

No. 616,909.

Patented Jan. 3, 1899.

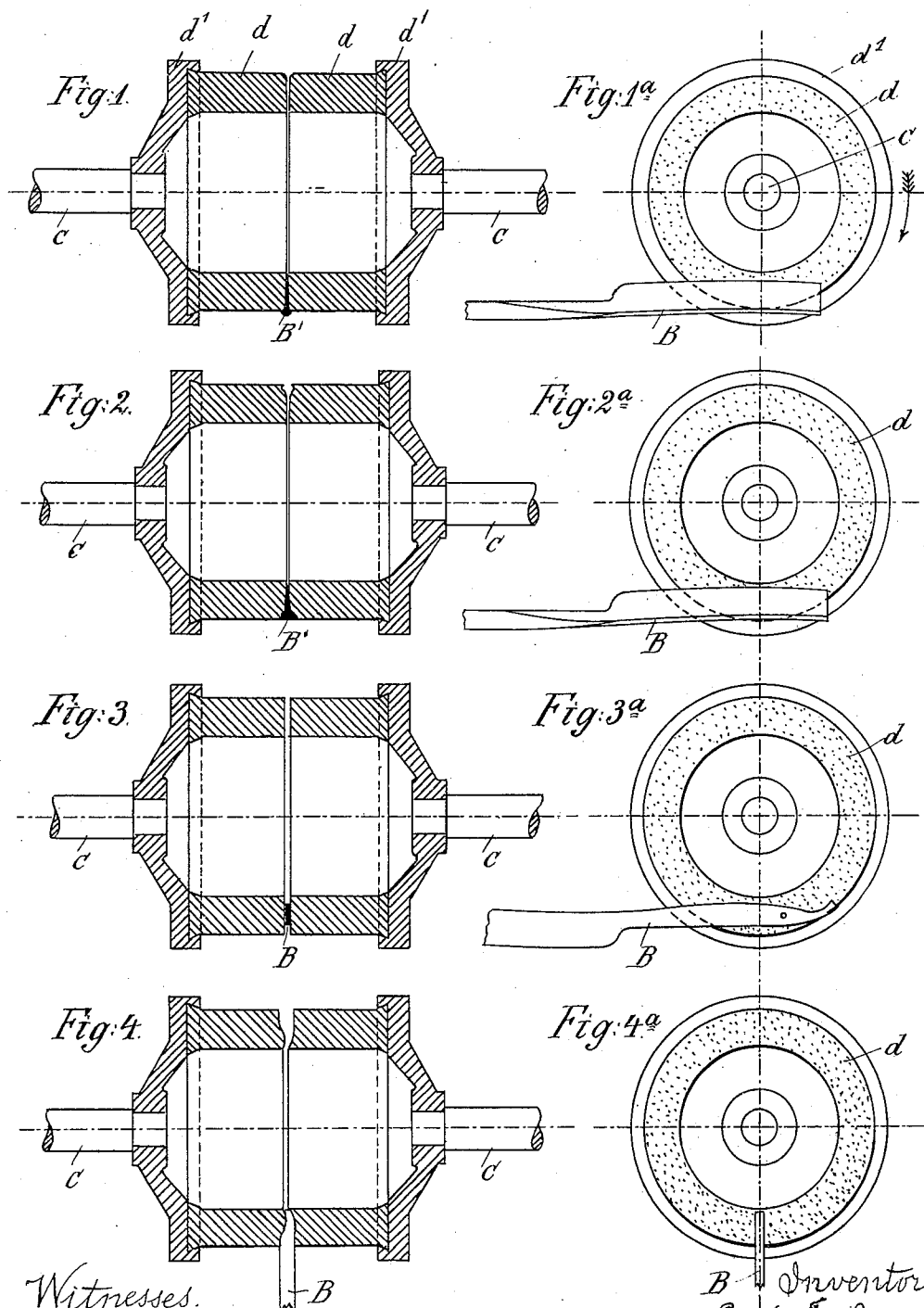
C. F. ERN.

MACHINE FOR GRINDING OR POLISHING BLADES OF KNIVES, RAZORS, &c.

