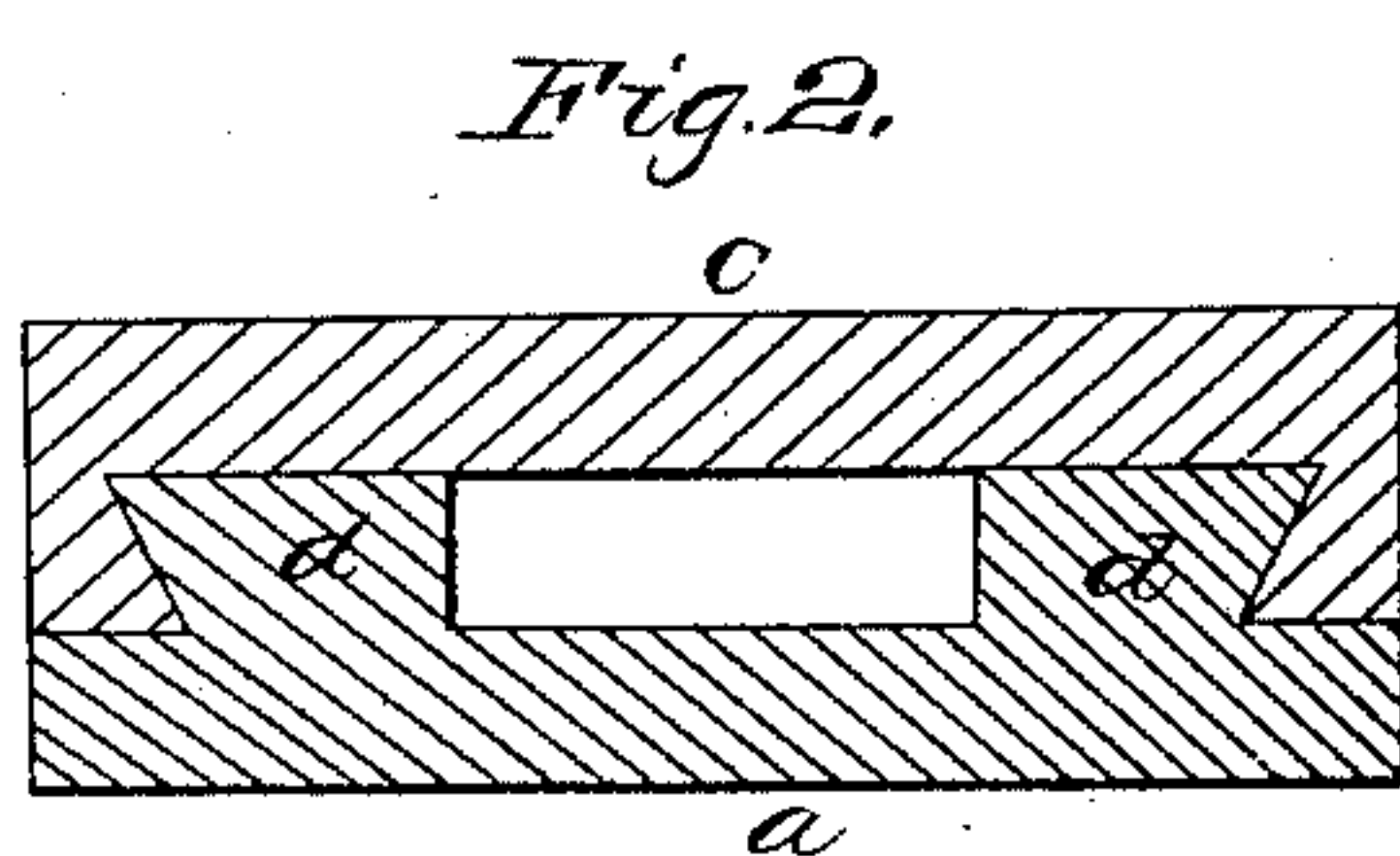
