No. 766,713. PATENTED AUG. 2, 1904.

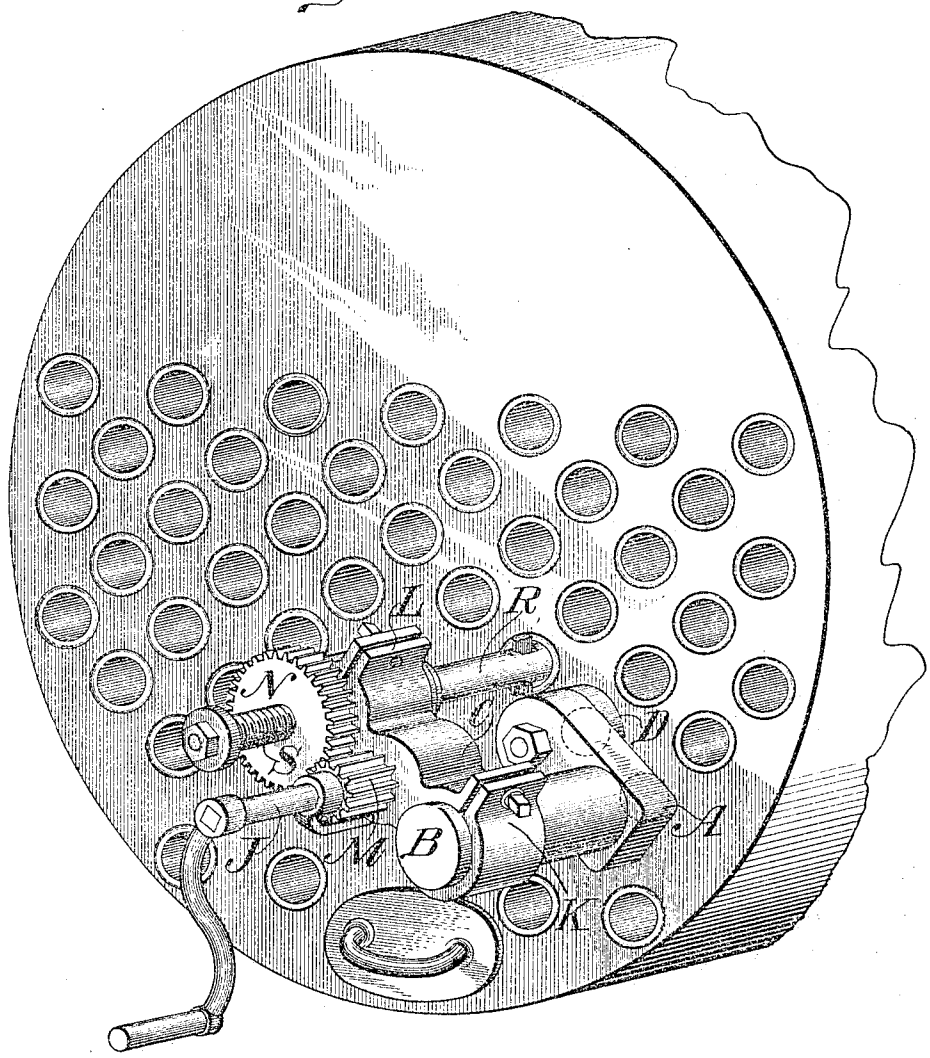
C. E. LOETZER.

MACHINE FOR CUTTING OUT, EXPANDING, OR BEADING BOILER FLUES.

APPLICATION FILED FEB. 3, 1903.

NO MODEL. 4 SHEETS—SHEET 1.

Fig. 1.



WITNESSES

W. Lee Holmes

M. E. Goodrich.

INVENTOR

Christian E. Loetzer

By Julian C. Dowell & Son

his Attorneys

No. 766,713. PATENTED AUG. 2, 1904.

C. E. LOETZER.

MACHINE FOR CUTTING OUT, EXPANDING, OR BEADING BOILER FLUES.

APPLICATION FILED FEB. 3, 1903.

NO MODEL. 4 SHEETS—SHEET 2.

Fig. 2.

