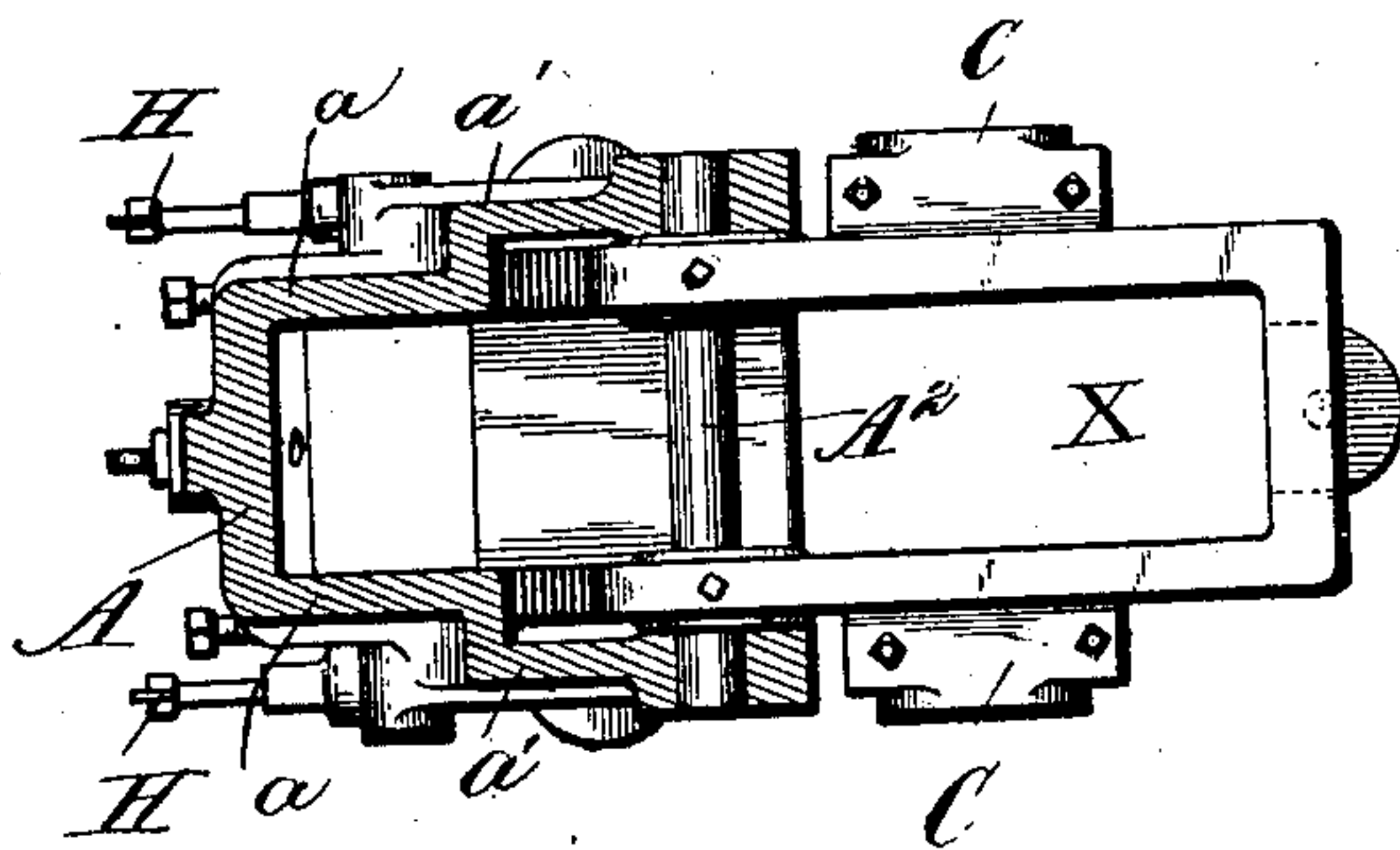
