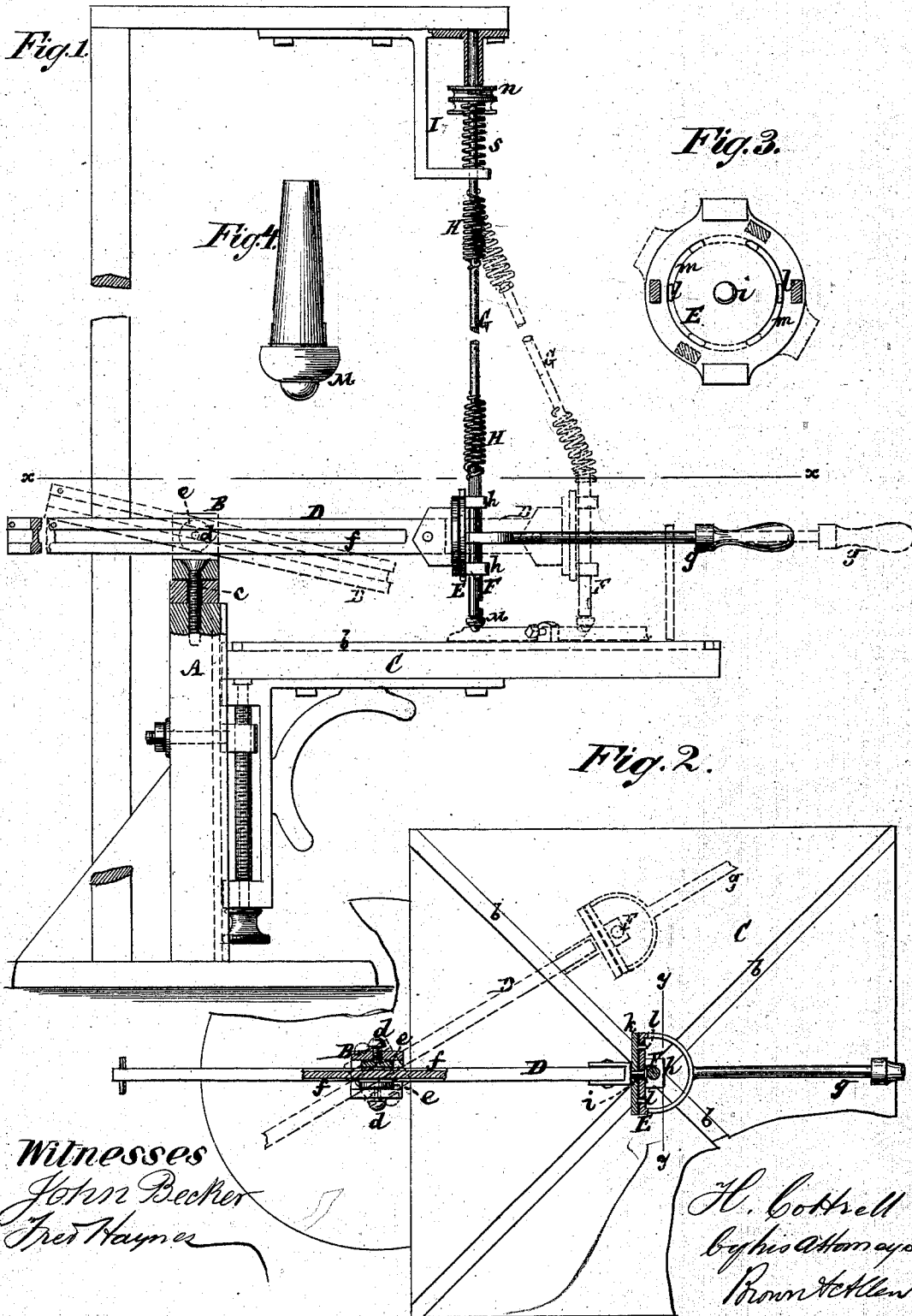


H. COTTRELL.
Carving-Machines.

No. 144,745.

Patented Nov. 18, 1873.



UNITED STATES PATENT OFFICE.

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IMPROVEMENT IN CARVING-MACHINES.

Specification forming part of Letters Patent No. 144,745, dated November 18, 1873; application filed
April 25, 1873.

To all whom it may concern:

Be it known that I, HERBERT COTTRELL, of the city of Newark, in the county of Essex and State of New Jersey, have invented certain Improvements in Carving-Machines for Carving, Surfacing, and Polishing Stone, of which the following is a specification:

This invention consists in certain combinations of devices for carving, surfacing, and polishing stone, including an extensible and flexible revolving tool-operating shaft; also, an extensible bar carrying the tool spindle or holder, and made capable of swinging laterally, or horizontally and vertically, or up and down, as required, whereby great facility is afforded for working over different surfaces or at various angles.

