

O. P. NYSTROM.
FURNACE TOP BURRING MACHINE.
APPLICATION FILED MAR. 31, 1917.

1,288,147.

Patented Dec. 17, 1918.
2 SHEETS—SHEET 1.

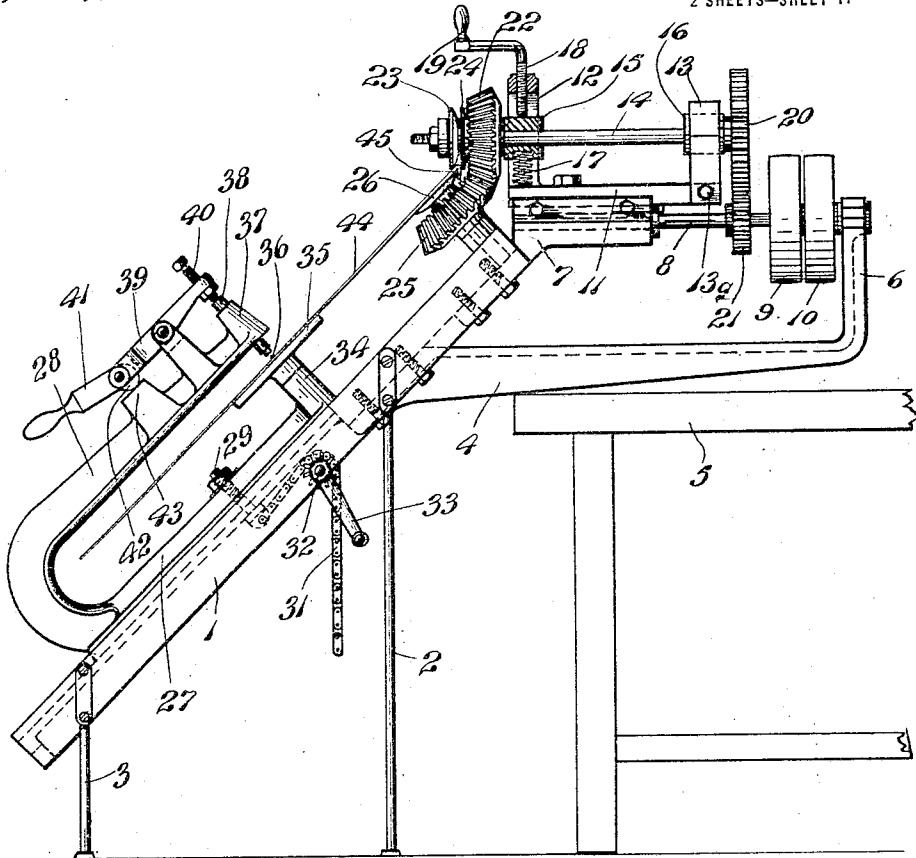


Fig. 1.

