

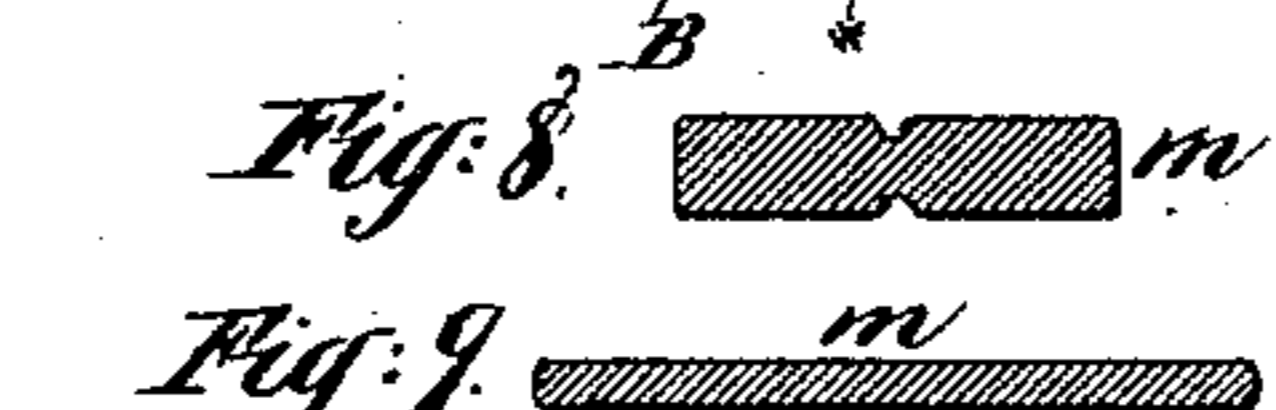
