

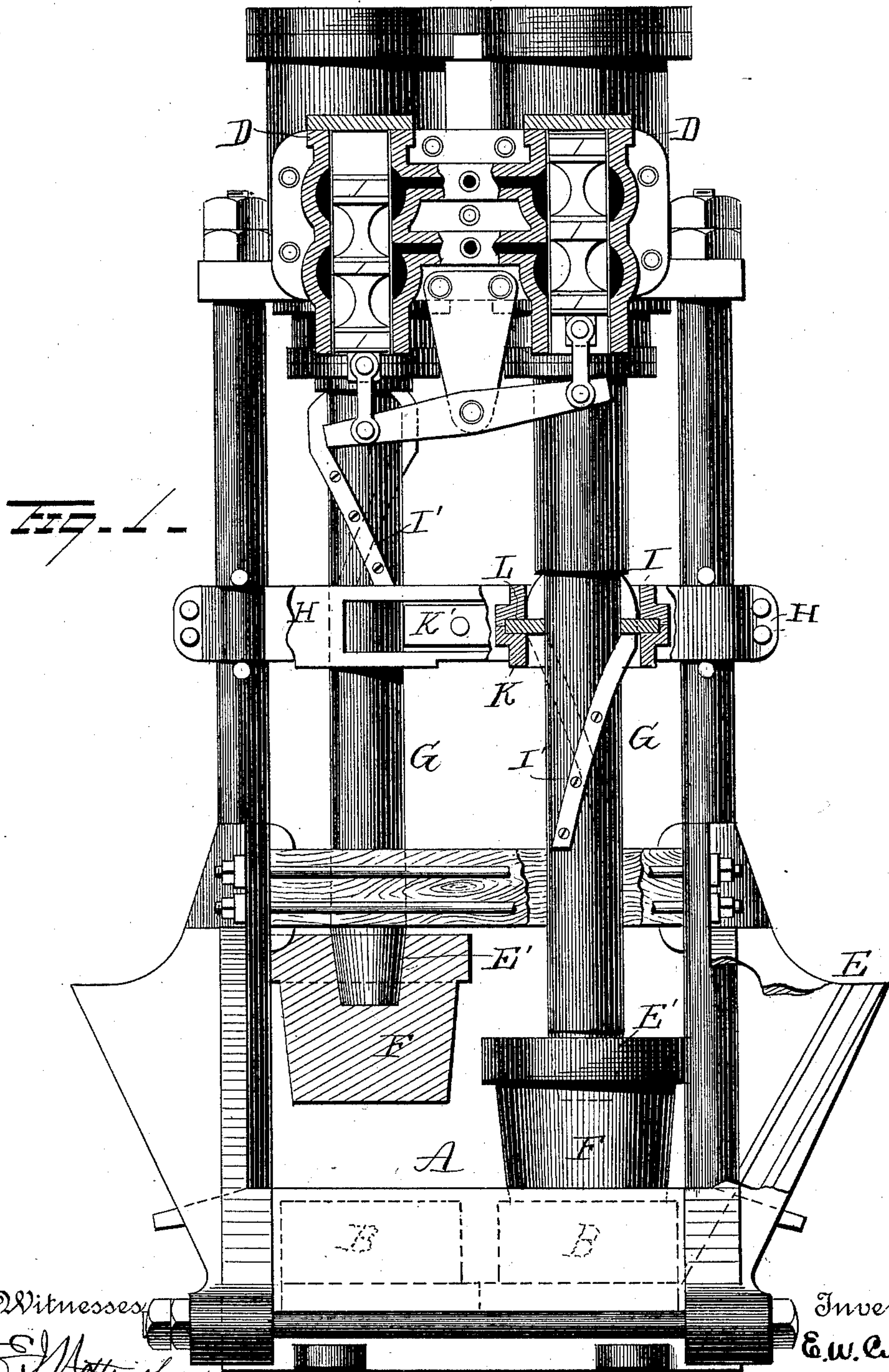
(No Model.)

3 Sheets—Sheet 1.

E. W. CURTISS.
STEAM ORE STAMP.

No. 465,128.

Patented Dec. 15, 1891.



Witnesses
E. J. Attridge
C. F. Downing

Inventor
E. W. Curtiss

By H. A. Seymour
Attorney

(No Model.)

