

No. 618,151.

Patented Jan. 24, 1899.

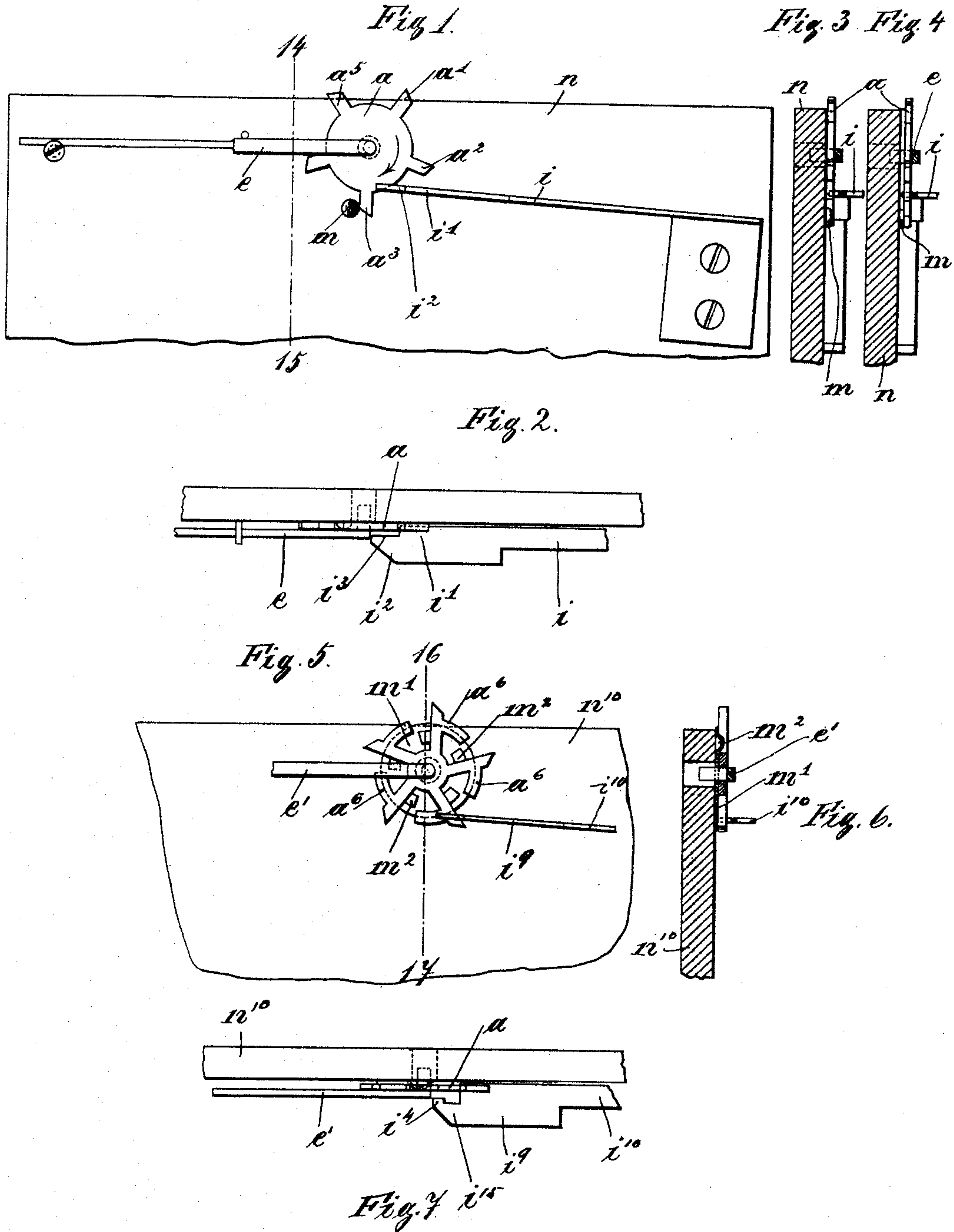
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DAMPING DEVICE FOR MUSICAL INSTRUMENTS.

(Application filed June 26, 1897.)

(No Model.)