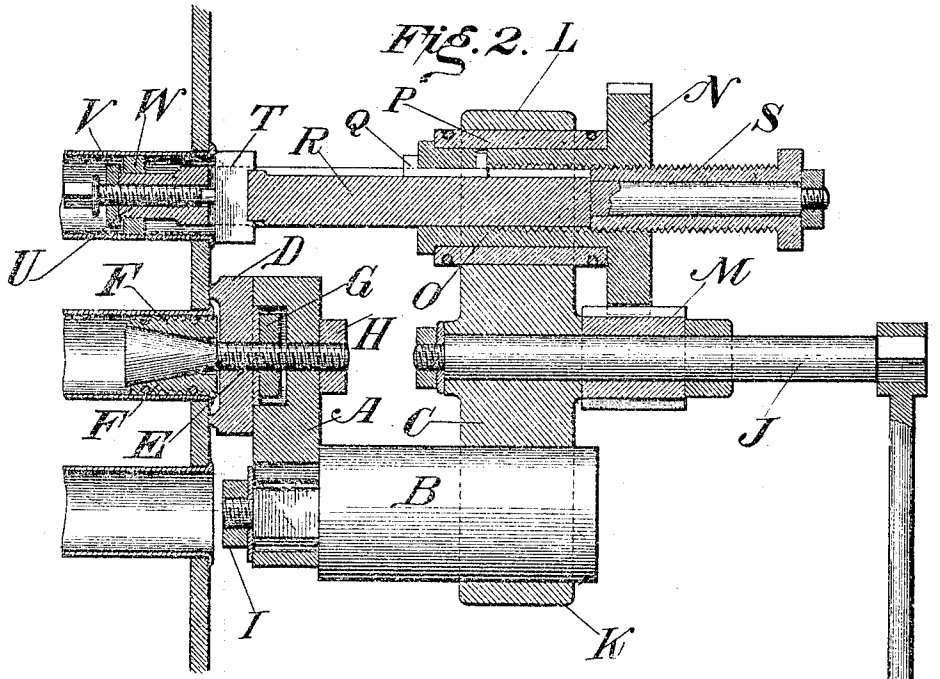


Fig. 3.

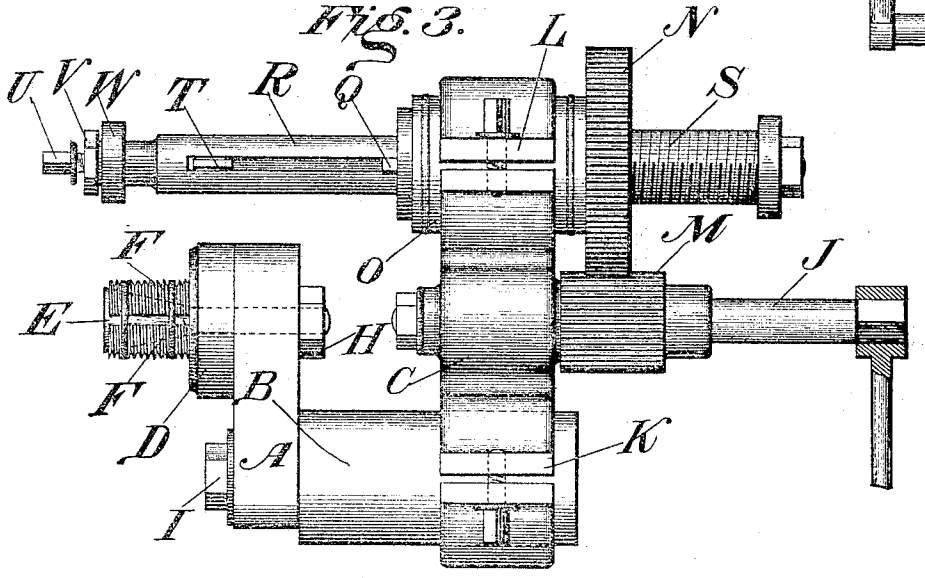
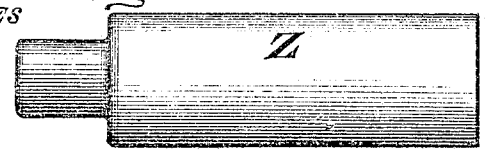


Fig. 4.



WITNESSES

H. Lee Johns

M. E. Goodrich.

INVENTOR

Christian E. Loetzer,

By Julian C. Dowell & Son.

his Attorneys.

No. 766,713. PATENTED AUG. 2, 1904.

C. E. LOETZER.

MACHINE FOR CUTTING OUT, EXPANDING, OR BEADING BOILER FLUES.

APPLICATION FILED FEB. 3, 1903.

NO MODEL. 4 SHEETS—SHEET 3.

Fig. 5.

