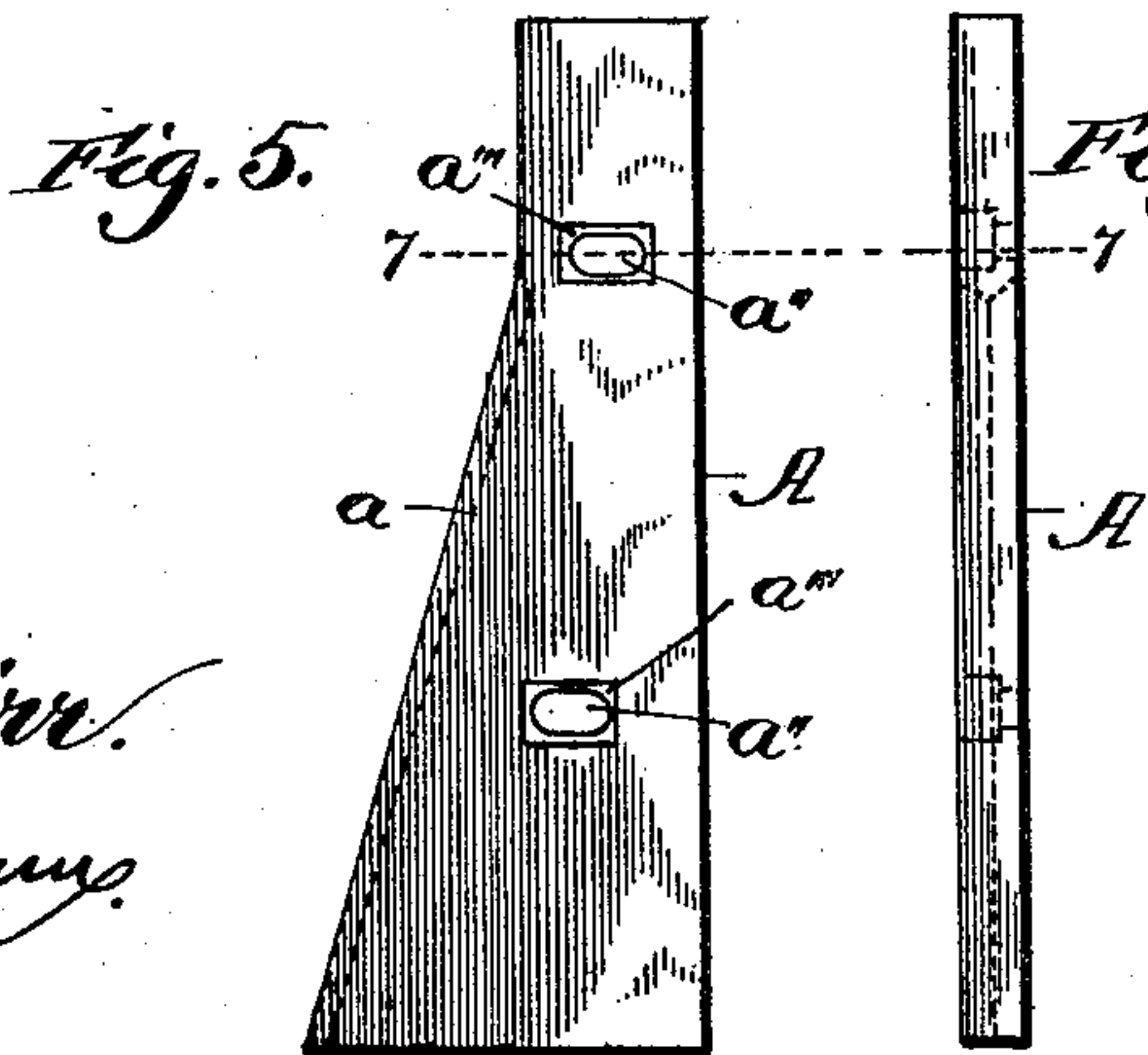
