

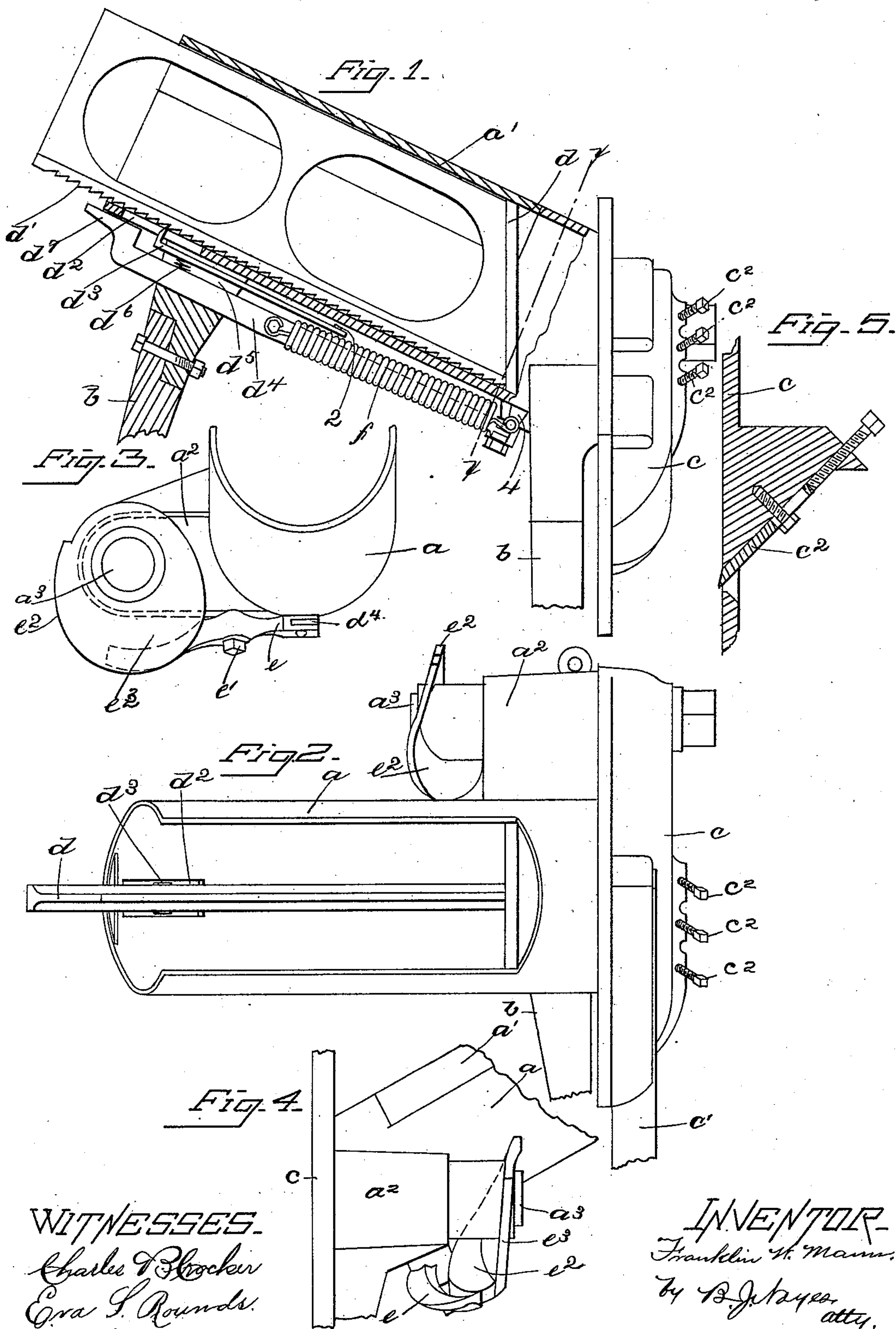
(No Model.)

2 Sheets—Sheet 1.

F. W. MANN.  
BONE CUTTING MACHINE.

No. 523,771.

Patented July 31, 1894.



(No Model.)