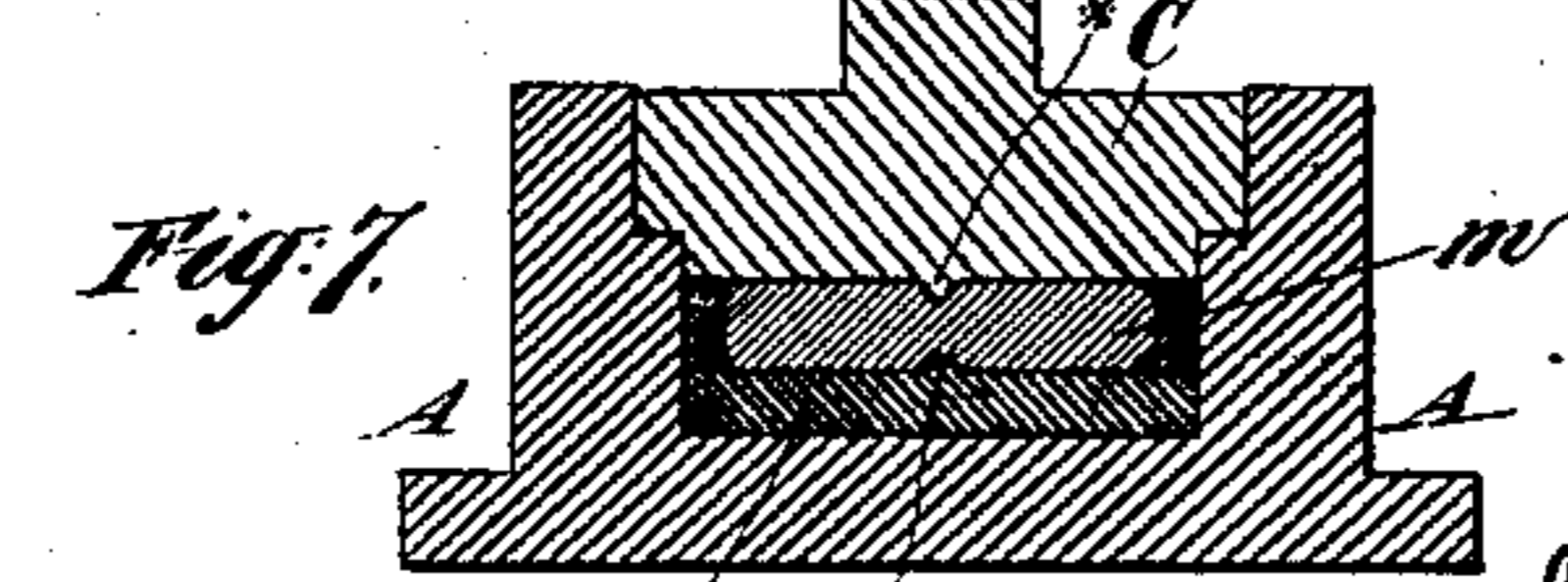
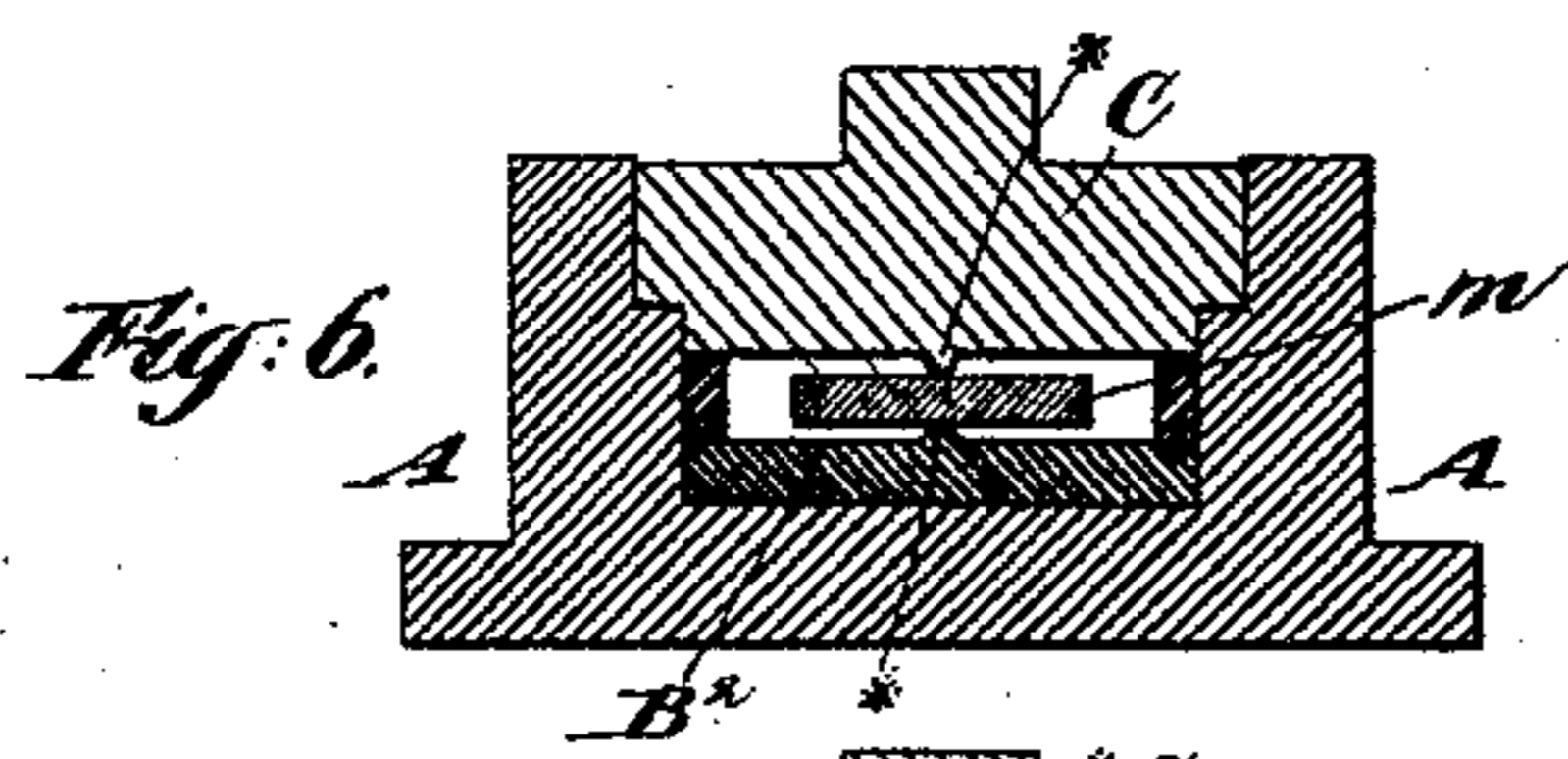