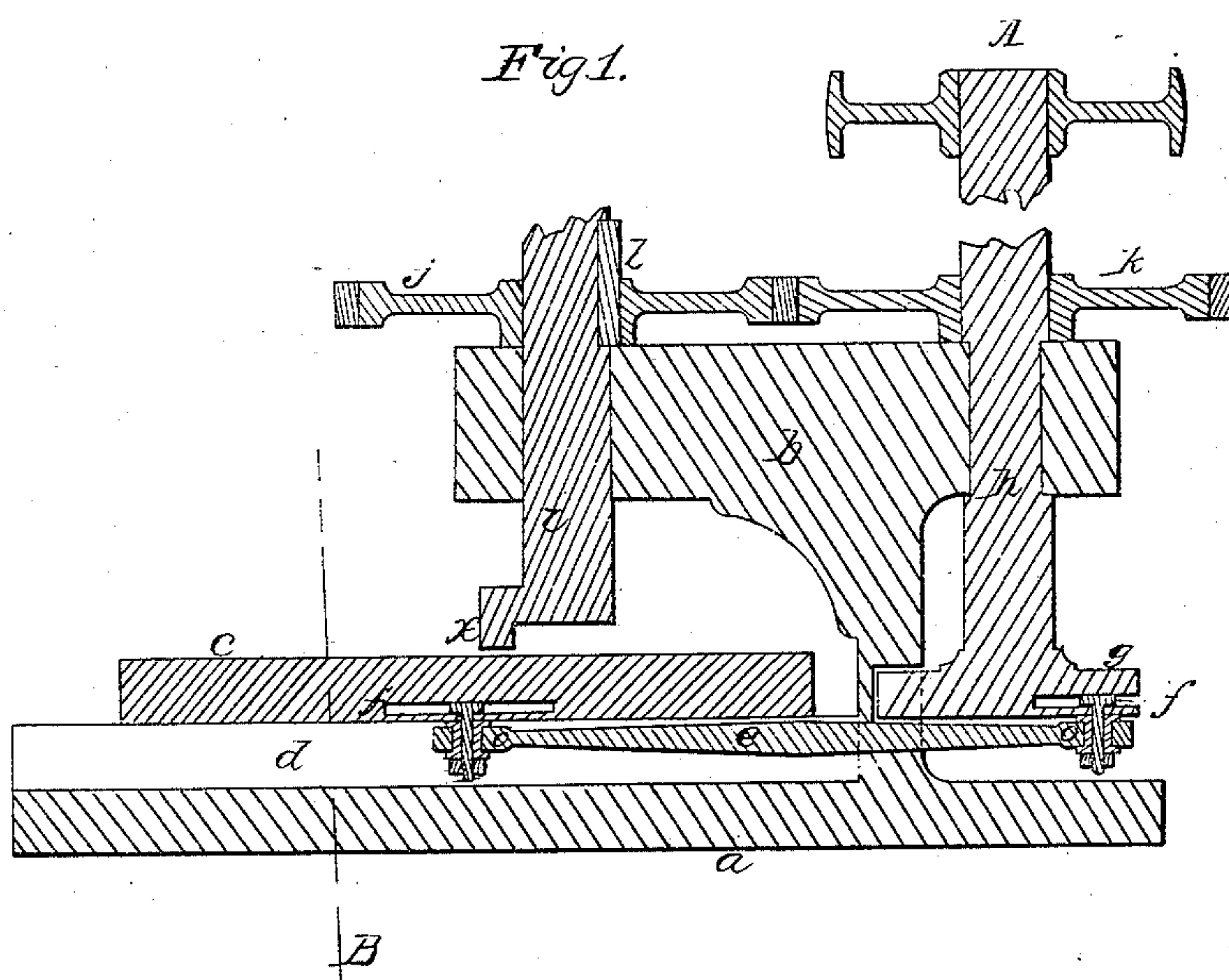


