

(No Model.)

S. RUCINSKI & F. M. KOZLOWSKI.  
BELLOWS FOR FORGES, &c.

No. 528,808.

Patented Nov. 6, 1894.

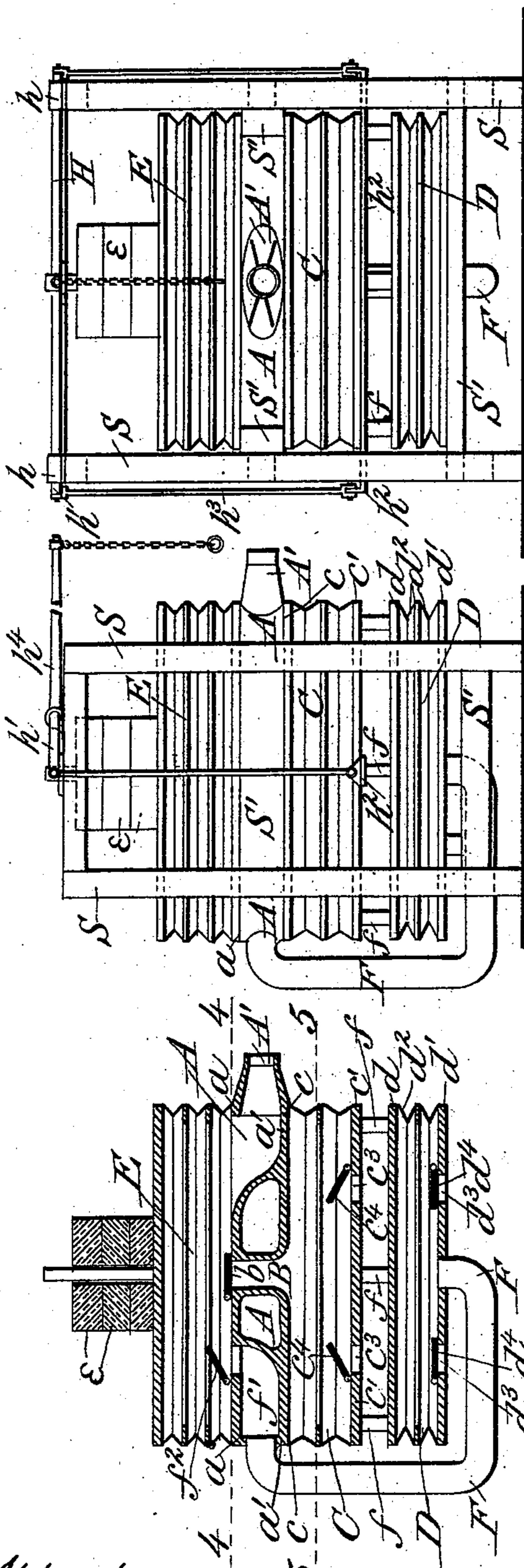


Fig. 1.

