C. GRAY.

TAP FOR CUPOLAS.

APPLICATION FILED APR. 29, 1920.

**1,360,520.** **Patented Nov. 30, 1920.**

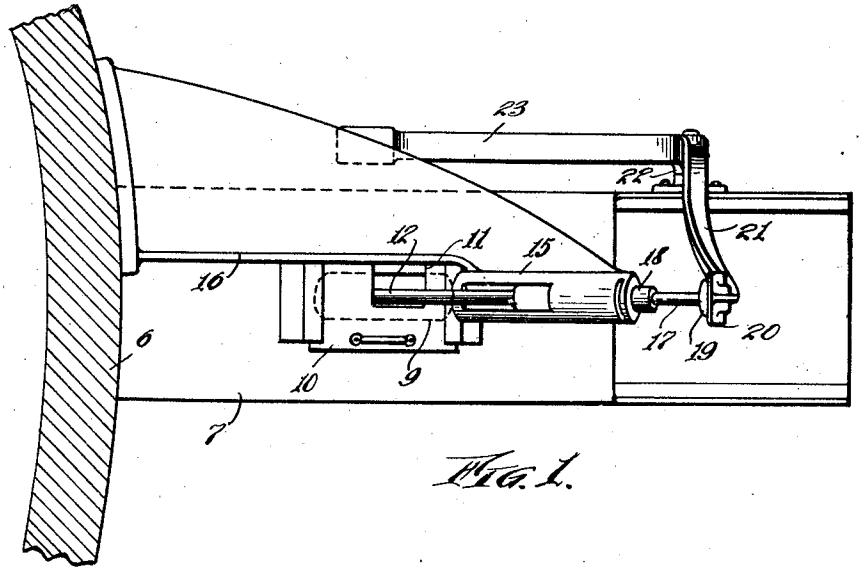



FIG. 1.

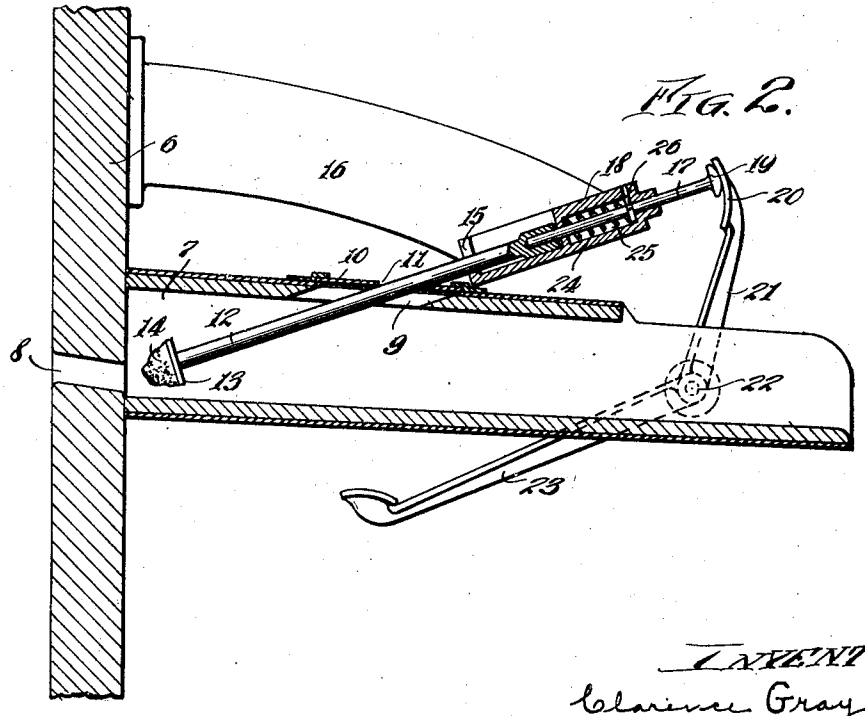



FIG. 2.

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# UNITED STATES PATENT OFFICE.

CLARENCE GRAY, OF CLEVELAND, OHIO.

## TAP FOR CUPOLAS.

1,360,520. Specification of Letters Patent. Patented Nov. 30, 1920.

Application filed April 29, 1920. Serial No. 377,511.

*To all whom it may concern:*

Be it known that I, CLARENCE GRAY, a citizen of the United States, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new and useful Improvements in Taps for Cupolas, of which the following is a specification.

This invention relates to taps for cupolas, and has for its object to provide an improved device for opening and closing the tap hole of a cupola furnace, the present device being used instead of the ordinary ball of wet clay applied by hand for that purpose.

The object of the invention is to provide an improved device which may be operated by the foot of a workman, without danger of flying sparks or the like, which sometimes cause serious injury.

The invention is illustrated in the accompanying drawings in which Figure 1 is a top plan view of the device. Fig. 2 is a vertical longitudinal section.

In the drawings 6 indicates the wall of a cupola furnace and 7 a trough leading from the tap hole 8 in the furnace wall. This trough is lined with fire brick as usual. The top of the trough is provided with an opening 9 which may be substantially covered by a sliding plate 10 having an opening 11 through which works the rod 12 provided with a head 13 which carries a mass of wet fire clay 14 by which the tap hole is plugged when the rod is advanced. The rod works in a guide 15 supported by a bracket 16 on the wall of the furnace and is connected at its rear end to a smaller rod 17 working through the guide 18 at the end of the bracket. The rod 17 has a head 19 in contact with a shoe 20 at the end of the lever 21 which is pivoted at 22 to the side of the trough and has a pedal 23 to receive the foot of the operator. A spring 24 is coiled around the rod 17 and inclosed in a cylinder 25 supported by a bracket 16, and said spring presses against a collar 26 fixed to the rod and acts to retract the plug from the tap hole.

In use, the rod and plug are normally retracted by the spring 17, the tap hole then being open. To close the tap the workman presses on the pedal 23, and this advances the rod 12 to stop or close the tap hole by means of the clay 14.

The device forms a convenient means for controlling the tap hole of a furnace and has manifest advantages over the old hand device.

What I claim as new is:

1. In a tapping apparatus for furnaces, the combination of a trough leading from the tap hole, a fixed bracket above the trough, having a guide at the outer end thereof, a tap rod slidable in said guide toward and from the tap hole, a spring mounted in the guide and bearing against the tap rod to retract the same, and a foot lever pivoted to the side of the trough and bearing against the outer end of the rod to advance the same.

2. In a tapping apparatus for furnaces, the combination with a trough leading from the tap hole, said trough having an opening in the top thereof, of a tap rod slidable through said opening to and from the tap hole, a removable cover for said opening, and means to advance and retract the rod.

3. In a tapping apparatus for furnaces, the combination of a trough leading from the tap hole, a bracket projecting above the trough and having a guide, a tap rod slidable in said guide toward and from the tap hole, a spring tending to retract said rod, and a lever pivoted to the side of the trough and having an upper arm bearing against the outer end of the tap rod and a lower arm provided with a pedal.

In testimony whereof I do affix my signature in presence of two witnesses.

CLARENCE GRAY.

Witnesses:

JOHN A. BOMMHARDT,

ROBERTSON BOWIE.