(No Model.) 3 Sheets—Sheet 1.

J. S. BANCROFT.

MACHINE FOR SHARPENING DRILLS.

No. 508,268. Patented Nov. 7, 1893.

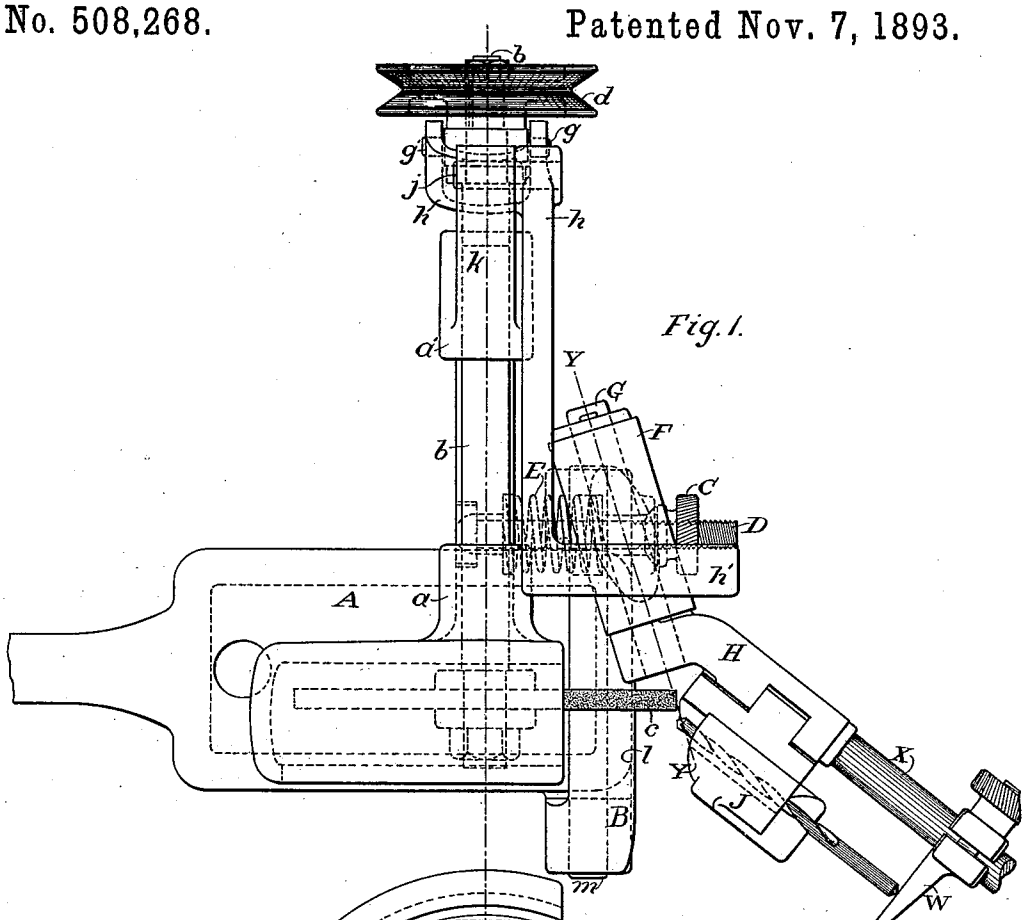

Fig. 1.