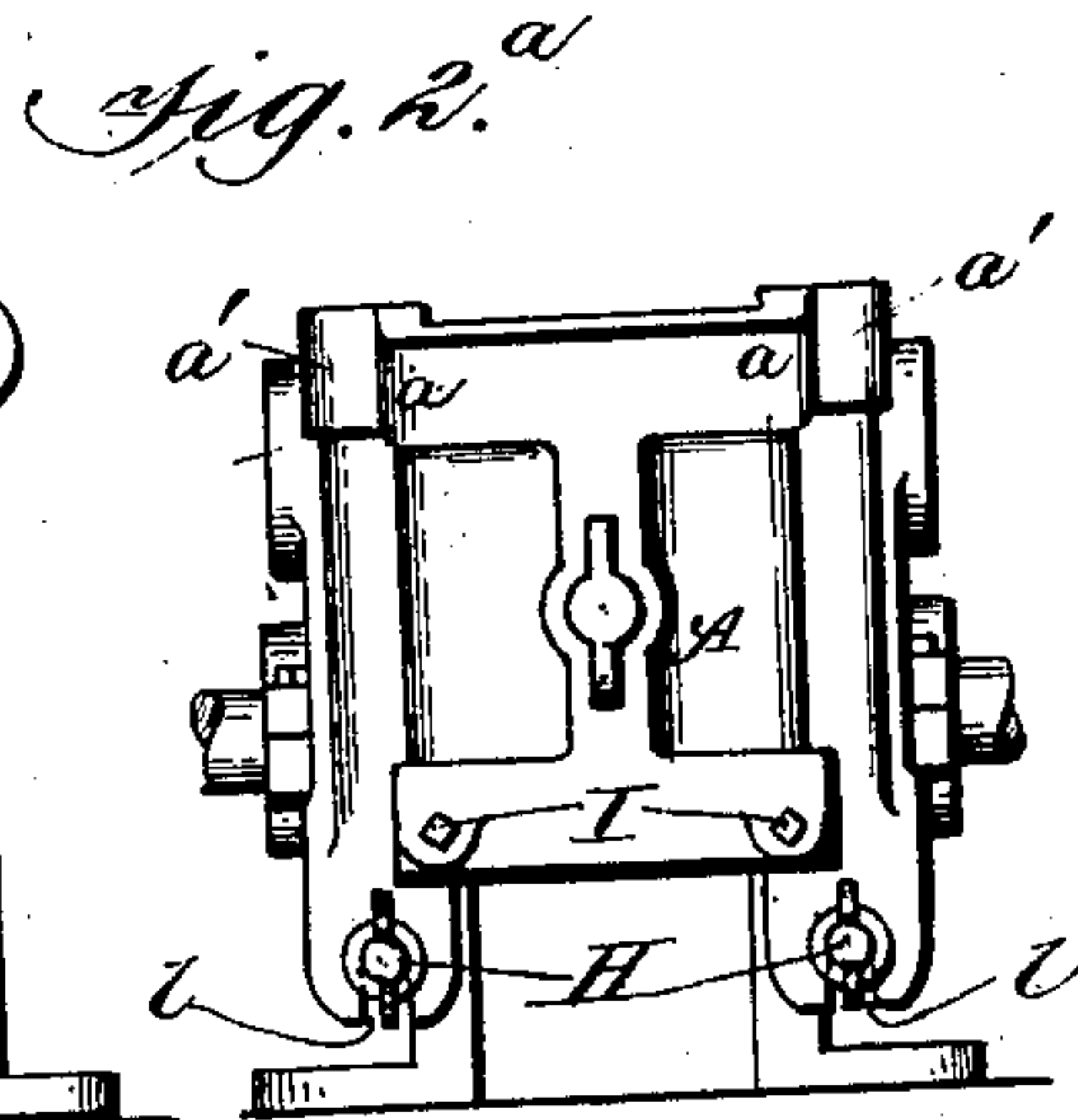
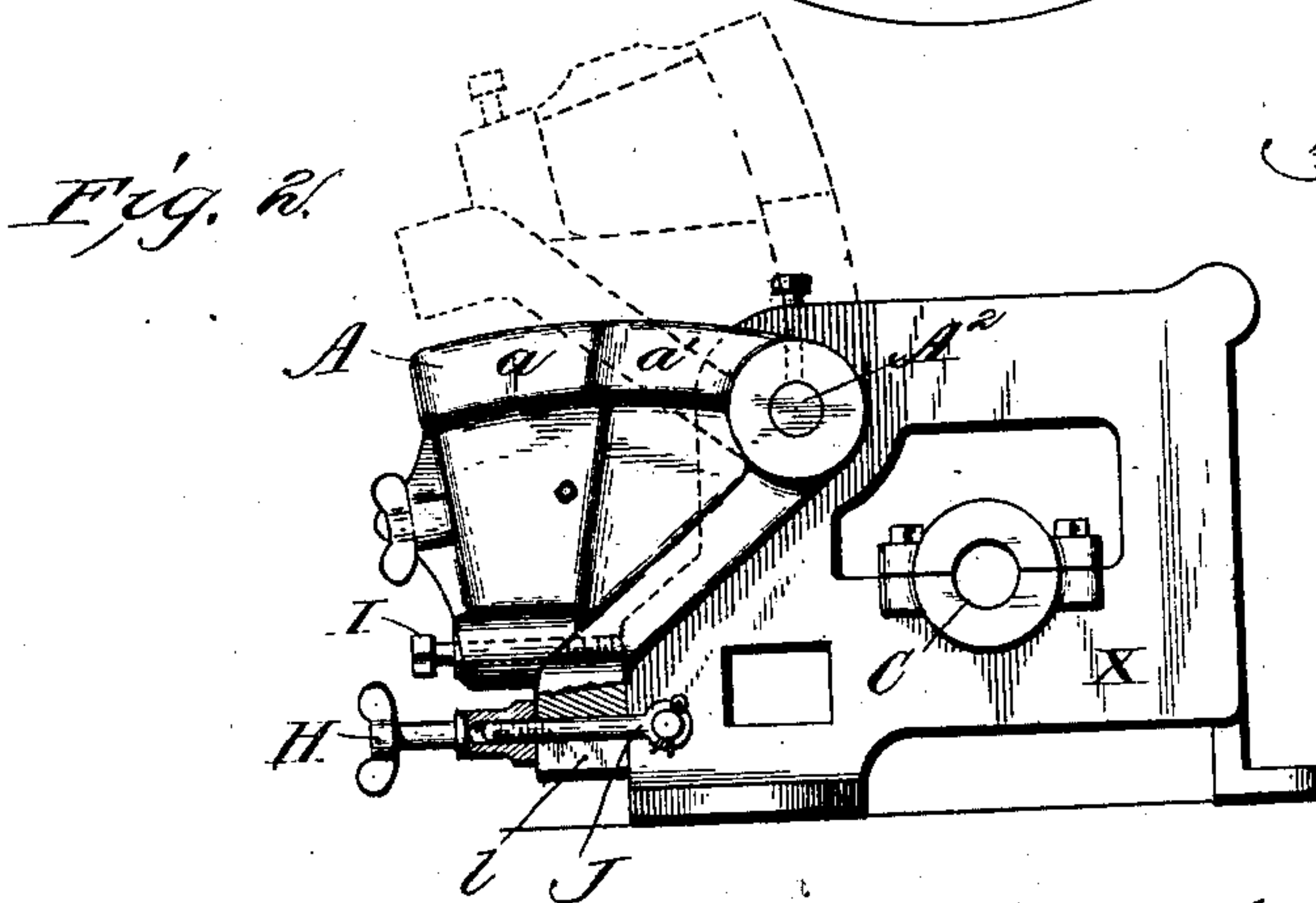
