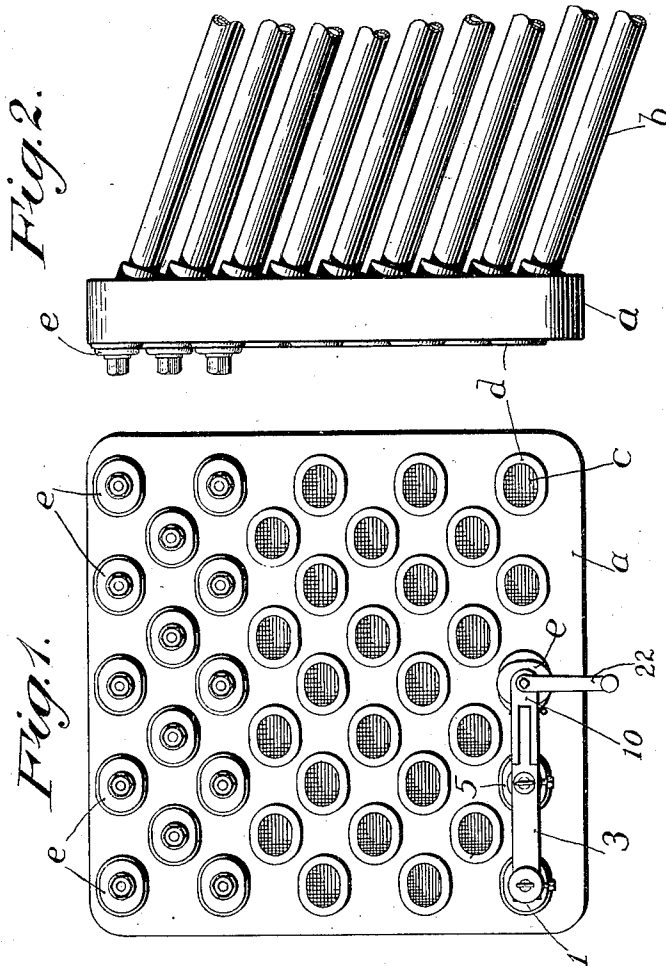


C. E. HART.
HAND PORTABLE GRINDING DEVICE.
APPLICATION FILED JAN. 24, 1910.

1,009,243.

Patented Nov. 21, 1911.

2 SHEETS-SHEET 1.



Witnesses:

S. S. Grotta.
Witness.

Inventor:

CHARLES E. HART.

C. E. Hart
his attorney

1,009,243.

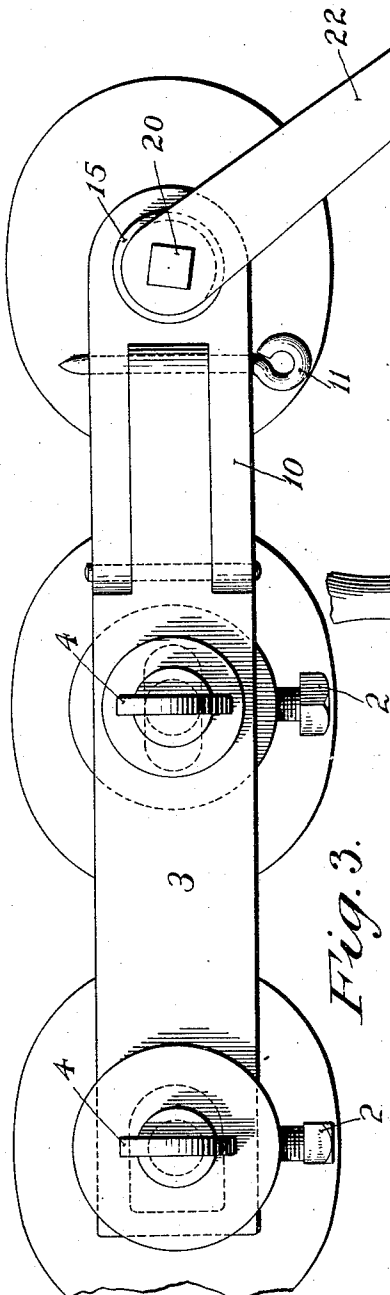


Fig. 3.