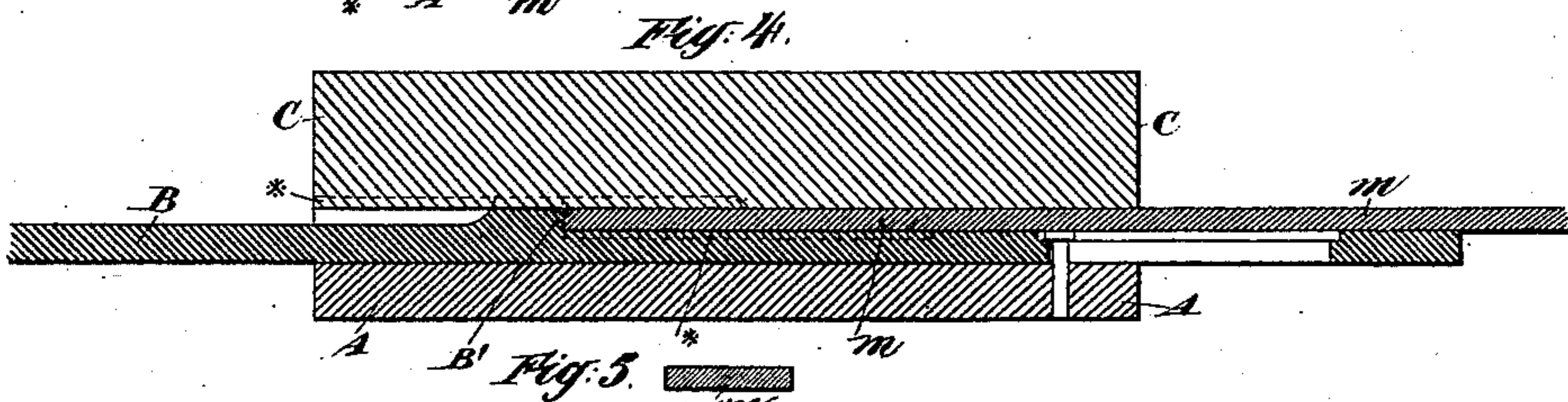