In the accompanying drawing, which forms a part of this specification, Figure 1 represents a partly-sectional side elevation of a machine constructed in accordance with my invention. Fig. 2 is a horizontal section on the line *x x*. Fig. 3, a vertical section upon a larger scale, at the line *y y*, in illustration of the turning head-block, which carries the carving, surfacing, or polishing tool. Fig. 4 is a longitudinal view of a rotary polishing-tool, designed to be used in the machine, and constructed to conform to sunken lines or irregular surfaces.

Similar letters of reference indicate corresponding parts.

A is a pedestal of convenient working height, surmounted by a compound swivel, B, and carrying a vertically-adjustable table, C, said table being provided on its upper surface with diagonally-arranged slots *b b*, for the adjustment of clamping devices to hold the work, and being detachable to admit of working blocks too large to secure by clamps. The compound swivel B is fitted with a vertical pivot, *c*, and side or horizontal pivots *d*, carrying turning slide-guides *e e*, the latter providing for movement up or down and backward and forward, or lengthwise, by means of side or longitudinal grooves *f* of a bar, D, that carries the head-block E, in which the tool-spindle F rotates, and the vertical pivot *c*, providing, by the turning of the swivel B, for the

horizontal or lateral swing of said bar with its attached tool-spindle and tool.

By these means the bar D has a compound motion as a lever, of which the bolts or pivots *c* and *d* are the fulcrums, and is capable of extension or contraction, as required, by a handle, *g*, attached to the head-block E, carried by the bar. Figs. 1 and 2 show, by dotted lines, certain of these adjustments.

The head-block E is provided, on its face, with bearings *h h*, for the tool-spindle F to rotate in, and is fitted to turn on a pivot, *i*, at the forward end of the bar, and against or in contact with a face-plate, *k*, attached to said end of the bar, and provided with stops or guides *l*, which enter curvilinear slots *m* in the head-block.

This adjustment of the head-block, which is shown by full and dotted lines in Fig. 3, provides for the angular adjustment of the tool or its spindle F, relatively to the table C or surface to be operated upon.

G is the spindle or shaft by which rotary motion is communicated to the tool-spindle F. This shaft is both extensible and flexible, to provide for swinging the operating-tool laterally, by the turning of the swivel B on its pivot *c*, up-and-down adjustment of the bar D on the pivots *d*, or various angular positions of the tool-spindle F, by the turning of the head-block E on its pivot *i*, according to requirements.

This universal adjustment of the tool carried by the spindle F is provided for by coiled wire or other flexible connections H H, at the ends of the shaft F, and longitudinally-sliding upper-socketed extension portion or section of said shaft within a hanger, I, subject to the control of a spring, *s*, that tends to keep the shaft raised; or the longitudinal adjustment or extension and contraction of the shaft might be provided for by division of the main or lower portion of the shaft, and connection of such divided sections by a suitable box with feather and groove; or both of such extension-adjustments may be used. The flexible connections H H at the upper and lower ends of the main portion or body of the shaft F provide for varying the angular positions of the shaft and tool carried by it, as herein-be-

fore referred to. Said shaft is rotated by a pulley, *n*, on its upper section, and thus rotary motion communicated to the tool-spindle F.

By reason of the manner in which the power is communicated directly to the shaft, and provision for adjustment of the rotating tool in every direction, and to various angles or portions of the surface to be operated on, without resorting to pulleys or belts running in close proximity to the tool, said surface is prevented from becoming soiled with oil or grease, which is important when the material being acted upon is marble. Access, however, is had, for the tool, by the hereinbefore-specified adjustments to all parts of the table, as well as provision for operating the different angles.

When the machine is used for cutting, an adjustable hand-rest may be attached to the table in proximity to the handle *g*.

The rotating tool-spindle F is suitably constructed to carry various tools for cutting and carving stone, also for surfacing and polishing it, including polishing-tools made to conform to sunken or irregular surfaces, the profile of the tool corresponding to that of the sunken or irregular surface to be polished. Figs. 1 and 4 show such a tool, M, suitable for polishing grooved surfaces. These polishing-tools, operating in connection with devices or mech-

anism for moving them over or in line with the surfaces to be worked, substantially as hereinbefore specified, may be made of any suitable material or materials, such, for instance, as a composition of emery and other substance molded into form; soft metal having emery or other cutting material embedded in its surface; wood, gutta-percha, or rubber used in connection with grit and ordinary polishing-materials; or they may be covered with leather, felt, or cloth, for use with polishing materials of different kinds.

What is here claimed, and desired to be secured by Letters Patent, is—

1. The swivel B and its pivot *c*, in combination with the pivots *d d*, the turning slide-guides *e e*, and the longitudinally-grooved bar D, essentially as described.

2. The upper pulley *n*, in combination with the extensible shaft G, the spring *s*, the flexible connections H H, the tool-spindle F, the turning head-block E, and the bar D, capable of lateral and up-and-down adjustment, essentially as described.

HERBERT COTTRELL.

Witnesses:

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