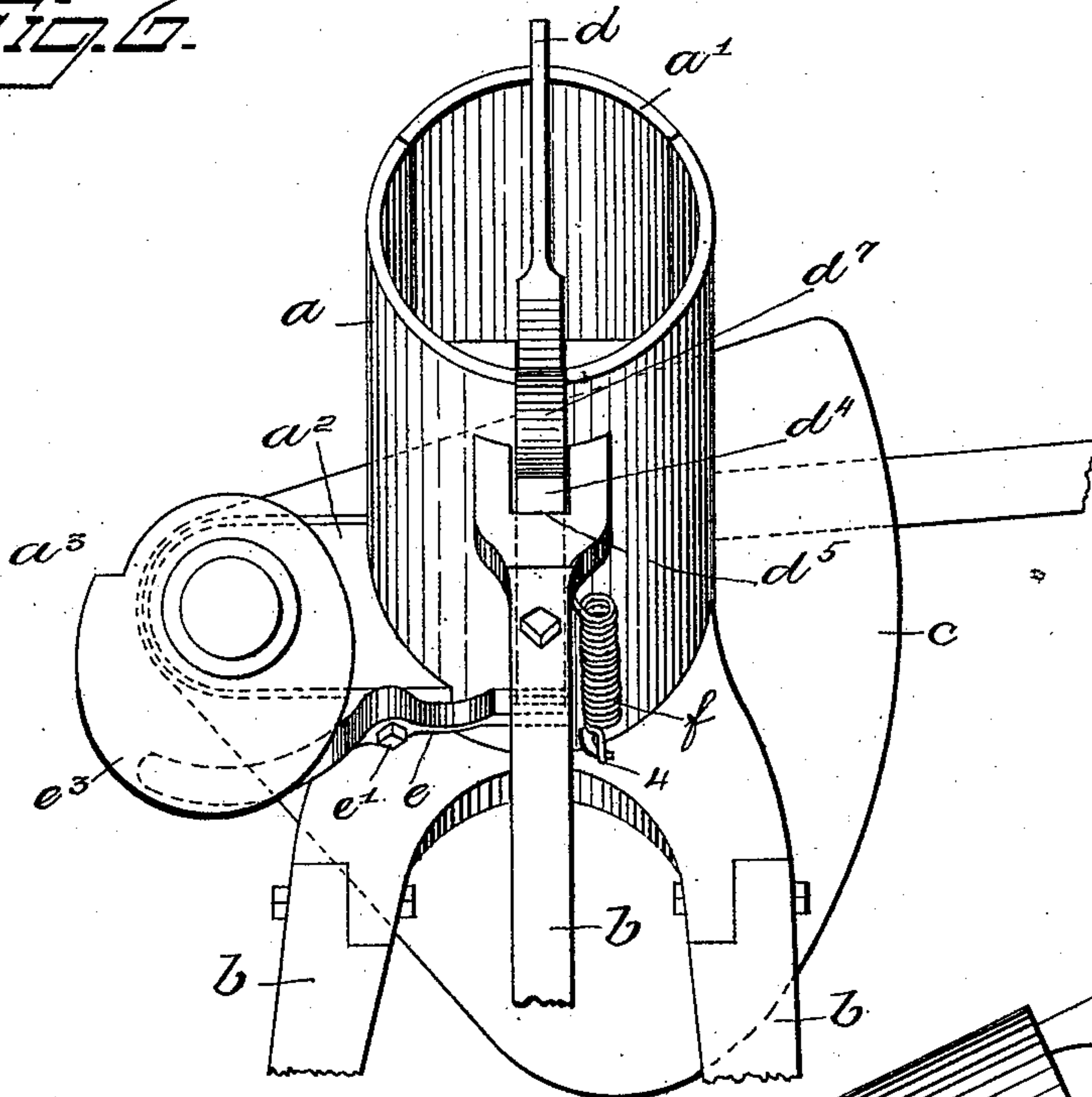
2 Sheets—Sheet 2.