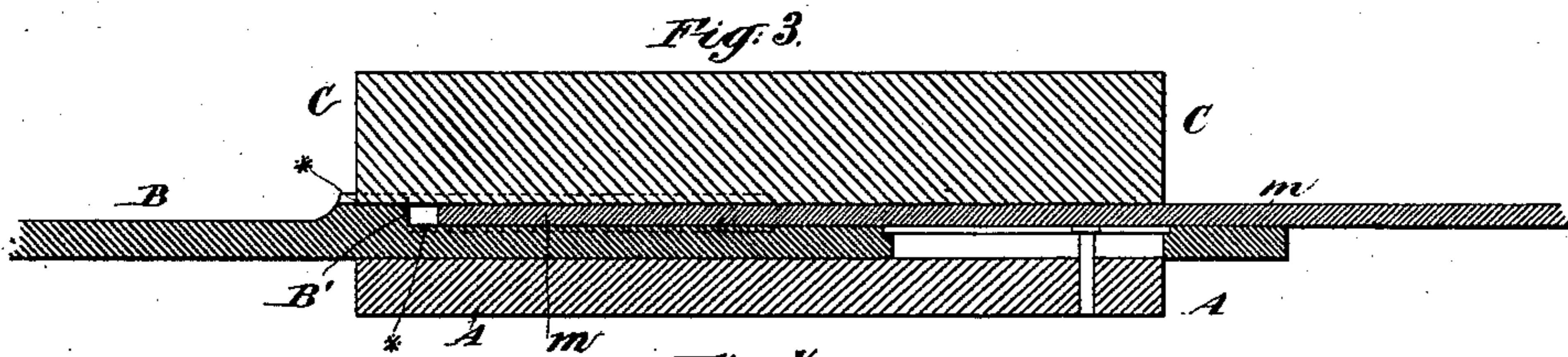
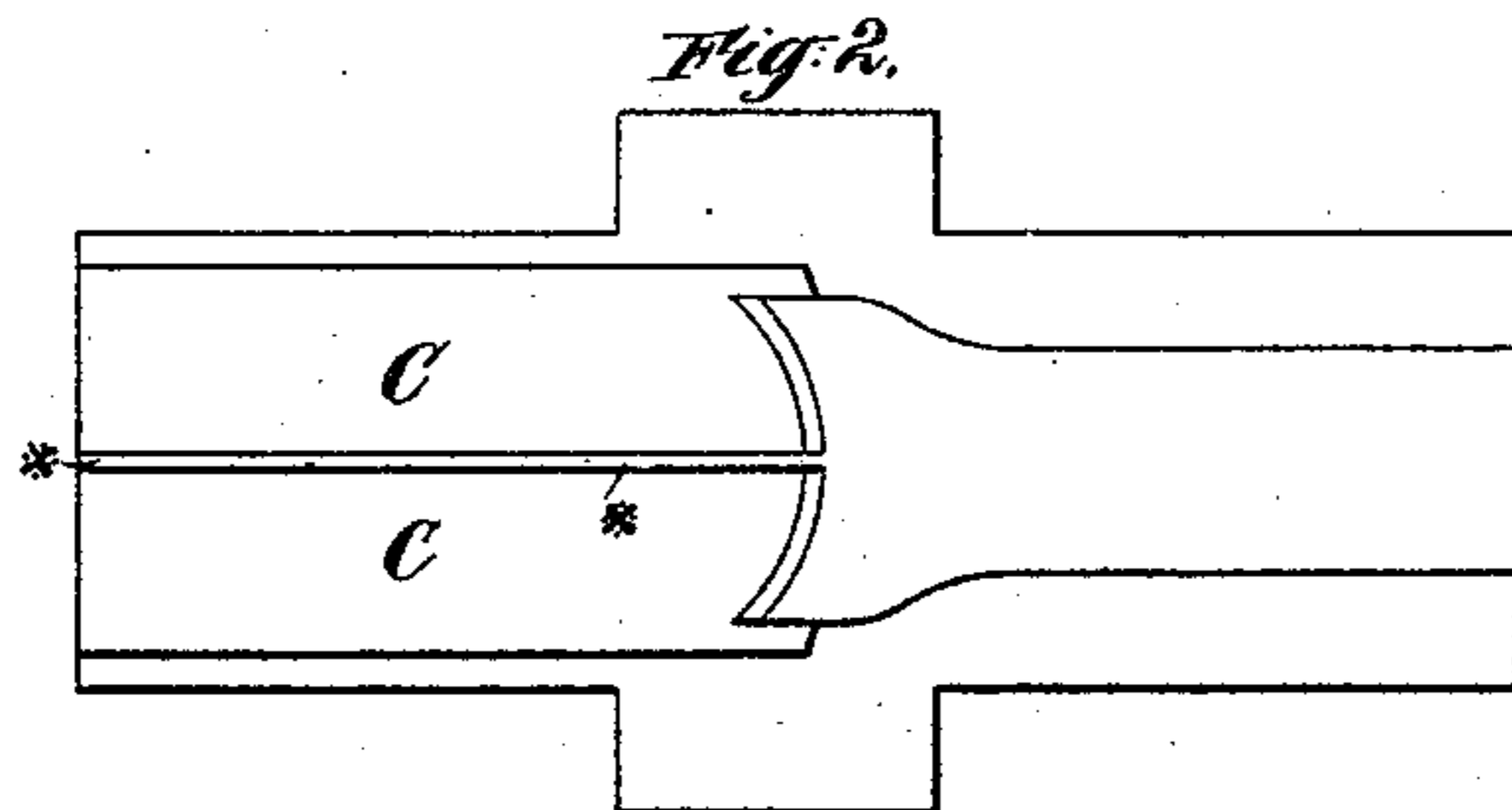
