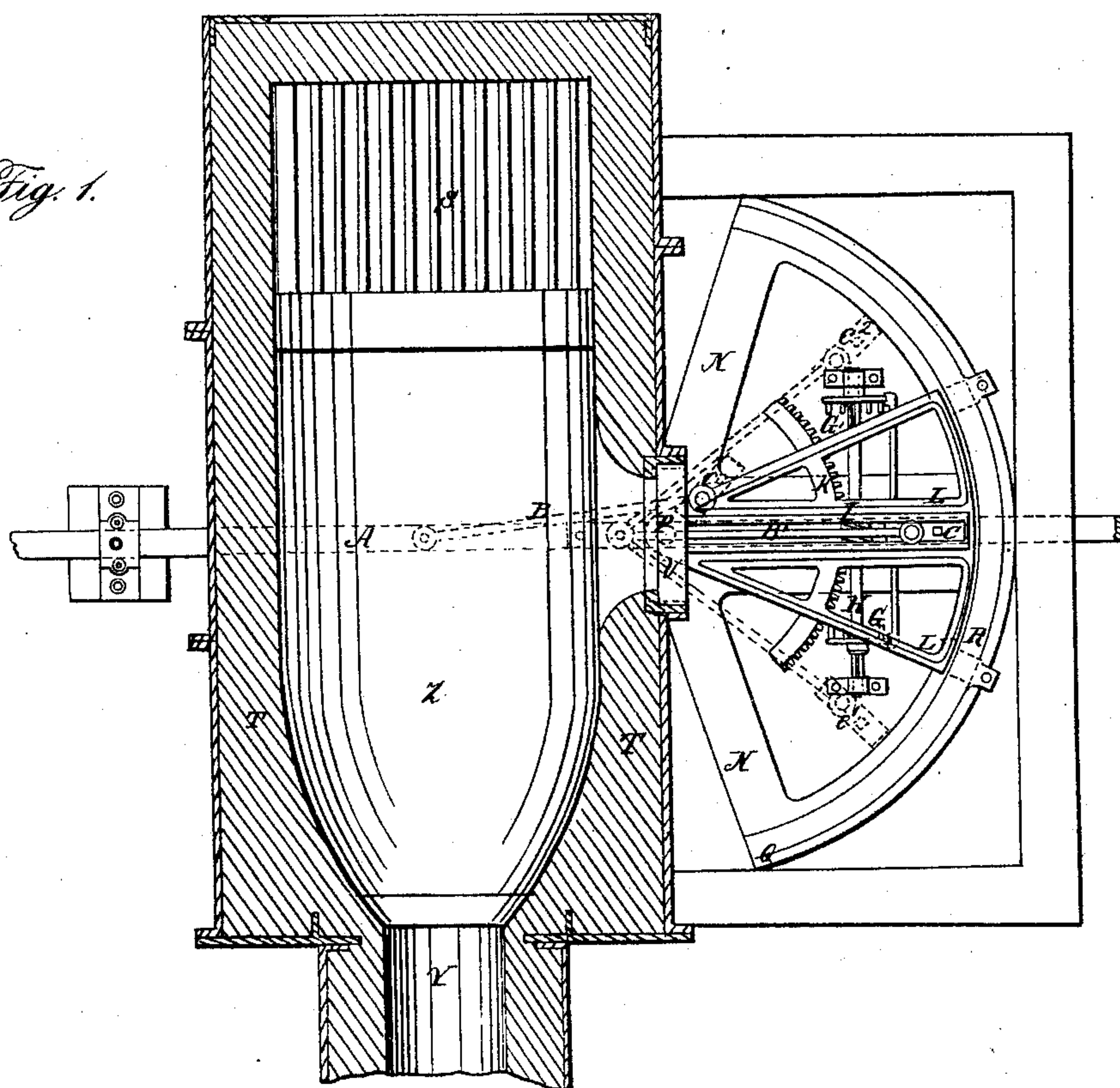


H. BENNETT.  
Mechanical Puddler.

