L. R. HEIM.

ROLL GRINDING MACHINE.

APPLICATION FILED JULY 13, 1917.

1,264,930.

Patented May 7, 1918.

4 SHEETS—SHEET 1.

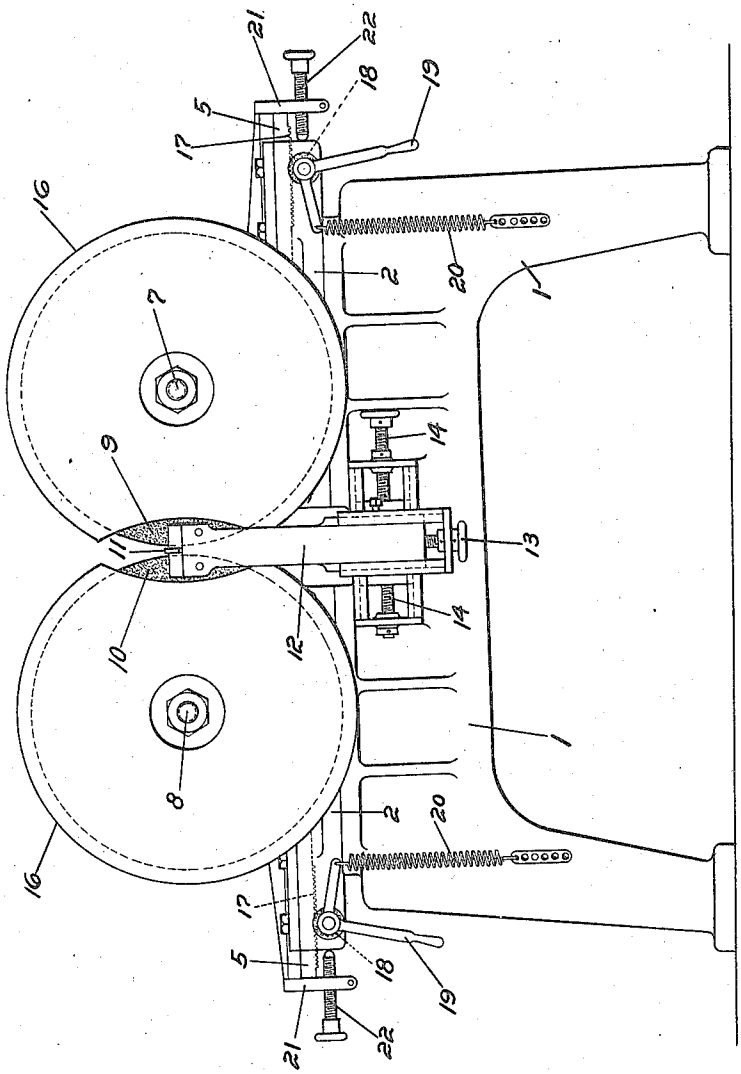



Fig. 1.

WITNESS

Chester F. Hayden

INVENTOR

Lewis R. Heim

BY

A. M. Wooster

ATTORNEY

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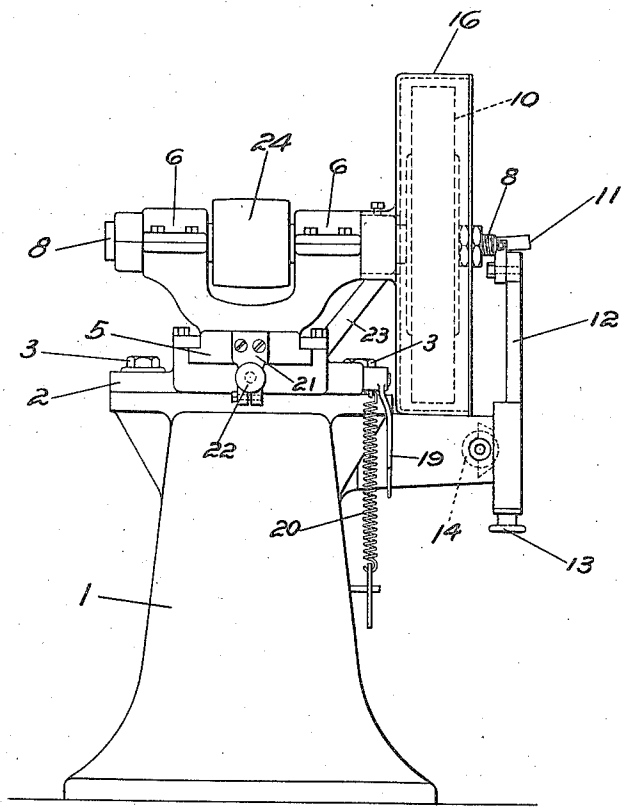
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4 SHEETS—SHEET 2.

