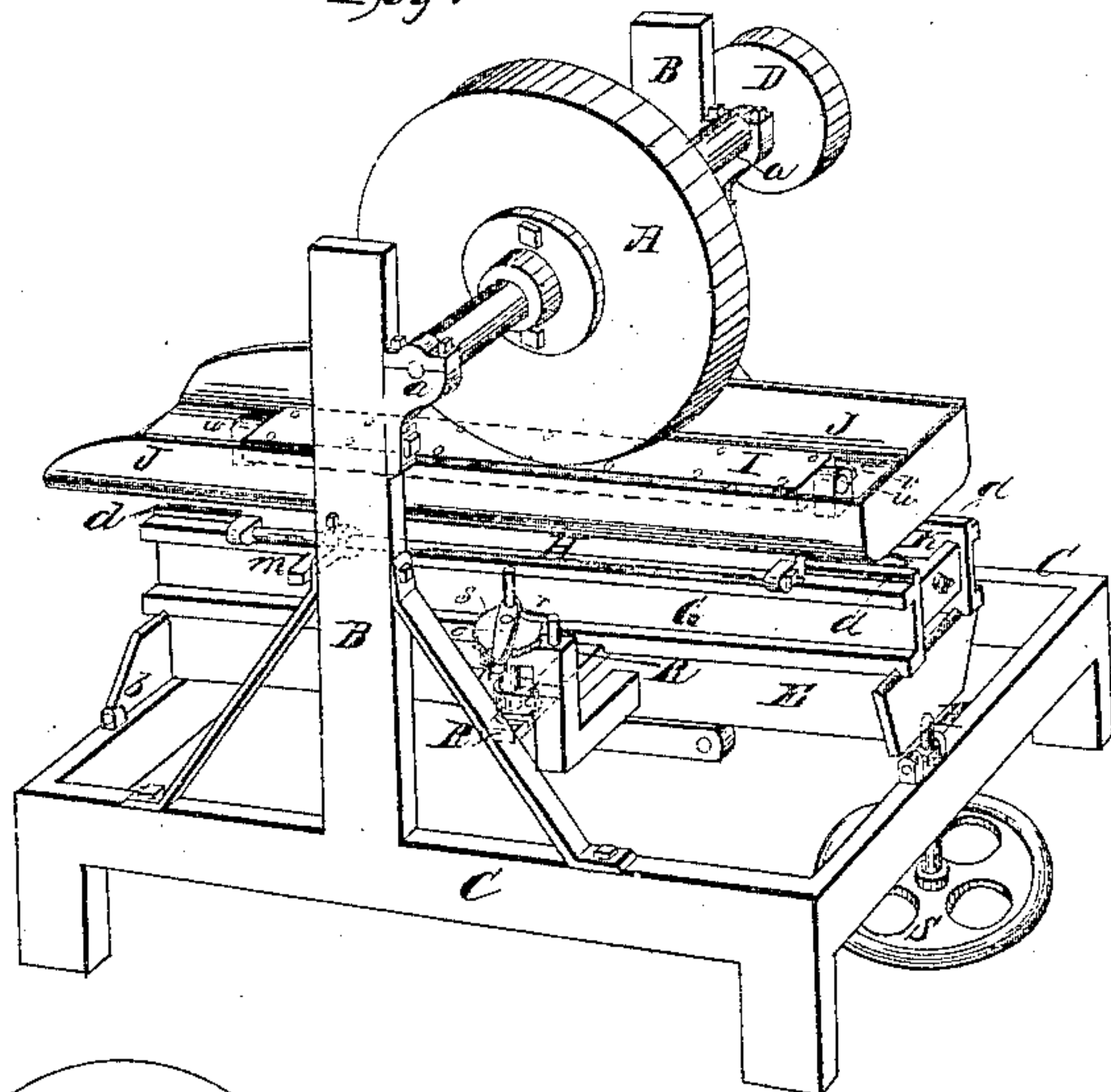


No. 9,976.