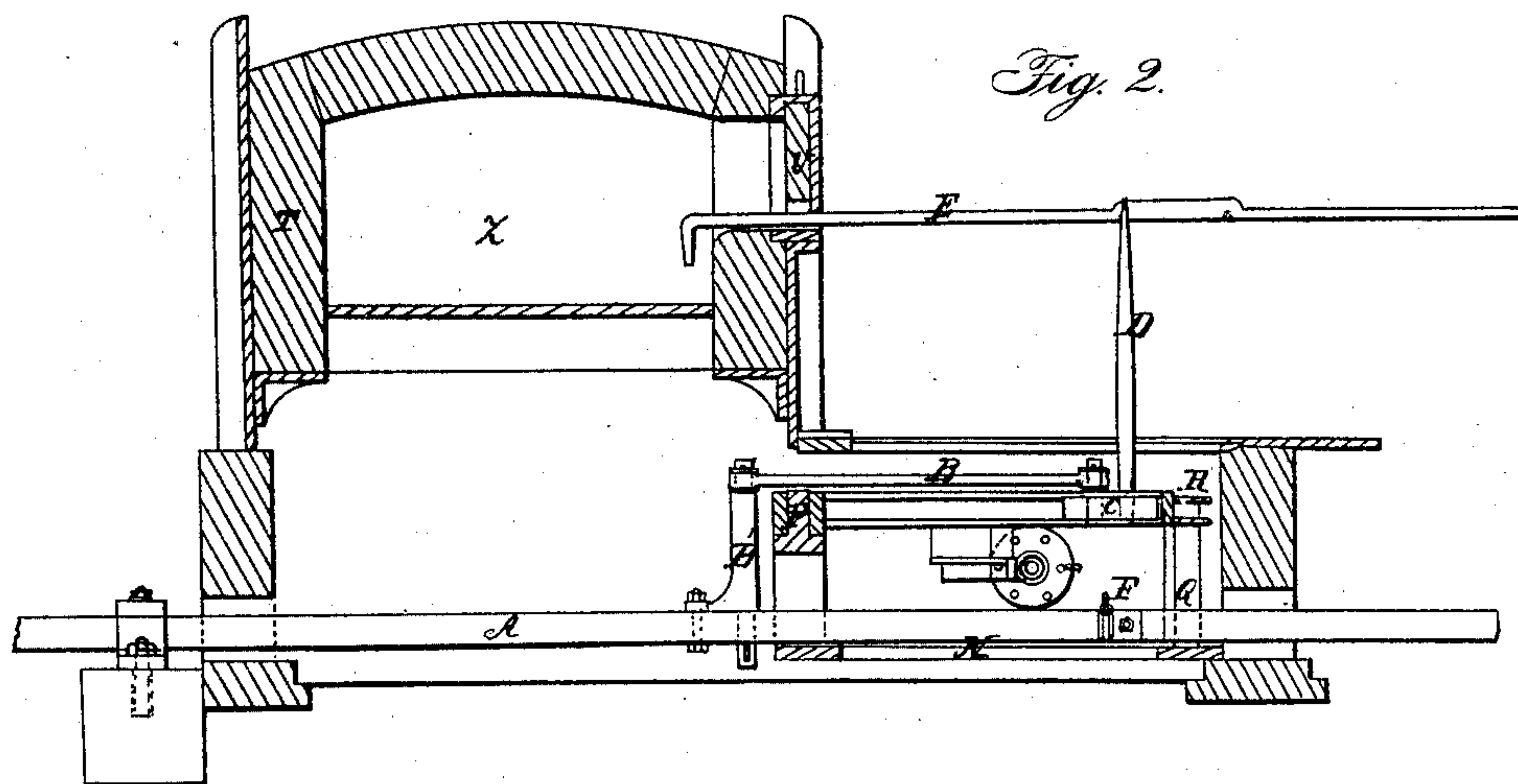
No. 41,671.

Patented Feb. 23, 1864.