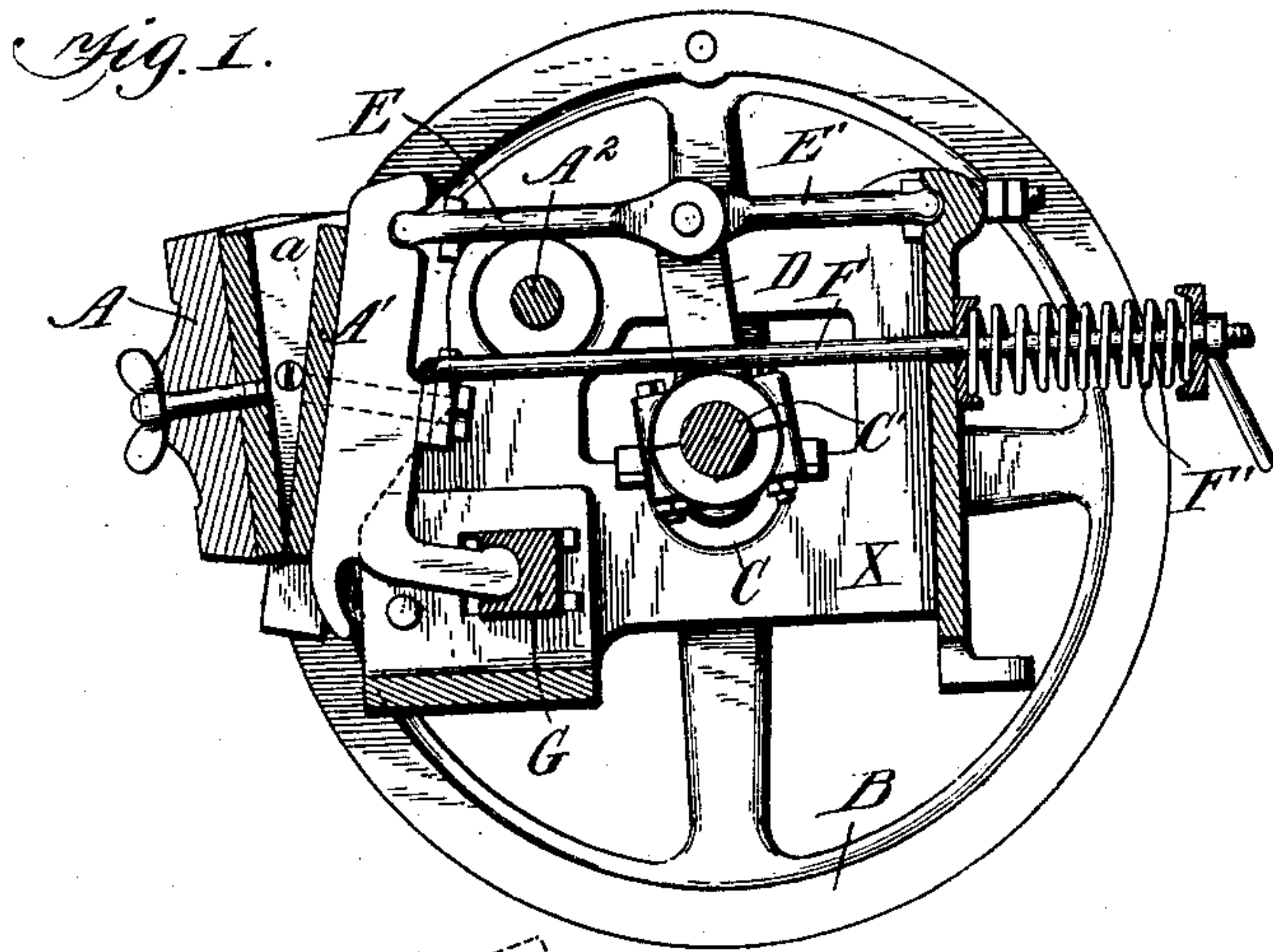