2 Sheets—Sheet 1.



Witnesses.  
 Emil Hayser.  
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2 Sheets—Sheet 2.

Fig. 8.

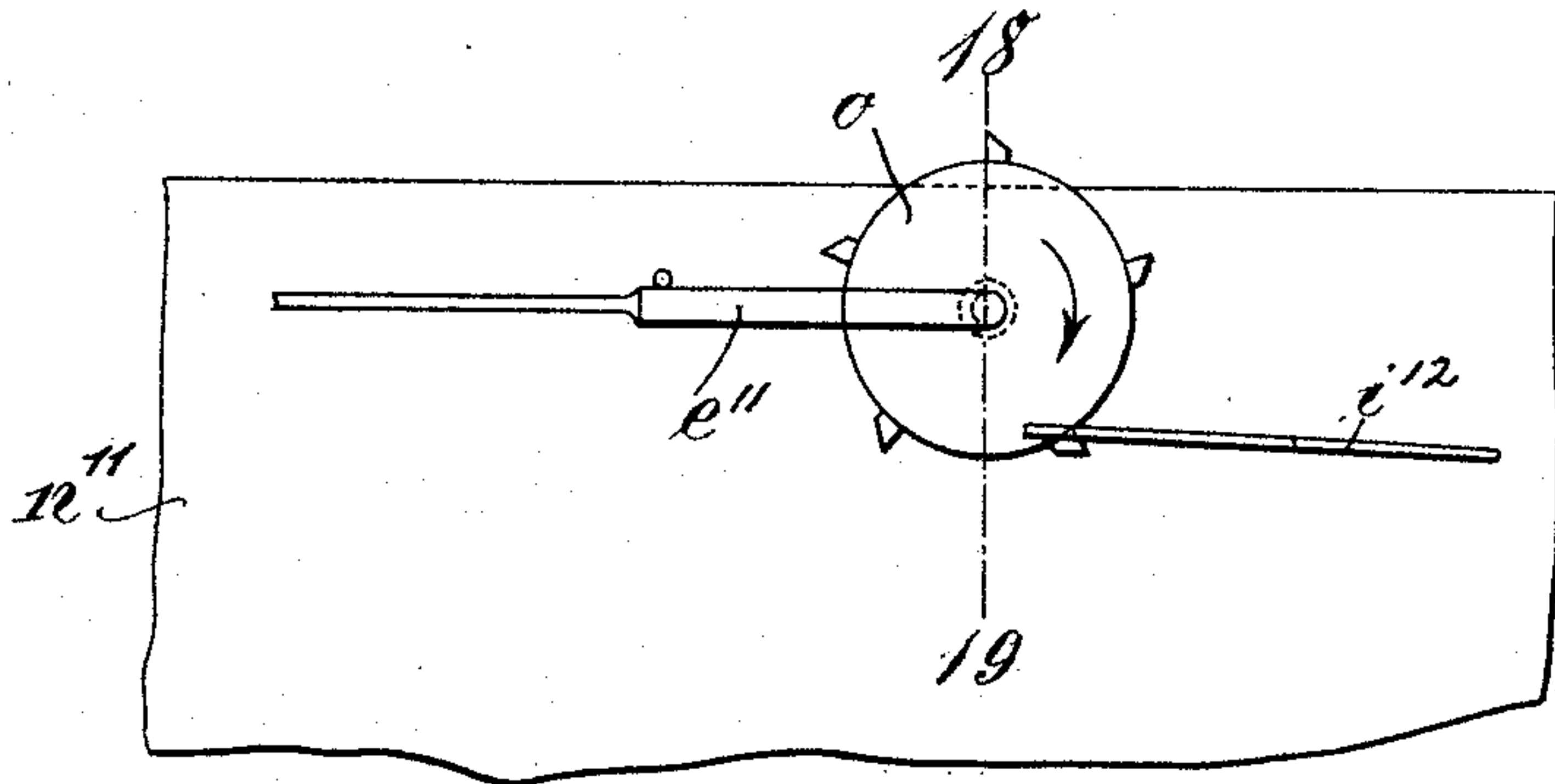


Fig. 10.