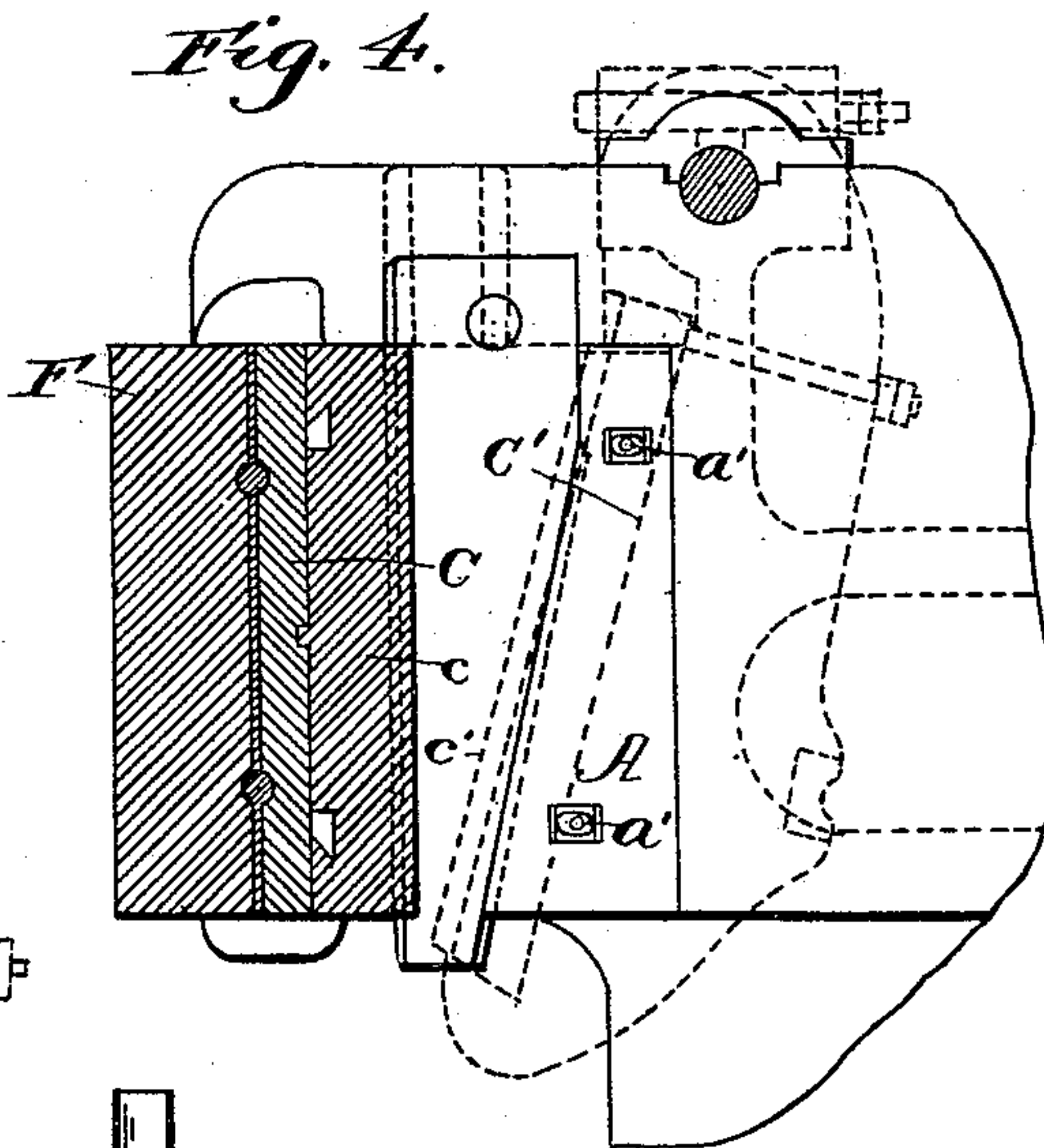