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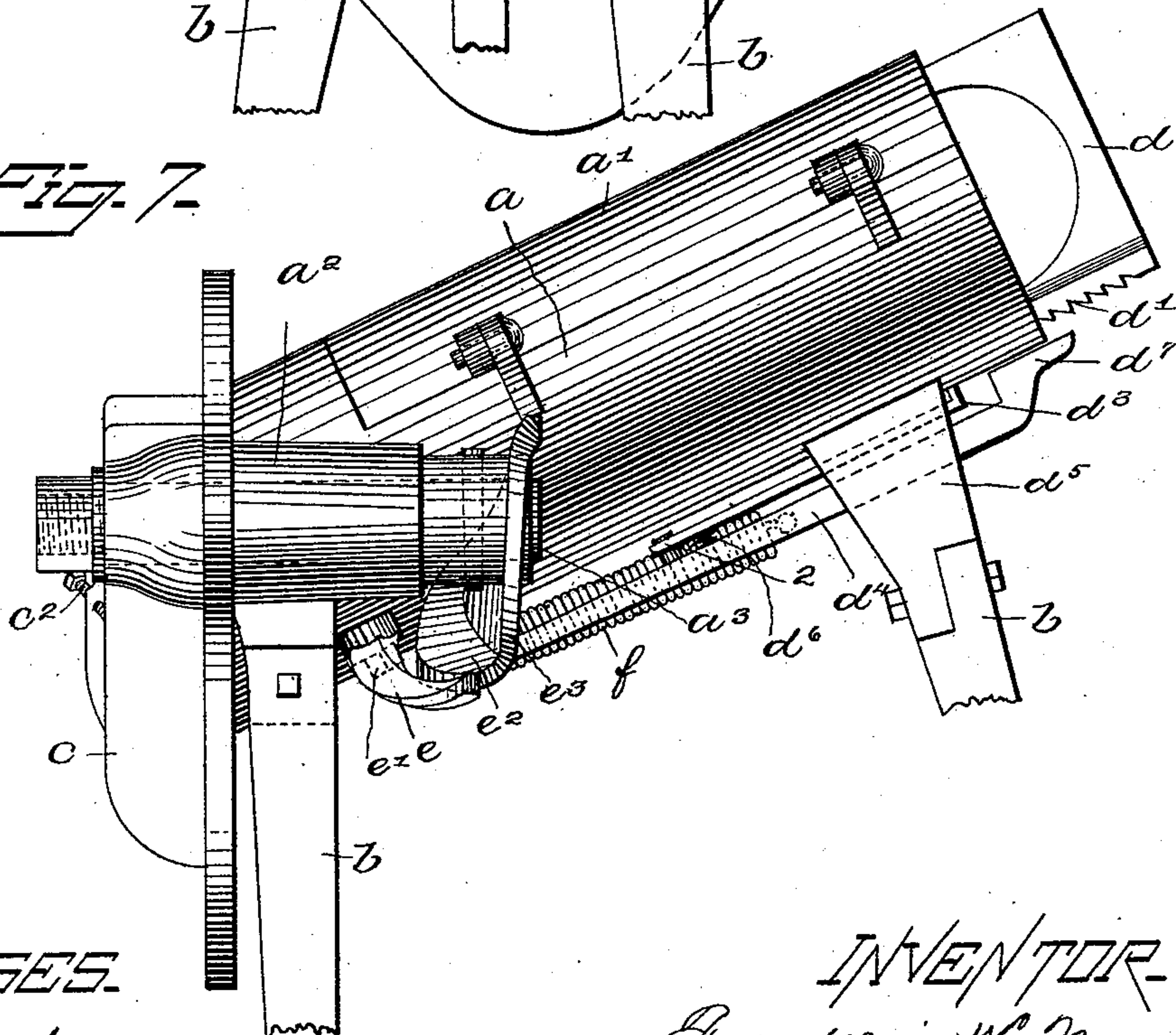
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*Fig. 6.*



*Fig. 7.*



WITNESSES.

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# UNITED STATES PATENT OFFICE.

FRANKLIN W. MANN, OF MILFORD, MASSACHUSETTS.

## BONE-CUTTING MACHINE.

SPECIFICATION forming part of Letters Patent No. 523,771, dated July 31, 1894.

Application filed June 2, 1893. Serial No. 476,353. (No model.)

*To all whom it may concern:*

Be it known that I, FRANKLIN W. MANN, of Milford, county of Worcester, State of Massachusetts, have invented an Improvement in Bone-Cutting Machines, of which the following description, in connection with the accompanying drawings, is a specification, like letters and figures on the drawings representing like parts.

10 This invention relates to bone cutting machines, and has for its object to simplify its construction whereby it may be more cheaply manufactured; and also to produce a variable feeding mechanism for the follower which  
15 may be operated manually, and which will exert a certain pressure only upon the material.