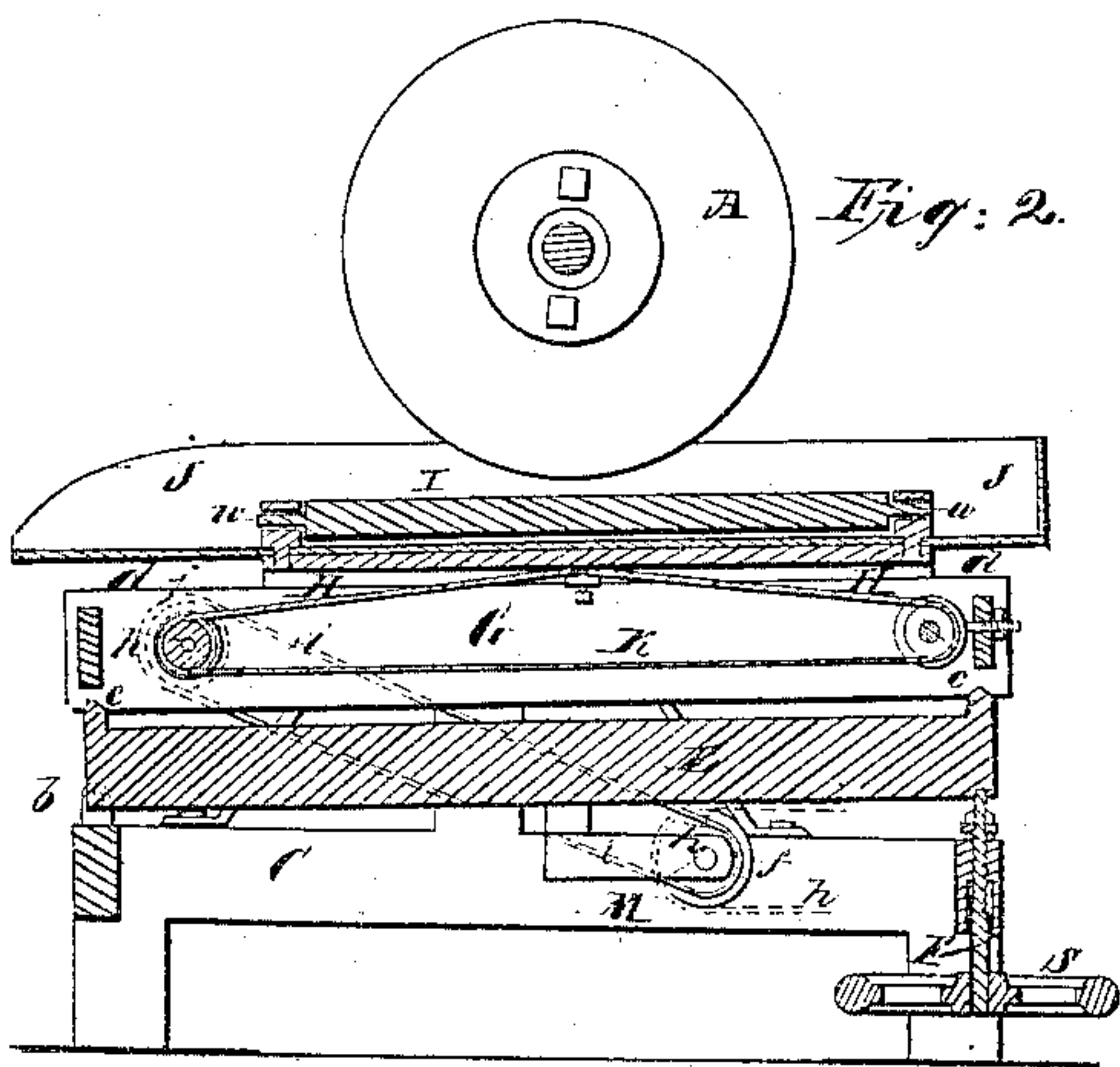
PATENTED AUG. 30, 1853.