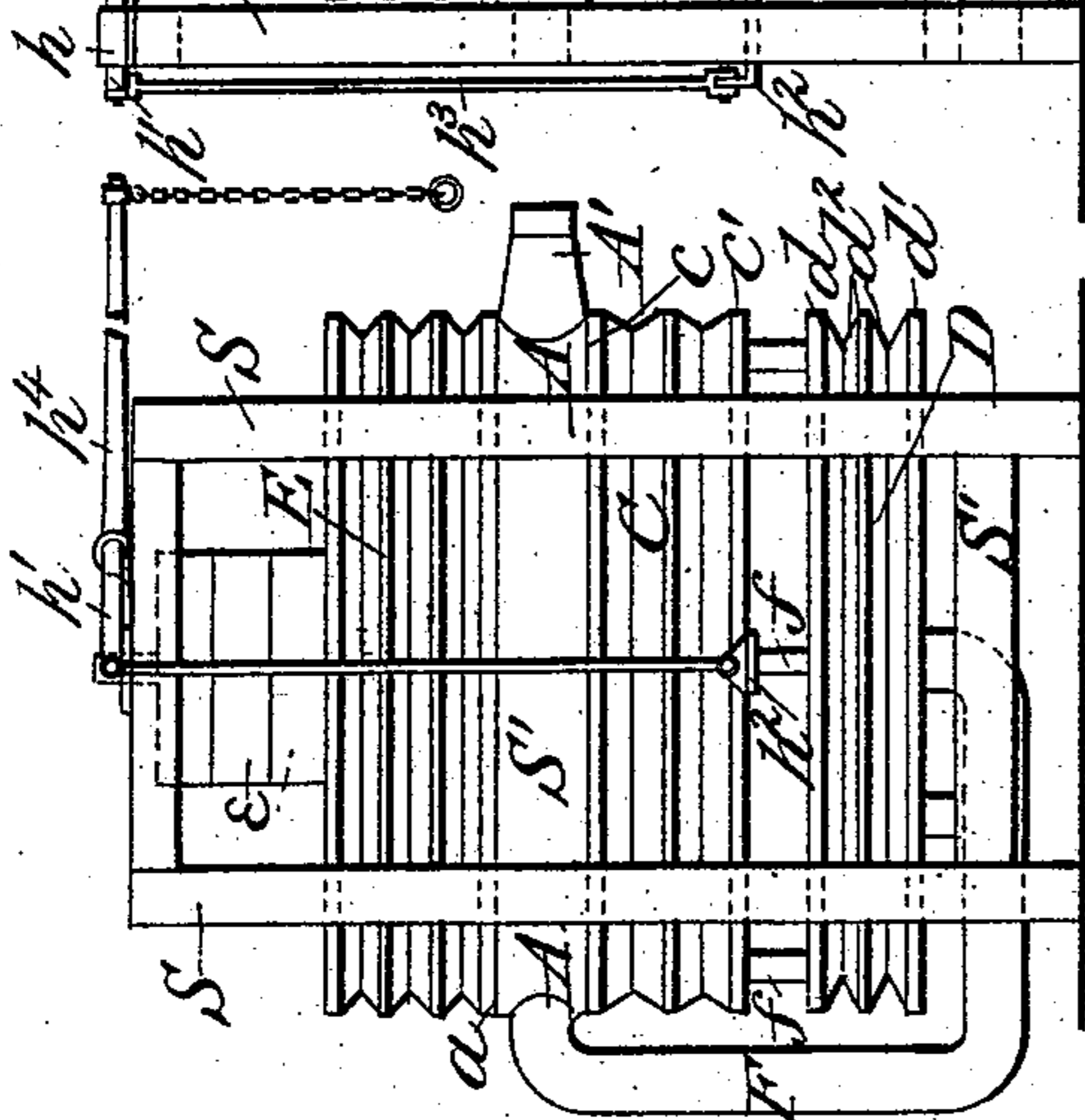


Fig. 2.

