T. C. HARRIS

Grinding and Finishing Cylindrical Object.

No. 209,476. Patented Oct. 29, 1878.

FIG. 1.

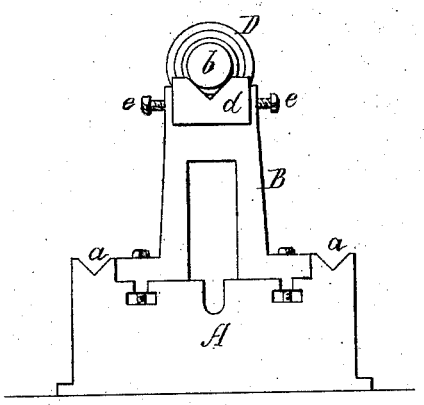


FIG. 2.

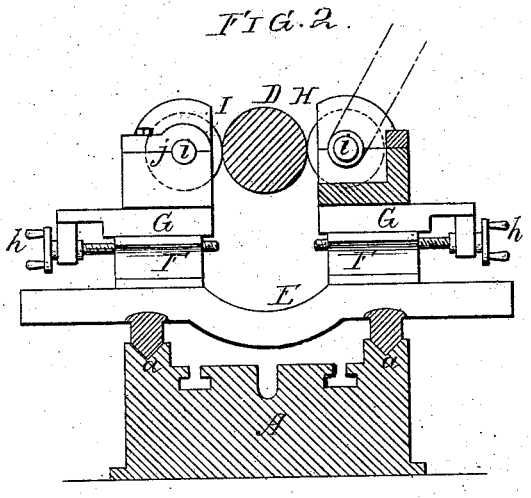
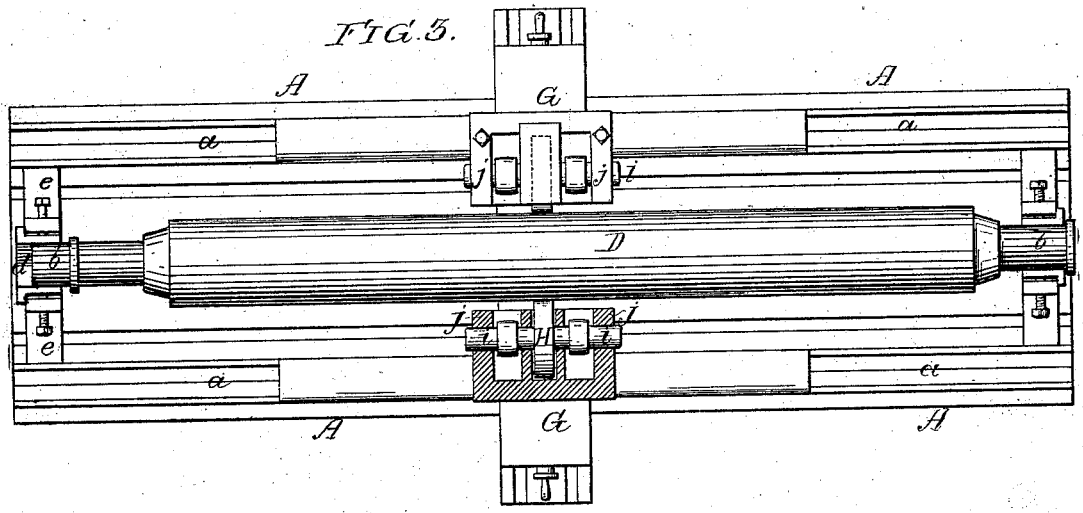


FIG. 3.



Witnesses,
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UNITED STATES PATENT OFFICE.

THOMAS C. HARRIS, OF WILMINGTON, DELAWARE.

IMPROVEMENT IN GRINDING AND FINISHING CYLINDRICAL OBJECTS.

Specification forming part of Letters Patent No. **209,476**, dated October 29, 1878; application filed May 20, 1878.

To all whom it may concern:

Be it known that I, THOMAS C. HARRIS, of Wilmington, New Castle county, State of Delaware, have invented a new and useful Improvement in Grinding and Finishing Cylindrical Objects, of which the following is a specification:

My invention relates to the grinding and finishing of cylindrical objects so as to remove therefrom such irregularities as may exist after the operations of turning and rough-grinding.