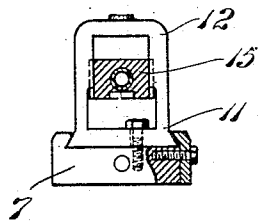


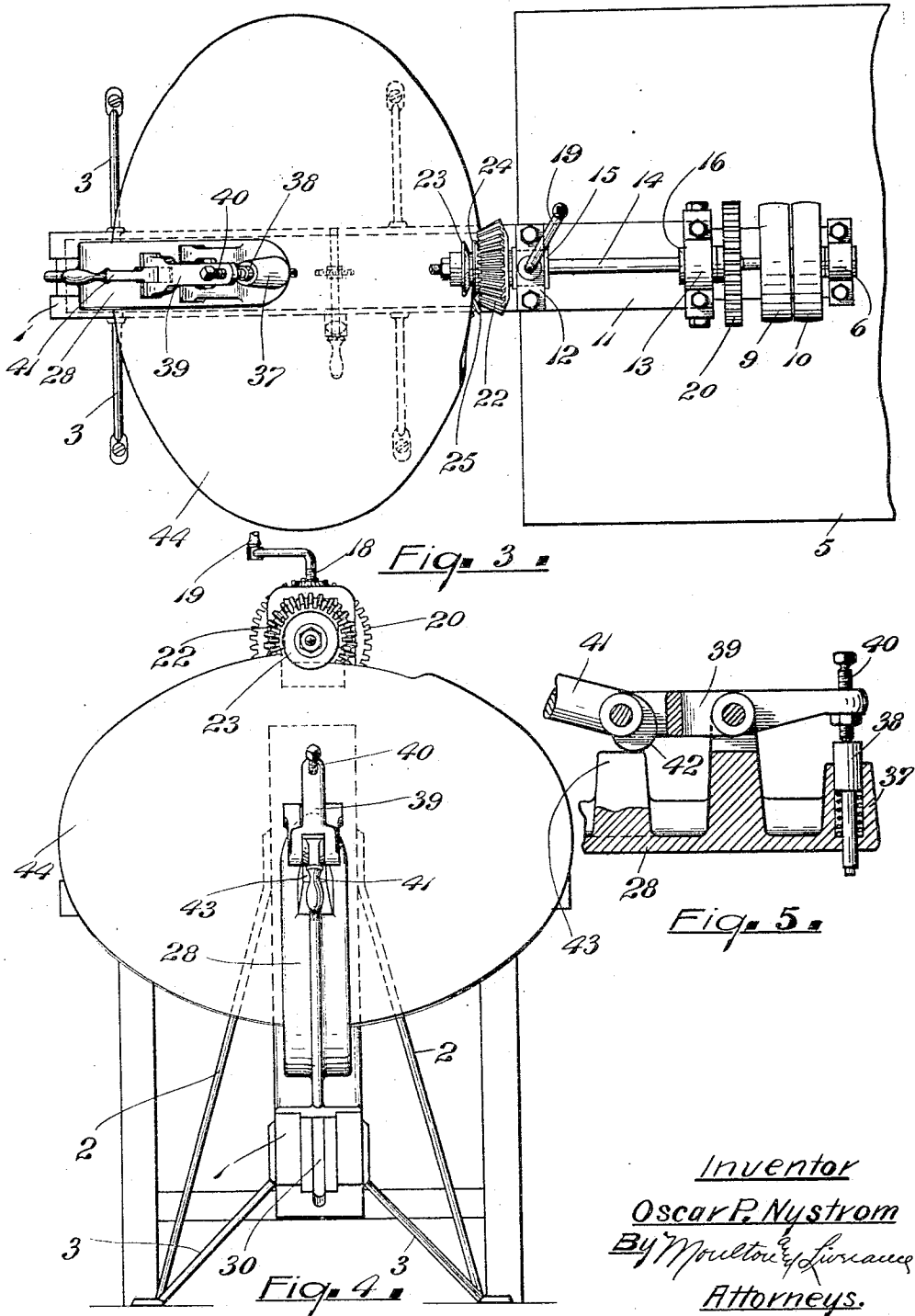
Fig. 2.

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UNITED STATES PATENT OFFICE.

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FURNACE-TOP-BURRING MACHINE.

1,288,147.

Specification of Letters Patent.

Patented Dec. 17, 1918.

Application filed March 31, 1917. Serial No. 159,049.

To all whom it may concern:

Be it known that I, OSCAR P. NYSTROM, a citizen of the United States of America, residing at Holland, in the county of Ottawa and State of Michigan, have invented certain new and useful Improvements in Furnace-Top-Burring Machines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to a machine for use in forming an annular lip or bur at the edges of a circular plate of metal, which, after being thus formed, is used in the construction of the upper part of a furnace casing.

My invention has for its object and purpose the provision of a machine of this character which can be used to quickly, effectively and efficiently operate upon circular plates of sheet metal and form a downwardly and inwardly extending bur around the periphery thereof. Further objects and purposes of the invention consist in the provision of many novel details of construction and arrangements of parts for attaining this and other ends not specifically enumerated but which will appear from the following description.

A preferred embodiment of the invention is shown in the accompanying drawings in which,

Figure 1 is a side elevation of the machine, Fig. 2 is a detail of construction partly in front elevation and partly in section.

Fig. 3 is a plan view of the machine,

Fig. 4 is a rear elevation thereof, and

Fig. 5 is an enlarged section of a detail of construction of the machine.

Like reference characters refer to like parts throughout the several views of the drawings.