*Fig. 1.*



*Fig. 2.*



**Witnesses:**

*P. C. Wilson  
for W. H. Patton*

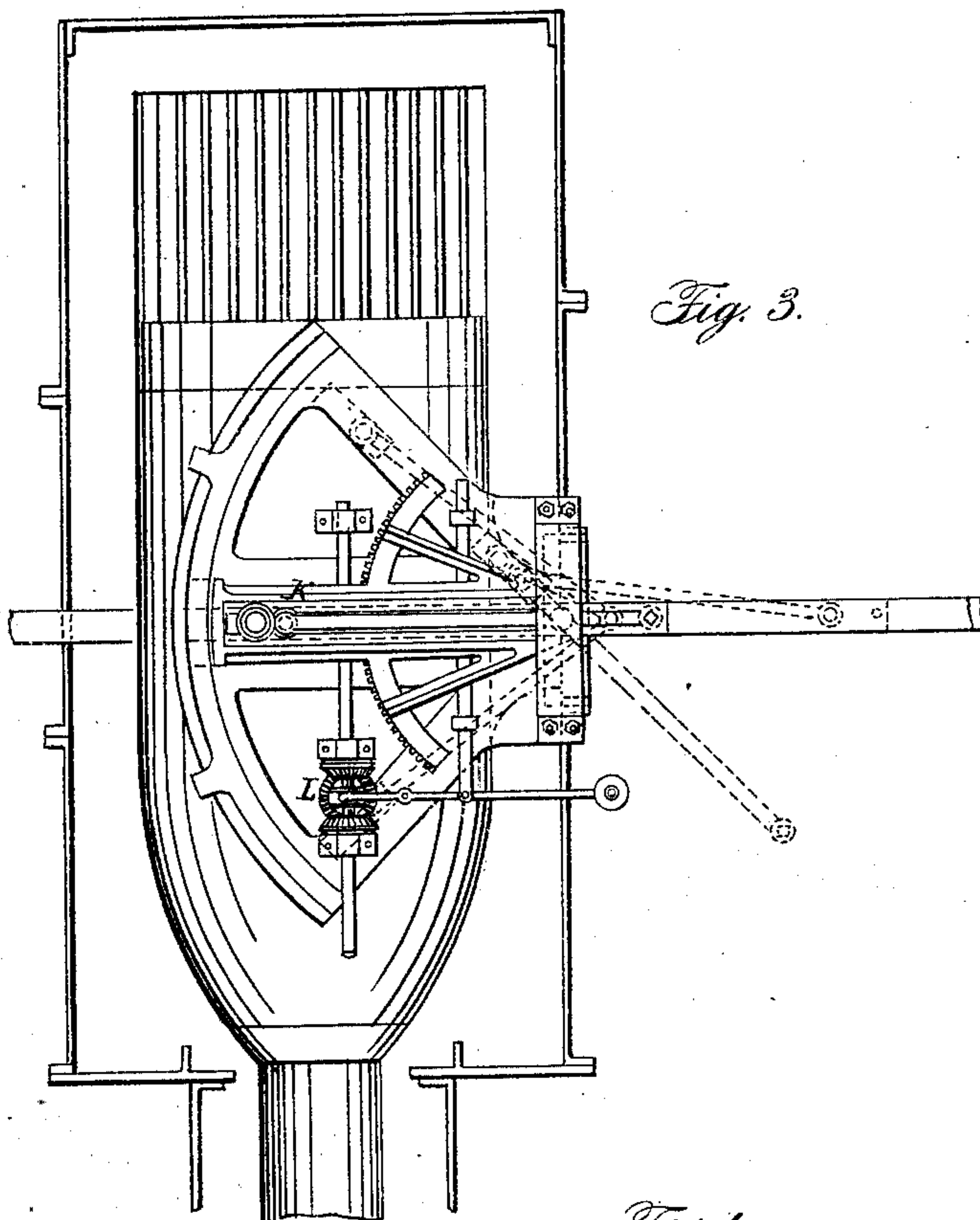
**Inventor:**

*Henry Bennett  
By W. H. Patton*

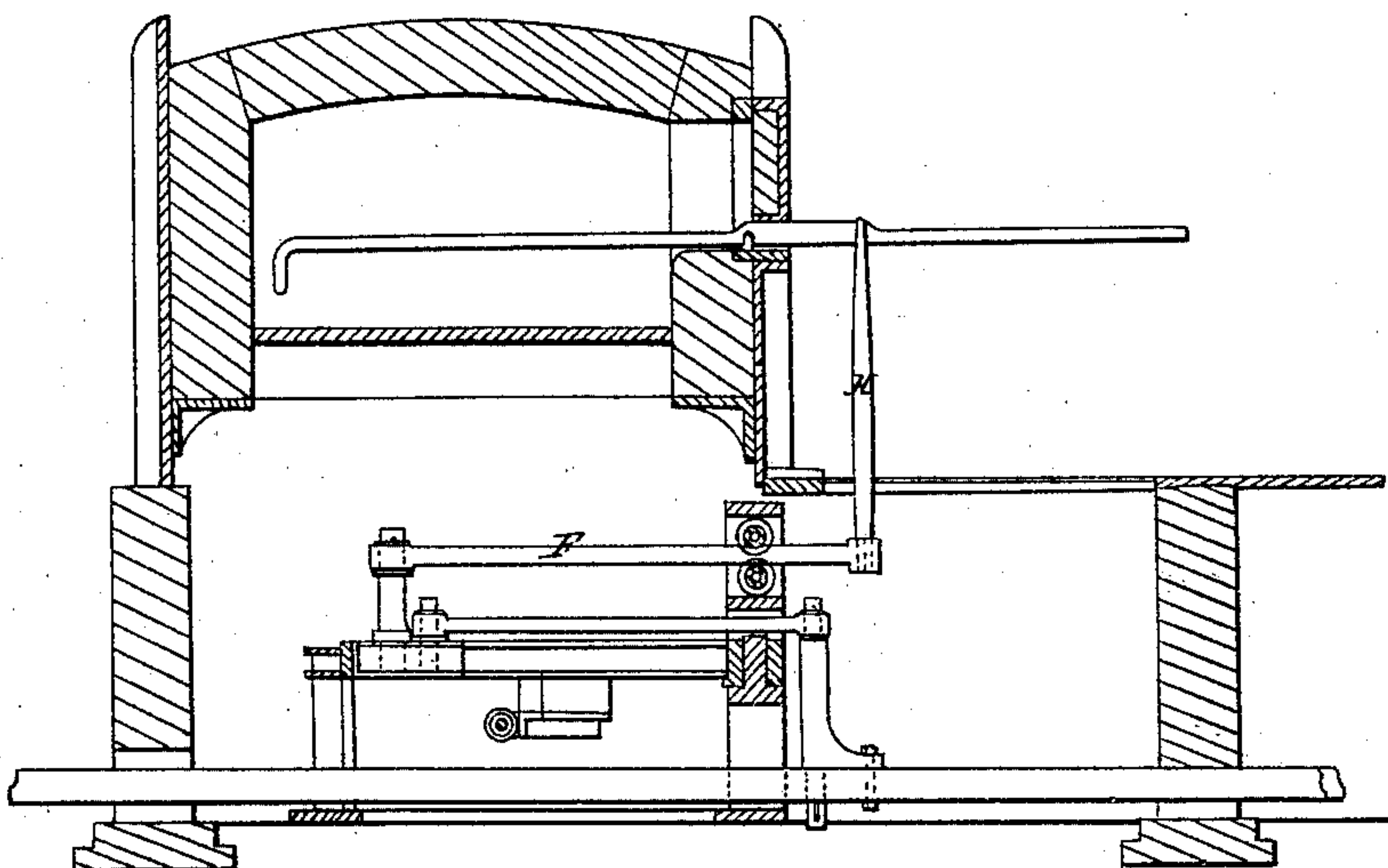
H. BENNETT.  
Mechanical Puddler.

No. 41,671.

Patented Feb. 23, 1864.



*Fig. 3.*



*Fig. 4.*

Witnesses:

*J. C. Wilson*  
*J. A. Patton*

Inventor:

*Henry Bennett*  
*By A. B. Stanton.*



# UNITED STATES PATENT OFFICE.

HENRY BENNETT, OF WOMBRIDGE, ENGLAND.

## IMPROVED MACHINERY TO AID IN PUDDLING IRON AND STEEL

Specification forming part of Letters Patent No. 41,671, dated February 23, 1834.