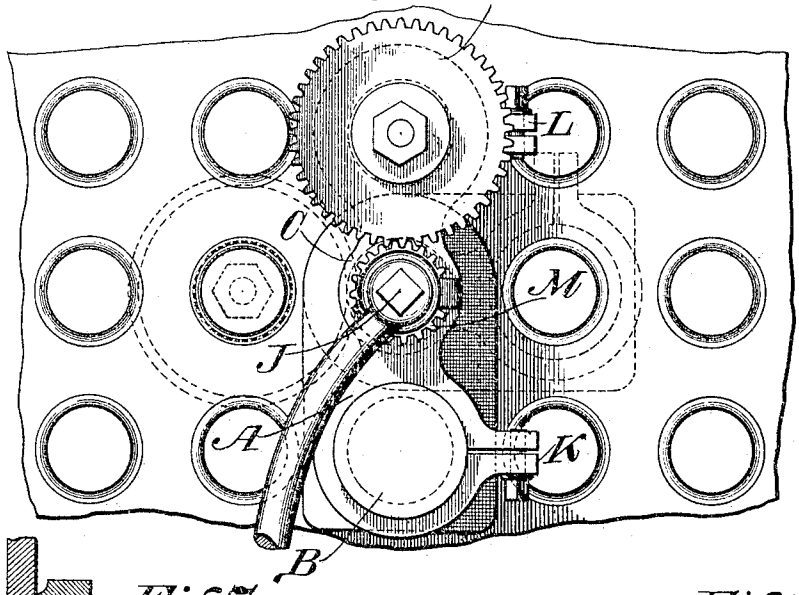


Fig. 7.

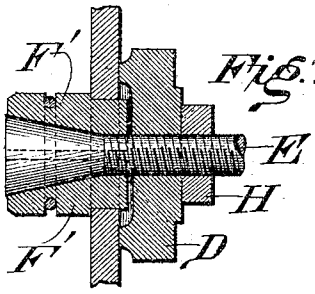


Fig. 6.

Fig. 8.

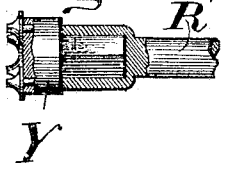


Fig. 9.



WITNESSES.

W. Lee Helms

M. E. Goodrich.

INVENTOR.

Christian E. Loetzer

By Julian C. Dowell & Son

His Attorneys

No. 766,713. PATENTED AUG. 2, 1904.

C. E. LOETZER.

MACHINE FOR CUTTING OUT, EXPANDING, OR BEADING BOILER FLUES.

APPLICATION FILED FEB. 3, 1903.

NO MODEL. 4 SHEETS—SHEET 4.

Fig. 10.

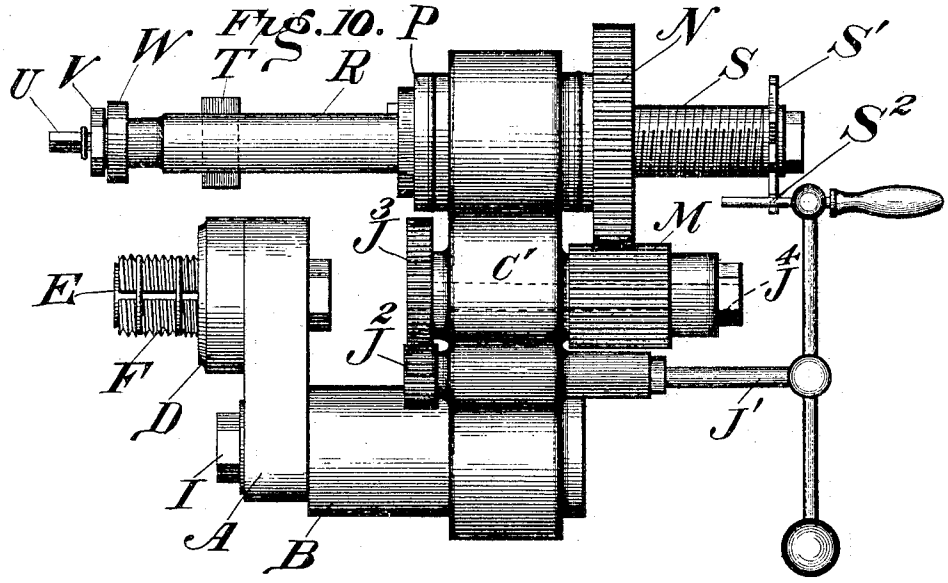


Fig. 11.

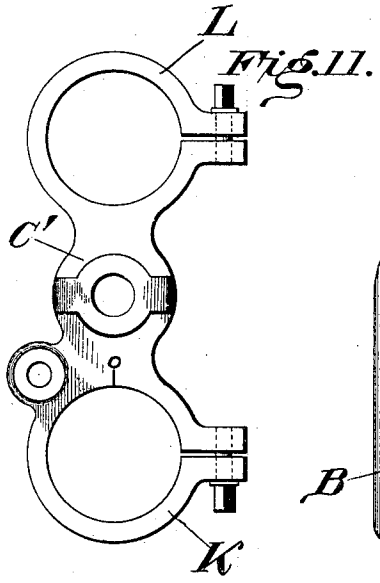
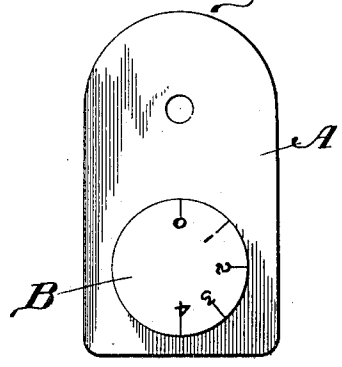


Fig. 12.