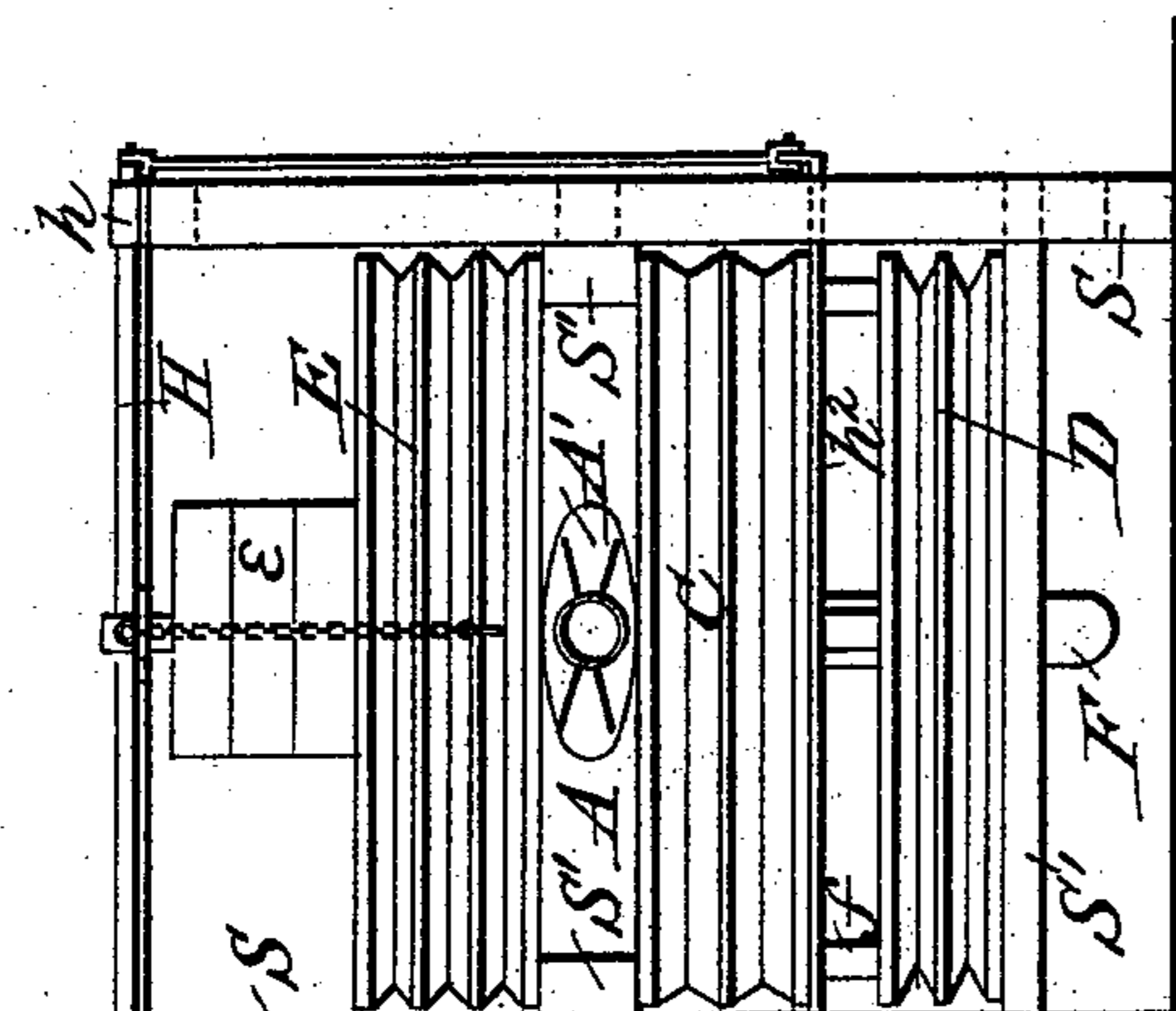


Fig. 3.