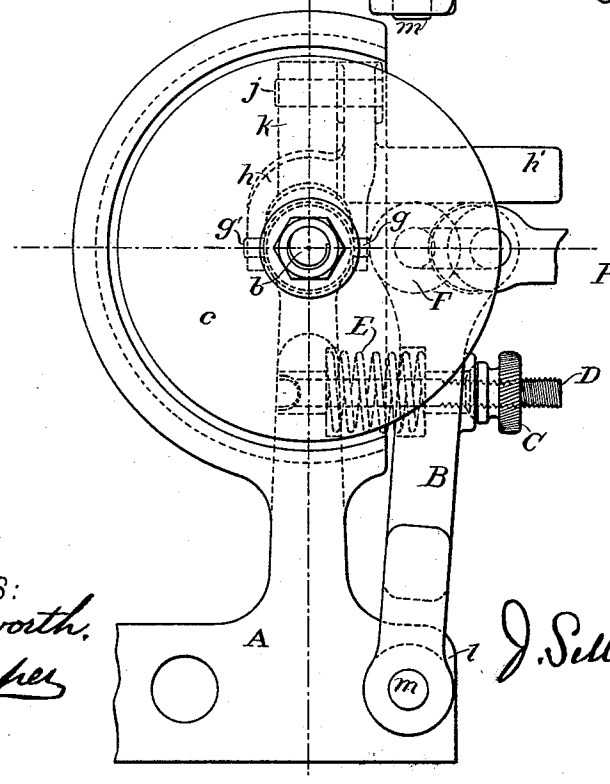

Fig. 2.

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Fig. 4.

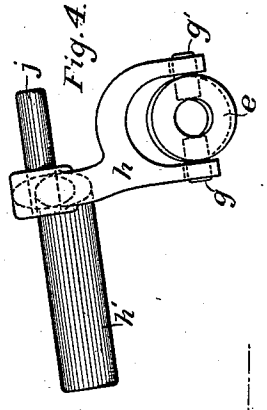

Fig. 3.

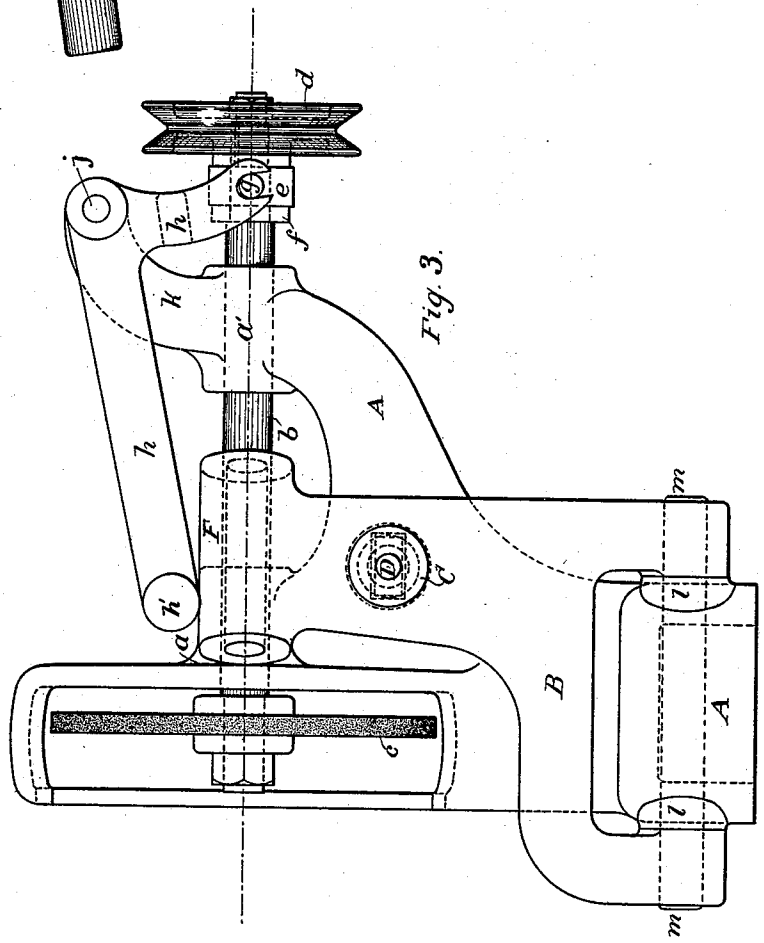

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Fig. 6.