Fig. 2




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ATTORNEY

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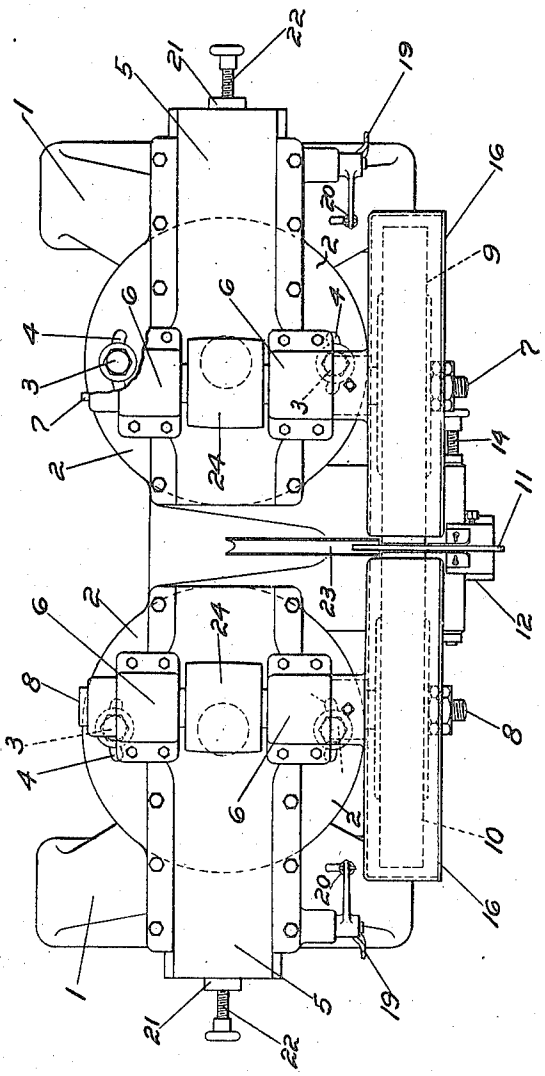
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4 SHEETS—SHEET 3.

Fig. 3




WITNESS

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4 SHEETS—SHEET 4.

Fig. 4

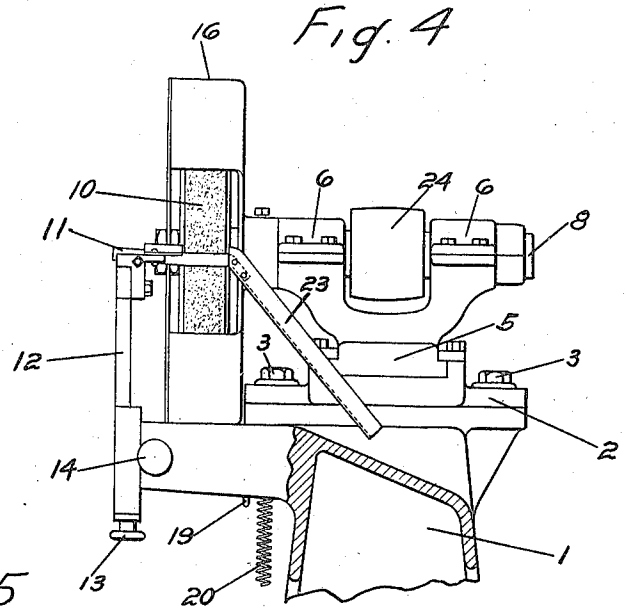



Fig. 5

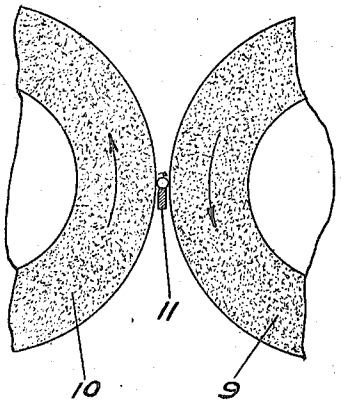
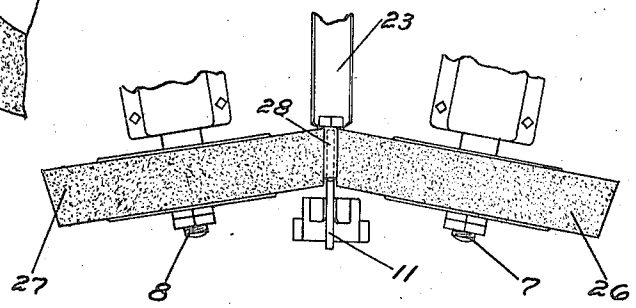



Fig. 6




WITNESS

Austin F. Hayden

INVENTOR

Lewis R. Heim

BY

A. M. Wooster

ATTORNEY

# UNITED STATES PATENT OFFICE.

LEWIS R. HEIM, OF DANBURY, CONNECTICUT, ASSIGNOR TO THE BALL AND ROLLER BEARING COMPANY, OF DANBURY, CONNECTICUT, A CORPORATION OF CONNECTICUT.

