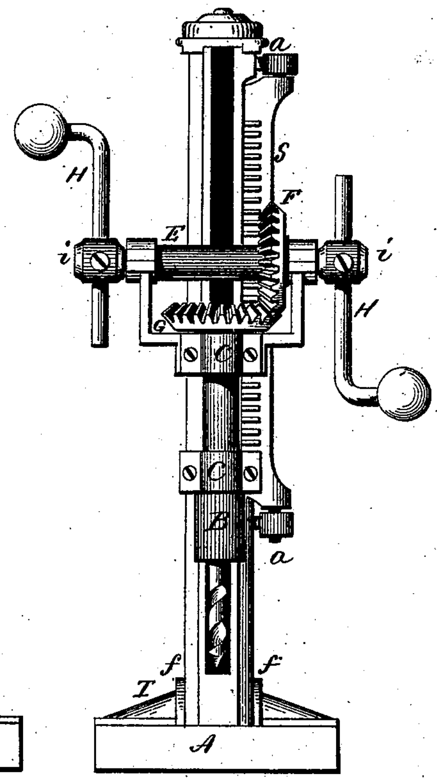


Fig. 4

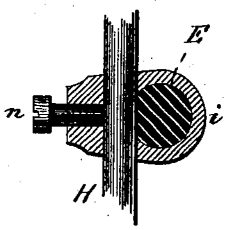


Fig. 5

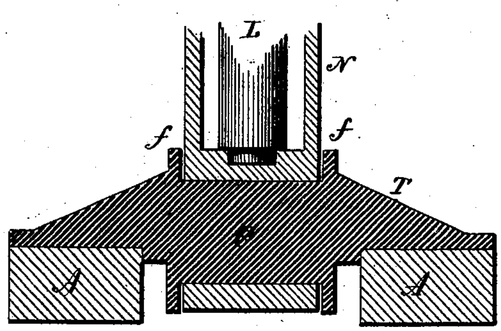
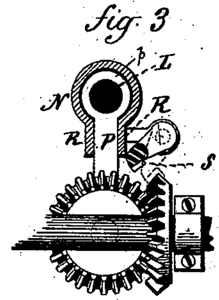


Fig. 3



Witnesses.
J. H. Shumway
A. J. Tibbits

James Swan
Inventor
By atty.
John E. Earle

N. PETERS, PHOTO-LITHOGRAPHER, WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

JAMES SWAN, OF SEYMOUR, CONNECTICUT.

IMPROVEMENT IN BORING-MACHINES.

Specification forming part of Letters Patent No. **210,220**, dated November 26, 1878; application filed May 25, 1878.

To all whom it may concern:

Be it known that I, JAMES SWAN, of Seymour, in the county of New Haven and State of Connecticut, have invented a new Improvement in Boring-Machines; and I do hereby declare the following, when taken in connection with the accompanying drawings and the letters of reference marked thereon, to be a full, clear, and exact description of the same, and which said drawings constitute part of this specification, and represent, in—

Figure 1, side view; Fig. 2, front view; Figs. 3, 4, and 5, detached views.

This invention relates to improvements in boring-machines; and consists, chiefly, in the combination, with the driving-shaft and its bevel-gear, which sets in motion the auger-spindle through a bevel-gear thereon, of a movable rack adapted to engage the said bevel-gear on the said driving-shaft, whereby, by further rotation of the said driving-shaft and its bevel-gear in the direction of boring, the frame or carriage carrying the driving-shaft and auger-bit will be elevated.

A represents the base or bed of the machine; B, the auger-spindle, arranged in bearings C C on a vertical carriage, D, adapted to move up and down, the said carriage carrying the driving-shaft E, on which is placed the auger-driving bevel pinion or gear F, which engages a bevel-pinion, G, on, and rotates the auger-spindle as, the driving-shaft is rotated by the cranks H.

The carriage D has an arm, P, extended backward into the open side of the case N, and the said arm is bored to form a sleeve or eye, *p*, to fit the spindle L placed in the said case, the sides of the arm P bearing on the cheeks R, which act as guides to govern the movement of the carriage D. Fitting the sleeve or eye of the arm P upon this spindle L, as described, enables the carriage to be guided with less friction and to be constructed cheaper than if the arm extended backward from the carriage had a long cylindrical block fitted to a cylindrically-bored passage in the case or standard, as heretofore common.

To withdraw the auger from the hole which it has bored, I have provided a toothed rack, S, pivoted at one side of the case, so that it may be turned to one side, (see dotted lines, Fig. 3,) and engage the bevel-teeth of the auger-driving pinion F on the driving-shaft, in which position further rotation of the shaft E in the direction of boring will cause the bevel-pinion F to travel upward along the rack and elevate the auger.

When the rack S is turned to engage the pinion F, as seen in broken lines, Fig. 3, a projection, *d**, at its lower end (see Fig. 1) falls into a corresponding notch in the lower bearing, and locks the rack in connection with the pinion. When it is again desired to cause the auger to descend, the shaft E is partially reversed, which causes the pinion F to lift or unlock the rack-projection *d**, after which the rack S will automatically turn from its connection with the pinion F, or may be turned by the operator to the position seen in full lines, Fig. 3.

The cross-head T attached to the bed or foot plate A is turned at or near its center to form a bearing, *e*, between shoulders *f*, and the lower end of the case, suitably divided as a plummer-box, is fitted to the cylindrical portion *e*, and the case is held in adjusted position, either vertical or inclined, as may be desired, by means of a set-screw, *h*. This construction of the cross-head enables me with one bearing to accomplish all that has heretofore been accomplished by two journals and bearings at the ends of the cross-head, it rotating instead of being fixed.

The shaft E has at each end a head, *i*, through which the spindle of a crank, H, is passed, as seen in Fig. 4. The shaft is cut away to form the seat for the crank. This makes a very strong connection, and avoids the liability of the loosening of the crank frequently experienced in boring-machines as usually constructed. The crank is set in the head at variable lengths by means of a set-screw, *n*.

It will be noticed that the shaft E has but a single gear upon it—viz., the one which drives the auger-spindle—and it is this gear with which the rack is made to engage to draw the auger upward.

I am aware that it is not new to provide the driving-shaft with an independent toothed wheel or pinion which is engaged by a mova-

ble rack when it is desired to elevate the auger, and also that a compound toothed and and spur gear has been used for a like purpose.

I claim—

1. In a boring-machine, the driving-shaft and its fixed auger-driving bevel-pinion F, combined with a rack pivoted at both ends to the case, and adapted to be thrown into engagement with the bevel-teeth of the said bevel-pinion, and held in this position by the automatic locking of its lower end in its bearing, substantially as and for the purpose described.

2. In a boring-machine, the pivoted rack and its locking device to retain the rack-teeth in engagement with the auger-driving pinion on the main shaft, combined with the auger-driving pinion F, whereby, by a movement of the driving-shaft and pinion F in a direction the reverse of that in boring, the said rack is liberated from the locking device and the said pinion, substantially as described.

JAMES SWAN.

Witnesses:

F. A. RUGG,

H. S. HALLIGAN.