WITNESSES

W. Lee Helms

M. E. Goodrick.

INVENTOR

Christian E. Loetzer

By Julian C. Dowell & Son

his Attorneys

No. 766,713. Patented August 2, 1904.

UNITED STATES PATENT OFFICE.

CHRISTIAN E. LOETZER, OF TOWANDA, PENNSYLVANIA, ASSIGNOR OF ONE-HALF TO CHARLES P. WELLES, OF TOWANDA, PENNSYLVANIA.

MACHINE FOR CUTTING OUT, EXPANDING, OR BEADING BOILER-FLUES.

SPECIFICATION forming part of Letters Patent No. 766,713, dated August 2, 1904.

Application filed February 3, 1903. Serial No. 141,745. (No model.)

To all whom it may concern:

Be it known that I, CHRISTIAN E. LOETZER, a citizen of the United States, residing at Towanda, in the county of Bradford and State of Pennsylvania, have invented certain new and useful Improvements in Machines for Cutting Out, Expanding, or Beading Boiler-Flues; 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 machines and implements for cutting, expanding, or beading boiler-flues, more particularly for cutting out old flues from the tube-sheets or boiler-plates.

As well known, the flues of boilers, especially locomotive-boilers, have to be removed and replaced by new or clean flues frequently, as often as once or even several times a year in localities where strong alkali waters are used, on account of the great accumulation of scale around the flues. By the old method of removing the flues the workman very laboriously cuts or breaks the bead at one end of each flue and loosens said end in its sheet or plate or otherwise cuts out said end and then knocks and gradually drives the flue out through the opposite boiler-plate. This procedure is not only tedious and time-consuming, but results in marring and often more or less injuring the boiler-plates from which the beads are broken or the ends of the flues cut, as well as splitting or injuring the flues themselves, rendering them unfit for further use, while on account of the hard scale which must be sheared or scraped off the flue as it is driven out through the opposite boiler-plate the latter boiler-plate is necessarily subjected to repeated blows and strains which often result in splitting it around the flue-holes or cracking it more or less across. Various implements and machines have been devised for cutting the flues internally close within the flue-sheet or boiler-plate; but these have not come into general use, principally on account of the difficulty of their application and adjustment to the different flues of the boiler, and, furthermore, they all have the ends of the flues in the boiler-plates and these ends must afterward be cut out or broken and removed with great difficulty and labor.

The principal objects of my invention are, first, to provide improved means for cutting out the ends of old flues in such manner as to leave the flue-holes perfectly clean, as well as to leave the ends of the flues cleanly cut, and second, to provide a simple and exceedingly efficient machine for operating the cutter or an expander, beader, or other tool, which machine may be secured to the boiler-plate at one of the flues or flue-holes and readily adjusted and set in position to operate on the various surrounding flues.

With these and other minor objects in view the invention will first be described with reference to the accompanying drawings, which form a part of this specification, and will then be pointed out more particularly in the annexed claims.

In said drawings, wherein corresponding parts in the different figures are indicated by similar characters of reference, Figure 1 is a perspective view of a boiler-head with a machine embodying my invention applied thereto for the purpose of cutting out the ends of the flues from the boiler-plate. Fig. 2 is a central longitudinal vertical section of the machine with parts in elevation, showing also a fragment of a boiler-head. Fig. 3 is a side elevation of the machine. Fig. 4 is a side view of a guide-plug used in connection with the machine for determining its proper adjustments. Fig. 5 is a rear end view of the machine as represented in Fig. 2, showing also a fragment of a boiler-head. Fig. 6 is a similar view showing the machine adjusted to operate on a wider range of flues than those on which it operates in the previous figure. Fig. 7 is a detail view, in vertical section, of a device for attaching the machine to the boiler-plate at one of the empty flue-holes. Fig. 8 is a detail reduced view of a suitable beader. Fig. 9 is a similar view of a suitable expander. Fig. 10 is a side elevation of the machine with certain modifications. Fig. 11 is

a rear view of the holder of said modified machine, and Fig. 12 is a rear view of the supporting member thereof.

My improved machine comprises in the main a supporting member adapted to be attached to the boiler-plate at one of the flues or flue-holes, capable of being adjusted axially around said flue or flue-hole and having an arm projecting therefrom substantially at a right angle to the boiler-plate, and a holder for the operating mechanism mounted on said arm in such manner as to be adjusted axially thereon, so as to increase or diminish the radius of travel of the cutter or other tool, together with suitable mechanism mounted in said holder for operating such tool.

