

(No Model.)

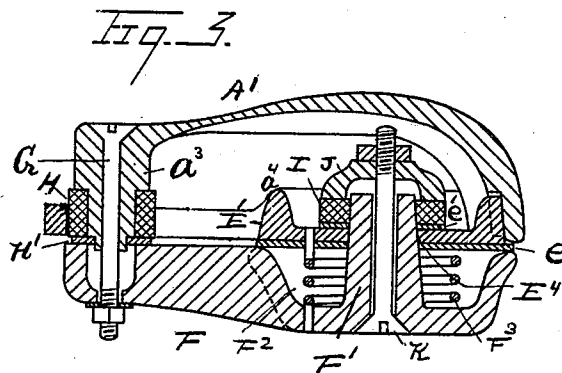
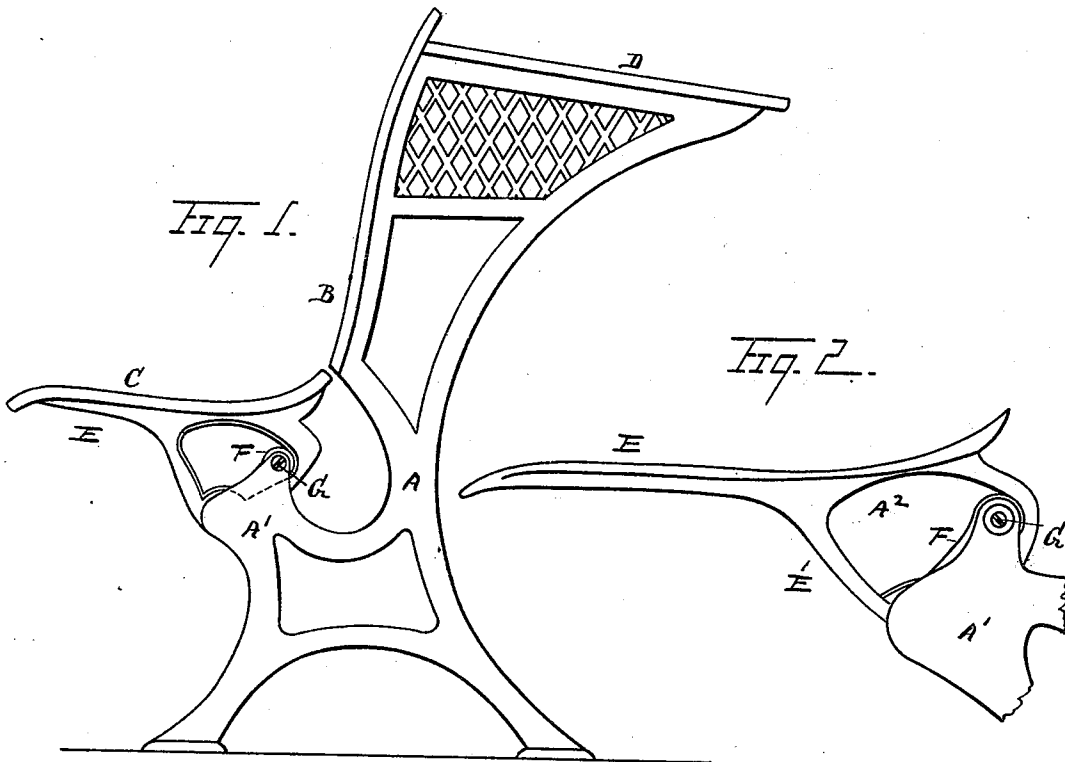
2 Sheets—Sheet 1.

E. M. DENNIS.

# AUTOMATIC HINGE FOR SCHOOL SEATS.

No. 511,881.

Patented Jan. 2, 1894.



Witnesses  
John Schuman  
John F. Miller.

Inventor  
Edward M. Dennis  
By his Attorney  
Newell S. Wright.