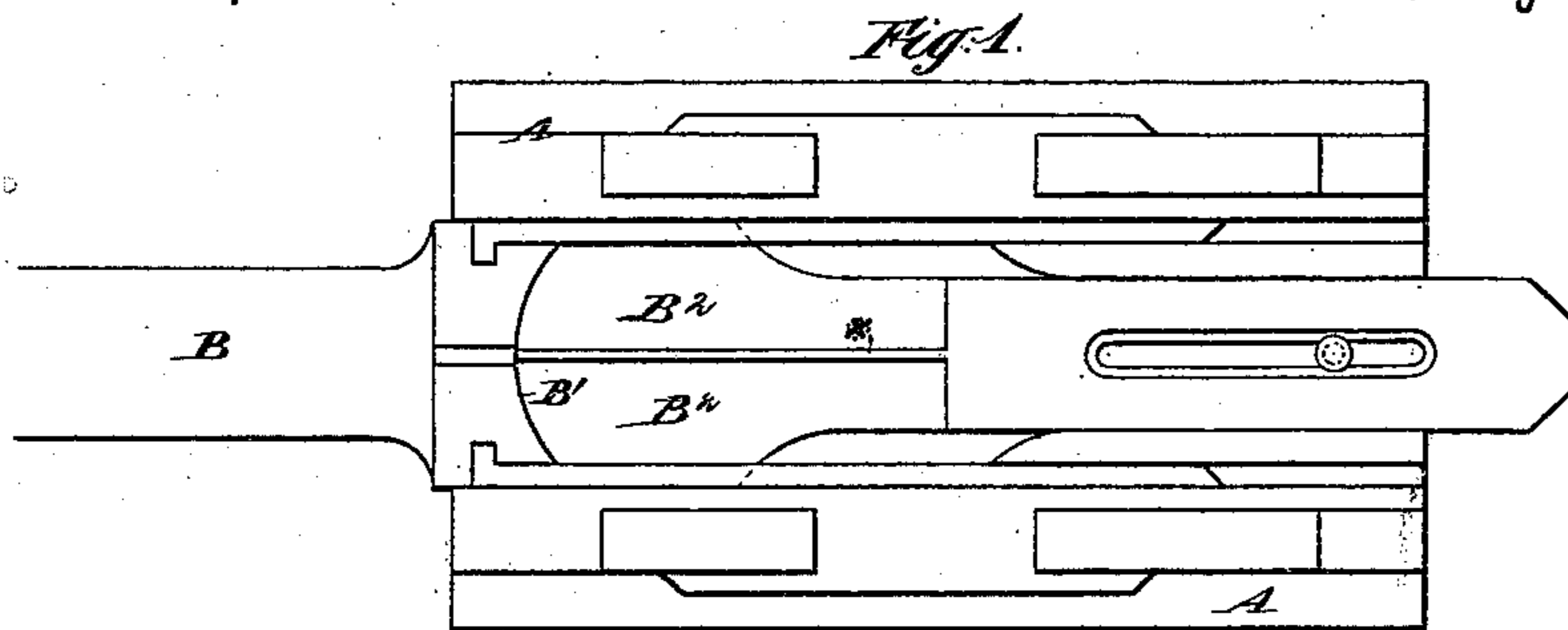
(No Model.)