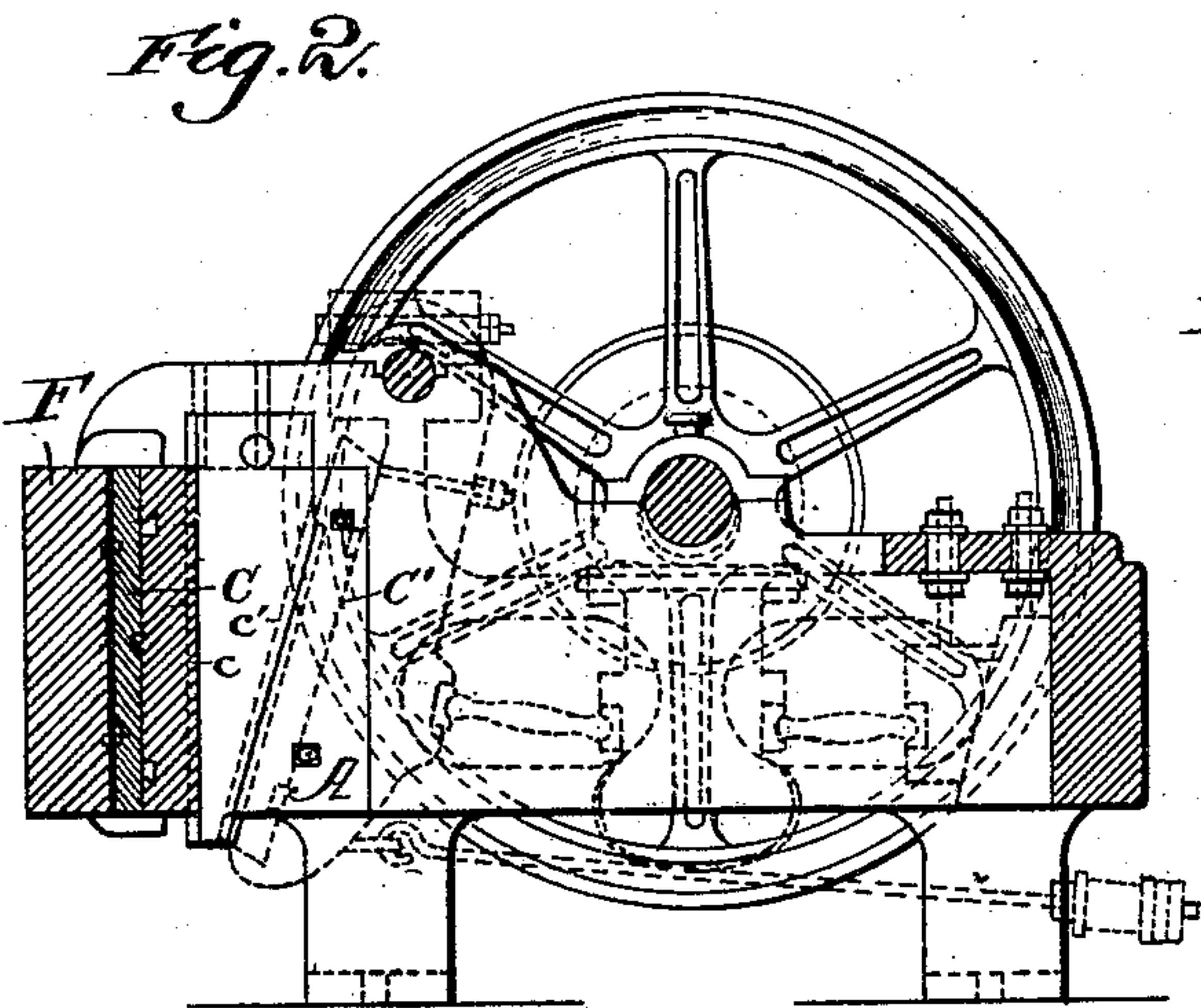