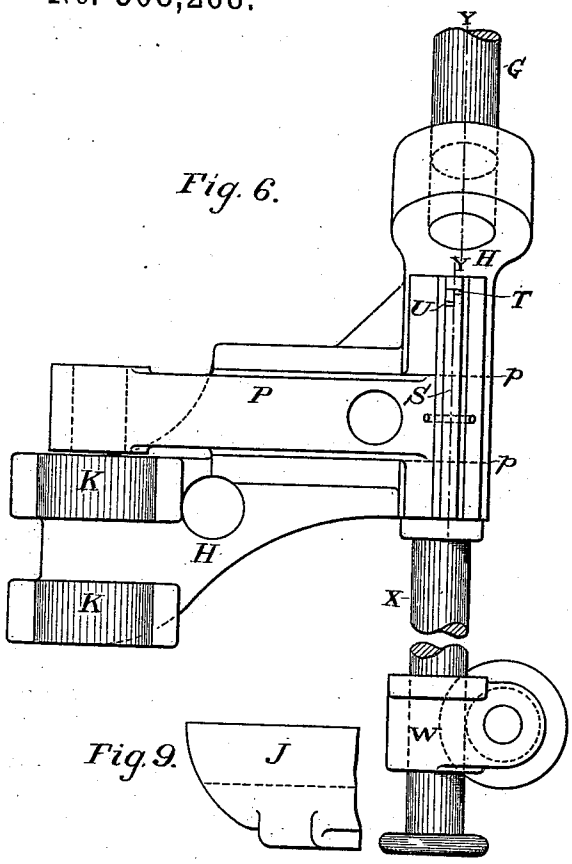


Fig. 9.

Fig. 5.

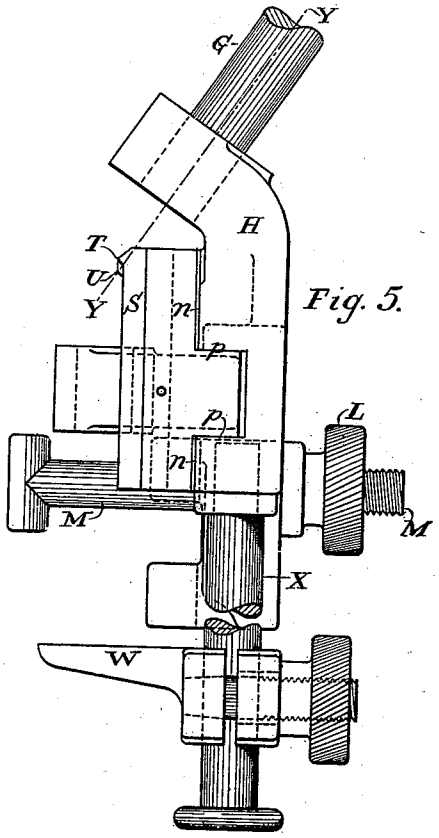


Fig. 8.

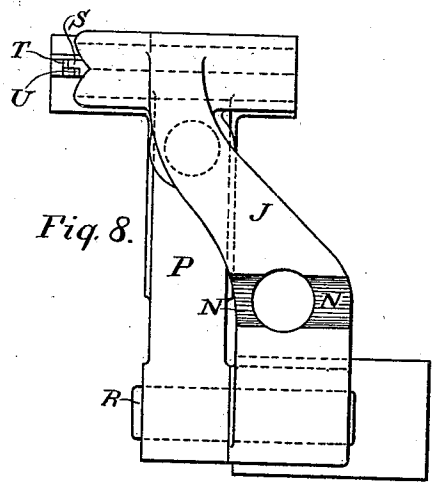
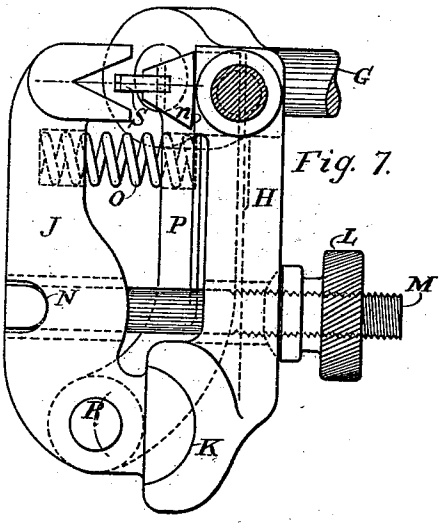


Fig. 7.