In the drawings the letter A denotes the supporting member, B designates the right-angle arm extending therefrom, and C indicates the holder for the operating mechanism mounted on said arm.

The member A is rotatably fitted to a washer or bearing-block D, which is clamped to the boiler-plate over the flue or flue-opening that is to be taken as the center of operation of the machine. Said washer has preferably a shallow recess in its front face, covering the bead at the end of the flue, and a circular boss on its rear face, which fits within a corresponding opening in the member A, leaving a surrounding flat circular bearing between the two parts, Figs. 2 and 7. The washer may be clamped to the boiler-plate either by such a device as that shown in Figs. 2 and 3 or by that shown in Fig. 7. The first is for use where the flue is in place, and it consists of a clamping-bolt E, having a conical or wedge-shaped head, with a number of loose or separated gripping-pieces F inclosing said head within the flue, the gripping-pieces being preferably formed to correspond with the head on their inner surfaces and having sharp outer teeth or projections adapted to bite the interior of the flue when said pieces are expanded by drawing tight the bolt, the stem of which latter passes through the washer and has a fastening and tightening nut G screwed thereon within the aforesaid recess in member A, said nut being of course applied before said member is attached. The latter clamping device (that shown in Fig. 7) is for use where the flue has been removed from its flue-hole, and said device is similar to the former except that in place of the toothed gripping-pieces a suitable number of segmental pieces F′ are substituted, having their rear ends reduced to fit within the flue-hole, and thus leaving an abrupt shoulder which bears tightly against the inner side of the boiler-plate when the clamping-bolt is tightened. Either device is sufficient, though the latter is more positive, and hence where the machine is very heavy it may be desirable to cut out the flue and attach the machine by means thereof in preference to the former. In order to prevent the pieces F or F′ from falling apart and dropping when the clamping device is detached from the boiler-plate, said pieces may be loosely bound around the bolt-head by a wire or wires, as shown. The bolt E passes also through the member A, which is secured rigidly in desired position by a nut H, screwed on said bolt. It will thus be observed that said member may be turned or adjusted to any desired axial position on its washer or bearing-block D without affecting the device which secures the machine to the boiler-plate.

The arm B may be integral with the member A, such construction being, indeed, preferred for strength and rigidity; but in order to effect delicate and slight adjustments not otherwise attainable, particularly where the machine is used on boilers in which the flues are set irregularly or not precisely at the standard distances, said arm is shown formed with a reduced polygonal front part, which fits in a straight longitudinal slot in the member A, and with a threaded terminal stud on which a nut I is screwed to fasten the arm rigidly to its supporting member. The projecting part of the arm is preferably cylindrical and uniform for substantially its entire length for a purpose hereinafter explained.

The holder C, as shown, has a central bearing for an operating-shaft J and has two clamps K and L, one at each side of and preferably at equal distances from the center of said bearing, said clamps being also, preferably, of equal sizes, which construction is not essential, however, but is adopted partly for simplicity and economy of construction and partly for greater convenience is use, since the holder may thus be mounted in inverse positions. One clamp—K in this instance—is secured on the arm B, while the other clamp, L, incloses a two-part or separable cylindrical bearing P, both clamps being tightened by suitable screws or bolts. The parts of the bearing P may be bound together by a loose wire or wires, as shown, to prevent them falling apart when withdrawn from the clamp, hereinafter explained.

The shaft J, which may be provided with a crank or may be driven by any suitable means, has a wide pinion M, which may be mounted rigidly on said shaft between the holder C and a supplemental bearing supported on a U-shaped arm extending around said pinion from said holder. This pinion meshes with a narrow gear or pinion N, rigid or integral with a hollow shaft or sleeve O, which is journaled in the bearing P, said sleeve being shown with a front flange, between which and the gear N said bearing is secured.

A tool-stock R is secured within the hollow shaft O in such manner as to rotate therewith, but capable of moving longitudinally therein, which arrangement may be effected by a key Q, secured to or within the sleeve and slid-

ably fitting in a longitudinal groove or slot in the tool-stock, Figs. 2 and 3. This key in the construction illustrated fits in a slot therefor in the interior of the sleeve or hollow shaft and has an upstanding lug or projection at each end, the front one of which bears against the front of said hollow shaft, while the rear one fits in a socket therein, thus keeping the key from longitudinal movement. Hence it is obvious that the key must first be fitted in its place in the hollow shaft, and the stock then inserted rearwardly to bring the key in its slot. The tool-stock is coupled at its rear with a left-hand-threaded stem or screw S, which, as herein shown, is tubular and incloses a reduced cylindrical part of the tool-stock, being secured thereon by a fastening-nut screwed on the rear threaded extremity of the tool-stock. This screw S rotates, of course, with the tool-stock; but during the operation of the machine the workman can from time to time clutch the screw, which may have a rear handle for that purpose, and thus move the tool-stock longitudinally to feed the cutter, expander, or other tool carried thereby. The machine is of course so adjusted that the tool-stock is in perfect axial alinement with the flue to be cut out or otherwise operated upon.