(Application filed July 10, 1896.)

(No Model.)

3 Sheets—Sheet I.



Witnesses.
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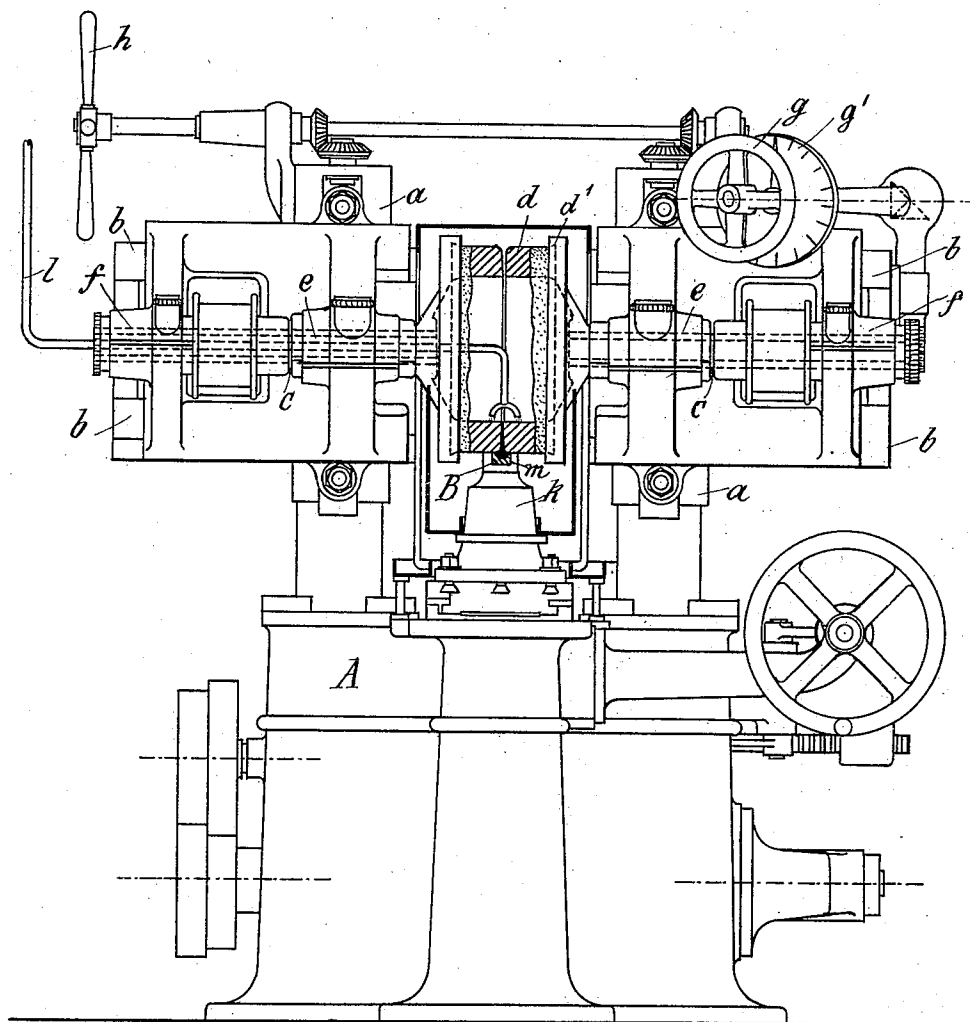
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3 Sheets—Sheet 2.

Fig. 5.



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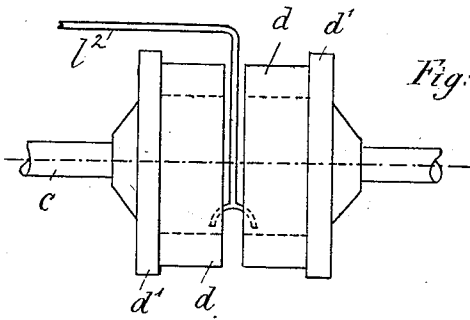


Fig. 7.