In finishing chilled rolls especially, this grinding operation is resorted to for the purpose of removing the annular ridges, which, although scarcely perceptible, detract from the truth and uniform diametrical finish of the rolls. Different kinds of machines have been adopted for this purpose. For instance, the roll to be ground has been caused to revolve in bearings which have such play that the roll is at liberty to move laterally under the action of traversing and revolving grinding-wheels, one on each side of the roll, the wheels being at the proper distance apart for insuring the reduction of the roll to a uniform diameter.

Another plan has been to cause a roll to revolve in fixed bearings while subjected to opposite traversing and revolving grinding-wheels, adjusted to a proper distance apart from each other, in accordance with the desired diameter of the rolls, but capable of yielding together transversely to the roll.

In one instance there must occasionally be a greater pressure of one grinding-wheel than the other against the roll, and in the other case there must at times be a greater pressure of the roll against one grinding-wheel than the other. This might have no evil results if the roll was of uniform hardness throughout; but in almost every chilled roll there are some places not quite as hard as others, and when such places are subjected to a greater pressure against one of the grinding-wheels than is exerted by the other wheel against a hard part of the roll there must necessarily be a greater reduction at this softer place than where the roll is harder.

I have found by practical tests that this evil may be avoided and the best results generally attained by causing the roll to revolve in fixed bearings, and using a revolving and traversing grinding-wheel on one side of the roll and a smooth wheel on the opposite side of the roll.

In the accompanying drawing, Figure 1 is an end view of my machine for finishing chilled rolls and other cylindrical objects; Fig. 2, a transverse section, and Fig. 3 a plan view.

The bed A of the machine should be strong and heavy, and secured to a most substantial foundation, for on the permanence and solidity of the bed depend that unvarying truth of the V-guides *a a* which is essential to the true working of the machine. To the bed A are secured two standards, B B, which are adjustable on the beds to any position which the length of the roll D may suggest. In turning this roll journals *b* are formed on its opposite ends, and these journals are adapted to bearings *d d*, so fitted to the standards B that they can be adjusted laterally therein until the roll is exactly parallel with the V-guides *a a*, the bearings being secured after adjustment by set-screws *e*, or otherwise clamped, so as to be immovable.

Across the bed A of the machine extends a saddle, E, having V-shaped ribs adapted to the similarly-shaped guides in the bed, and this saddle may be traversed longitudinally on the bed by a screw or other appliances—such, for instance, as are used in metal-planing machines.

On the saddle are guides for the carriages F F, which may be adjusted to any position on the saddle, and secured after adjustment, each carriage supporting a slide, G, which may be adjusted from or toward the roll by the screw *h*, as in an ordinary slide-rest.

Each slide has opposite bearings *j j* for a spindle, *i*, and the spindle of one slide carries a grinding-wheel, H, which is driven at great speed by belts passing round pulleys on the spindle.

The spindle *i* of the other slide carries a plain wheel, which bears against and is rotated by the roll, the wheel being perfectly true, and having a periphery which is preferably hardened.

The saddle with its adjuncts is moved along the bed until it is near one of the standards,

so that both the grinding-wheel and the plain wheel I can be brought to bear against the surface of the roll at one end of the same, after which, as the roll rotates slowly and the grinding-wheel revolves rapidly the saddle is moved slowly along the bed of the machine until the two wheels arrive at the opposite end of the turned portion of the roll, when a slight readjustment of the wheels may be required prior to the return of the saddle. The two wheels are thus caused to traverse backward and forward until the roll is properly finished.

No jar can be communicated to the roll by the rapidly-revolving grinding-wheel, owing to the backing afforded by the smooth periphery of the wheel I, which, as before remarked, is rotated by the roll, and hence does not slip against the surface of the same.

There may be more than one grinding-wheel on one side of the roll and more than one smooth wheel or roller on the opposite side; but the arrangement described above has proved to be successful in practice.

No soft part of the roll can be reduced by the grinding-wheel to a greater extent than harder portions, owing to the rigid backing which the wheel I affords.

I claim as my invention—

In a machine for finishing chilled rolls and other cylindrical objects, the combination of the following elements, namely: first, a substantial bed with longitudinal guides; second, fixed bearings on the bed for the journals at the opposite ends of the rolls; and, third, a movable saddle adapted to guides on the bed, and carrying an adjustable grinding wheel or wheels for acting on one side of the roll and an adjustable plain wheel for bearing against the opposite side of the roll, all substantially as set forth.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

THOMAS C. HARRIS.

Witnesses:
EDWD. J. P. GRUBB,
JAMES M. WATSON.