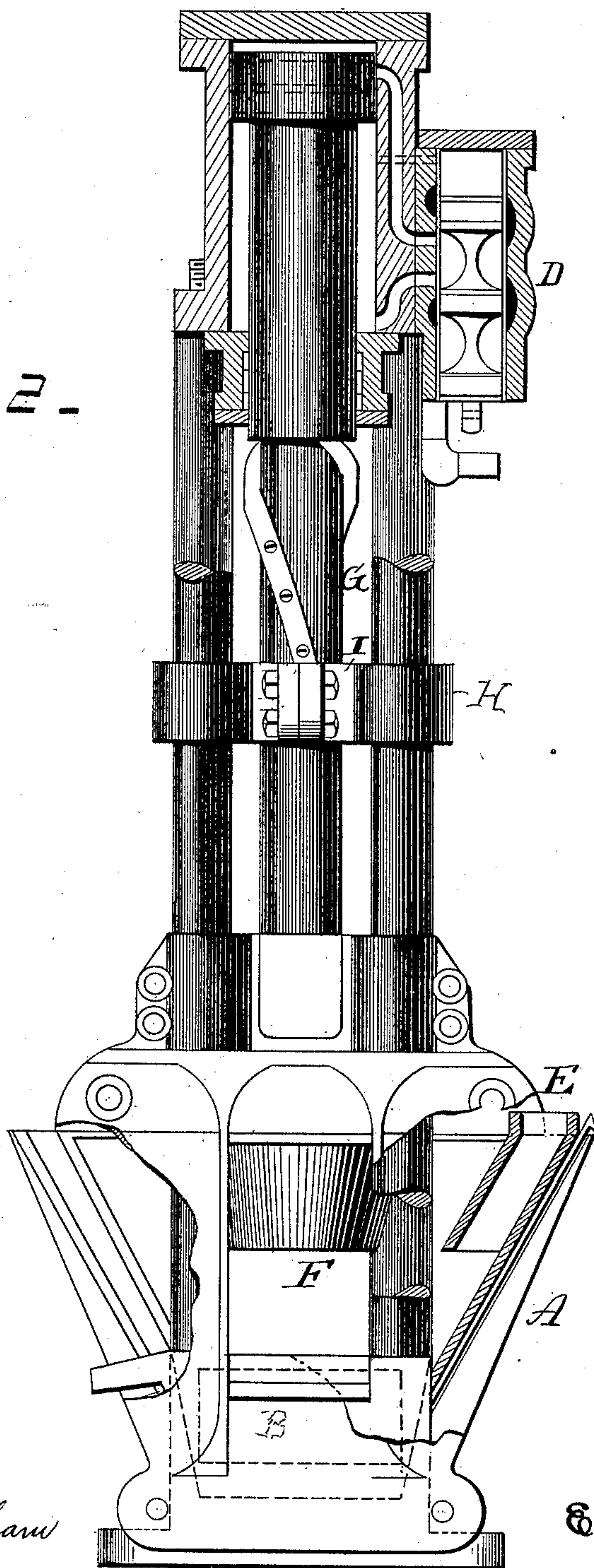
3 Sheets—Sheet 2.

E. W. CURTISS.
STEAM ORE STAMP.

No. 465,128.

Patented Dec. 15, 1891.

Fig. 2.



Witnesses
E. J. Nottingham
G. J. Downing

Inventor
E. W. Curtiss
By *H. A. Seymour*
Attorney

(No Model.)

3 Sheets—Sheet 3.

E. W. CURTISS.
STEAM ORE STAMP.

No. 465,128.

Patented Dec. 15, 1891.

Fig. 3.