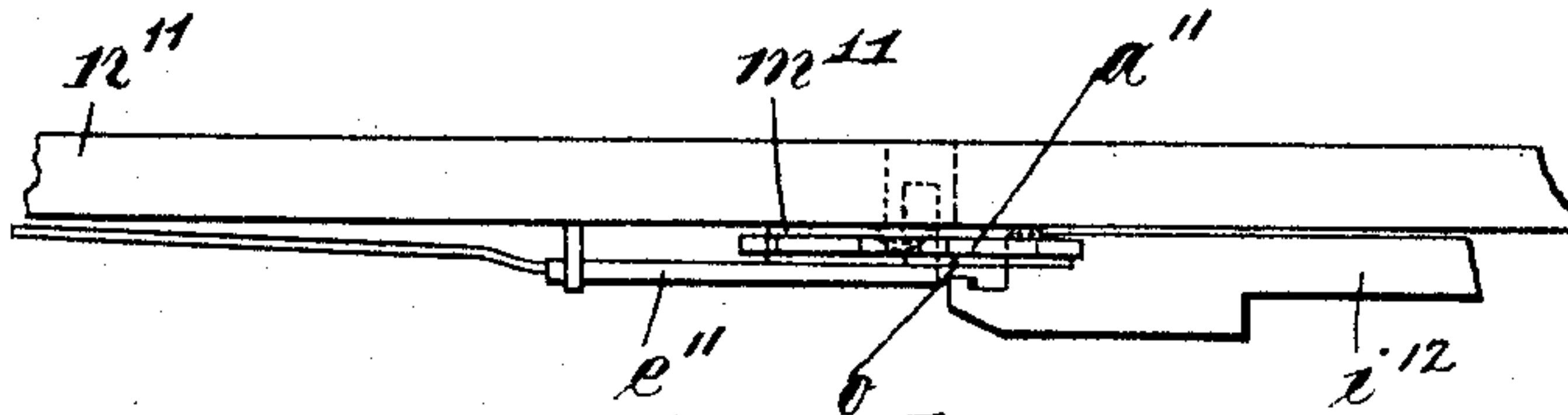
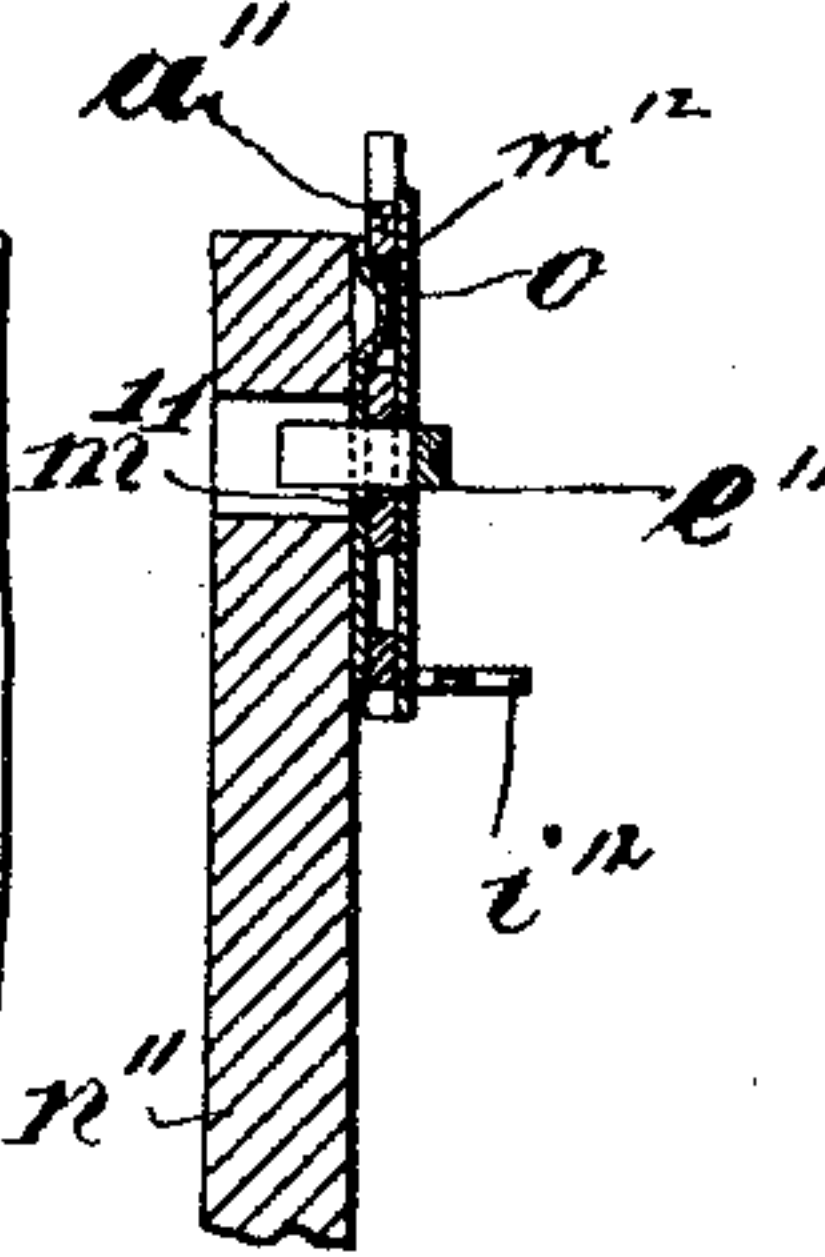