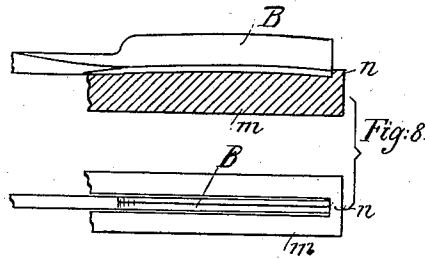
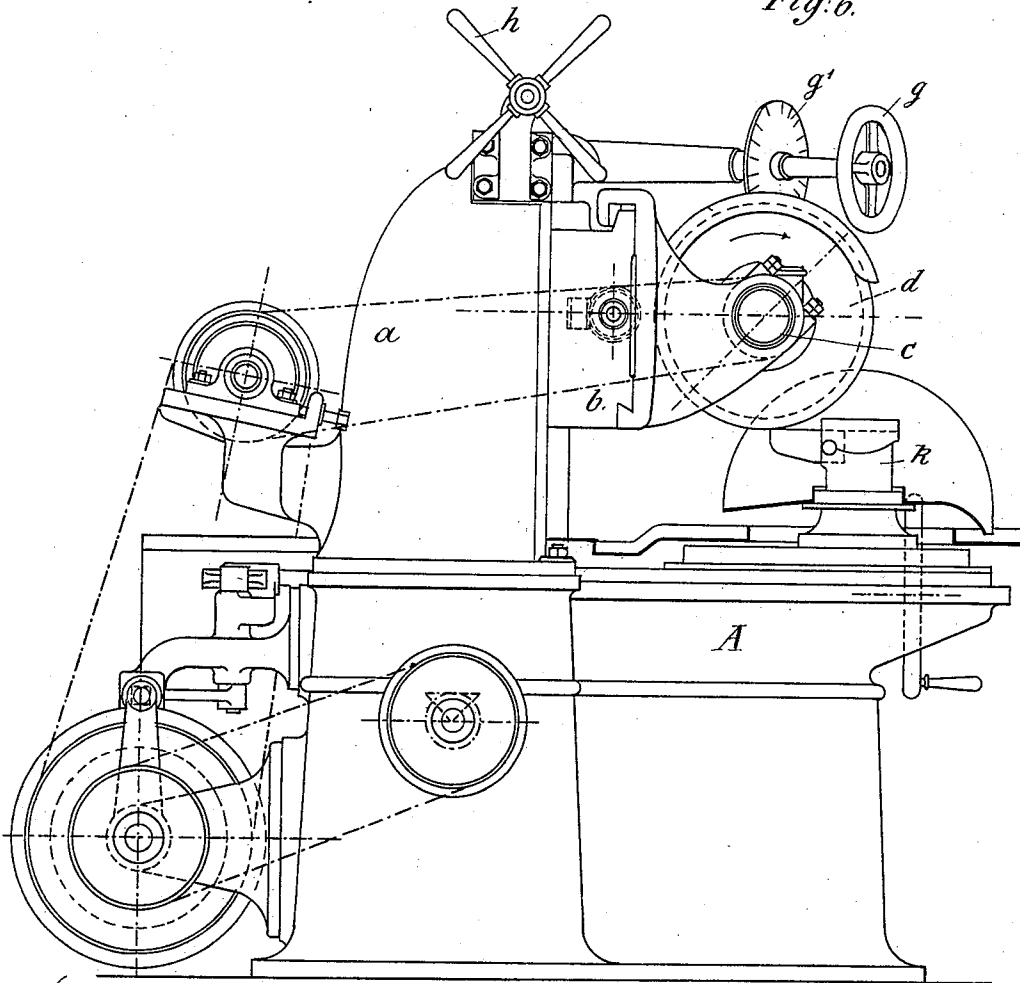


Fig. 8.

Fig. 6.



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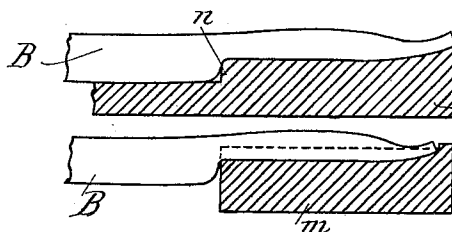


Fig. 9.