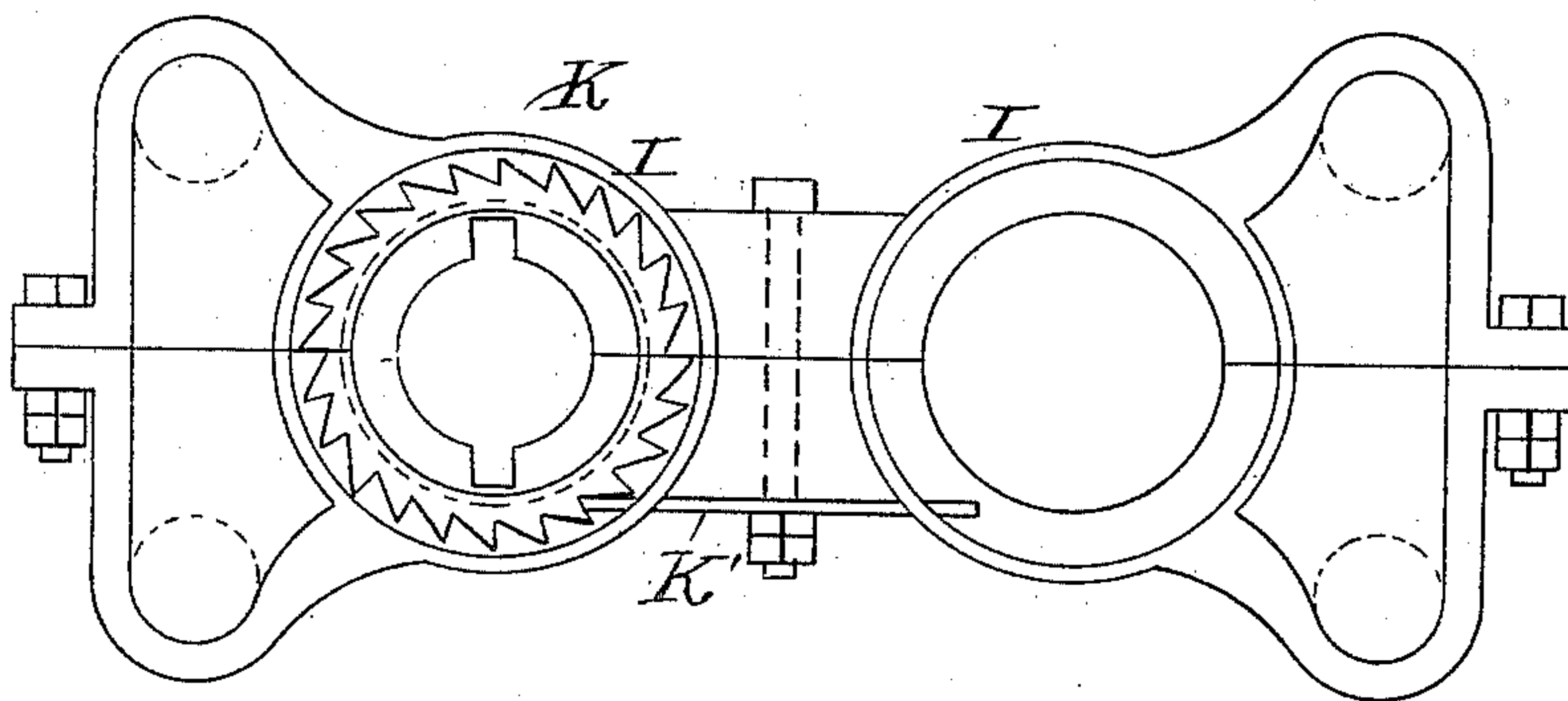


Fig. 4.