No. 735,942.

PATENTED AUG. 11, 1903.

A. C. CALKINS.  
ASSAYER'S ORE CRUSHER.  
APPLICATION FILED JAN. 10, 1902.

NO MODEL.



WITNESSES:

*Fred D. Bradford*  
*Edw. W. Byrn*

INVENTOR  
*Albert C. Calkins.*

BY *Munn & Co.*

ATTORNEYS



# UNITED STATES PATENT OFFICE.

ALBERT CHAMPLIN CALKINS, OF LOS ANGELES, CALIFORNIA, ASSIGNOR TO  
THE CALKINS COMPANY, OF LOS ANGELES, CALIFORNIA, A CORPORATION  
OF CALIFORNIA.

## ASSAYER'S ORE-CRUSHER.

SPECIFICATION forming part of Letters Patent No. 735,942, dated August 11, 1903.

Application filed January 10, 1902. Serial No. 89,143. (No model.)

*To all whom it may concern:*

Be it known that I, ALBERT CHAMPLIN CALKINS, of Los Angeles, in the county of Los Angeles and State of California, have invented a new and useful Improvement in Assayers' Ore-Crushers, of which the following is a specification.

My invention is in the nature of an ore-crusher designed mainly for the use of assayers; and its object is to provide a simple and convenient ore-crusher in which free access may be had to the crushing-chamber to perfectly clean the same, so that the traces of a previous charge may not remain and falsify the assay of subsequent crushings of other samples of ore.

It consists mainly in the construction and arrangement of the crushing-chamber designed with reference to securing easy and convenient access to the interior and its perfect cleaning, as will be hereinafter more fully described with reference to the drawings, in which—

Figure 1 is a vertical section taken transversely to the jaws and the drive-shaft. Fig. 2 is a side elevation, Fig. 2<sup>a</sup> is a front elevation, and Fig. 3 a horizontal section, of the crushing-chamber.

