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Patented Nov. 4, 1902.

H. L. DUNN.  
CHUTE AND DISCHARGE GATE.

(Application filed June 11, 1902.)

(No Model.)

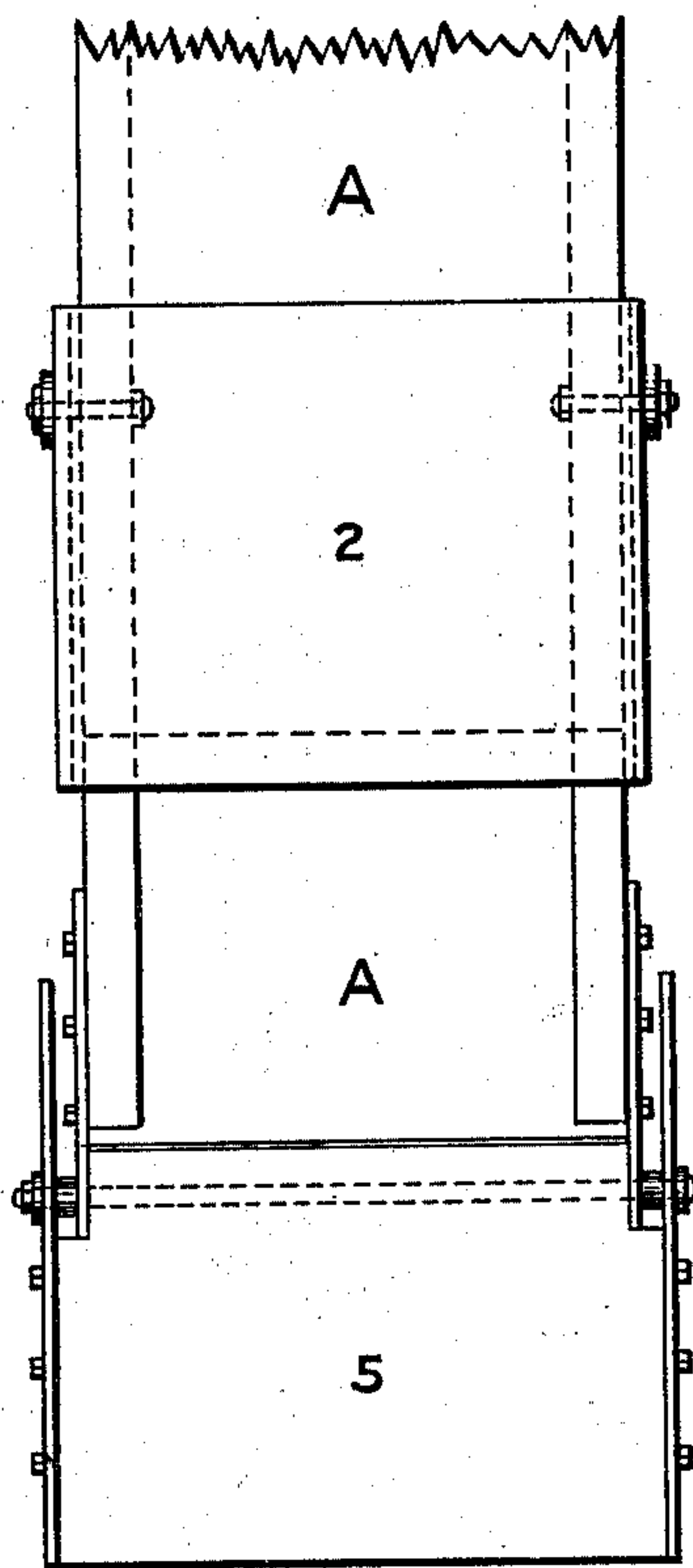


Fig. 2

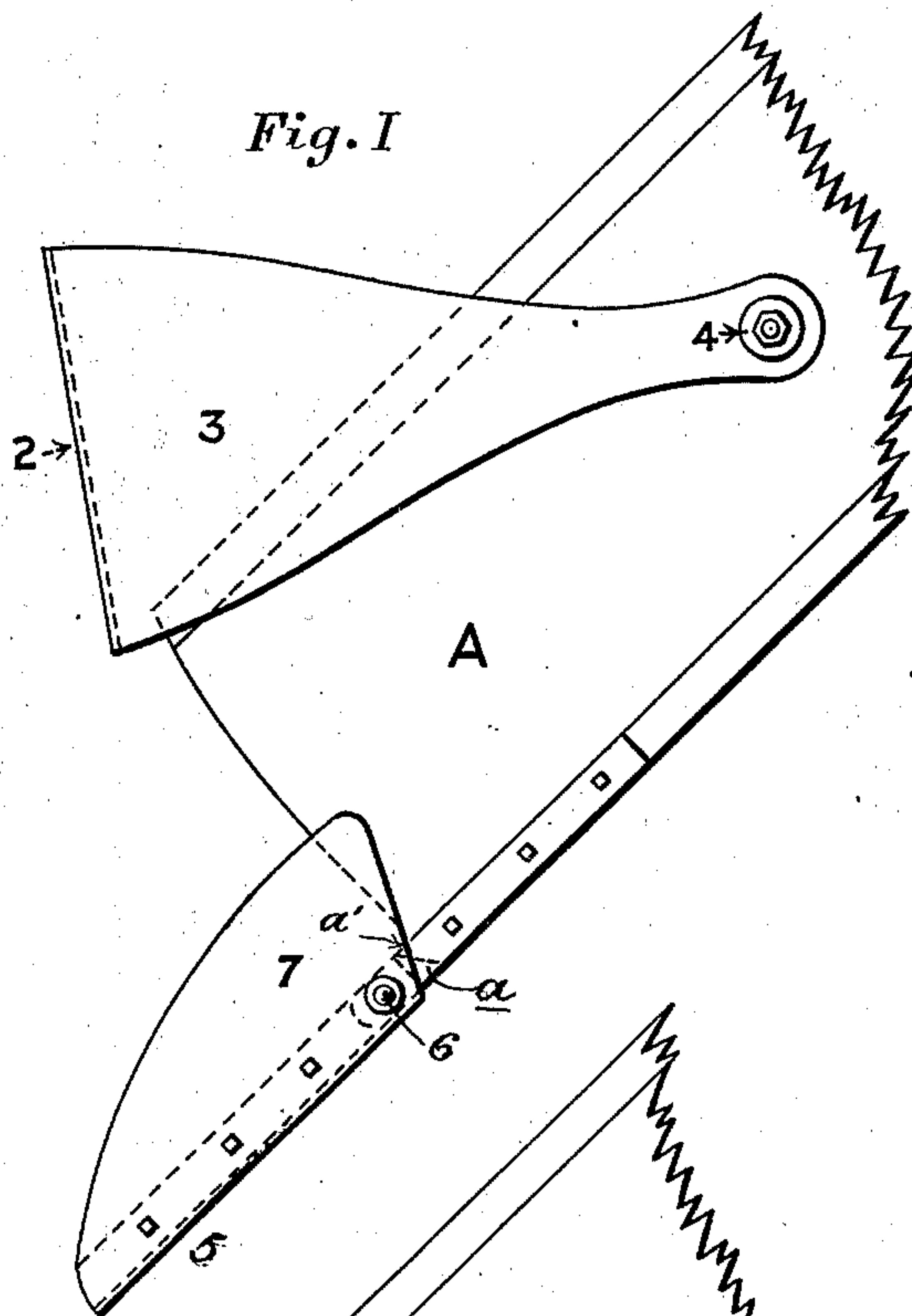


Fig. 1

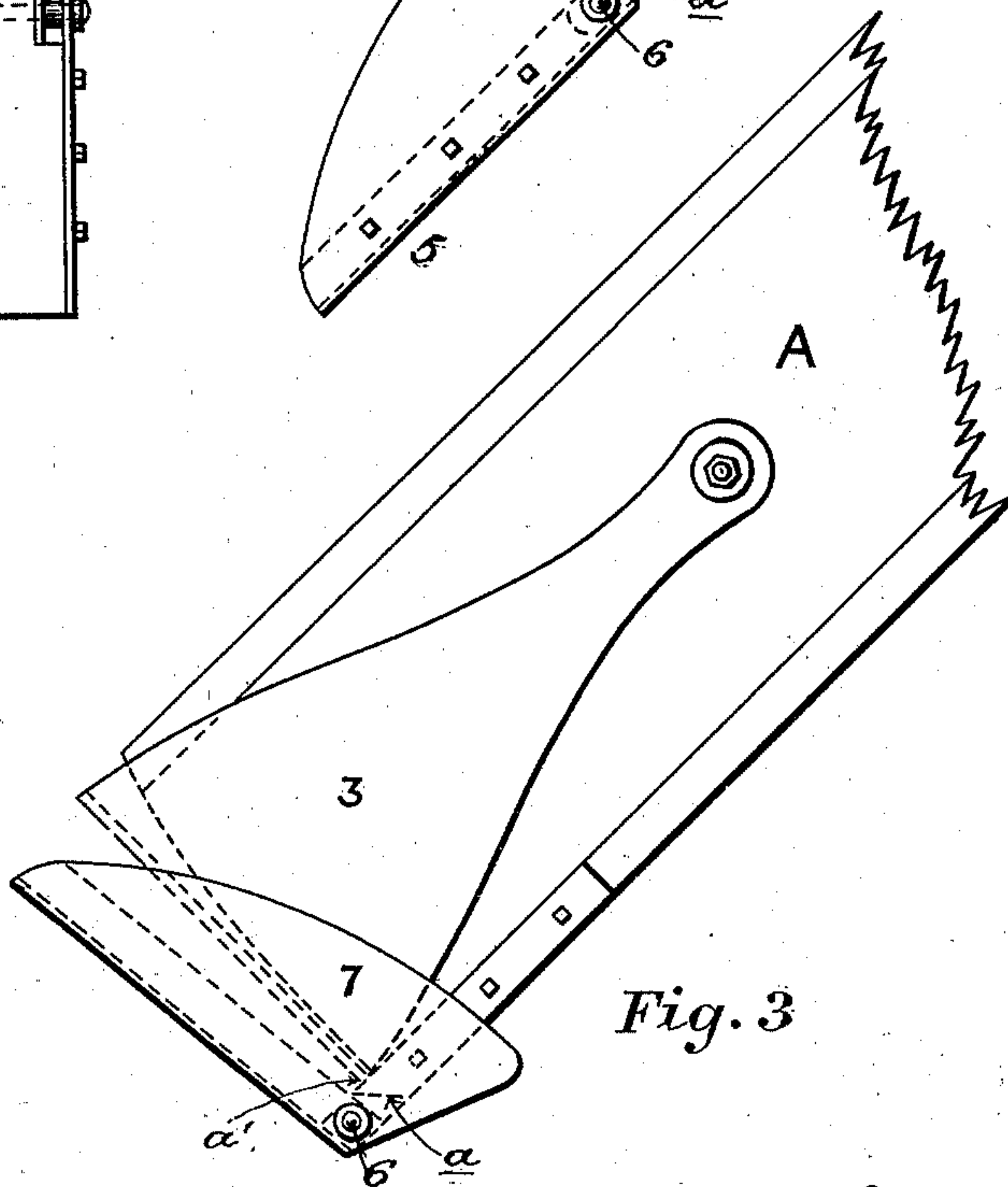


Fig. 3

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# UNITED STATES PATENT OFFICE.

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## CHUTE AND DISCHARGE-GATE.

SPECIFICATION forming part of Letters Patent No. 712,661, dated November 4, 1902.

Application filed June 11, 1902. Serial No. 111,157. (No model.)

*To all whom it may concern:*

Be it known that I, HENRY L. DUNN, a citizen of the United States, residing at Seneca, county of Plumas, State of California, have  