In Figs. 1, 2, and 3 the machine is shown provided with my improved device for cutting out the ends of the flues. The front end of the tool-stock projects into the flue, and a cutter T, adapted to cut or shave off the flue across its end, is fitted in a transverse slot in said stock and is rigidly secured therein by a set-screw U, screwed into the front extremity of the stock, a lock-nut B being provided on said screw to prevent loosening thereof. The said front extremity of the stock is preferably round, and loosely fitted thereon between the lock-nut and a rearward shoulder on the stock is a guide ring or collar W of a diameter adapted to fit closely within the flue, thus insuring proper axial adjustment of the cutter. Said cutter may be of any suitable construction. As illustrated, it consists of a rectangular metal piece having a recess or rabbet in its back to fit over the correspondingly-formed rear end of the slot in the stock and being of a length equal or nearly equal to the external diameter of the flue and having suitable front cutting edges at its opposite ends, or a cutter having a single cutting edge may be employed, this being preferable where it is necessary to adjust the cutter to suit the size of the flue, or a circular or other milling tool may be used. In operation, the machine being properly adjusted to bring the tool-stock in alinement with the flue, the cutter is brought to bear first against the outer or beaded end of the flue, then rotated by means of the operating mechanism, and gradually fed forward by the feed-screw, whereby the tool cuts its way gradually inward and the flue is cut or bored away for any desired length from its extremity. In other words, the flue is not merely cut transversely, but is bored entirely out of the flue-hole, leaving the latter perfectly clean for the reception of a new flue. Thus the labor and expense of cutting out the ends of the flues from the boiler-plate is avoided. The guide ring or collar W serves another purpose in addition to that of insuring alinement of the cutter. Said collar holds up the end of the flue after it has been cut or bored out as far as the inner face of the boiler-plate and prevents such flue from dropping down prematurely, thus allowing the flue to be cut away as far inward from the boiler-plate as desired. Two of the machines are usually employed simultaneously at opposite ends of the boiler. When the ends of the flue have been cut out from their holes and trimmed off to the desired extent, the tool-stocks are withdrawn, and the flue being thus released drops down to the bottom of the boiler, from which it can be withdrawn through the manhole. By reason of the guide-collars W, neither end can drop down prematurely and cause the flue to lodge in inclined position between the opposite boiler-plates.

My machine is of course capable of use with any suitable boiler-flue-operating tool—such, for example, as any of the usual forms of internal rotary cutters and expanders and beaders. An expander is shown in Fig. 9, consisting of a conical or tapering plug X, the polygonal stem of which is seated in a corresponding recess in the front of the tool-stock, which in said figure is designated by the symbol R′. In Fig. 8 is shown a beader consisting of a series of rotary conical devices mounted in a circular head Y, having also a polygonal stem for mounting it in the stock R′.

The mode of use and operation of the machine will now be explained. It may first be stated that the machine is constructed to operate on boilers in which the flues are of a certain standard size and set at a certain standard distance apart, different machines being built for different standard boilers. When the arm B is made integral with the supporting member A, the distance between the axial center of said arm and the center of the washer or bearing-block D is made equal to the distance between the centers of adjacent flues. The distance between the center of said arm and the center of the tool-stock is twice as great. Hence when the holder C is set parallel with the member A, with the shaft J in perfect axial alinement with the bolt E, the center of the tool-stock is at a distance from the center of the washer D exactly equal to the distance between adjacent flues; but, as hereinbefore stated, it may be desirable to have the arm B adjustable on the member A, as shown, for the purpose of securing delicate adjustments which might be necessary where there is any irregularity or departure

from the standard in the sizes and locations of the flues. However, in any case when the holder C is set parallel with the member A and extends in the same direction therewith from the arm B, as shown in Figs. 1, 2, 3, and 5, the distance from the center of the washer D and center of the tool-stock must be equal to the distance between adjacent flues in order to operate on the nearest circle of flues around the central flue or that over which the washer is clamped.