Fig. 9.

Fig. 11.

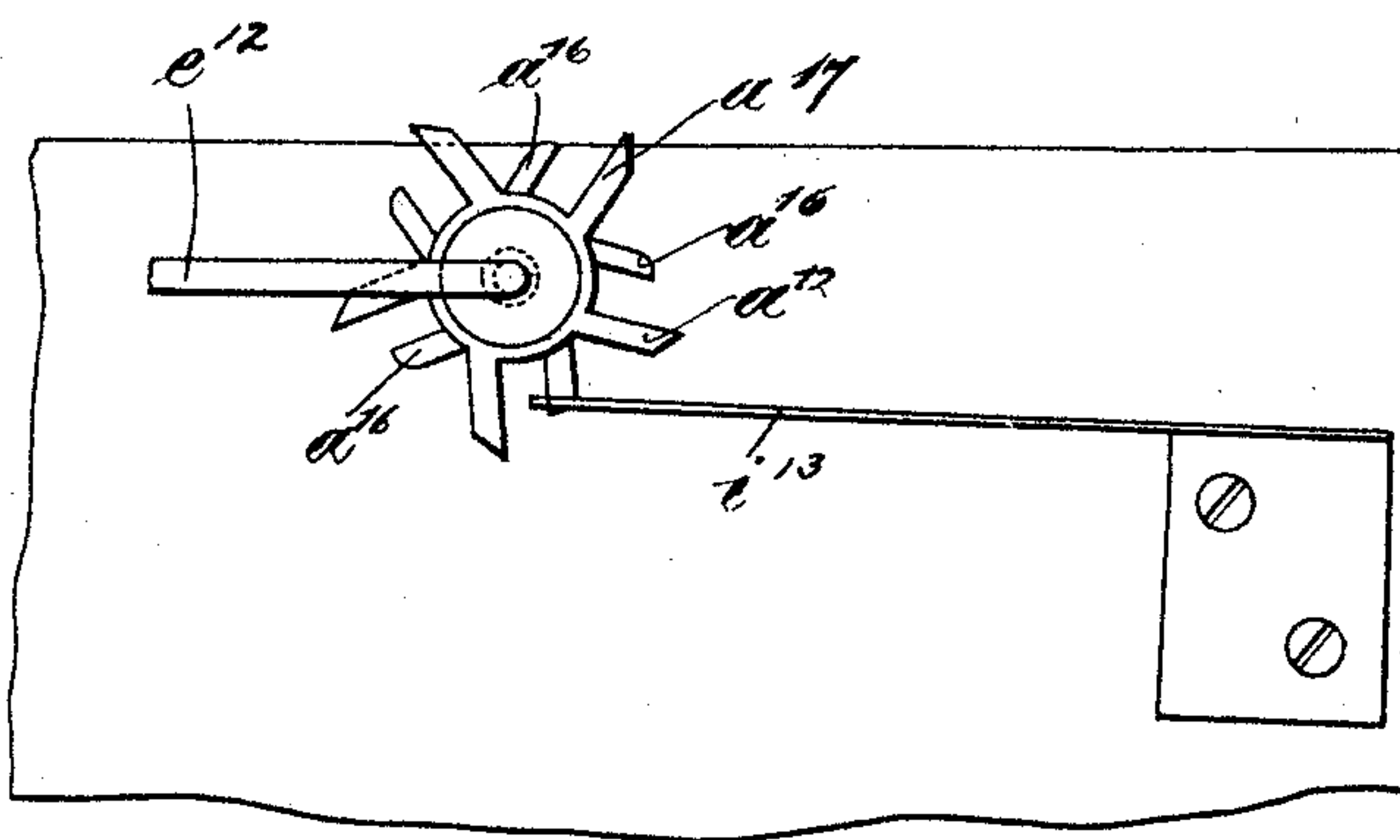


