J. H. McGRAW.

Flue Roller and Expander.

No. 212,964. Patented Mar. 4, 1879.

Fig. 1.

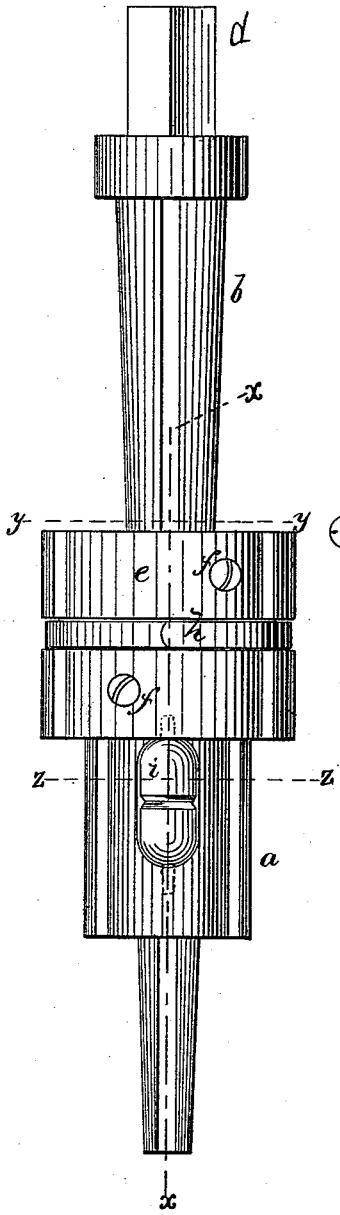


Fig. 3.

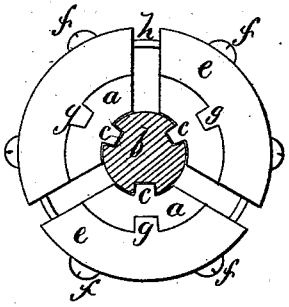


Fig. 4.

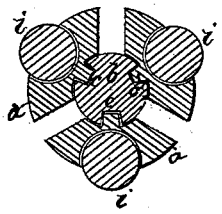
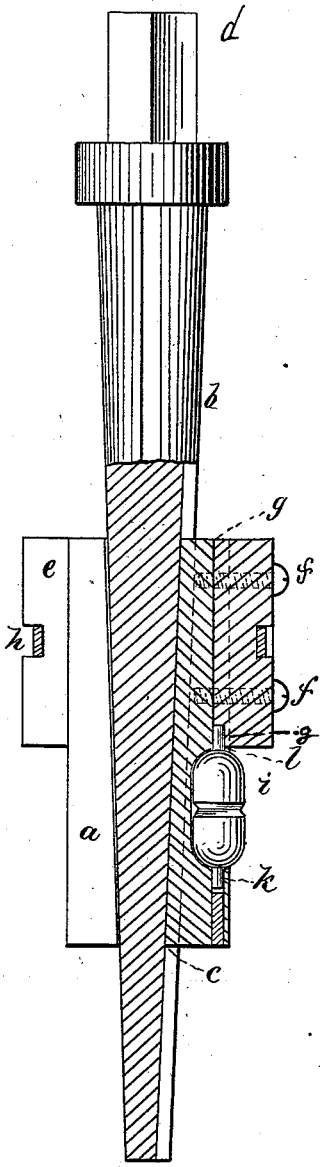


Fig. 2.



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IMPROVEMENT IN FLUE ROLLER AND EXPANDER.

Specification forming part of Letters Patent No. **212,964**, dated March 4, 1879; application filed July 26, 1878.

To all whom it may concern:

Be it known that I, JOHN H. McGRAW, of Oswego, in the county of Oswego and State of New York, have invented a new and Improved Flue Roller and Expander, of which the following is a specification:

The object of my invention is to furnish a tool for rolling or expanding boiler flues or tubes, which may be used for expanding a tube to any size generally necessary and that will be durable.

My invention consists in a segmental head or cylinder having circumferential grooves for rollers and boxes for the arbors of the rollers, and provided with a central wedge-pin for turning the head and also expanding it.

In the accompanying drawings, Figure 1 is an elevation of my flue-expander. Fig. 2 is a longitudinal section of the same at the line *x x* of Fig. 1. Fig. 3 is a cross-section at the line *y y*, and Fig. 4 a cross-section at line *z z*.

Similar letters of reference indicate corresponding parts.

The cylinder *a*, which is the tool-head, is divided into three or more segments, as shown, and has a tapering hole longitudinally through its center for the insertion of the wedge-shaped pin *b*. Each segment of *a* is provided with a rib, *c*, projecting into a corresponding groove in wedge-pin *b*, whereby the head *a* is caused to turn with pin *b*, and the larger end of *b* is formed square, as seen at *d*, to permit the application of a wrench for turning the head *a*.

The enlarged portion *e* of head *a* is formed by separate segments, attached to *a* by screws *f*, and having ribs or splines *g*, which enter grooves in the surface of *a*.

h is a spring-metal band, placed in a groove around the segments *e*, for the purpose of compressing the segments of which the head *a* is composed together, and retaining them upon the pin *b*.

i i i are rollers that are held in grooves or sockets upon the surface of head *a* by their arbors *k l*, which project from the ends of the rollers into boxes formed in *a*.

The box for the arbor *k* of each roller *i* is made by boring a hole from the outer end of head *a* inward to the socket for each roller *i*, and then plugging up the outer end of the hole, as seen in Fig. 2.

The boxes for arbors *l* are formed in the ribs *g* of the segments *e*. The rollers *i* are thus held securely in position and can turn freely, and as their arbors are protected from grit they will not cut out.

The position of the boxes for the arbors *k l* is such that the rollers *i* project nearly half their diameter from the surface of the segments *a*.

In using the expander above described, the head *a* is inserted within the flue until the end of the flue abuts against the offset formed by the enlarged portion *e*. The head may then be expanded by driving the wedge-pin *b* farther in and the head turned by a wrench placed upon the end *d* of pin *b*.

This tool may be expanded to suit any-sized flue, and the friction when using the roller comes entirely upon the arbors, which are protected and will wear a long time.

I do not limit myself to the shape of the rollers *i*, nor to the described manner of connecting the segments *e* to the cylinder *a*, as those details may be varied without departing from my invention.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. The segmental head *a e* and rollers *i*, combined and arranged substantially as described, in combination with the central wedge-pin, *b*, and spring *h*, substantially as and for the purposes set forth.

2. The rollers *i i*, held in sockets of heads *a* by arbors *k l*, the arbors *k* having boxes in head *a*, and the arbors *l* having boxes in the segment-rib *g*, as and for the purpose specified.

JOHN H. McGRAW.

Witnesses:
JOHN CHAUNCEY,
W. LEWIS.