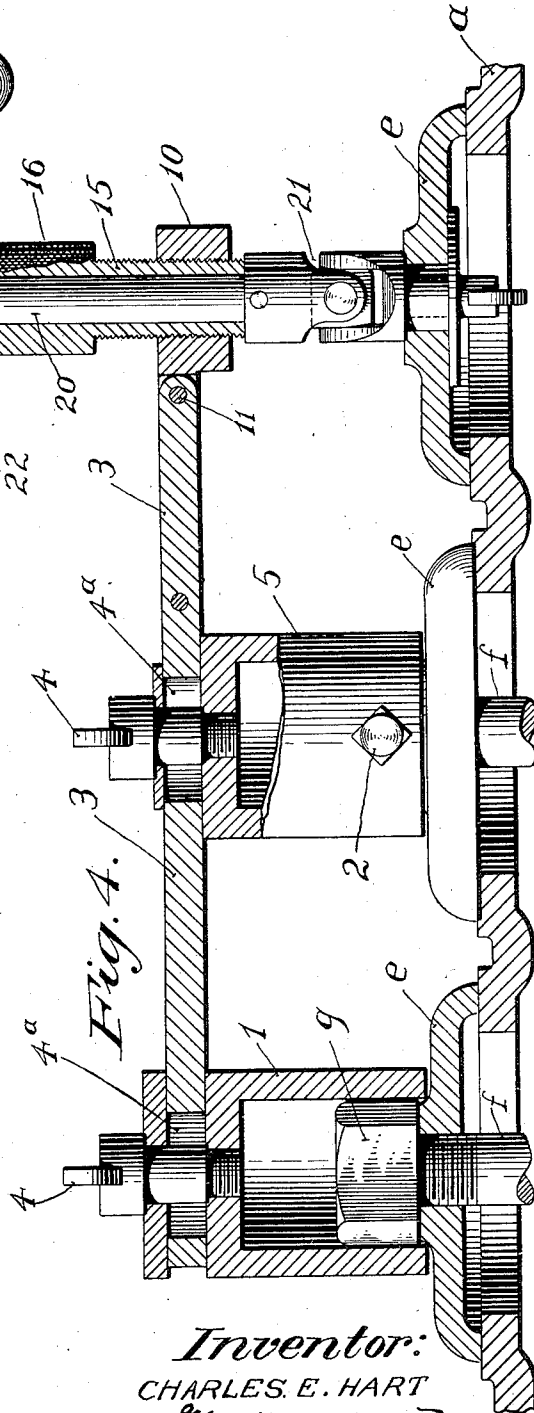


Fig. 4.

Witnesses:

S. S. Grotta
A. J. J. J. J.

Inventor:

CHARLES E. HART
by H. E. Hart
his attorney.

UNITED STATES PATENT OFFICE.

CHARLES E. HART, OF NEW BRITAIN, CONNECTICUT.

HAND PORTABLE GRINDING DEVICE.

1,009,243.

Specification of Letters Patent.

Patented Nov. 21, 1911.

Application filed January 24, 1910. Serial No. 539,707.

To all whom it may concern:

Be it known that I, CHARLES E. HART, a citizen of the United States, and a resident of New Britain, in the county of Hartford and State of Connecticut, have invented certain new and useful Improvements in Hand Portable Grinding Devices, of which the following is a specification.

The apparatus herein illustrated and described is designed for the purpose of grinding and fitting a header cap on a header of a water-tube boiler.

The object of the invention is to provide a grinding device by means of which the two metallic surfaces which are butted together to form a steam and water tight joint may be ground one with the other in order to get an accurate fit, the device providing a means for accomplishing the work quickly and with accuracy, thus materially reducing the cost of up-keep of a boiler of this type and at the same time insuring better joints than is possible with the usual modes of fitting.

The device is inexpensive and thoroughly efficient.

Referring to the drawings—Figure 1 is a front view of a header showing some of the header caps removed and the device in place ready for use. Fig. 2 is a side view of a header and shows some of the tubes. Fig. 3 is a detail plan view of the device. Fig. 4 is a view partly in central vertical section of the device showing it in position ready for use.

Referring to the Figs. 1 and 2 of the drawings *a* denotes the header into one side of which are secured the ends of the tubes *b*. In the front of the header opposite each tube is an aperture *c* through which access can be had to the tubes for cleaning, repairing or removing them. These apertures are usually surrounded by a boss *d* upstanding slightly from the face of the header. Caps *e* close these apertures and are held in place by an anchor-bolt *f* which engages the inner wall of the header, passes through the aperture and a hole in the cap and engages nuts *g* by means of which the cap is firmly clamped in place.

In order to insure a steam-tight joint which will stand hard usage and high pressures it is preferable to have the metal face

of the header cap fit directly onto the metal face of the boss and to insure the tight joint between these two metal surfaces it is necessary that they be ground accurately and truly. The device which will now be described provides a means for doing this expeditiously and accurately.

In the embodiment of the invention illustrated in the drawings the device consists of a pair of bonnets 1—5, which are adapted to fit over the nuts of the caps adjacent to and in line with that joint which is to be ground. These bonnets are secured in position as by means of set-screws 2. A bar 3 extends across the tops of the bonnets 1—5 and is held in position by the set-screws 4 which take into the ends of the bonnets. The apertures in the bar through which these set-screws pass are enlarged, as at 4^a in order to permit adjustment of the bonnets toward or away from one another in order to accommodate any variation between any pair of nuts to which the bonnets are to be secured and also to permit of the use of the device diagonally of the header.

One end of the bar 3 projects beyond the bonnet 5 and has pivoted to it a latch-plate 10 which may be locked in operative position by the pin 11. Through the end of this latch-plate is a threaded hole in which is mounted a threaded tubular sleeve 15 having a knurled head 16 by means of which it can be turned to cause it to move through the latch-plate in either direction. Passing through this sleeve is a spindle 20 to the inner end of which is secured one member of a universal joint 21, the opposite member of the universal joint carrying a stud on which a header cap *e* can be secured. At the opposite end of the spindle is a crank 22 or other means for rotating the spindle.