My invention consists generally in the combination of a bone receiver open at one end, 20 a knife-carrying plate adapted to move across said open end, a hand lever or equivalent for moving it, a follower contained in said bone receiver, and spring-actuated feeding mechanism for said follower, comprising a spring- 25 extending device connected with and operated by the aforesaid hand lever or otherwise manually operated, as hereinafter pointed out in the description and appended claims.

30 Figure 1, shows in side elevation and partial section a bone cutting machine embodying this invention, the hand lever being detached from the knife-carrying plate; Fig. 2, a plan view of the bone cutting machine shown in Fig. 1, the cover to the bone receiver 35 being removed, and the hand lever being broken off; Figs. 3 and 4, details of a co-operative part of the feeding mechanism; Fig. 5, a sectional detail of a portion of the knife-carrying plate showing the knives; Fig. 6, an 40 elevation of the lower end of the machine, and Fig. 7 an elevation of the rear side of the machine.

45 The bone receiver  $a$ , is herein represented as an oblique or inclined chute, open at its lower end, and also preferably at its upper end, and mounted upon suitable legs or supports  $b$ , and also open at the top for the admission of the material, which latter opening is provided with a hinged cover  $a'$ , yet so far 50 as my invention is concerned such construction and arrangement of the bone receiver is immaterial.

A projection  $a^2$ , is formed upon the rear side of the lower end of the receiver  $a$ , through which a short rod or shaft  $a^3$  passes, and upon 55 one end of which a knife carrying plate  $c$ , is secured, which abuts against the lower open end of the receiver, and is provided with a handle  $c'$ , (broken off) by which it may be moved across said open end. Knife  $c^2$ , is ad- 60 justably secured to said knife carrying frame.

A follower  $d$ , is contained in said bone receiver  $a$ , the lower end of which is shaped to substantially fit the interior of the receiver, yet follow along freely, while the remaining 65 portion of the follower is made as a vertical plate or a frame, the lower edge of which is provided with ratchet teeth  $d'$ .

A slot or opening  $d^2$ , is formed in the under side of the bone receiver, preferably at 70 the upper or rear end, beneath the ratchet toothed edge of the follower, and a pawl  $d^3$ , projects up through said opening and engages the ratchet teeth.

The pawl  $d^3$ , is loosely attached at 2, to the 75 upper side of a pawl carrier-bar  $d^4$ , which lies substantially parallel with the receiver, its upper end portion resting upon the bottom of a recess  $d^5$ , formed in a projection upon the under side of the receiver and which is 80 herein shown as a suitable projection to which one of the supporting legs may be attached.

A spring  $d^6$ , is interposed between the bar  $d^4$ , and pawl  $d^3$ , tending to continually raise 85 said pawl into engagement with the ratchet toothed edge of the follower.

The upper end of the bar  $d^4$ , may have a projection or flatface  $d^7$ , which bears against 90 the under side of the receiver and acts as a guide.

The lower end of the bar  $d^4$ , is pivotally 95 connected to one end of an arm  $e$ , pivoted at  $e'$ , to the under side of the projection  $a^2$ , the other end of said arm curving rearwardly and engaging a cam  $e^2$ , secured to and projecting from a flange  $e^3$ , secured to said rod or shaft 100  $a^3$ , so that as the said rod or shaft is reciprocated by the knife carrying frame secured to it, the said cam  $e^2$ , will act to turn the arm  $e$ , on its pivot and thereby move the bar  $d^4$ , longitudinally in a direction toward the rear end of the receiver.

A strong spiral spring  $f$  is connected at one end to a projection 4 on the under side of the



receiver, and at the other end to the bar  $d^4$ , the tendency of which is to draw said bar in a direction toward the knife-carrying plate, and hence by the engagement of the pawl carried by said bar, with the ratchet toothed edge of the follower, to in turn draw said follower down upon or against the material contained in said receiver.