## ROLL-GRINDING MACHINE.

1,264,930. Specification of Letters Patent. Patented May 7, 1918.

Application filed July 13, 1917. Serial No. 180,461.

*To all whom it may concern:*

Be it known that I, LEWIS R. HEIM, a citizen of the United States, residing at Danbury, county of Fairfield, State of Connecticut, have invented an Improvement in Roll-Grinding Machines, of which the following is a specification.

This invention has for its object to provide a machine for grinding cylindrical, conical or headed blanks in large quantities by means of a peripherally operative grinding wheel rotating at a relatively high speed, in combination with a regulating wheel rotating at a relatively low speed in the opposite direction, and preferably having its periphery coöperating with the grinding wheel, in combination with a rest or carrier to support the blanks during the grinding operation. The employment of a peripheral grinding wheel, with or without a peripheral regulating wheel, has a number of practical advantages, such for example as simplified feeding of the blanks, since they may be fed in either from the side or from above, better clearance, and it is much easier to maintain the wheels true. Moreover, headed articles such as bolts can be readily ground on this machine either on the shank or on the head, or both, and the shank can be ground close up to the head. Moreover, tapered or conical articles can be readily ground.

The invention comprises generally a base carrying a pair of rotatably adjustable tables, each table carrying a slide and each slide carrying a wheel and its bearings, the bearings being arranged transversely of the slides so that the peripheries of the wheels will properly coact. The slides are preferably yieldingly pressed toward each other, and adjustable stops or gages are provided for limiting this movement, so that the minimum distance between the wheels can be accurately adjusted, thereby insuring accuracy and uniformity of the finished work. The invention lends itself especially to the employment of conical or beveled peripheral wheels, which are especially useful for grinding close to shoulders or heads, and which can also be used for cylindrical or taper grinding upon proper adjustment of the grinding surfaces.

One form of the invention is illustrated in the accompanying drawings wherein,

Figure 1 is a front elevation of the machine,

Fig. 2 is a side elevation seen from the left of Fig. 1,

Fig. 3 is a top plan view,

Fig. 4 is an elevation partly in section looking toward the left in Fig. 1, with the grinding wheel removed.

Fig. 5 is a detail on an enlarged scale showing the relation of the grinding and regulating wheels to the blank support or carrier, and

Fig. 6 is a detail showing peripherally beveled wheels adapted to grinding a bolt.

1 represents a base carrying a plurality of tables 2 adapted to be angularly adjusted relatively to each other by bolts 3 working in slots 4. Each table is provided with a slide 5 carrying bearings 6 and shafts 7, 8 respectively. The shaft 7 is provided with a peripheral grinding wheel 9, and the shaft 8 with a peripheral regulating wheel 10, both of these wheels rotating in the same direction, but owing to being peripheral wheels, their adjacent surfaces rotate in opposite directions, as shown in Fig. 5. Extending between the two wheels is a blank support or carrier 11, mounted as shown in Figs. 1 and 4 on a vertically and laterally adjustable bracket 12. The bracket 12 is adjusted vertically by a set screw 13 and laterally by set screws 14, so as to accurately position the carrier relatively to the wheels. Each wheel may be inclosed by a casing as 16 having openings to expose the wheels.

The slides 5 are each provided with a rack 17, which is engaged by a pinion 18 mounted on the table 2, the pinions 18 being operated by levers 19 and springs 20. The springs act to normally feed the slides toward each other, and in order to limit this movement each slide is provided with a depending lug 21 carrying a gage screw 22 which can be set to engage the table 2 to limit the movement of the slides. While the slides for both the grinding and the regulating wheels are shown as similarly mounted, one wheel could be fixed, and still permit of a backward yielding motion sufficient to accommodate over size blanks with-

out danger of either springing the wheel shafts, or breaking the wheels. 23 is a discharge chute for the ground blanks, and 24 is a driving pulley for each wheel.