5 invented an Improvement in Chutes and Discharge-Gates; and I hereby declare the following to be a full, clear, and exact description of the same.

My invention relates to a device for controlling the discharge from chutes and like  
10 conductors; and it consists in a novel arrangement of plurality of coacting gates, whereby the flow of material—such as sand, gravel, crushed rock, and the like—may be arrested  
15 or controlled.

It also comprises details of construction which will be more fully explained by reference to the accompanying drawings, in which—

20 Figure 1 is a side elevation showing the end of a chute and my device opened. Fig. 2 is a front view of the same. Fig. 3 is a view similar to Fig. 1 with the gates closed.

In the transportation of ore in mines, and  
25 other like mobile material, it is customary to employ inclined chutes, through which the material is carried by gravitation, and at the lower end it is delivered into cars or other vehicles for transportation or to other receivers. When cars are thus loaded, it is  
30 necessary to check the flow of the material after a car is filled and during the interim of bringing another car to be loaded. Ordinarily-constructed gates are difficult to handle,  
35 because the flowing body may contain rocks or pieces of considerable size, which will often be stopped beneath the gate, thus preventing the latter from closing, and the smaller material will continue flowing around the ob-  
40 struction and beneath the partially-closed gate, thus overflowing the car and covering the floor or space beneath the chute and making very considerable waste of material. It is the object of my invention to overcome this  
45 difficulty, which is effected in the following manner:

A represents a closed chute of any description. In the present case it is represented  
50 as a rectangular chute standing at an angle of about forty-five degrees. As shown in Figs. 1 and 3, the bottom of the chute is extended

slightly beyond the sides, as at *a'*. The controlling-gates are here shown as attached to the end of this chute, as follows: 2 represents one gate, made of any suitable material  
55 and having extensions or arms extending at right angles from its sides and backward along the outside of the chute, as shown at 3. The gate may be made of wood or iron. If made of iron, the portion represented by 3  
60 may be simply bent at right angles with the front or gate portion 2 and extended back upon each side of the chute as far as is found desirable. At the rear end this extension is  
65 pivoted, as shown at 4, so that the gate may be raised or lowered about these pivots, the upper part of the chute being cut away sufficiently to allow the gate to move in close proximity thereto, the sides of the chute being  
70 preferably formed upon a curvature of which the length of the extension 3 forms the substantial radius. This gate may be raised and lowered in any suitable manner and by any well-known means.

5 is a second gate, having hinged connections upon each side which connect it with  
75 the lower end of the bottom of the chute and just exterior to the gate 2 when the latter is closed. This gate 5 may then be turned up about its hinges, so as to stand in an inclined  
80 position or as nearly parallel with the gate 2 as the condition of the discharging material will allow, and when in this position it checks the flow of any smaller material which may be passing beneath the gate 2. Various de-  
85 vices may be employed for hinging this gate. I have found that strap-hinges upon the outer edges of the gate and connecting with similar hinges fastened to the bottom of the chute are very satisfactory for this purpose. The pivot-  
90 points 6 are set slightly in advance of the rear edge of the gate 5, and the lower edge of the bottom of the chute may be slightly beveled or made divergent, as at *a*, so that any material which may find its way through the  
95 crack or joint between the gate 5 and the bottom of the chute A when the two are in line with each other will escape without clogging or interfering with the movement of the joint when the gate is to be closed.

The gate 5 may be operated by any suitable  
100 or convenient means. The ordinary position



of the gate 5 while the chute is discharging is extended in the line with the bottom of the chute A, forming a continuation thereof, and when the gate 2 is opened the material will  
 5 flow over the gate 5, and this extension of 5, which may be of any desired length, insures the carrying of the ore to such a distance beyond the chute as to deliver it properly into the car or receptacle. When a car has been  
 10 filled, the gate 2 is closed, and if by reason of the kind of the material it can only be partially closed, as frequently occurs, the gate 5 is then turned up about its hinges 6, so as to stand in front of the gate 2. Thus the gate  
 15 2 closes the upper part of the chute, and the gate 5, hinged from below, closes the lower part and checks any further flow of material which would escape beneath the partially-closed gate 2.

20 In order to prevent fine material from escaping at the sides between the upturned gate 5 and the end of the chute, I have shown plates 7, which are fixed to and movable with the gate 5. These plates may be secured  
 25 upon opposite edges of the gate 5 and extend beyond, so as to overlap each side of the chute, as shown, and whether the gate be extended or turned up these plates always form sides to prevent lateral escape of the material. By this employment of coacting gates  
 30 I first check the flow in the upper part of the chute and afterward complete the stoppage of the flow by the closing of the second gate.

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

1. The combination with a chute, of coacting gates both connecting with and controlling the discharge end of the chute, one of  
 40 said gates overlapping the other and closing in a direction opposite to said other gate and both of said gates having side extensions

which extend over and embrace the outer sides of the discharge end of the chute.

2. The combination with a chute, of coact- 45 ing, oppositely-closable gates each having side plates to extend over the outer sides of the discharge end of the chute and with the side plates of one gate substantially inclosing the outer end of the other gate when said gates 50 are closed.

3. The combination with a discharge-chute of a gate pivoted to the sides of the chute and closable from above over the end of the chute, a second gate hinged to the sides of the chute 55 adapted to stand in line and form a continuation of the bottom thereof, said gate being closable upwardly about its hinges to overlap the first-named gate.

4. The combination with a box-chute of a 60 gate having fulcrumed connections with the side of the chute and adapted to be closed downwardly over the end, a second gate hinged to stand in line with the bottom of the chute when opened and adapted to be closed 65 upwardly outside of the first-named gate, said second gate having side plates or extensions overlapping the sides of the chute.

5. A closed chute having the bottom extended beyond the sides, a gate flexibly con- 70 nected to form a continuation of said bottom, or to be turned up transversely thereto, a second gate adapted to close the mouth of the chute and having arms or connections pivoted to the sides of the chute and about which 75 pivots said arms are turnable to open or close the gate.

In witness whereof I have hereunto set my hand.

HENRY L. DUNN.

Witnesses:

S. H. NOURSE,

CHAS. E. TOWNSEND.