In mounting the device ready for use the two bonnets 1—5 are first fitted onto the nuts which are adjacent to and in line with the joint to be ground; the pin 11 is removed so that the latch-plate can be swung up away from the header and the cap is secured to the inner member of the universal joint. The surface of the cap and of the boss are now dampened and covered with powdered emery or other suitable abrasive material, the latch-plate is swung down and locked into position by the pin 11, the sleeve 15 is

run in until the cap bears with suitable pressure on the boss, and then the cap is turned by means of the crank 22, or if desired a motor can be secured to the outer end of the spindle in place of the crank. The presence of the universal joint makes it unnecessary to set the device up perfectly true and permits of bringing the cap to bear squarely on the boss; in this way provision is made for grinding these two surfaces one with the other, insuring a perfect fit or joint between them. As the grinding operation continues the pressure can be varied by means of the sleeve 15. The results obtained by this method of procedure are far superior to those obtained when the cap and the boss are separately ground.

I do not desire to be understood as limiting myself to the embodiment of the invention illustrated in the drawings. I am aware that it is susceptible of modifications and alterations and I have intended merely to illustrate and describe one embodiment of the invention for the purpose of making a full disclosure of an operative structure.

I claim:—

1. A hand-portable grinding device for fitting a header cap onto its seat on the header of a water-tube boiler, said device comprising a pair of bonnets adapted to be secured in place on said header, a supporting bar adjustably secured to said bonnets, a latch-plate pivoted to one end of said supporting bar, means for locking said latch-plate in operative position, a rotatable spindle carried by said latch-plate, a stud adapted to hold a header cap, a universal joint connecting said stud and said spindle, and means for rotating said spindle.

2. A hand-portable grinding device for fitting a header cap onto its seat on the header of a water-tube boiler, said device comprising a pair of bonnets adapted to be secured in place on said header, a supporting bar adjustably secured to said bonnets, a latch-plate pivoted to one end of said supporting bar, means for locking said latch-plate in operative position, a sleeve passing through and having a threaded engagement with said latch-plate, a spindle extending through said sleeve, a stud to which a header cap may be secured, a universal joint connecting said stud and said spindle, and means for rotating said spindle.

3. A hand-portable grinding device for fitting a header cap onto its seat on the header of a water-tube boiler comprising an adjustable support detachably connected to the header, a latch plate hinged to said support, a grinding element, an operating element for the grinding element, said operating element carried by the latch plate, means for locking the latch plate to the support, a universal joint connection between

said elements, and means carried by the operating element and engaging the universal joint connection for applying pressure to the grinding element.

4. A hand-portable grinding device for fitting a header cap onto its seat on the header of a water-tube boiler comprising an adjustable support and provided with means for detachably connecting it to two points of the header, a latch plate hinged to said support, a grinding element, an operating element for the grinding element, said operating element carried by the latch plate, means for locking the latch plate to the support, a universal joint connection between said elements, and means whereby pressure can be exerted on said grinding element for maintaining it in contact with the work operated upon.

5. A hand-portable grinding device for the cap seats on the header of a water-tube boiler comprising supporting means adapted to be detachably secured to the header, a supporting bar adjustably secured to said means, a latch plate pivoted to one end of said supporting bar, means for locking said latch plate in operative position, a rotatable spindle carried by said latch plate, a stud adapted to hold a header cap, a universal joint connecting said stud and said spindle, and means for rotating said spindle.

6. A hand-portable grinding device for the cap seats on the header of a water-tube boiler comprising the combination with a cap adapted to rest against its seat, of a support to which the cap is connected, an operating element, and a universal joint connection between the support and the operating element whereby on the operation of the latter the cap is rotated on its seat in order that the two contact surfaces are ground together one by the other thereby providing a steam and water tight joint.

7. A hand-portable grinding device for the cap seats on the header of a water-tube boiler comprising the combination with a cap adapted to rest against its seat, of a support to which the cap is connected, an operating element, a universal joint connection between the support and the operating element whereby on the operation of the latter the cap is rotated on its seat in order that the two contact surfaces are ground together one by the other thereby providing a steam and water tight joint, and means for exerting pressure on the universal joint connection whereby the cap is forced against the seat during the rotation of the cap.

8. A hand-portable grinding device for the cap seats on the header of a water-tube boiler comprising a supporting means adapted to be detachably secured to the header, a rotary spindle carried by said support, a stud carrying the header cap adapted to en-

gage its seat, a universal joint connecting
said stud and spindle, means for turning the
spindle thereby rotating the cap on its seat
so that the two contacting surfaces are
5 ground together one by the other, thereby
providing a steam and water tight joint, and
means for exerting pressure on the cap to

force it against its seat during the rotation
of the cap.

CHARLES E. HART.

Witnesses:

PHILO. R. SWIFT,
F. CHESTER HALE.

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