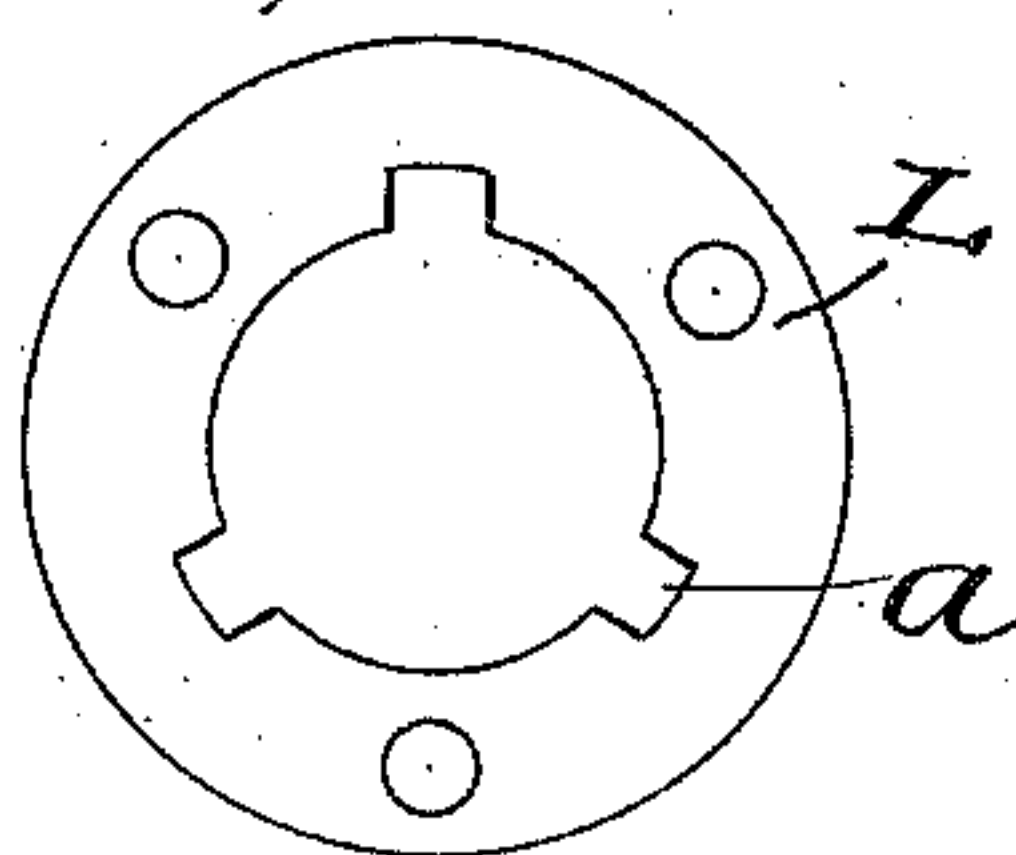


Fig. 5.