In operation two machines are usually employed simultaneously, one at each end of the boiler and both operating at the same time on opposite ends of the same flue, particularly where the machine is used for cutting out the flues. Each machine is attached to its respective boiler-plate by clamping the washer or bearing-block D over preferably the central flue or flue-hole or any flue or flue-hole which is to be taken as the center of operation, then fastening the member A to said washer or bearing-block by the nut H. The workman first sets the holder C parallel with the member D with the shaft J in alinement with the bolt E, or substantially in such position, and tightens the clamp K to make the parts A, B, and C perfectly rigid. He then loosens the nut H and adjusts the member A thereon till the tool-stock is in alinement with one of the flues of the nearest adjacent circle, whereupon he tightens said nut and proceeds to cut out the flue or otherwise operate thereon, as the case may be. When the first flue is finished, he loosens said nut H and turns the machine so as to bring the tool-stock into alinement with the next flue of the same circle, and when this flue is finished he turns the machine to operate on the next flue, and so on till all the flues have been operated upon. When the first circle of flues is finished, the workman then loosens the clamp K and adjusts the holder C on the arm B at an angle to the member A, thus increasing the radius or distance from the center of the washer D to the center of the tool-stock till the latter is brought into alinement with one of the flues of the second circle, then tightens said clamp, and he thereupon proceeds to operate on the second circle of flues in the same manner as upon the first, adjusting the machine from flue to flue of said circle on the washer D as an axis, as before. The third and subsequent circles can be successively brought within range of the machine by adjusting the holder at different angles on the arm B to increase successively the radius transcribed by the tool, with the washer D as an axis, the largest radius being that transcribed when the holder C is swung clear around on the arm B to a position opposite to but parallel with the member A. In Figs. 1, 2, and 5 the machine is shown set to operate on the first adjacent circle of flues surrounding that to which it is attached, while in Fig. 6 the machine is shown set to operate on the third surrounding circle.

In order to enable the workman to attain perfectly accurate adjustments of the machine, I provide for use in connection with the same a guide-plug Z, (shown in Fig. 4,) consisting of a cylinder, preferably hollow for lightness, of exactly the same external diameter as that of the bearing P and having a front reduced part adapted to fit closely within a flue. Each time an adjustment is to be made the workman loosens the clamp L and withdraws the bearing P therefrom, together with the tubular shaft O, its gear N, screw S, and tool-stock and parts carried thereby, all of which can be moved out backward without disturbing their proper relation. The guide-plug Z is then slid into clamp L, which is tightened thereon, and the reduced end of said plug is fitted into the flue which is to be cut out, expanded, or beaded. Then the clamp K and the nut H are tightened, so that the machine has precisely the proper adjustment. Clamp L is then loosened, the guide-plug withdrawn therefrom, and the bearing P, with the other parts carried thereby, is then slid back into said clamp, which is tightened on said bearing, and the machine is then driven to operate on the flue. It will thus be seen that there is no danger in the cutting operation of cutting or boring the flue-hole by any inaccurate setting of the machine, and perfect alinement of the cutter is further insured by the guide-collar on the front end of the tool-stock, which fits within the flue.

The machine has a large range of longitudinal adjustment. The holder C can be mounted on the arm B either near or far from the boiler-plate, and likewise the bearing P can be secured at different longitudinal positions in its clamp, the gear N sliding on the wider gear M, and thus always engaging the same.

A modification of the machine described is represented in Figs. 10, 11, and 12. In this modified construction the holder (indicated by the symbol C′) has two bearings, one substantially at the center and the other at the side and parallel therewith. The operating-shaft (designated by the symbol J′) is journaled in the latter bearing and has a pinion J^2 at the front side of the holder engaging a gear J^3 on a shaft J^4, journaled in the central bearing, which latter shaft has the wide pinion M thereon engaging the gear N of the tubular shaft O, as before described. Such construction reduces the speed of rotation of the cutter for the same rotation of the shaft (or by a proper arrangement of gears the speed could be increased) and enables the crank and cutter to be rotated in the same direction or toward the right. The screw S in this modification is shown having a star-wheel S′ thereon, which is engaged by a pin S^2, projecting from the crank at each revolution thereof, thus turning the screw a certain distance at each rotation

of the crank and producing regular feed of the cutter. A zero-mark is shown on the holder with which a mark 1 on the arm B registers when the machine is adjusted to cut the first or innermost row or circle of flues around the central flue, and to adjust the machine for the succeeding circles of flues the other marks 2 3 4, &c., should be successively brought to register with said zero-mark. Similar index characters could also be provided on the nut D and member A.

The invention is also capable of other embodiment, and it will be understood that I am not limited to the specific details of construction shown and herein described, particularly of the operating mechanism, which may be of any suitable construction, as may be desired.

Having thus fully described my invention, what I claim as new, and desire to secure by Letters Patent of the United States, is—

1. In a boiler-flue cutter, a rotary tool-stock having a transverse slot and a round front end adapted to project into the flue, said end having a rearward abutment, a cutting-tool fitted in said transverse slot, a set-screw screwed into the front end of said stock against the face of said tool, a lock-nut screwed on said screw, and a guide collar or ring adapted to fit loosely within the flue and fitted loosely on said round front end between said rearward abutment thereon and said lock-nut.