Fig. 13.

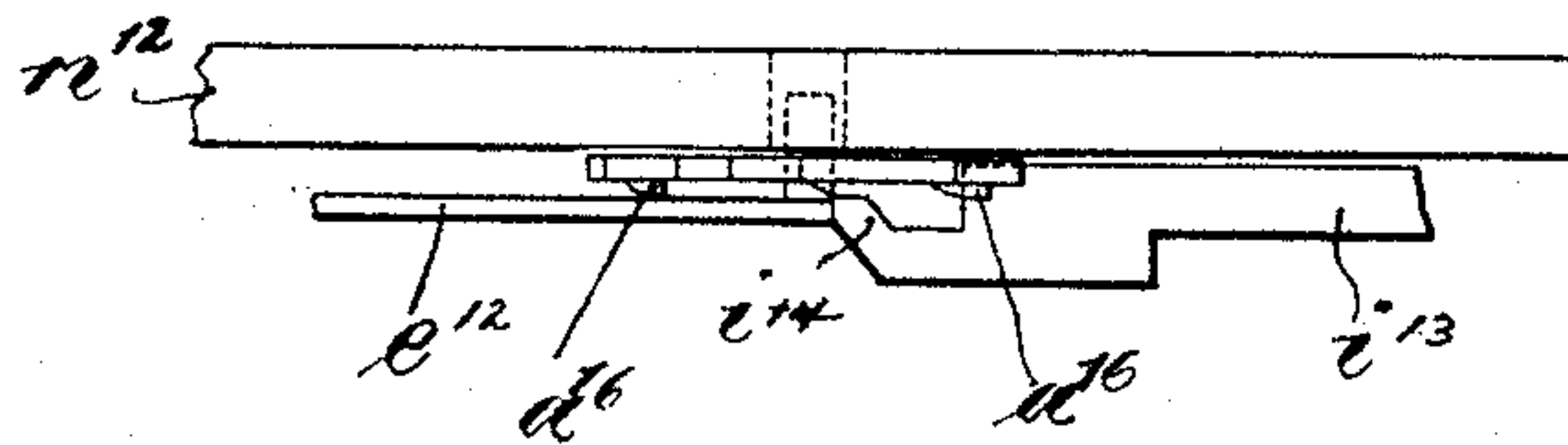