In the construction of the machine a base bar 1 is provided which is located at an angle to the vertical and horizontal, being supported by front and rear supporting legs 2 and 3 respectively. An arm 4 at its rear end is connected to the under side of the bar 1 and extends over a table 5, its rear end being turned upwardly as indicated at 6. The table 5 is no essential part of the present invention and may, if desired, be dispensed

with entirely though in practice it has value as steadying the arm 4 against vibration.

A bracket 7 is permanently secured at the upper end of the bar 1 with its major portion located horizontally and in the rear end of which a bearing is made for one end of a shaft 8 which, at its opposite end, is journaled in the upper end of the arm 6. Fixed and loose pulleys 9 and 10 are located on the shaft 8.

A base plate 11 is slidably mounted upon the bracket 7 and may be adjusted a limited amount with respect thereto if desired. A stirrup 12 is cast integral with the plate and extends upwardly from its front end while at the opposite end of the plate a member 13 is pivotally mounted about a pivot 13^a and extends upwardly from said plate. A shaft 14 is disposed lengthwise of and above the base plate and is journaled in a loose bearing 15 adjacent its front end and in a relatively fixed bearing 16 at its rear end, the bearing 15 being slidably mounted between the sides of the stirrup member 12 while bearing 16 is fixed on the member 13 heretofore described. Between the lower side of the bearing 15 and the upper side of the plate 11 a coil spring 17 is interposed which has a tendency to elevate the bearing and shaft. A screw 18 threads through the upper part of stirrup 12 its lower end engaging against the upper side of bearing 15. The screw is formed with an operating handle 19 for ready manual operation. At its rear end shaft 14 is provided with a gear 20 which meshes loosely with a pinion 21 on the shaft 8. Adjacent its front end and in front of the bearing 15 the shaft carries a beveled gear 20 integral with and in front of which are a pair of dies 23 and 24 of the formation shown. The die 23 has a rear convex face and the die 24 an adjacent vertical front face whereby a groove is made between them.

A beveled gear 25 is rotatably mounted on the upper end of the base 1 integral with and above which is a die 26 of the formation shown. In one position gears 22 and 25 are adapted to mesh, and the edge of die 26 in such position is operatively disposed with relation to the annular notch or groove between dies 23 and 24 to form the bur on a circular sheet metal plate as will hereafter be described.

A work holder member of substantially U-shape formation is mounted upon the base 1 including lower and upper arms 27 and 28 the former of which may be fixed with respect to the base 1 by means of a bolt and nut 29 as shown. The bolt passes through a longitudinal slot 30 formed in the bar 1 so that the work holder may be adjusted to different positions. As one means of easily effecting this a sprocket chain 31 is connected to the lower end of the bolt 29 passing over a suitable sprocket wheel on the shaft 32 which is mounted on the bar 1 and which may be turned through a medium of a crank 33.

The arm 27 is formed with a bearing 34 on which a disk 35 is rotatably mounted. The disk is provided with a center point 36. The upper arm 28 likewise at its upper end is formed with a bearing 37 in which a plunger 38 is slidably mounted the lower end of which comes directly above the center point 36. Normally this plunger is spring actuated to move away from the center point. A lever 39 is pivotally mounted between its ends on and above the arm 28. Its upper end carries a screw 41 adapted to bear against the upper end of the plunger 38. The lower end of the lever 39 carries a pivotally mounted handle 41 one end of which is formed with a cam 42 adapted to bear against the upper side of a base 43 cast integral with the arm 28 so that on upper movement of the handle the upper end of lever 39 is depressed forcing the plunger 38 toward the center point 36.

This machine, as stated, is used to form a continuous downwardly and inwardly extending bur around a circular plate of sheet metal. In practice a circular plate, indicated at 44, having been centered is placed upon the disk 35 and is readily centered thereon. The edge of the plate is designed to come to a point a short distance beyond the upper edge of the die 26. In placing the plate on the machine it is necessary to turn crank 19 so that the bearing 15 is elevated by spring 17. After the plate has been placed upon the disk 35 the crank 19 is operated forcing the gear 22 into engagement with the gear 25 and bending the edge of the plate 44 between the dies 23, 24 and 26. On driving the shaft 8 rotation of shaft 14 and of gears 22 and 25 occurs whereby the plate is turned about its center and at the same time a downwardly and inwardly extending bur such as indicated at 45 is formed around the plate.