W. COOKE & D. CARLOUGH.

MACHINE FOR UPSETTING EYE BARS.

No. 345,573.

Patented July 13, 1886.



Witnesses:

Charles R. Searle,  
Manierre Ellison.

Inventor:

Watts Cooke  
Daniel Carrough  
By their attorney  
Thomas Drew Station

# UNITED STATES PATENT OFFICE.

WATTS COOKE AND DANIEL CARLOUGH, OF PATERSON, NEW JERSEY.

## MACHINE FOR UPSETTING EYE-BARS.

SPECIFICATION forming part of Letters Patent No. 345,573, dated July 13, 1886.

Application filed December 19, 1885. Serial No. 186,117. (No model.)

*To all whom it may concern:*

Be it known that we, WATTS COOKE and DANIEL CARLOUGH, both of Paterson, Passaic county, in the State of New Jersey, have invented a certain new and useful Improvement in Machines for Upsetting Eye-Bars, of which the following is a specification.

The improved machine is of the general construction set forth in the patent to us dated October 13, 1885, No. 328,290. We have improved on that machine, so as to overcome a difficulty. In that machine the eye was, in the act of being upset, increased not only in width, but also in thickness. The increased thickness was afterward reduced by hammering. Our improved machine does the same.

When a bar is firmly held by its main body, and an end is heated so as to be very soft, and is compressed endwise by any suitable force to upset it, it will in a majority of cases broaden and thicken without any special means for holding it straight. The simple surrounding it by a strong metallic casing, with its inner surfaces properly placed to shape the resulting eye, is usually sufficient to produce a perfect corresponding form; but in exceptional cases the metal, instead of thus upsetting in a straight or nearly straight condition, will cramp or double to the right or to the left. Our invention is of service in preventing such cramping.

We have discovered that the portion of the bar which is to be upset may be usefully and effectually steadied against lateral deflection, and its straight and uniform upsetting insured, by presenting a longitudinal ridge on the broad top face of the box or inclosing-casing in which the upsetting is conducted, and another such ridge on the corresponding bottom face. Such ridges produce grooves extending longitudinally of the eye; but this is only a temporary result. The hammering to which the thickened eye is subjected immediately on its removal from the machine sinks the broad faces and thins the eye until the grooves are entirely obliterated. Instead of having a longitudinal ridge on the interior of the die on each face, there may be such a ridge on one face alone, and the other face may be left plane. In such case the upset eye will show a longitudinal groove on one face and none on the other. We

prefer to provide both the interior faces of the inclosing-box with the proper longitudinal ridges, and thus to print a longitudinal groove in each face of the thickened and widened end of the bar. It will be understood that when the eye-bar, having its ends thus upset and finished, is to be used in a bridge or other structure a hole of the proper diameter is smoothly bored in the center of the eye or widened portion at each end. The eye, on receiving a proper transverse pin in such hole, is firmly engaged with the other parts of the bridge or other structure. We make the ridges of such moderate depth and breadth that they do not imprint the eye until the upsetting has commenced to thicken the metal of that portion. So soon as this is experienced the thickening eye commences to take the impression of the ridge or ridges, and the entire metal is thereafter guided by such ridge or ridges. The invention practically insures that the metal of the eyes in any number of bars may with proper care be upset in a straight condition.

The accompanying drawings form a part of this specification, and represent what we consider the best means of carrying out the invention.

Figure 1 is a plan view with the cover removed. In this view the device is in the condition for receiving the bar to be treated. Fig. 2 is a plan of the cover seen from below. Fig. 3 is a central longitudinal vertical section showing the parts with a bar in place before the upsetting operation. Fig. 4 is a corresponding section showing the parts after the upsetting operation. Fig. 5 is a cross-section of the bar before the upsetting. Fig. 6 is a cross-section through the machine with the bar in place before the upsetting. Fig. 7 is a corresponding section after the upsetting. Fig. 8 is a cross-section through the eye as it comes from the machine, and Fig. 9 is a cross-section through the same part after the subsequent hammering.