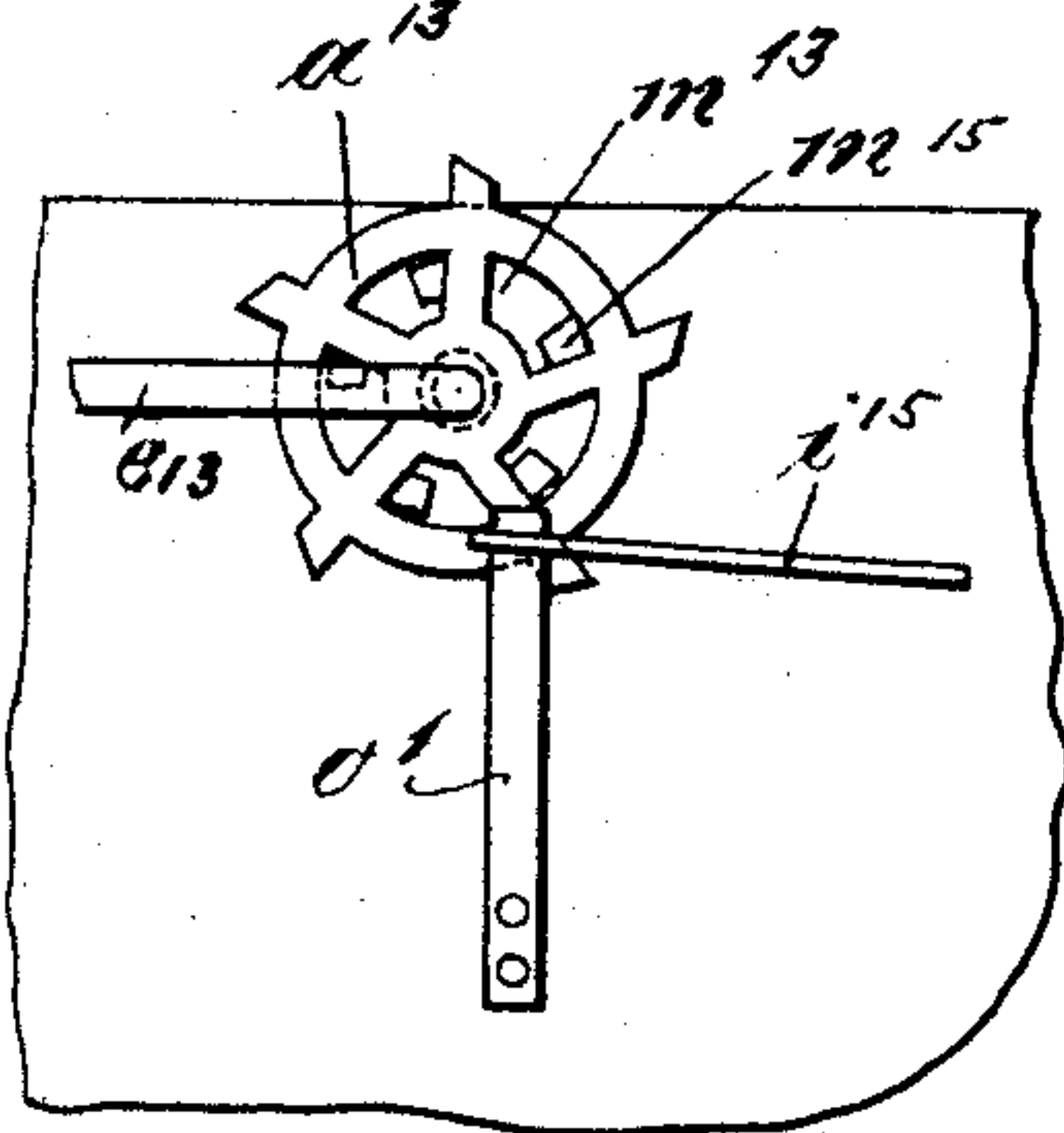