2. In a machine for cutting out, expanding or beading boiler-flues, a suitable supporting-holder having a tubular bearing in line with the flue to be operated upon, a hollow shaft journaled therein having an interiorly-screw-threaded part, a tool-stock for the tool fitted in said shaft so as to rotate therewith but capable of moving longitudinally therein, a feed-screw coupled to said tool-stock and screwed into said shaft, whereby when the feed-screw is turned independently of the shaft the stock will be advanced to feed the tool, and means for rotating said shaft.

3. In a machine of the character described, a supporting member adapted to be clamped to the boiler-plate and to be turned or adjusted in different positions with the center of a flue as an axis, an arm extending therefrom at a right angle to the boiler-plate, and a holder mounted on said arm and capable of being turned or adjusted at different positions thereon, a stock for the tool rotatably mounted in said holder parallel with said arm, and means for operating or driving said stock, substantially as described.

4. In a machine of the character described, a supporting member adapted to be clamped to the boiler-plate and to be turned or adjusted to different positions with the center of a flue as an axis, an arm extending therefrom at a right angle to the boiler-plate; and a holder mounted on said arm and capable of axial adjustments thereon, a tool-carrying stock rotatably mounted in said holder, the distance between the axial center thereof and the center of axial adjustment of the supporting member being equal to the distance between adjacent flues when the holder stands parallel with said member, and means for driving said stock, substantially as described.

5. In a machine of the character described, a supporting member adapted to be clamped to the boiler-plate and to be adjusted about a flue or flue-hole as an axis, said member having an arm projecting therefrom at a right angle to the boiler-plate with its center at a distance from the center of said flue substantially equal to the distance between adjacent flues, a holder mounted on said arm and axially adjustable thereon, and a tool-carrying stock rotatably mounted in said holder with its axial center at twice the distance between adjacent flues from the pivotal center of said arm, and means for driving said stock, substantially as described.

6. In a machine of the character described, a supporting member adapted to be clamped to the boiler-plate and to be adjusted about a flue or flue-hole as an axis, an arm projecting therefrom at a right angle to the boiler-plate and longitudinally adjustable on said member, a holder mounted on said arm and axially adjustable thereon, a tool-carrying stock rotatably mounted in said holder, and means for driving said stock, substantially as described.

7. In a machine of the character described, a supporting member adapted to be clamped to the boiler-plate and to be adjusted about a flue or flue-hole as an axis, said member having an arm extending therefrom at a right angle to the boiler-plate, a holder mounted on said arm and axially adjustable thereon, said holder having a tubular bearing parallel with said arm, a shaft journaled therein carrying a cutting-tool, a counter-shaft journaled in a bearing therefor in said holder between the cutter-shaft and said arm, intermeshing gears or pinions on said shafts, and means for rotating said counter-shaft, substantially as described.

8. In a machine of the character described, a supporting member adapted to be clamped to the boiler-plate and to be adjusted about a flue or flue-hole as an axis, said member having a cylindrical arm projecting therefrom at a right angle to the boiler-plate, a holder consisting of a central part with opposite clamps, one of which is secured on said arm, a tubular bearing parallel with said arm secured within the other clamp, a hollow shaft journaled therein having a gear or pinion rigid therewith, a tool-carrying stock secured within such shaft so as to rotate therewith but capable of moving longitudinally therein, means for feeding or advancing said stock in said shaft, an operating or driving shaft journaled in the central part of the holder, and a pinion

thereon meshing with said gear on said hollow shaft and wider than the same to allow for longitudinal adjustment thereof, substantially as described.

9. In a machine of the character described, a bearing-block or washer adapted to be clamped to the boiler-plate over the end of a flue or flue-hole, a bolt having a wedge-shaped head located within the inner face of the boiler-plate, and gripping devices inclosing said head and engaging the interior of the flue or the inner face of the boiler-plate, a fastening-nut on said bolt securing the bearing-block in place and drawing tight the bolt, a supporting member rotatably fitted to said bearing-block and having said bolt extending through the axis thereof, a nut screwed on said member securing the latter rigidly in place, and suitable mechanism supported by said member for operating on a boiler-flue, substantially as described.

10. In combination with a holder for the tool-stock capable of being adjusted to bring the stock into axial alinement with the flue to be operated upon, said holder having a clamp adapted to hold a bearing for the tool-stock or its shaft therein, the guide-plug adapted to fit within said clamp when said bearing is removed therefrom and having a reduced extremity adapted to fit within a flue, substantially as described.

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

CHRISTIAN E. LOETZER.

Witnesses:
J. H. PENNEPACKER,
L. M. OSBORNE.