Fig. 10.

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UNITED STATES PATENT OFFICE.

CARL FRIEDRICH ERN, OF WALD, GERMANY.

MACHINE FOR GRINDING OR POLISHING BLADES OF KNIVES, RAZORS, &c.

SPECIFICATION forming part of Letters Patent No. 616,909, dated January 3, 1899.

Application filed July 10, 1896. Serial No. 598,638. (No model.)

To all whom it may concern:

Be it known that I, CARL FRIEDRICH ERN, a subject of the Emperor of Germany, residing at Wald, Prussia, German Empire, have invented certain new and useful Improvements in Machines for Simultaneously Grinding or Polishing the Two Sides of the Blades of Knives, Razors, and other Cutting Instruments, (for which I have obtained Letters Patent in Austria, No. 47,642, dated February 28, 1897, and in England, No. 13,222, dated June 16, 1896,) of which the following is a specification.

My invention relates to a machine for simultaneously grinding or polishing the two opposite surfaces, symmetrical or not symmetrical, of knife-blades or other articles.

In my improved machine the grinding or polishing is effected by two coöperating rotary grinding disks or cylinders, the article to be ground or polished being placed between the side faces of the same, so that the grinding or polishing process is accomplished by the side surfaces of the disks or cylinders. In this manner the pressure exerted by the grinding-cylinders on the article to be ground is distributed over nearly the entire surface operated upon, thus avoiding the injurious heating of the article and the ensuing untempering of the same. Hitherto the grinding and polishing has been effected on the curved surface of the disks or cylinders and the grinding is effected in lines or comparatively narrow strips which have consequently been subjected to the full pressure of the grinding-cylinders, so that, for instance, razor-blades were frequently overheated at some places and thereby untempered. Moreover, in the machines hitherto in use only two surfaces symmetrical to each other could be simultaneously ground, so that, for instance, the finishing of razor-blades by a machine could not be thoroughly accomplished. These disadvantages are removed by my improved machine, whereby the two opposite surfaces of an article are ground or polished between the side surfaces of two emery cylinders or disks, the operating-surfaces being shaped in accordance with the configuration of the article operated upon.

In order to make my invention better understood, I have illustrated the same in the

annexed drawings, making a part of this specification. In Figures 1 to 4^a, inclusive, I have illustrated the grinding of the surfaces of a razor-blade and of its shank, showing the successive grinding-cylinders used and also the manner of placing the knife-blades between the same.

Figs. 1 and 1^a illustrate the grinding of a razor with straight-sided blade. Figs. 2 and 2^a illustrate the grinding of a convex razor. Figs. 3 and 3^a illustrate the grinding of the two sides of a razor-shank. Figs. 4 and 4^a illustrate the grinding of the end edges of a shank—i. e., of two sides not symmetrical to each other. Figs. 5 and 6 show, respectively, a front view and a side view of my grinding-machine. Fig. 7 illustrates a modified device for feeding the grinding-water or polishing medium to the grinding-cylinders. Figs. 8, 9, and 10 show devices for holding the blades during the grinding and polishing process.

As shown in Figs. 1 to 4^a, the two opposite sides of the blade or shank, as of a razor B, are ground or polished simultaneously over their entire surface and the two grinding-cylinders *d d* are advanced toward each other in accordance with the progress of the grinding process, whereby the article operated upon is moved when practicable a little transverse to the direction of the grinding. When, as illustrated in Figs. 1 to 2^a, the article B' is provided with two sides inclined toward each other, the same is inserted between the said grinding-cylinders and moved.

By the use of the side surfaces of two grinding-cylinders movable toward each other I am enabled to effect the grinding or polishing of the two opposite sides of an article at the same time and over nearly the entire surface of these sides. Furthermore, the pressure of the grinding-cylinders is distributed over the entire surface of the article operated upon, and thus decreased at any point, so that the untempering of razor-blades is avoided, the grinding being also more uniform. Moreover, the grinding-cylinders *d d* can be used until they are practically entirely worn off, because these cylinders are held in rings *d'* in such way that even with a considerable decrease of the width of the cylinders bursting becomes practically impossible.