The operation of the machine is as follows:—  
 10 The material having been placed in the bone receiver, and the follower placed in position, with the pawl in engagement with the ratchet teeth, and the lid closed, the handle is raised whereupon the cam  $e^2$ , passes by the curved  
 15 end of the arm  $e$ , permitting the said arm to bear against the portion or flange  $e^3$ ; the handle is then depressed and during the lower part of its downward movement the cam  $e^2$ , acts upon and turns said arm  $e$ , moving the bar  $d^4$ ,  
 20 rearwardly and extending the spring  $f$ , the pawl  $d^3$  at such time moving over several of the ratchet teeth. As the handle is again raised the spring  $f$ , acts to draw the pawl and follower down upon the material, pressing it forward  
 25 toward or against the knife-carrying plate. As the handle is again depressed the knives act to cut off the material providing the follower has moved it sufficiently far downward, and the pawl again moved to its extreme rearward  
 30 position. When this operation has been repeated a sufficient number of times for the material to be pressed firmly against the knife-carrying plate, then at each upward movement of the hand lever the spring  $f$ , will draw  
 35 the follower down but a short distance, and at each complete downward movement of said hand lever the pawl will be returned to its extreme upper or rearward position, so that the pressure exerted upon the material will  
 40 always be equal to the power of the spring  $f$ , which is set to its extreme capacity at each complete downward movement of the handle.

By employing an inclined receiver or chute as shown the onward course of the material  
 45 is assisted more or less by gravity, and when bearing against the knife-carrying plate and the latter is depressed the knife will engage and hold the bones so that the pressure may be relieved say at the lower third of the  
 50 stroke, thereby permitting the power which is to be exerted for feeding the follower, to be stored up during the last part of the downward movement of the handle, at the same time that the knife is cutting the bones, and  
 55 thereafter permitting the handle to be raised easily.

If the hand lever should not be moved completely downward at each operation, the spring will not be extended to its full capacity, yet it may be extended sufficiently to move the pawl  $d^3$  rearwardly one or more teeth.

I claim—

1. In a bone cutting machine, the bone receiver open at one end, and knife-carrying  
 65 plate provided with a knife movable across said open end, and hand lever for moving it, a follower contained in said bone receiver,

and spring for advancing it, and actuating mechanism for extending said spring connected with and operated by said hand lever, 70 substantially as described.

2. In a bone cutting machine, a bone receiver open at one end, a knife-carrying plate provided with a knife movable across said open end, and a hand lever for moving it, a 75 follower contained in said receiver, and step-by-step spring actuated feeding mechanism for advancing it, substantially as described.

3. In a bone cutting machine, a bone receiver open at one end, a knife-carrying plate 80 provided with a knife movable across said open end, and a hand lever for moving it, a follower contained in said receiver, and step-by-step spring actuated feeding mechanism for advancing it, comprising a spring-extending mechanism connected with and operated 85 by the hand lever, substantially as described.

4. In a bone cutting machine, a bone receiver open at one end, a knife-carrying plate provided with a knife movable across said 90 open end, and a hand lever for moving it, a follower contained in said receiver having a series of ratchet teeth, a pawl, a pawl carrier, and actuating spring connected to said pawl carrier, and manually operated spring-extending mechanism, substantially as described. 95

5. In a bone cutting machine, a bone receiver open at one end, a knife-carrying plate provided with a knife movable across said open end, and a hand lever for moving it, a 100 follower contained in said receiver, a spring for advancing it, and spring-extending mechanism operated manually, and intermittingly, substantially as described.

6. In a bone cutting machine, a bone receiver open at one end, a knife-carrying plate provided with a knife movable across said open end, and a hand lever for moving it, a 105 follower contained in said receiver, having a series of ratchet teeth, a pawl, and pawl carrier and actuating spring connected with said pawl carrier and a cam for moving said pawl carrier in opposition to the action of the spring, substantially as described. 110

7. In a bone cutting machine, a bone receiver open at one end, a knife-carrying plate provided with a knife located at said open end, and means for moving it, a follower contained in said bone receiver, and actuating spring therefor, and variable extending mechanism for said spring, substantially as described. 115 120

8. In a bone cutting machine, a bone receiver open at one end, a knife-carrying plate provided with a knife located at said open 125 end, and means for moving it, a follower contained in said bone receiver, and actuating spring therefor, and variable extending mechanism for said spring connected with and operated by said hand lever, substantially as described. 130

9. In a bone cutting machine, a bone receiver open at one end, a knife-carrying plate provided with a knife located at said open



end, and means for moving it, a spring actuated follower contained in said bone receiver having a series of ratchet teeth, a pawl, a pawl carrier connected with and operated by  
5 said hand lever to move said pawl one or more teeth, substantially as described.

In testimony whereof I have signed my

name to this specification in the presence of two subscribing witnesses.

FRANKLIN W. MANN.

Witnesses:

BERNICE J. NOYES,  
EVA S. ROUNDS.