In the drawing Fig. 1, X is the main frame, in which in suitable bearings is journaled the drive-shaft C, carrying fly-wheel B. The cranked portion C' of the drive-shaft connects with a vertical pitman D, which in turn at its upper end connects with the middle joint of the horizontal toggle-arms E E'. One of these arms finds an abutment against the back wall of the stationary frame-casing X and the other against a seat in the top of the movable jaw A'. This jaw A' at its lower end has a heel seated in an adjustable heel-block G, which forms a rocking abutment for the movable jaw. A tension-rod F, with adjusting-spring F', draws back the movable jaw after it has been advanced by the action of the toggle-arms E E'.

As so far described my crusher does not differ materially from the construction shown in my previous application for patent, Serial No. 63,732, filed June 8, 1901. To provide, however, a construction and arrangement of

crushing-chamber which will carry out the objects of my invention, I form the crushing-chamber (see Figs. 2 and 3) with a removable part A, which is closed at the end to form the relatively stationary jaw and on its two sides a a' has wings or cheek-pieces in planes at right angles to the end portion. The portions a a' of the removable crushing-chambers are made of the same internal dimensions as the inside cross measurement of the side walls of the main frame or casing X. The other portions a' a' are wider apart and lap upon the outside of the side walls of the main casing and are hung upon a cross-shaft A<sup>2</sup>, fixed in the said side walls, so that the removable crushing-chamber A may be turned on shaft A<sup>2</sup> from the position shown in Fig. 2 back upon and over the main casing X, so as to be entirely inverted. This not only gives free access to the face and sides of the movable jaw A', but it also allows the crushing-chamber A to be fully discharged of all remaining traces of a crushing charge, both by the act of inversion and also by the complete exposure of its interior surfaces.

To hold the removable crushing-chamber A down when in working position, a slotted lug l is formed on the lower portion of the same on each side, the slots in which drop over an eyebolt J on each side, which is attached to the main casing in the plane of the slotted lugs and whose outer threaded end receives an internally-threaded handle-nut H. When the latter is screwed up to a bearing against the lugs l, it holds the crushing-chamber and its jaw down.

To determine the approach of the relatively stationary jaw A to the movable one A', said stationary jaw A (see Fig. 2) is provided on each side with a set-screw I, which is threaded into the walls of the crushing-chamber A and bears against the ends of the side walls of the stationary main frame X. By means of these adjusting-screws I the discharge-opening between the jaws of the machine is made greater or less to regulate the fineness of the crushed ore. By the swinging adjustment of the crushing-chamber itself it not only discharges itself and makes it fully accessible for cleaning, but it also gives



full access to both the face and sides of the vibrating jaw without unhooking the tension-rod or disturbing any of the other parts of the machine, thus greatly promoting cleanliness and accuracy in the assays and convenience in manipulating the machine.

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

10 1. An ore-crusher comprising a main casing, a movable jaw, a relatively stationary jaw having side pieces to form a crushing-chamber, said side pieces being hinged respectively at their upper ends to the main  
15 casing so as to be turned outwardly and up over the other jaw substantially as described.

2. An ore-crusher having its outer and relatively stationary jaw formed with side pieces to form a crushing-chamber, said side pieces  
20 being respectively hinged to the main casing at their upper ends and offset or formed in two planes, the narrower portion being of the width of the main frame-casing, and the other portion being arranged outside of the main  
25 frame-casing as described.

3. An ore-crusher comprising a main casing, an inner movable jaw, and an outer and relatively stationary jaw formed with side pieces hinged to the main frame near the top

to adapt it to move outwardly and up to an inverted position over the inner jaw and having locking devices near its lower end substantially as described.

4. An ore-crusher comprising a main casing, an inner movable jaw, and a relatively stationary outer jaw formed with side pieces hinged to the main frame-casing near the top to adapt it to be turned up and over the inner jaw and having at the bottom slotted  
35 lugs, screw-threaded stems attached to the main frame in the plane of the slots of said lugs, and screw-nuts adapted to fit upon said threaded stem and bear against the lugs substantially as and for the purpose described.

5. An ore-crusher comprising a main casing, an inner movable jaw, and a relatively stationary jaw formed with side pieces hinged to the main frame-casing near the top, means for locking said jaw at the bottom, and set-screws tapped through the said outer jaw and  
45 bearing against the main frame-casing to adjust the position of said relatively stationary jaw substantially as and for the purpose described.

ALBERT CHAMPLIN CALKINS.

Witnesses:

G. F. COLTON,

CHAS. COLGAN.