S. DARLING.  
APPARATUS FOR SHAPING METALS BY GRINDING.

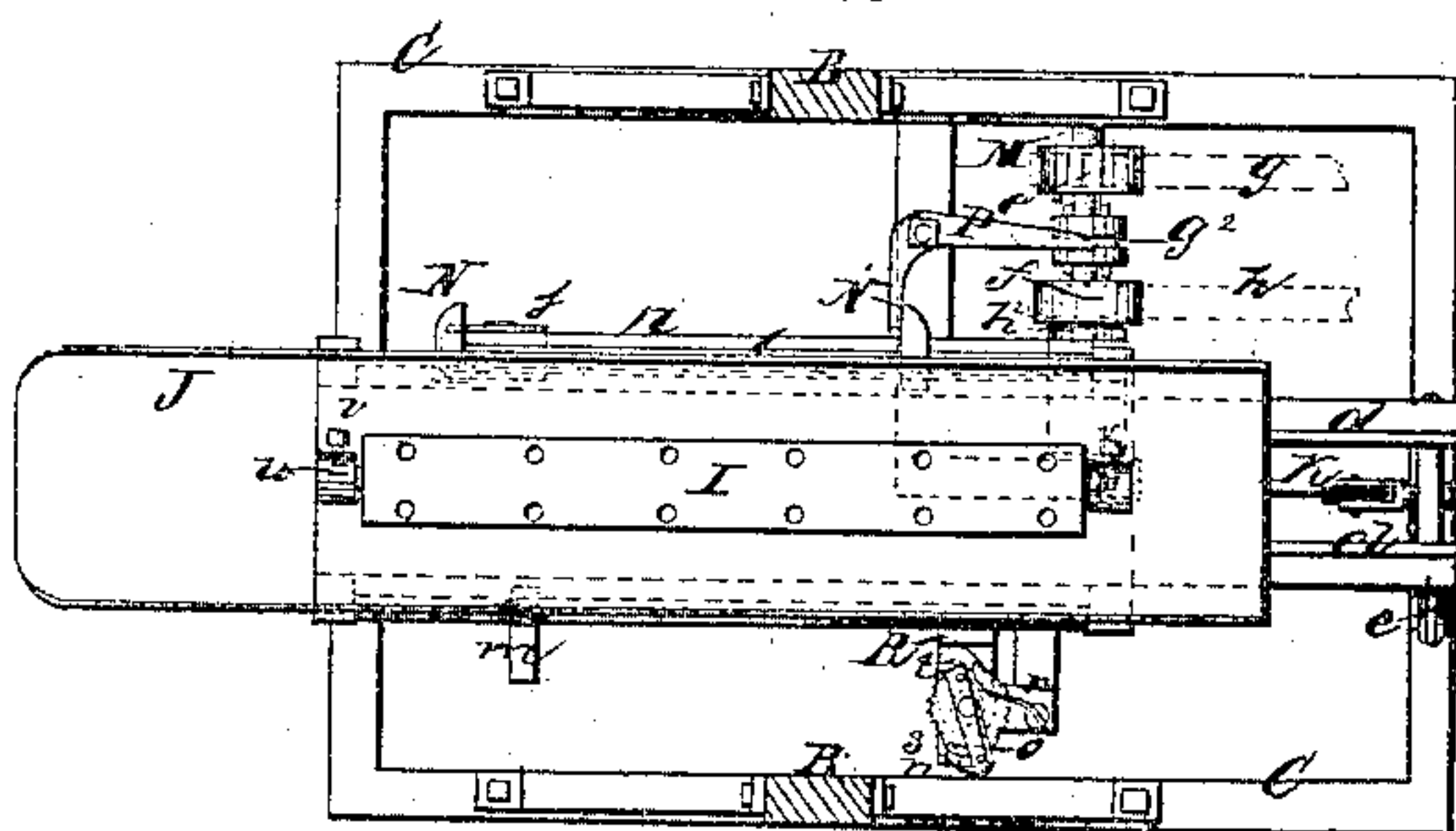
*Fig: 1.*



*Fig: 2.*



*Fig: 3.*





# UNITED STATES PATENT OFFICE.

SAMUEL DARLING, OF BANGOR, MAINE.

## APPARATUS FOR GRINDING AND SHAPING METALS.

Specification of Letters Patent No. 9,976, dated August 30, 1853.

*To all whom it may concern:*

Be it known that I, SAMUEL DARLING, of Bangor, in the county of Penobscot and State of Maine, have invented certain new and useful Improvements in Grinding Apparatus for Shaping Metals, &c., by Grinding, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, which form part of this specification, and in which—

Figure 1 represents a view in perspective of my improved apparatus for grinding and polishing; Fig. 2 a vertical longitudinal section of the same; and Fig. 3 a plan having the stone removed.

In the accompanying drawings, a grindstone (A) is represented as mounted on a shaft which rests in bearings supported on brackets (a) attached to standards (B) which project from a frame (C), rotary motion being communicated to the stone by means of a pulley (D) driven by a belt. A bed (E) is secured to the frame at one end by hinges (b) and at the other rests upon an adjustable screw (F) by means of which it is raised or lowered at will. The top of this bed is fitted at either end with a cross way (c) on which a second bed (G) is fitted and rests, and is moved laterally as may be required, the top of this second bed (G) is fitted with longitudinal ways (d) on which a carriage (H) slides. This carriage (H) supports an adjustable clamp plate or holder (I) to which articles to be dressed are clamped while being subjected to the action of the grindstone. To prevent grit and water from washing down among the mechanism a trough (J) is arranged to inclose the clamp plate (I), which carries off the water &c. and discharges the same at one end of the machine into a drain or other suitable conduit or receptacle.