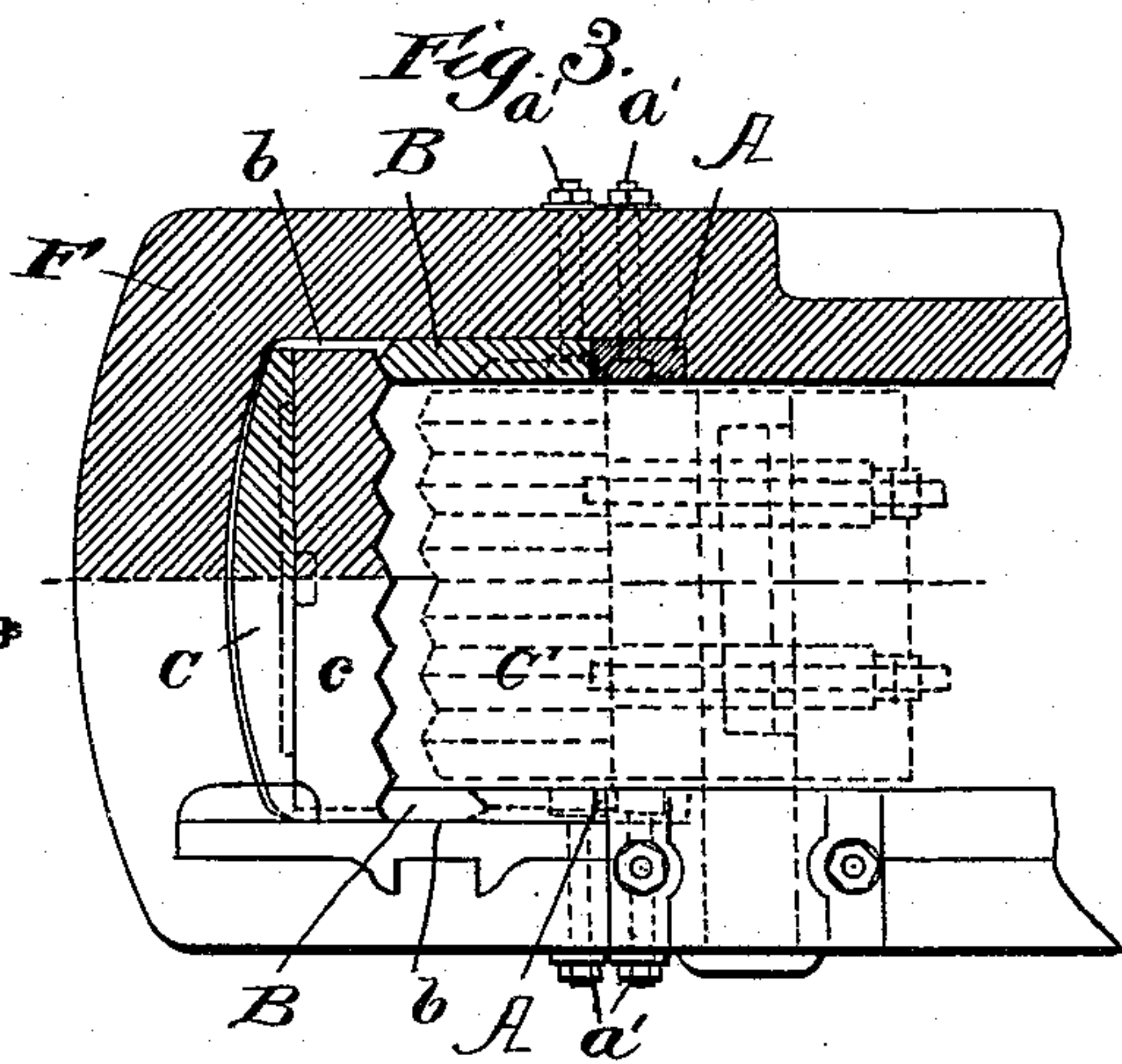