Fig. 12.

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# UNITED STATES PATENT OFFICE.

ALEXIS VERNAZ, OF STE. CROIX, SWITZERLAND, ASSIGNOR TO MERMOD FRÈRES, OF SAME PLACE.

## DAMPING DEVICE FOR MUSICAL INSTRUMENTS.

SPECIFICATION forming part of Letters Patent No. 618,151, dated January 24, 1899.

Application filed June 26, 1897. Serial No. 642,483. (No model.)

*To all whom it may concern:*

Be it known that I, ALEXIS VERNAZ, a citizen of the Republic of France, and a resident of Ste. Croix, canton of Vaud, Switzerland, have invented certain new and useful Improvements in Damping Devices for Musical Instruments, of which the following is an exact specification.

This invention refers to musical instruments of the kind in which tongues are operated by means of star-wheels, and particularly to means for damping each tongue some time after it has been acted on by an arm of the respective star-wheel and shortly before it is again acted on by the next arm of said wheel, and according to my invention I cause the star-wheel itself to effect the damping of the tongue by acting laterally upon the respective tongue; and the invention consists in the novel construction, arrangement, and combination of parts, as hereinafter fully described, illustrated in the drawings, and pointed out in the appended claims.

In order to make my invention more clear, I refer to the accompanying drawings, in which similar letters denote similar parts throughout the different views, and in which—

Figure 1 is a side view of one form of construction of my invention. Fig. 2 is an upper view of the star-wheel  $a$ , the adjacent end of the spring  $e$ , supporting the star-wheel, and the adjacent end of the tongue  $i$ . Fig. 3 is a section in line 14 15 of Fig. 1, the star-wheel  $a$  being in its normal position; and Fig. 4 is a similar section, the star-wheel being, however, laterally displaced by the projection  $m$ . Fig. 5 is a side view similar to Fig. 1, but showing a slightly-modified form of construction. Fig. 6 is a section in line 16 17 of Fig. 5, and Fig. 7 is an upper view of the parts shown in Fig. 5. Fig. 8 is a side view similar to Figs. 1 or 5, but showing another modification. Fig. 9 is an upper view of the parts shown in Fig. 8, and Fig. 10 is a section in line 18 19 of Fig. 8. Fig. 11 is a side view similar to Figs. 1, 5, or 8, but representing a fourth form of construction. Fig. 12 is an upper view of the parts shown in Fig. 11, and Fig. 13 is a fifth form.

Referring to Figs. 1 to 4,  $a$  is the star-wheel, and  $e$  a spring holding the star-wheel or

forming an elastic or yielding bearing for the same, respectively.  $i$  is a tongue, and  $m$  is a pin or knob that projects from the plate  $n$ . The star-wheel  $a$ , or, more precisely, the arms  $a^1$   $a^2$  to  $a^5$  of the same, are operated in known manner by means of a perforated note plate or disk. (Not shown.) In the position shown in Fig. 1 the tongue  $i$ , or, more precisely, the broadened head  $i'$ , Figs. 1 and 2, of the same, respectively, has just been actuated by the arm  $a^3$  of the star-wheel, and the latter itself has been actuated from the perforated note plate or disk by the mediation of the arm  $a^1$ . Supposing the tongue  $i$  shall be caused to sound a second time instantly after the first time or the arm  $a^5$  of the star-wheel be driven by the perforated note plate or disk instantly after the arm  $a^1$  has got free from the same, it is first necessary to damp the tongue. This is effected by the arm  $a^3$  of the star-wheel rising upon the projection or pin  $m$ , the latter being inclined in the direction to the arms that are to pass upon and over it. The direction of incline of the pin  $m$  is thus in a sense opposite to the direction of rotation of the star-wheel. As long as the arm  $a^3$  of the star-wheel moves from the head  $i'$  of the tongue to the pin  $m$  the star-wheel is in contact with the plate  $n$ , as distinctly shown in Fig. 3; but as soon as the arm  $a^3$  has risen upon the pin  $m$  the star-wheel is displaced in its axial direction, so that it assumes the position represented in Fig. 4. In this position the star-wheel touches the nose  $i^2$  of the head  $i'$  of the tongue, or, more precisely, the edge  $i^3$  of said nose, when the vibrations of the tongue will instantly cease, as will be clear without any further explanation. Thereafter the arm  $a^3$  leaves the pin  $m$ , and the arm  $a^2$  operates the tongue  $i$ ; but this occurs only after the arm  $a^3$  has left the said pin, so that the star-wheel has resumed its former or original position before the second actuation of the tongue takes place.

In the form of construction shown in Figs. 5, 6, and 7 the pin or projection  $m$  of Fig. 1 has been dispensed with; but instead of said pin there is made use of a disk  $m'$ , that is located between the star-wheel and the plate  $n^{10}$ . Said disk is provided with projections  $m^2$ , the number of which corresponds to the num-