Similar letters of reference indicate corresponding parts in all the figures where they occur.

It will be understood that the parts not fully here shown or described may be of any ordinary or suitable construction.

The general character of this machine corresponds with that set forth in the said Patent No. 328,290, of October 13, 1885.

As in the previous patent referred to, A indicates the stationary part or anvil, and B the part which is strongly moved longitudinally, certain portions of this part being designated, when necessary, by additional marks, as B' B<sup>2</sup>. The extension B<sup>2</sup> sliding on the bed presents its upper face to serve as the part which shapes the lower surface of the eye.

C is the removable top piece, the under surface of which shapes the upper face of the eye.

In the previous patent referred to the upper surface of B<sup>2</sup> and the lower surface of C are held at a distance apart considerably greater than the thickness of the original bar which is being treated. In the act of upsetting the metal is thickened until this increased space is filled. This leaves the eye thicker than the main body of the bar, which thickness is subsequently reduced by hammering until the eye is of the same thickness as the main body.

In the present improved machine we provide a straight ridge, \*, of smoothly rounded section extending longitudinally along the center of the face of C, which shapes the upper side of the eye. A similar ridge, similarly marked, also extends longitudinally along the face of B<sup>2</sup>, which shapes the lower side of the eye. It will now be understood that each longitudinal ridge \* imprints itself in the eye as the latter thickens. We have ascertained by experiment that the thickening always commences and progresses to a sufficient extent to enable the metal to get strongly hold of the ridge \* before any appreciable tendency to lateral buckling is encountered.

The success of this invention depends upon the fact that the thickening iron of the eye will be guided by the longitudinal ridge and sustained against lateral deflection, thus insuring that the operation results in an almost mathematically parallel movement and the practically uniform thickening of both edges and all parts of the eye, excepting, always, the portion where the ridge \* is presented and a corresponding groove is formed. The depth of the ridges \* is a little less than the increased space provided for the thickening of the bar.

The part B', which forms the abutting surface to thrust against the end of the bar *m*, is

grooved to receive the ridge \*, which is on the top piece, C, and is, in the act of upsetting, caused to move longitudinally therein.

The increased space provided for the thickening of the eye in the act of upsetting may be all above the general plane of the bar, as in the patent referred to of October, 1885; or it may be half above and half below. We prefer the latter construction, and have so represented it. In either case the ridge \* on the lower surface of B<sup>2</sup> does not involve any difficulty. The ridges \* produce no groove which will not be readily removed by the hammering in the subsequent treatment. When we sink the surface of B<sup>2</sup> so as to distribute the thickening of the eye on the two faces of the bar, the shifting of the position of the parts in the act of upsetting allows the neck or that part of the bar adjacent to the eye to be thickened to the same extent. The ridge \* on the part B<sup>2</sup> also produces its groove along that part of the bar; but this is of no consequence. The hammering in finishing the work flattens this part of the bar equally with the rest and erases the groove. It is important that the ridges \* shall be rounded. We prefer the section shown.

When only one ridge \* is used, we prefer that the cavity in which the eye is upset shall be adjusted accordingly—that is to say, that the space for the thickening of the bar shall be all on that face of the eye where the ridge is presented, and where, consequently, the groove is to be formed.

We claim as our invention—

1. In a machine for upsetting eye-bars, the longitudinal ridge or ridges \* in the interior of the inclosing die, arranged to serve as herein specified.

2. The ramming or upsetting head B', grooved longitudinally to receive the ridge \*, in combination with the top piece, C, having the longitudinal ridge \*, arranged to serve as herein specified.

In testimony whereof we have hereunto set our hands, at Paterson, New Jersey, this 15th day of December, 1885, in the presence of two subscribing witnesses.

WATTS COOKE.  
DANIEL CARLOUGH.

Witnesses:

J. H. BLANNETT,  
WESLEY BUCKLEY.