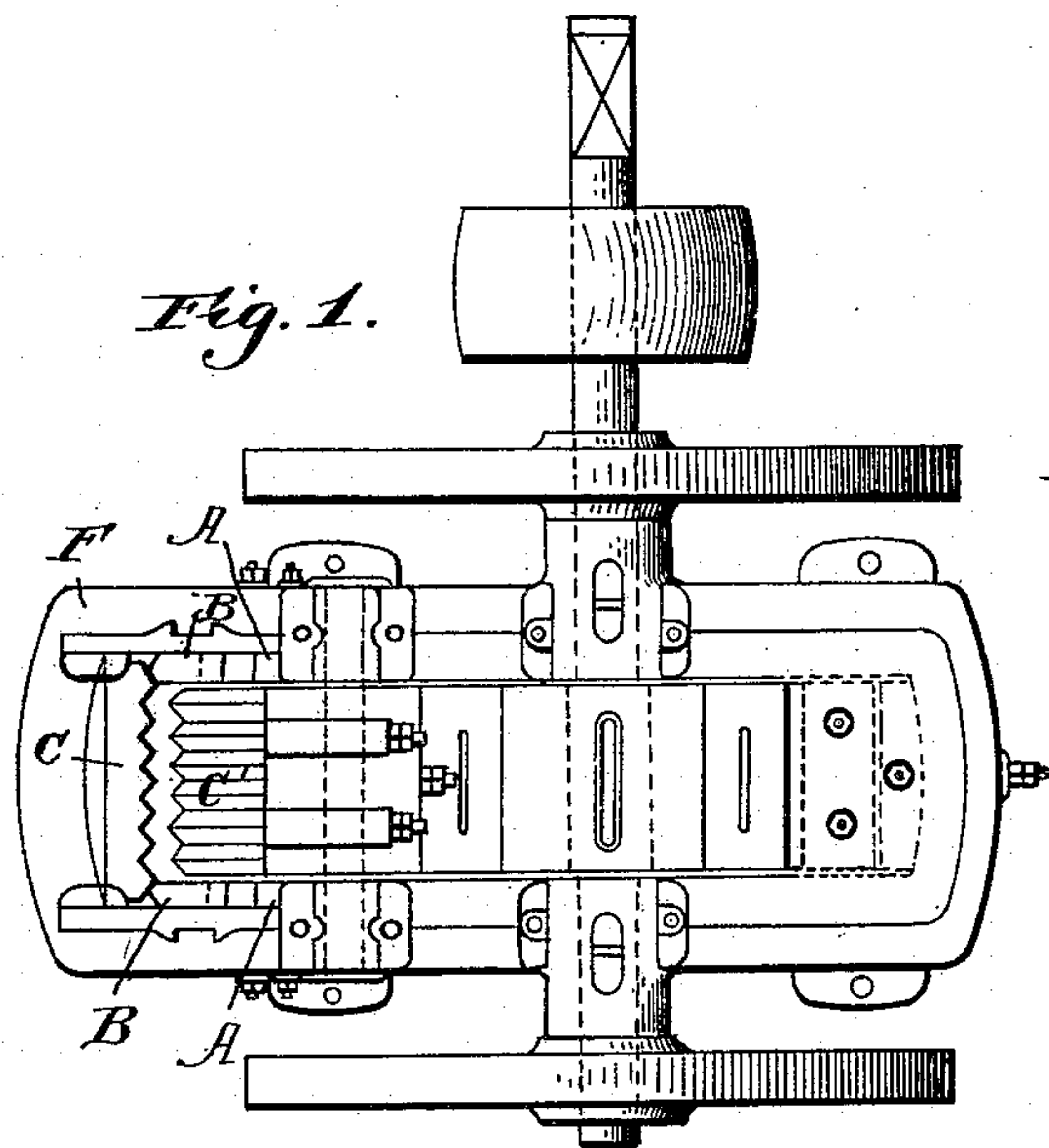