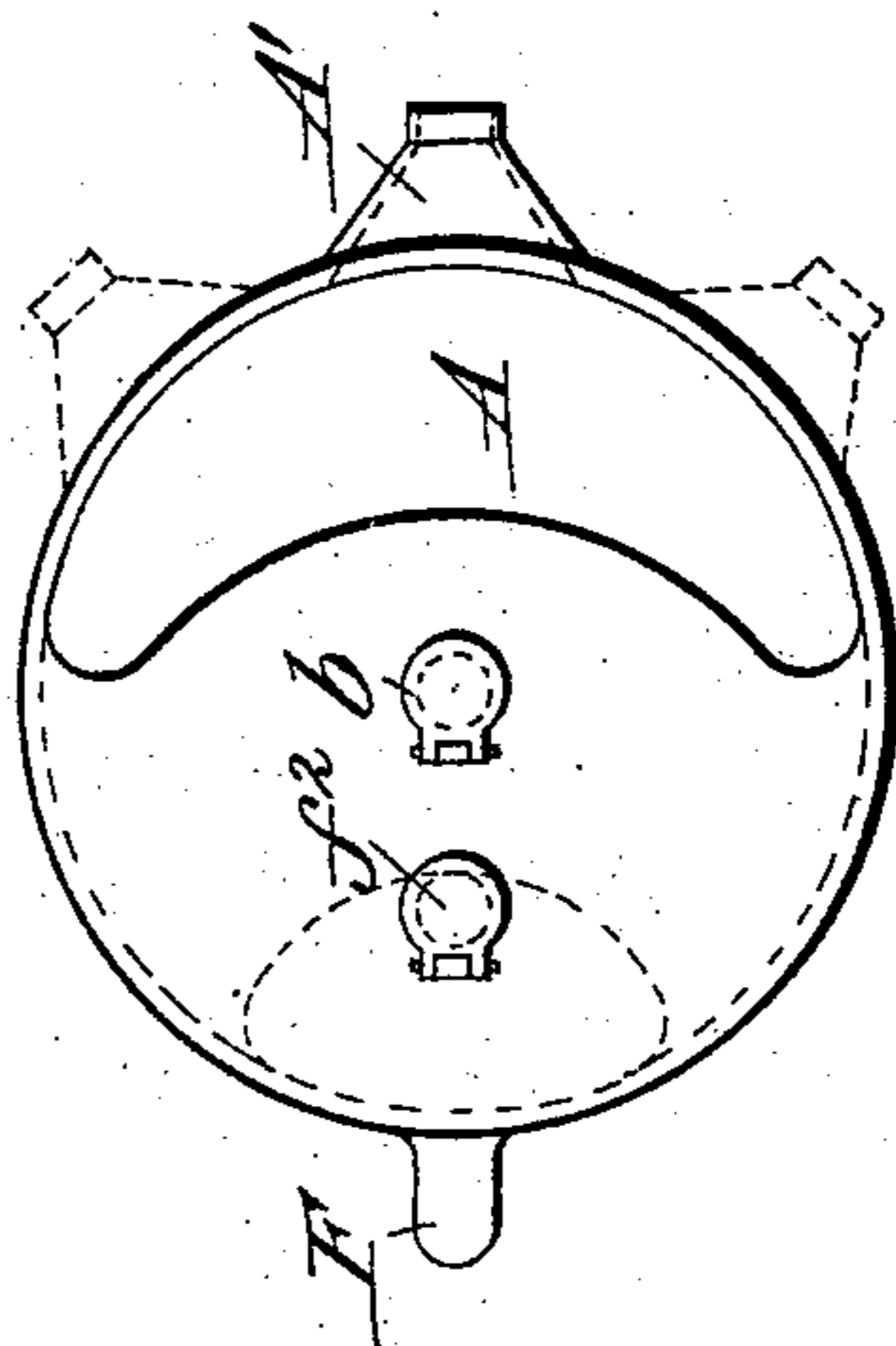


Fig. 4.