A machine of the character described may be operated very effectively and plates shaped as described with great rapidity. These plates, as will be noted with reference to my co-pending application Serial No. 159,048 filed March 31, 1917, are used as the upper horizontal member to the top section

of a furnace casing. The machine is of relatively simple structure and is very durable and efficient for the purpose described.

I claim:—

1. In a machine of the character described, a horizontal shaft, means normally tending to elevate the front end of the shaft, a beveled gear fixed on said front end of the shaft, a circular die member having an annular groove therein fixed on the shaft in front of the beveled gear, a support positioned at an angle to the horizontal, a beveled gear rotatably mounted thereon and meshing with the first gear, a circular die fixed to and above the second gear coacting with the first die to form a downwardly and inwardly extending bur at the edges of a circular sheet of metal, means to drive the shaft and manually operable means to force the front end of the shaft downwardly to bring the gears in driving engagement with each other and the dies in operative relation to each other.

2. In a machine of the character described, a bar, means to support the same at an angle to the vertical, a work holder mounted on the bar and including a rotatable disk, a gear rotatably mounted at the upper end of the bar, a circular die having a flat upper face and an inclined under face secured above and rotatable with the gear, a horizontal shaft rotatably mounted above said gear, means to raise and depress the front end of the shaft, a gear on the front end of said shaft meshing with the first gear, a second die provided with an annular groove secured to said shaft, the groove being located directly above the edge of the first die, and means to drive the shaft.

3. In combination, a bar located and supported at an angle to the vertical, a U-shaped member mounted on the upper side of the bar with one arm lying directly over the other, a disk rotatably mounted at the upper end of the lower bar, a plunger slidably mounted at the upper end of the upper arm with one end coming directly above the center of the disk, means normally tending to move the plunger away from the disk, a lever pivotally mounted between its ends on said upper arm, an adjusting screw in one end of the lever engaging against the plunger, means to operate the lever to depress the plunger, coacting die members rotatably mounted at the upper end of the bar adapted to receive the edges of a circular sheet of metal held on the disk by the plunger and turn a bur on said sheet, and means to drive the die members to form a bur entirely around the sheet, substantially as described.

4. In combination, a bar located and supported at an angle to the vertical, a U-shaped member mounted on the upper side of the bar with one arm lying directly over

the other, a disk rotatably mounted above and at the upper end of the lower bar, a plunger slidably mounted at the upper end of the upper arm with the lower end thereof positioned above the center of the disk, a spring normally tending to elevate the plunger, a lever pivotally mounted between its ends above said upper arm, a screw threading through the upper end of the lever against the upper end of the plunger, a hand lever pivotally connected to the lower end of the lever, and a cam formed on said lever engaging with the upper arm whereby on operation of the hand lever in one direction the plunger is forced toward the disk, substantially as described.

5. In combination, a bar located and supported at an angle to the vertical, a gear rotatably mounted at the upper end of the bar, a circular die having a flat upper face and an inclined under face whereby the die tapers to a relatively thin edge at its periphery secured to and movable with the gear, a bracket connected to the upper end of the bar and extending horizontally therefrom, a base adjustably mounted on the bracket, a stirrup member projecting upwardly from the front end of the base, a bushing loosely mounted between the sides of the stirrup member and the base, a screw

threading through the stirrup member against the upper side of the bushing, a member pivotally connected to and extending upwardly from the opposite end of the base, a horizontal shaft rotatably mounted in said bushing and member, a gear on the shaft in front of the bushing adapted to mesh with the first gear, and provided with an annular groove directly above the edge of the first die, and means to drive the shaft, substantially as described.

6. In combination, a bar located and supported at an angle to the vertical, a work holder mounted on the upper side of the bar and adjustable lengthwise thereof, means on said work holder to hold a circular sheet of metal, a circular die tapered to a relatively thin edge rotatably mounted at the upper end of the bar, a second circular die rotatably mounted above the first die and having annular groove located directly above the edge of said first die, means to drive the dies in unison, and means to move the second die away from the first die to permit the introduction of the edges of said sheet of metal between them, substantially as described.

In testimony whereof I affix my signature.

OSCAR P. NYSTROM.