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UNITED STATES PATENT OFFICE.

JOHN SELLERS BANCROFT, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO THE WILLIAM SELLERS & COMPANY, INCORPORATED, OF SAME PLACE.

MACHINE FOR SHARPENING DRILLS.

SPECIFICATION forming part of Letters Patent No. 508,268, dated November 7, 1893.

Application filed July 21, 1893. Serial No. 481,121. (No model.)

To all whom it may concern:

Be it known that I, JOHN SELLERS BANCROFT, of the city and county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Machines for Sharpening Drills, of which the following is a specification.

My present invention relates to a chuck for holding the drill to be sharpened in proper relation to the axis of the drill, and to the axis that determines the contour of the drill lip.

Figure 1, Sheet 1, represents a plan of a drill grinding machine, embodying my present improvement. Fig. 2, is an elevation of Fig. 1, with the chuck removed. Fig. 3, Sheet 2, is a side elevation of the parts shown in Fig. 2. Fig. 4, shows an end view of the lever and yoke for traversing the grinding wheel. Fig. 5, Sheet 3, is a plan view of the chuck on a larger scale, with the clamping jaw removed. Fig. 6, is an elevation of the parts shown in Fig. 5. Fig. 7, is an end elevation of the chuck. Fig. 8, is a side view of the two holding jaws, and Fig. 9 is a plan view of the end of the clamping jaw shown in Fig. 8.

In all the figures, similar letters refer to similar parts.

A, is the main frame of the machine, Figs. 1, 2 and 3, provided with bearings *a*, *a'* for the shaft *b* of the grinding wheel *c*. A pulley *d* is secured on one end of this shaft *b*, and a collar *e*, fitting loosely on the shaft between a washer, *f*, and the hub of the pulley *d*, is provided with trunnions or pins *g*, *g'*, which engage with slots in the short arm of the forked and counterweighted lever *h*, Figs. 1, 3 and 4, pivoted at *j* in the arm *k*, raised on the frame A. The operator by moving the end *h'* of this lever *h* up and down, moves the shaft *b* endwise in its bearing, and so traverses the grinding wheel *c* across the lip of the drill to be ground, thus preventing grooving the wheel, and producing a good surface on the drill.

On the lower front face of the frame A is formed a bearing *l*, which receives the pin *m*, on which is pivoted the arm B; this arm B is moved toward the frame A, by the nut C provided with a ball face bearing against the arm B, and engaging with the screw thread on the T-headed bolt D. A spiral spring E, between the frame A and arm B holds the arm B against the nut C and takes up all lost motion. The upper end of this arm B is provided with a bearing F, to receive the journal G of the drill chuck. This bearing is at approximately the same height above the base as the grinding wheel shaft *b*, but viewed in plan, is at an angle with it as shown in Fig. 1. The axis of this shaft extended, forms the axis of the cone to which the end of the drill lip is to be ground, and by varying the angle which this journal makes with the grinding wheel shaft, which for this purpose may be made adjustable, the form produced on the drill lip may be varied from that of a cylinder when the axes are parallel to that of a very flat cone; for many practical reasons I prefer an angle similar to that shown.

H, Figs. 5, 6 and 7, is the drill chuck body which is carried by its journal G, formed with or secured to it, and which can be swung or vibrated through an arc, long enough to grind the end lip of the drill, about the axis of its journal G.