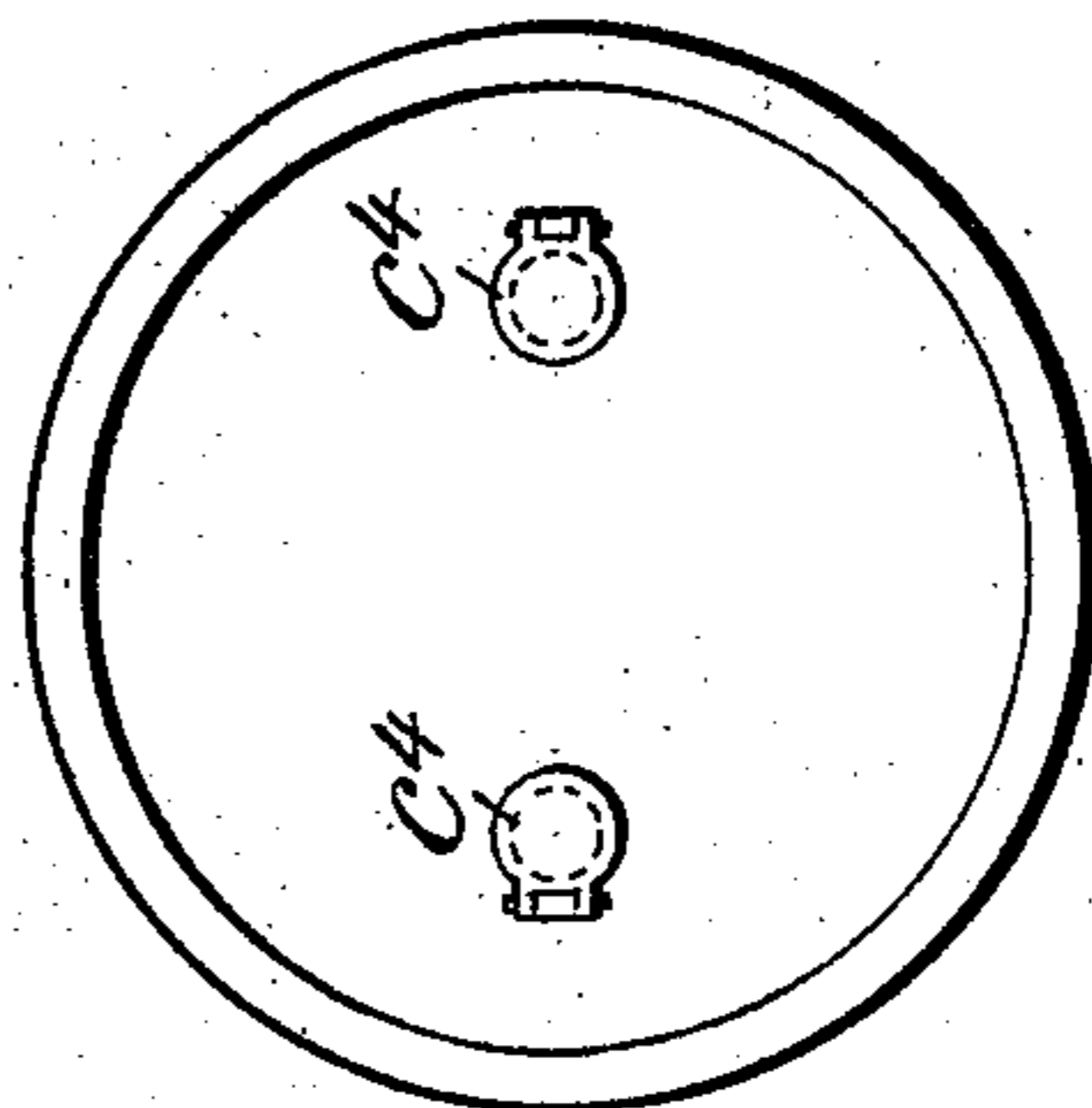


Fig. 5.

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# UNITED STATES PATENT OFFICE.

SZYMON RUCINSKI AND FRANK M. KOZLOWSKI, OF HAZLETON, PENNSYLVANIA.

## BELLOWS FOR FORGES, &c.

SPECIFICATION forming part of Letters Patent No. 528,808, dated November 6, 1894.

Application filed February 14, 1894. Serial No. 500,176. (No model.)

*To all whom it may concern:*

Be it known that we, SZYMON RUCINSKI and FRANK M. KOZLOWSKI, citizens of the United States, residing at Hazleton, in the county of Luzerne and State of Pennsylvania, have invented certain new and useful Improvements in Bellows for Forges, &c., of which the following is a full, clear, and exact description, such as will enable those skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, which form a part of this specification.

The invention relates to improvements in bellows of that class which are adapted to be used with forges, &c., and it has for its object the provision of such a device, whereby air can be forced almost continuously into an expansible receiver, and forced therefrom in a continuous and regular stream.

The invention consists in the novel construction, combination and arrangement of parts, such as will be hereinafter described, pointed out in the appended claims and illustrated in the accompanying drawings.

In the accompanying drawings, in which similar letters of reference designate corresponding parts, Figure 1 is a transverse vertical section of a device embodying the invention. Fig. 2 is a side elevation of the same. Fig. 3 is a front elevation. Fig. 4 is a horizontal section on the line 4—4 of Fig. 1. Fig. 5 is a similar view on the line 5—5 of the same figure.

Referring to the drawings by letter, S, S, designate uprights which support the several parts of the device. These uprights and the transverse supports S', S', are of any construction suitable in the premises. Between the upper of the transverse supports S', S', the tuyere box A is secured. This box is preferably formed of a casting, but it may be built up of separate parts. The casting is so formed as to fit between the supports S', S', with its top and bottom, *a* and *a'*, respectively projecting beyond the main body so as to respectively fit over and under the said supports. In this way the box can be securely and immovably held in place. Leading from the box is a tuyere A' adapted to connect

with a forge. There may be several of these as shown in Fig. 4 in full and dotted lines.

Immediately above the tuyere box, and opening into the same, is the extensible hood E. This hood and the tuyere box together form the receiver into which air is forced by a pair of bellows placed immediately below the same. Upon the top plate of the extensible hood, weights *e, e*, are placed, which serve to force the said plate downward and keep the air contained in the receiver at a constant pressure and thereby insure a regular supply of air to the forge. The force with which the air will be expelled can be varied by varying the weights.