J. McBride.

Drilling Oval Openings in Boiler-Heads.

N^o 57,533.

Patented Aug. 28, 1866.



Witnesses:
James P. Johnston
James D. Jamieson

Inventor:
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UNITED STATES PATENT OFFICE.

JAMES McBRIDE, OF ALLEGHENY CITY, PENNSYLVANIA.

IMPROVEMENT IN MACHINERY FOR CUTTING OVAL HOLES IN BOILER-HEADS.

Specification forming part of Letters Patent No. 57,533, dated August 28, 1866; antedated August 17, 1866.

To all whom it may concern:

Be it known that I, JAMES McBRIDE, of the city and county of Allegheny, in the State of Pennsylvania, have invented a new and useful Improvement in Machines for Cutting Oval or Elliptic Openings in Boiler-Heads, &c.; and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon.

The nature of my invention consists in cutting oval or elliptic openings in boiler-heads by means of a cutter secured to a revolving shaft, which can be moved on a plane at a right angle to the plane of a boiler-head placed on a table having a reciprocating motion, said cutter, shaft, boiler-head, or table being operated by the mechanism hereinafter described.

To enable others skilled in the art to make and use my invention, I will proceed to describe its construction and operation.

In the accompanying drawings, Figure 1 represents a longitudinal section of my improved machine for cutting oval or elliptic openings in boiler-heads, &c. Fig. 2 represents a transverse section of the same cut through at B in Fig. 1.

In the drawings, *a* represents the base of the machine. *b* represents the support for the operating-gear. *d* represents the slides or guides for the table *c*, which is connected to the disk marked *g* on the lower end of the shaft *h* by means of a pitman marked *e*, which can be adjusted by means of the wrists marked *o*, which are secured in the slots *f*, so as to give the desired length of motion to the table *c*. *x* represents the cutter, which is secured to the shaft marked *i*, which is fitted to an opening in the support *b*.

The shaft marked *i* is furnished with a wheel marked *j*, which gears into a wheel marked *k* on the shaft marked *h*. The shaft *i* is raised or lowered in the hub of the wheel *j* by means of any known and suitable mechanism.

The size, form, and manner of constructing the various parts herein described and represented I leave to the skill and good judgment of the mechanic, for I do not confine myself to any precise form, size, or arrangement of

the various parts, provided the said parts move and act in the manner herein described.

The operation of my improved machine for cutting oval or elliptic openings is as follows: I arrange and secure the boiler-head or the plate for it on the table *c*, and arrange the tool *x* so that it will describe a circle the diameter of which shall be equal to the short diameter of the elliptic opening desired. I then arrange the wrists *o* in the slots *f* so that the pitman *e* will move the table *c* the desired distance for making the difference between the long and short diameter of the elliptic opening—that is to say, if the short diameter of the elliptic opening is ten inches and the long diameter is fifteen inches, then the pitman is so adjusted with relation to the table *c* and disk *g* that the table shall move two and one-half inches forward and two and one-half inches backward.

Having all things properly arranged, I impart motion to the shaft *h* by applying the power by means of a pulley, as indicated by the broken section marked A, or by other means, and the revolving of the shaft *h* will revolve the disk *g*, which will cause the pitman *e* to impart a reciprocating motion to the table *c*, and the wheel *k* will cause the wheel *j*, by means of the feather or key *l*, to turn the shaft *i*, and thereby revolve the cutter *x*, which is held to its work by any known mechanism, which will raise or lower the shaft *i* for bringing the cutter to and from its work. Thus by the combination of the reciprocating motion of the table *c* with the circular motion of the cutter any desired size of elliptic or oval opening can be cut in boiler-heads, &c.

Having thus described the nature, construction, and operation of my improved machine for cutting elliptic openings in boiler-heads, &c., what I claim as of my invention is—

The combination and arrangement of the wheels *k* and *j*, shafts *h* and *i*, disk *g*, table *c*, pitman *e*, wrists *o*, slots *f*, and cutter *x*, combined, arranged, and operating substantially in the manner herein described, and for the purpose set forth.

JAMES McBRIDE.

Witnesses:

JAMES J. JOHNSTON,
JAMES O. FANNING.