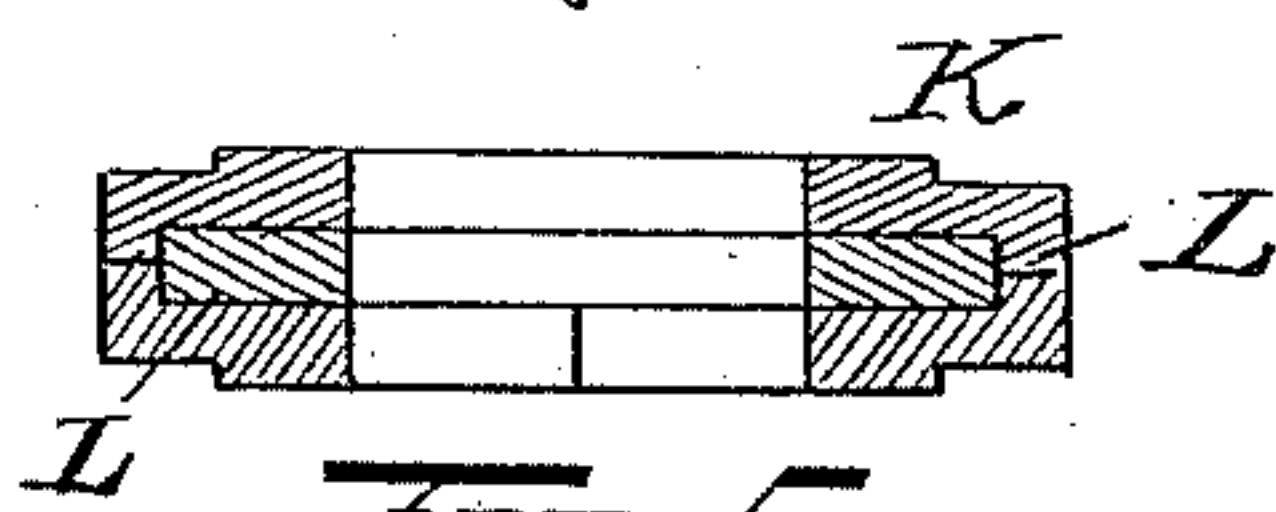
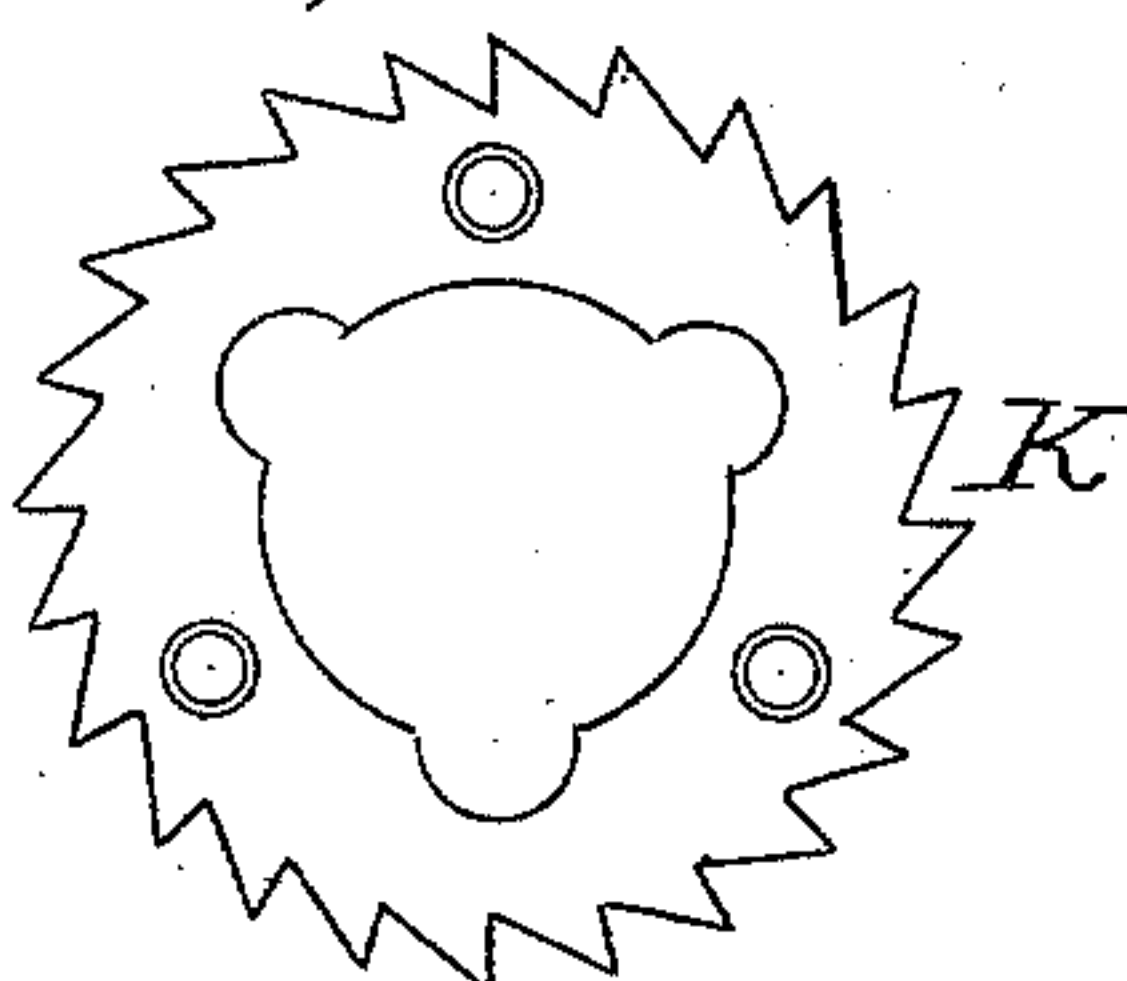


Fig. 6.

Witnesses

C. W. Nottingham
G. J. Downing.

Inventor

E. W. Curtiss

By H. A. Seignour

Attorney

UNITED STATES PATENT OFFICE.

EDWARD W. CURTISS, OF PORTLAND, OREGON.

STEAM ORE-STAMP.

SPECIFICATION forming part of Letters Patent No. 465,128, dated December 15, 1891.

Application filed June 26, 1891. Serial No. 397,629. (No model.)

To all whom it may concern:

Be it known that I, EDWARD W. CURTISS, a citizen of Portland, in the county of Multnomah and State of Oregon, have invented certain new and useful Improvements in Steam Ore-Stamps; 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.

My invention relates to an improvement in steam ore-stamps, and more particularly to devices for imparting a variable revoluble motion to the plungers, its object being to produce simple devices for causing a variable revoluble motion of the plunger of an ore-stamp, which devices shall comprise but few parts and be effectual in the performance of their functions.