The bellows C and D are mounted immediately below the receiver, one below the other, upon the supports S, S, and S', S'. The crown or upper plate *c* of the bellows C is stationary, and forms the base of the tuyere box A. The base plate *c'* of the bellows is movable and is connected with the crown plate by the usual flexible sides *c<sup>2</sup>*. These bellows are connected with the receiver by the pipe B leading through the tuyere box at a central point and opening into the hood E. The pipe B is provided with a valve *b* to prevent the return of the air when the pressure on the bellows is removed. The base plate *c'* is provided with two openings *c<sup>3</sup>, c<sup>3</sup>*, which are controlled by the valves *c<sup>4</sup>, c<sup>4</sup>*. These valves allow an ingress of air into the bellows but will not allow an egress.

The bellows D consists of the crown plate *d*, which is movable, and the base plate *d'*, which is fixed, the two being connected by the flexible sides *d<sup>2</sup>*. The movable crown plate *d* is connected with the movable base plate *c'* by the links *f, f*, which firmly united the said plates, so that a movement of one will cause a like movement of the other. The base plate *d'* is provided with openings *d<sup>3</sup>, d<sup>3</sup>*, which are controlled by the valves *d<sup>4</sup>, d<sup>4</sup>*, which allow an ingress of air but prevent an egress, into the bellows. A pipe F leads from the bottom of the bellows D to the tuyere box A, where it connects with a passage *f'* emptying into the extensible hood E. This passage is controlled by the valve *f<sup>2</sup>*.

It is to be observed that the several pas-

sages, pipes, and connections, leading from the bellows to the receiver, connect with the stationary parts and are themselves stationary in consequence, so that it is not necessary  
5 to use flexible connections of any sort.

A shaft H is journaled in boxes  $h$ ,  $h$ , secured to the upper part of the supports, and has extending from its ends, which project beyond their bearings, crank arms  $h'$ ,  $h'$ . Beneath the base plate of the bellows C, the rod  
10  $h^2$  extends and is connected at its ends by the rods  $h^3$ ,  $h^3$ , with the free ends of the crank arms  $h'$ ,  $h'$ . To the shaft H, at an intermediate point, the end of the lever  $h^4$  is attached.  
15 By means of this lever and the connecting mechanism, the bellows are operated.

The operation of the device is as follows: By means of the lever  $h^4$  and the intermediate mechanism, the base plate of the bellows  
20 C and the crown plate of the bellows D are moved up and down. An upward movement of the base plate  $c'$  will cause the valves  $c^4$ ,  $c^4$ , to close the openings  $c^3$ ,  $c^3$ , and will force the air contained in the bellows C through  
25 the pipe B into the extensible hood E. While the bellows C is being contracted, the bellows D is being expanded, through the upward movement of the crown plate of the latter. The air is drawn into the bellows through  
30 the openings  $d^3$ ,  $d^3$ , the passage  $f'$  being closed by its valve. By moving the plate  $c'$ , and consequently the crown plate  $d$ , in the opposite direction, the air contained in the bellows D will be forced into the extensible  
35 hood through the pipe F and the passage  $f'$ , and the bellows C will be refilled. In this way, either one bellows, or the other, is always forcing air into the receiver E.

Having thus described our invention, what  
40 we claim, and desire to secure by Letters Patent, is—

1. In a device of the class described, the

combination of the tuyere box, the extensible hood mounted thereon, the two forming a receiver, the tuyeres connected with the  
45 said box, the latter having a passage leading through the same from the receiver proper to the tuyeres, a passage leading from the periphery to the interior of the receiver, and the central passage leading from beneath the base  
50 of the box through the same into the receiver, and the oppositely operated bellows respectively connected with the passages leading from the exterior of the tuyere box into the receiver, substantially as described. 55

2. In a device of the class described, the combination of the tuyere box, the extensible hood mounted thereon, the two forming a receiver, the tuyeres connected with the said  
60 box, the latter having a passage leading through the same from the receiver proper to the tuyeres, a passage leading from the periphery of the box to the interior of the receiver, and the central passage leading from beneath the base of the box through the  
65 same into the receiver, the bellows mounted immediately below the tuyere box and one below the other, the crown plate of the upper bellows and the base plate of the lower bellows being fixed, and the base plate of the  
70 upper and the crown plate of the lower being movable and connected to a common operating mechanism, the upper of the said bellows being connected with the central passage of the tuyere box and the lower con- 75 nected by means of a pipe with the passage leading from the periphery of the box into the receiver, substantially as described.

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Witnesses:

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