(No Model.)

F. A. ROSS.  
ORE CRUSHER.

No. 475,347.

Patented May 24, 1892.



*Fig. 6.*



*Fig. 7.*



Witnesses:

*J. B. McGinnis.*  
*E. J. Benjamin.*

Inventor:

*F. A. Ross,*  
*by Smith & Low*  
*attys.*



# UNITED STATES PATENT OFFICE.

FRANK A. ROSS, OF CHICAGO, ILLINOIS, ASSIGNOR TO FRASER & CHALMERS,  
OF SAME PLACE.

## ORE-CRUSHER.

SPECIFICATION forming part of Letters Patent No. 475,347, dated May 24, 1892.

Application filed October 9, 1891. Serial No. 408,233. (No model.)

*To all whom it may concern:*

Be it known that I, FRANK A. ROSS, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have  
5 invented certain new and useful Improvements in Crushers for Ores and other Materials; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to  
10 which it appertains to make and use the same.

My present invention relates to that class of crushers in which the material to be operated upon is grasped and broken between a stationary and a moving jaw. These jaws  
15 are ordinarily provided with removable jaw-plates, which take the direct wear of the crushing operation and which may be readily renewed when worn out, thereby preserving the integrity of the machine and permitting the  
20 further and continued use thereof. If, however, what may be termed the "permanent portion" of the machine as distinguished from the renewable jaw-plates is not properly protected at the points where the impact and  
25 abrasion of the ore, stone, &c., causes a rapid wear, I have found that notwithstanding the renewal of the jaw-plates the machine will become in a great measure useless, although the main portion of it may be in a good or perfect condition. Moreover, in order to maintain a perfect and satisfactory working of the machine the means for securing the removable pieces in place must be adequate, and especially should they be positive and enduring.  
30 ing.

With such considerations in view my improvement relates to means for protecting the permanent portions of the crushing-machine at the sides of the jaws and for securing in  
40 place the jaw-plate which is carried by the frame of the crusher; and it consists in the parts and combinations thereof hereinafter set forth and claimed.

In order to make my invention more clearly  
45 understood, I have shown in the accompanying drawings a means for carrying it into practical effect, without, however, intending to limit the application of my improvements to the particular construction which, for the  
50 sake of illustration, I have delineated.

The invention is especially applicable to what is known in the art as the "Blake" crusher, and I have illustrated it as applied to that form of machine.

In said drawings, Figure 1 is a plan view of 55 a Blake crusher having my improvements applied thereto. Fig. 2 is an elevation, partly in section, of the same. Fig. 3 is a plan view, partly in section, of a portion of the machine, taken on a larger scale. Fig. 4 is a sectional 60 view on line 4 4, Fig. 3. Figs. 5, 6, and 7 are side, edge, and plan views of the shoe hereinafter described.

Inasmuch as the form of machine shown is well known in its details, I shall confine my 65 description of the drawings to those parts which embody my invention and to the parts of the old machine which are immediately connected with them.

Referring to the drawings, C C' represent 70 the stationary and removable jaws, of which c c' are the removable and renewable jaw-plates.

B B are the side plates, fitting in recesses b, formed in the frame F of the crusher and 75 shaped on one edge to engage the face of the plate C near the ends thereof.

A A are supplemental side plates or shoes, also fitting in the recesses b of the frame and engaging the end of the recess and the rear 80 edge of the plate B. The plates A are of the tapering or wedge shape clearly shown in Fig. 5 and are formed on their front edges with grooves a, in which are received the correspondingly-convex edges of the plates B. The 85 plate A is widest at its lower end, while the plate B is correspondingly tapered and widest at the top. Vertical or inward displacement of the shoes is prevented by bolts a', which pass through the shoes and engage the frame 90 F. Horizontally-elongated holes a'' for these bolts are formed in the shoes, and also countersunk recesses a''' for the bolt-heads.

From a consideration of the construction thus described it will be seen that the perma- 95 nent frame of the crusher is entirely protected from the severe wear which takes place at the sides of the crushing-jaws. This wear extends to a point in the rear of the tapered edge of the side plate B and causes the breaking off 100



or gradual destruction of the retaining-lip of the groove *a* when it has been attempted to form such groove in the frame itself. By the complete protection of the frame, however, by  
5 plates and shoes which can be easily renewed great durability is conferred on the machine and it may be kept in perfect condition and efficient use long beyond what is now its ordinary period of practical usefulness.

10 What I claim is—

1. In a crusher for ores and other materials, the combination of the frame, a stationary jaw carried thereby, renewable side plates, and renewable supplemental side plates or  
15 shoes on which said first-mentioned side plates

rest and by which they are held in place, substantially as set forth.

2. In a crusher, the combination of the frame having recesses *b*, a stationary jaw, side plates in said recesses and engaging the plate 20 of said jaw, and shoes *A*, supporting and holding said plates in place and protecting the frame, substantially as set forth.

In testimony whereof I affix my signature in the presence of two witnesses.

FRANK A. ROSS.

Witnesses:

JNO. F. PACKER,

EDMOND S. TROUGHTON.