ber of the arms of the star-wheel. Each of these arms has a curved lateral extension  $a^6$ , and the position of the projections  $m^2$  of the disk  $m'$  with regard to the end of the head  $i^9$  of the tongue  $i^{10}$  is such that the extension  $a^6$ , which is next to come into use, is pressed (laterally with regard to the star-wheel) against the head of the tongue as soon as the arms of the star-wheel push against and rise upon the projections  $m^2$  of the disk  $m'$ . The configuration of the nose  $i^{15}$  of the head of the tongue is in this form of construction slightly changed in that the nose  $i^{15}$  has a projection  $i^4$  that extends in the direction of the star-wheel, Fig. 7. The projection  $i^4$  of the tongue comes into contact with the respective extension  $a^6$  of the star-wheel on the latter being axially displaced by the influence of the projections  $m^2$  of the disk  $m'$  upon the arms of the star-wheel, as has heretofore been described.  $e'$  indicates the spring similar to spring  $e$ . (Shown in Figs. 1 to 4.)

In the form of construction shown in Figs. 8, 9, and 10 there is also made use of a disk  $m^{11}$ , with projections  $m^{12}$  of the kind shown in Figs. 5 and 6. In this case, however, the position of the projections  $m^{12}$ , just mentioned, is such a one that not the arms proper of the star-wheel  $a^{11}$ , but the lateral extensions of the same, (not shown in Figs. 8 to 10,) come into contact with the said projections when the star-wheel is suitably turned. There is in this form of construction besides the plate  $m^{14}$ , Figs. 9 and 10, another plate  $o$ , that is located at the outside of the star-wheel and is secured to the latter, so as to rotate together with the same. Therefore in this form of construction not the star-wheel proper, but the disk  $o$ , is pressed against the tongue  $i^{12}$ . In this construction the parts  $n^{11} e^{11}$  are similar to the parts  $n e$ , respectively, of Figs. 1 to 4.

In the form of construction shown in Figs. 11 and 12 the extensions  $a^{16}$  of the star-wheel do not project from the arms, but from the nave of the same, and the said extensions  $a^{16}$  are bent so as to project beyond the plane of the outer surface or side of the star-wheel, as distinctly represented in Fig. 12. Therefore prior to an actuation of the tongue  $i^{13}$  by any of the arms  $a^{17} a^{12}$  of the star-wheel the tongue  $i^{13}$  is put out of vibration by the respective extension  $a^{16}$ , the latter coming in contact with the nose  $i^{14}$  of the tongue.  $e^{12}$  indicates the spring acting on the star-wheel.

In Fig. 13 I have shown a form of construction in which the tongue  $i^{15}$  is damped from the star-wheel  $a^{13}$  not directly, but by means of a spring  $o'$ . The star-wheel may be laterally displaced in the same way, as has been described with regard to Fig. 5. The spring  $o'$  may be regarded as a substitute for the disk  $o$  of Fig. 8, the difference being that said disk may rotate together with the star-wheel, whereas the spring  $o'$ , Fig. 13, is a stationary part. The effect, however, is exactly the same as has been described with regard to the other forms of construction, and in this form of construction the parts  $e^{13}$ ,  $m^{13}$ , and  $m^{15}$  correspond to the parts  $e'$ ,  $m'$ , and  $m^2$  of Fig. 5.

I wish it to be understood that I do not limit my claim to the exact details of construction shown, as minor changes may be made without departing from the principle of my invention.

Having thus fully described the nature of this invention, what I desire to secure by Letters Patent of the United States is—

1. In a musical instrument having tongues, and star-wheels for operating said tongues, the combination with said star-wheels, of means for displacing them axially in a direction toward the tongues on each actuation, for the purpose as described.

2. In a musical instrument having tongues, and star-wheels for operating said tongues, the combination with said star-wheels, of means for displacing them axially in a direction toward the tongues before each actuation of the latter, for the purpose as described.

3. In a musical instrument having tongues, star-wheels adapted to be shifted axially as described and having arms adapted to operate said tongues, and projections so arranged as to be struck by the arms of the star-wheel and shift the latter axially toward the tongues.

4. In a musical instrument having tongues, star-wheels having arms provided with extensions in the direction of rotation and projections arranged to shift the star-wheel axially toward the tongues to bring the extensions against said tongues for damping them.

In testimony whereof I have signed this specification in the presence of two subscribing witnesses.

ALEXIS VERNAZ.

Witnesses:

E. A. STOREY,  
E. F. BARRY.