*To all whom it may concern:*

Be it known that I, HENRY BENNETT, of Wombridge, in the county of Salop, England, engineer, a subject of Her Britannic Majesty, have invented Improved Apparatus or Mechanism to be Used in Puddling Iron, Steel-Iron, or Steel; and I do hereby declare that the following is a full and exact description of my said invention—that is to say:

This invention consists of improved apparatus or mechanism, to be worked by steam or other power, to assist the workman or puddler in the process of puddling, and by which he is relieved of all the more laborious part of the work, the quality of the metal is considerably improved, larger charges can be worked, and the cost greatly reduced.

In the drawings, Figure 1 is a plan, and Fig. 2 a transverse section, representing a puddling-furnace with my improved apparatus attached. Fig. 3 is a plan, and Fig. 4 a transverse section, of a puddling-furnace with similar apparatus attached, but modified to admit of its being placed beneath the furnace.

I will now proceed to describe the construction and working of the apparatus as exhibited in Figs. 1 and 2.

A represents the shaft, which may be extended, if required, to several furnaces. This shaft works in an oscillating motion, which may be varied according to the length of stroke required, and in a direction across the furnace.

B is the connecting-rod, its motions being shown by the dotted lines in Fig. 1, actuating the sliding piece C. This connecting-rod B is supported by a vertical bearing, B', attached to the driving-shaft A.

D is the vertical shaft, on the top of which the puddler's rabble or tool E is supported.

The shaft A may be driven by steam or any other suitable power, the motion of the sliding piece C backward and forward in correspondence with that of the driving-shaft, and its second motion—a partly-circular one—being obtained in the following manner: The catch F upon an arm of the shaft A engages in the teeth of the clutch G, and, driving the spindle H, upon which the clutch is mounted, works the sliding frame L in a quadrantal direction round the guard R, by means of the worm I, which gears into the rack K, the sliding frame having worked round on the center

pin, P, to the position shown in dotted lines C'. The clutch G is thrown out of gear by a stud upon the under side of the sliding frame L, and the clutch G' at the same time being brought into gear. The slide is returned by a similar motion to the point shown at C''.

N shows the bottom frame supporting by the uprights Q the guard-piece R, for the sliding frame L. The center pin, P, is bridged, as shown in Fig. 2, to admit of the shaft oscillating, as described.

Z represents the bed of the furnace; Y, the flue; V, the charging-door, and T the walls, S being the fire-bars.

Figs. 3 and 4 show a modification of the apparatus already described adapted for placing underneath the bed of the furnace, to avoid any damage that might arise from cinder falling upon it; and by simply reversing the position of the parts this form of apparatus may also be applied upon the crown of the furnace with the same object, if preferred. In this form of apparatus the connecting-rod B has its motion, in similar manner to that last described, of the driving-shaft A, working through a bridged center pin, P, as before; but the slide D is attached to a vertical rod, E, carrying an arm, F, through a universal joint, G. This arm F carries the vertical shaft H, which supports the puddler's rabble, the circular reciprocating motion of the sliding frame K being governed by ordinary reversing-gear, L, instead of the clutch motion before described, and this reversing-gear may also be used in the apparatus shown in Figs. 1 and 2, instead of the clutch motion.

The apparatus shown in Figs. 1 and 2 is capable of being constructed in a movable form by mounting it entire upon a suitable carriage, and placing the rack K and reversing-gear outside the guard, instead of in the position shown in the drawings. The connecting-rod B, working the slide C, must also work above the floor of the furnace instead of beneath, as shown.

By the employment of apparatus as herein described I obtain the motion of the puddler's arm, and also the movements of his body, in reaching all parts of the furnace. The only duties required of the puddler are the feeding of the furnace, the changing of the rabble as it heats, and the balling up of the iron. The quality of the iron is considerably improved,

larger charges can be worked, and at less cost.

Having thus described the nature of my said invention and the manner in which the same is to be performed, I do not confine myself to these precise details, as many of the mechanical parts may be considerably varied without altering the motions or departing from the principle of my invention; but

That which I claim is—

Improved apparatus or mechanism to be used in the process of puddling iron, steel-iron, or steel, and constructed substantially as herein more fully set forth and specified.

HENRY BENNETT.

Witnesses:

J. M. G. UNDERHILL,  
WM. TADMAN FOULKES.