In Fig. 6, the shafts 7, 8 are similarly arranged as before, but the grinding and regulating wheels 26, 27 are beveled as shown, so as to grind the shank of a bolt as 28, close to the head, the bolt being supported while being ground on the carrier 11. Where conical or beveled grinding wheels are used, the tables 2 are correspondingly adjusted, either to bring the peripheries of the wheels parallel for cylindrical grinding, or inclined, in case of taper grinding. Tapers can also be ground with cylindrical wheels by properly setting the tables, and where it is not necessary to grind accurately close to the head, bolts can be ground with cylindrical wheels. It will also be seen that ordinary cylindrical articles such as rollers for bearings or other cylindrical articles can readily be ground. The blanks can be fed in by hand or in any other suitable manner, either from the side along the carrier 11 in the case of cylindrical blanks, or from above, either for cylindrical, tapered or headed blanks.

By this invention, a wide variety of blanks can be rapidly and accurately ground, and owing to the rapid increase of clearance between two peripheral wheels, the ground blanks readily feed themselves out without clogging. Further advantages reside in the readiness with which the wheels can be trued, the adjustability of the machine, and the simplicity. Various changes and modifications can be made in the details herein described without departing from the scope of the appended claims.

What is claimed, is:

1. A grinding machine comprising a rotary peripheral grinding wheel having a relatively high speed, an oppositely rotating regulating wheel having a relatively low speed and coöperating with said peripheral grinding wheel, means between said wheels for supporting the blanks while being ground, and means for yieldingly pressing one of said wheels toward the other.

2. A machine for grinding cylindrical or like blanks comprising a peripheral grinding wheel mounted to be bodily movable in one direction to a predetermined position, a peripheral regulating wheel having a relatively low speed located adjacent the predetermined position of said grinding wheel, a carrier, for supporting the blanks, mounted independently of and between said wheels, and means for yieldingly pressing said wheels toward each other.

3. A machine for grinding cylindrical or like blanks comprising relatively fast and slow grinding and regulating wheels having their peripheries coöperatively rotating in opposite directions, means for yieldingly forcing said wheels toward each other, means for limiting the movement of one or both of said wheels toward the other, and a blank-supporting carrier between said wheels.

4. A machine for grinding cylindrical or like blanks comprising a peripheral grinding wheel rotating at a relatively fast speed, a peripheral regulating wheel adjacent said grinding wheel, and rotating at a relatively low speed in the opposite direction, said wheels being relatively yieldingly mounted, spring-controlled means for forcing said wheels toward each other, a blank support, and means for limiting the movement of said wheels toward each other.

5. The combination with a base, of a pair of slides mounted thereon and movable toward and from each other, a relatively fast moving grinding wheel mounted on one of said slides at one side thereof, a relatively slow moving regulating wheel similarly mounted on the other slide so that the peripheries of said wheels coöperate with each other, means for moving said wheels toward each other, limiting means, and a vertically and longitudinally adjustable carrier mounted on said base and extending between the peripheries of said wheels.

6. The combination with a base, of a pair of tables rotatably mounted thereon, means for locking said tables, a slide on each table mounted to move toward and from each other, bearings on said slides arranged transversely thereof, a wheel on each shaft arranged to have coöperating peripheries, and a carrier between said wheels.

7. The combination with a base, of a pair of tables rotatably mounted thereon, means for locking said tables, a slide on each table mounted to move toward and from each other, bearings on said slides arranged transversely thereof, a wheel on each shaft arranged to have coöperating peripheries, and a carrier between said wheels, said wheels rotating in opposite directions at different rates of speed.

8. A machine especially adapted for grinding the shanks of headed blanks, such as bolts, comprising a wheel having a grinding periphery driven at a relatively high speed, an oppositely moving regulating wheel driven at a relatively low speed, a blank-support between said wheels, shafts by which said wheels are carried, bearings for said shafts, and spring-pressed slides on which said bearings are mounted.

9. A machine especially adapted for grinding the shanks of headed blanks, such as bolts, comprising a wheel having a grinding periphery driven at a relatively high speed, an oppositely moving regulating wheel driven at a relatively low speed, a blank-support between said wheels, shafts

by which said wheels are carried, bearings for said shafts, spring-pressed slides on which said bearings are mounted, and positioning means for limiting the movement of one or both of said slides toward the other.

10. A grinding machine comprising a base having a pair of rotatably adjustable tables, a slide carried by each table, bearings and a shaft extending transversely of each slide, a wheel on each shaft arranged so that their peripheries coact, and a carrier supported by the frame and located between said wheels, one of said wheels being a regulating wheel and moving at a lower speed opposite to the grinding wheel.

In testimony whereof I affix my signature.

LEWIS R. HEIM.

Copies of this patent may be obtained for five cents each, by addressing the Commissioner of Patents, Washington, D. C.