J, Figs. 7 and 8, is the clamping jaw which is hinged to or journaled in a seat provided at K in the lower part of the body H; it is drawn toward the body H for the purpose of clamping the drill by means of the nut L, on the clamping screw M which passes through openings in the body H and jaw J, its T-head resting in a recess N, N, Fig. 8; the spring O, Fig. 7, acts to separate the jaws to receive the drill and holds the head of the bolt M and the nut L in their respective seats and pressing against the adjusting jaw P holds it firmly on its seat *n*, *n*, *p*, *p*, Fig. 5, provided in the body H.

The crank pin R, Figs. 7 and 8, supports the jaw P and connects it to the jaw J at a point, Fig. 7, back of the center of oscillation of the hinge connection between the jaw J and the body H, so that as the jaw is swung in the direction to close it, the pin R will rise and lift the jaw P through a small distance, sliding it on its seat in the body H.

The jaw P is made slightly convex on its upper end at *n*, *n*, where it bears against the body H, so that as its lower end moves in the

arc described by the crank pin R, the bearing on the upper end will be opposite the clamping V in the jaw J.

The jaw P is provided with a straight edge S, preferably of tempered steel, against which the drill to be ground is clamped; the end of the drill is brought against the end stop T and the end of the cutting edge of a lip is brought against the stop U, which determines the rotative position of the drill.

The V formed in the clamping jaw holds the drill in contact with the straight edge S, thus holding the drill between three straight edges, all parallel to the axis of the drill. When the drill is thus clamped with the end of one of its cutting edges, resting in the angle formed by the intersection of the faces of the end stop T and the stop U, the opposite lip of the drill will be in the correct position relatively to the axis Y—Y of the chuck, so that as the chuck is swung about this axis and the grinding wheel traversed across the end of the drill, the end surface of the lip will be ground to the form of a cone with its clearance. properly proportioned to the surface of the produced hole. It will be observed in Figs. 1 and 5, that the axis Y—Y, passes very closely to the intersection of the end stop T with the straight edge S, and that the curvature of the surface produced on the end of the drill is dependent upon the distance of this surface from the axis Y—Y. A larger drill than that shown will have its end surface at a greater distance from the axis, by the amount of difference in the diameter of the drill, and the movement of the jaw J required to grasp this larger drill, will, by the action of the crank pin R, lower the jaw P and the stop U, thus bringing the center of the larger drill to a greater distance below the axis Y—Y. The contour of the drill lip therefore is regulated by the drill itself, and does not depend upon the skill of the operator further than to begin with, he must see that the drill lip is properly placed against its stops T and U. The sliding stop W which may be clamped upon the rod X, secured in the body H, is brought up against the end of the drill as shown in Fig. 1, after the drill has been clamped in the chuck to have the first lip ground; when this is finished, the jaw J is released, the drill turned half way round until this lip rests against the stop U, and holding the drill back against the stop W, it is again clamped by the jaw J; if the wheel is passed over the lip now presented without adjusting the nut C, both lips will be of the same length, and the drill will be properly sharpened.

Having now described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a drill sharpening machine, a chuck provided with a clamping jaw having two plane surfaces inclined to each other, vibratable about an axis and a straight edge parallel to the line of intersection of the two plane surfaces in the clamping jaw, with two stops, one to determine the end position of the drill, and one to fix the rotative position of the drill lip.

2. In a drill sharpening machine, a chuck provided with two jaws, the clamping jaw hinged to the chuck body and the other jaw guided by the chuck body, and connected to the clamping jaw at a point eccentric to the center of its hinge connection to the body.

3. In a drill sharpening machine, a chuck body vibratable about an axis, a clamping jaw hinged to the chuck body, a jaw guided by the chuck body and hinged to the clamping jaw, and provided with two stops, one of which determines the axial position of the drill and the other determines the rotative position of the drill lip.

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