The carriage is caused to move back and forth on the ways (d) and beneath the stone (A) by means of an endless chain or rope (K) which is connected to it and passes over a pulley at one end of the upper bed (G) and is wound around and secured to a drum (L) at the other end, and as this drum turns alternately in opposite directions, the carriage (H) is made to travel backward and forward. This movement of the carriage is effected and made adjustable and self-acting by the following devices, namely: Loose running pulleys (e and f) are mounted upon the shaft (M) and are turned in opposite

directions by belts (g, h); a sliding clutch (g<sup>2</sup>), between the two pulleys, which is connected by a feather with the shaft, serves to throw either pulley into gear with the shaft, on which is keyed a driving drum (h<sup>2</sup>) that is connected by a driving band (i) with a pulley (j) on the shaft of the chain drum (L), so that, by putting the pulleys (e and f) into gear alternately the chain drum will be made to rotate alternately in opposite directions, causing the carriage (H) to move backward and forward.

Adjustable brackets or toes (N N') at the side of the carriage (H) serve to reverse its motion and vary its travel; these toes slide along a rod (O) to which they are held by set screws when adjusted to the proper position. The toes alternately strike and turn a suitably formed lever (P) which as it is turned in one direction or the other throws the sliding clutch (g<sup>2</sup>) into gear with one or the other of the pulleys (e and f) thus reversing the motion of the belt (i) and of the carriage (H). The range of motion of the carriage may be varied by setting the toes nearer or farther apart; and any given portion, long or short of the carriage may be alternated beneath the stone to cause it to act wherever it may be required, on an article large or small clamped to any part of the holding plate (I) by setting the toes (N, N') nearer to one end of the rod, than the other, and varying their distance apart. This facility of change in the range of motion of the carriage, and the capability of limiting the action of the stone to any section short or long of the clamp plate, gives this machine far greater versatility of application than any other of the kind heretofore devised. A similar arrangement of an adjustable toe (m) is provided on the opposite side of the bed (G); this toe serves to give the upper bed (G) a lateral movement in either direction along the cross-ways (c) by the following combination of devices; the toe (m) is set so that at the end of each return or alternate movement of the carriage (H) it strikes and moves a pin projecting from a lever (Q) that, by means of a pawl (n) attached to it turns a ratchet wheel (s) on the shaft of which is keyed a cam (t) that bearing against collars in an arm (R) connected with the upper bed (G) gives to the latter the required lateral movement, a



spring (*r*) serving to throw back the lever (Q) after each stroke, to the proper position to be struck again on the return movement of the carriage. The trough (J) is 5 firmly secured to the top of the carriage, and within is the clamp plate or table (I) on which the article to the ground is secured by means of suitable clamps or fastenings of the usual form, this inner bed 10 (I) is hung on trunnions (*w*) which rest in bearings fitted with set screws (*v*) to hold the table at any required angle. For the purpose of varying the distance of the table from the stone to meet the requirements of the work to be done; it can be 15 raised and lowered by turning a wheel (S) which turns a screw (F) that causes one end of the bed (E) to be raised or lowered and with it the several beds resting 20 thereon.

Much facility in grinding things of varying shape, it is obvious, will be afforded by these several movements and adjustments, the table or bed (I) may be speedily raised 25 or lowered to adjust it to the required distance from the stone according to the thickness of the body to be ground and to the thickness, which its surface is to be reduced; it also admits of the table being set at any 30 desired angle, horizontally, so that if a blade with one edge thick and the other thin like a scythe, for example, is required to be ground, its upper face presents a level surface to the stone. The firm attachment 35 of the body to the table prevents the lateral

vibrations, while the straight longitudinal run of the bed insures the production of an even and regular finish of the article operated on, all irregular scoring of whose surface is prevented, by the lateral movement of the article taking place only at the end of the longitudinal movement of the carriage. By this mode of operation, successive straight, narrow, parallel breadths of the article to be shaped or finished are 45 subjected to the action of the stone until its entire surface is dressed.

The lateral feed of the body to the carriage G may be increased or diminished as required by adjusting the toe (*m*) to operate the ratchet wheel (*s*) one or more teeth 50 each stroke as may be required.

What I claim as my invention and desire to secure by Letters Patent, is—

The combination of the holder of the article to be ground with a grindstone or grinding disk substantially in the manner herein set forth, so that the article and the stone will change positions relatively to each other during the operation in three directions—namely: toward each other, and 60 parallel with, and transverse to the axis of the stone.

In testimony whereof, I have hereunto subscribed my name.

SAMUEL DARLING.

Witnesses:

W. C. CROSBY,  
GEO. R. SMITH.