My improved grinding and polishing ma-

chine is shown in Figs. 5 and 6. Two solid frames *a* are mounted on a table or base *A*, and on the slide-beds *b* of these frames the driving-shafts *c* of the grinding-cylinders *d* and their bearings *e* and *f* are supported. A hand-wheel *g*, with a scale-disk *g'* placed behind the same, serves for the adjustment of the grinding-cylinders *d*, and a regulating-wheel *h*, placed also at the upper part of the machine, serves for the raising or lowering of the cylinders. There are two shafts *c*, Fig. 1, and the cylinders *d d* are adjusted by moving said shafts endwise from or toward each other.

Besides the necessary driving and transmission mechanism the frame *A* carries a sliding support *k*, equipped with the necessary mechanism, said support having for its purpose to carry the blade-holder *m*, if the machine is used, for instance, for grinding razor-blades.

A pipe *l*, passed through a longitudinal hole in one of the shafts *c* of the grinding-cylinder, serves to feed the grinding-water or polishing means at or near to the grinding-surfaces of the cylinders *d*, so that the centrifugal force of the rotating cylinders effects a uniform distribution of the grinding or polishing medium, which is of great importance for the effective working of the machine.

The grinding or polishing medium may also be fed directly from the top when the grinding-machine is used for articles of such dimension that the distance between the grinding-cylinders is sufficient for the passage of a feeding-pipe *l'* between the same. This arrangement is shown in Fig. 7. Also in this construction the grinding or polishing medium is conveyed to the same place, so as to use the centrifugal force for a uniform distribution of the same.

In connection with my improved grinding and polishing machine I prefer to use blade-holders *m*, provided with projections or checks *n* for the blade *B*, so that the blades can be readily placed in or removed from the holder, but that the blades cannot be accidentally drawn between the grinding-cylinders. Such blade-holders are shown in Figs. 8, 9, and 10, whereof Fig. 8 illustrates a holder for grinding the blade-surfaces, Fig. 9 a holder for grinding the side surfaces of the shank, and Fig. 10 a holder for grinding the top side of the shank.

The grinding disks or cylinders *d* are held in head-pieces *d'*, fixed on the axle *c*, so that the said cylinders can be fully used and

worn without any danger of bursting. The manipulation of the machine is a very simple one, as the ground blades can be removed from the holders without changing the position of the grinding-cylinders *d d*, the blade-holders being all provided with checks toward the direction of the grinding, as aforesaid.

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

1. In a grinding or polishing machine the combination of two vertically and laterally adjustable rotatable grinding-cylinders, adjacent working surfaces on said cylinders shaped to the configuration of the corresponding side of the ground articles, longitudinally-adjustable shafts for said grinding-cylinders adapted to increase and diminish the distance between the grinding-surfaces, and means for adjusting said shafts, substantially as described.

2. In a grinding and polishing machine, the combination with vertically and laterally adjustable rotatable grinding-cylinders provided with working side surfaces, of longitudinally-adjustable shafts for said grinding-cylinders and means to adjust said shafts, and a feed-conduit for a grinding or polishing medium led to a point between the adjacent grinding-surfaces, the one of said surfaces conforming to the one, and the other of said surfaces conforming to the other side of the object to be ground, whereby the centrifugal force of the rotating cylinders distributes said medium around said working surfaces, substantially as described.

3. In grinding and polishing machines in combination with grinding-cylinders having working side surfaces, one of said surfaces conforming to the one, and the other of said surfaces conforming to the other side of the article to be ground, longitudinally-adjustable shafts for said grinding-cylinders and means to adjust said shafts, and a holder for the article to be ground or polished provided with a check opposed to the pressure of the cylinders on the said article and adapted to be moved in or against the direction of said pressure, substantially as described.

In witness whereof I have hereunto set my hand in presence of two witnesses.

CARL FRIEDRICH ERN.

Witnesses:

H. T. HESS,
O. KÖNIG.