With these objects in view the invention consists in certain novel features of construction and combinations and arrangements of parts, as hereinafter set forth, and pointed out in the claims.

In the accompanying drawings, Figure 1 is an elevation of an ore-stamp having my improvements applied thereto. Fig. 2 is an end view. Figs. 3, 4, 5, and 6 are detail views.

A represents a mortar in which dies B are located. Secured to and projecting upwardly from the mortar is a series of stout rods. The frame thus formed carries at its top a steam-engine D, the construction of which is fully set forth in Letters Patent granted to me bearing date of March 31, 1891, and numbered 449,208. If desired, screens may be placed on three sides of the frame and a hopper E on the fourth side. The piston-rods G of the engine are made conical on their lower ends and adapted to enter and be secured in similarly-shaped sockets E' in the top of shoes F. A cross-bar or guide H is secured to the frame of the machine and perforated for the accommodation of the piston-rods G. The piston-rods G are adapted to pass through suitable boxing I, supported by the frame-work of the machine, and at the point where the piston-rod passes through said boxing, and above and below the same, a spiral I' is secured to said piston-rod. This spiral may consist of a strip or strips of metal secured to the rods G and made

to curve more at one point than at another, so as to produce a variable pitch. Located in the boxing I is a ratchet-wheel K, with which a dog K', located in the boxing I, is adapted to engage. The ratchet-wheel K is preferably made, as shown in Fig. 6, in two parts, and the parts secured together in any suitable manner to produce a sort of box, in which a steel plate or disk L is located, said disk or plate being held in place by the same fastening devices which hold the parts of the ratchet-wheel together. The disk L is provided with a central opening, the walls of which are made with notches or recesses *a*, adapted to receive the spiral or spirals I'. From this construction it will be seen that during the operation of the machine the ratchet-wheel K revolves on the upstroke of the piston, and on the downstroke the dog or pawl K' engages said ratchet-wheel and causes the piston-rod to revolve while the ratchet-wheel is at rest, thus causing a rotary or grinding motion of the shoes at the time the blow is struck, thus giving the grinding as well as the crushing effect at the same time.

By having the spiral strips I' of variable pitch an important result is reached—that is to say, on the upstroke no advantage is gained; but as the inertia of rest of the ratchet-wheel is small, owing to the small amount of mass or weight to be set in motion, it is of no great disadvantage. On the downstroke the piston, piston-rod, and shoe combined make a heavy weight, and to give this the revoluble motion suddenly would cause great strain and would soon ruin the machine.

The revoluble motion depends upon the pitch of the spiral. In the drawings the spiral is so made that at the commencement of the downstroke there is little or no spiral, but gradually increases as the spiral passes through the ratchet. Thus the revoluble motion is started very gently and reaches its greatest velocity just as the blow is struck, resulting in great efficiency. It is for this reason I use the thin disk or plate of steel L. It is to be able to use a variable-pitch spiral. Besides the grinding effect on the ore being crushed, the wearing of the pistons and cylinders and all bearings, as well as the "shoes and dies," is such as to keep every part true—i. e., the cyl-

inders cannot wear more on one side than on another. The direction of revolution of the piston-rods and shoes is always the same.

Having fully described my invention, what
5 I claim as new, and desire to secure by Letters Patent, is—

1. In an ore-stamp, the combination, with a rod and a spiral thereon, of a boxing, a ratchet-wheel in said boxing, a dog to engage said
10 ratchet-wheel, and a disk inclosed by the ratchet-wheel and provided with recesses to receive the spiral, substantially as set forth.

2. In an ore-stamp, the combination, with a rod and a spiral thereon, of a boxing, a ratchet-wheel therein, said ratchet-wheel being made
15 in two parts and adapted to form a box, a dog adapted to engage the ratchet-wheel, and a

plate carried within said ratchet-wheel and provided with notches or recesses adapted to receive the spiral on the rod, substantially as
20 set forth.

3. The combination, with the rod or plunger of an ore-stamp, of a spiral thereon at a variable pitch and ratchet mechanism with which said spiral is adapted to engage, sub-
25 stantially as set forth.

In testimony whereof I have signed this specification in the presence of two subscribing witnesses.

EDWARD W. CURTISS.

Witnesses:

R. L. TAFT,

J. W. MCFARLAND.