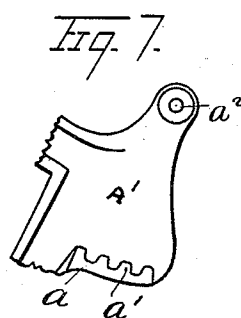
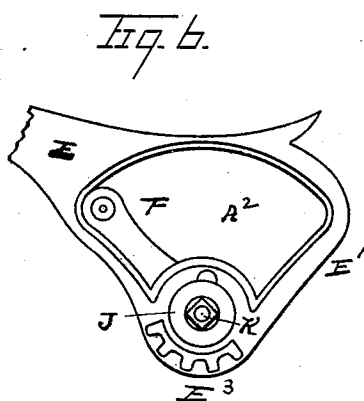
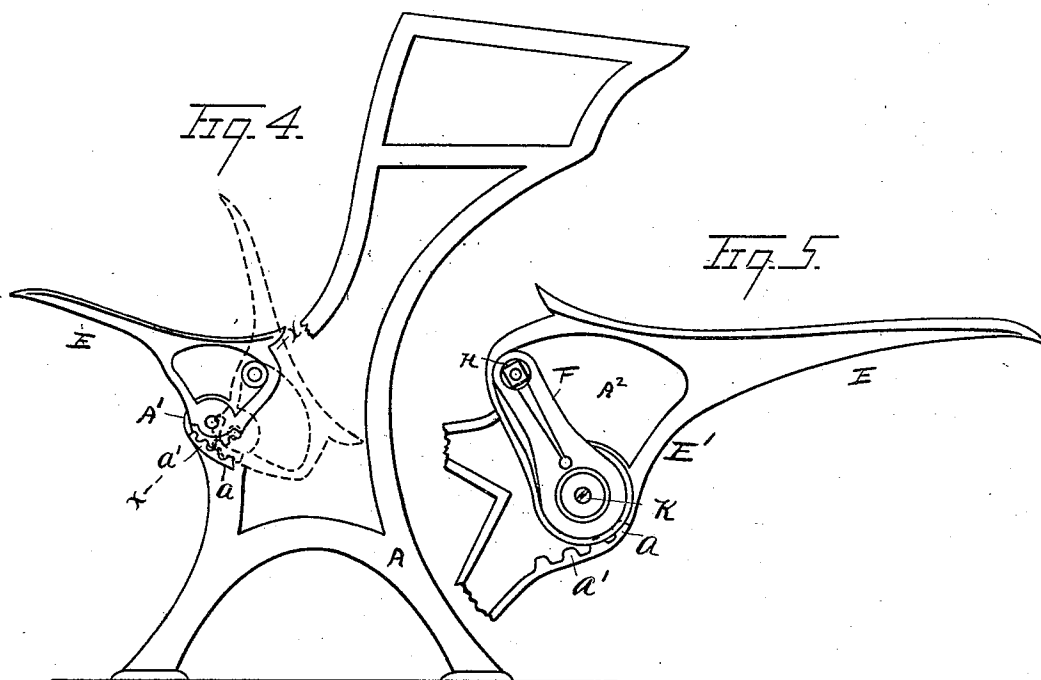
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2 Sheets—Sheet 2.

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# UNITED STATES PATENT OFFICE.

EDWARD M. DENNIS, OF WALKERVILLE, CANADA, ASSIGNOR OF ONE-HALF  
TO FRANCIS R. BEAL, OF NORTHVILLE, MICHIGAN.

## AUTOMATIC HINGE FOR SCHOOL-SEATS.

SPECIFICATION forming part of Letters Patent No. 511,881, dated January 2, 1894.

Application filed December 10, 1892. Serial No. 454,723. (No model.) Patented in Canada May 7, 1892, No. 38,867.

*To all whom it may concern:*

Be it known that I, EDWARD M. DENNIS, a citizen of the United States, residing at Walkerville, county of Essex, Province of Ontario, Canada, have invented a certain new and useful Improvement in Automatic Hinges for School-Seats, (for which I have obtained a patent in the Dominion of Canada, bearing date of May 7, 1892, and numbered 38,867;) and I declare the following to be a full, clear, and exact description of the same, such as will enable others 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.

My invention has for its object an automatic hinge for school seats of novel construction, which shall be simple, durable and of superior efficiency. The desirability of having a school seat which may be turned up when not in use, and be again turned down for use, both operations being noiseless, is well understood. The desirability also of having a seat so operated, constructed in such a manner that the seat will automatically raise itself, when not in use, at least after a little start at the very beginning of its movement, is also evident.

It is the purpose of my invention to provide a school seat with an automatic hinge to accomplish these results in a most satisfactory manner, and to overcome objectionable features in hinges or joints for school seats heretofore common.

To these ends my invention consists of the devices and appliances, their construction, combination and arrangement as hereinafter specified and claimed and illustrated in the accompanying drawings, in which—

Figure 1 is a side elevation of a school seat embodying my invention, showing the seat in position for use. Fig. 2 is an enlarged view in detail of the hinge, in side elevation. Fig. 3 is a view in section on the line  $x-x$  Fig. 4. Fig. 4 is an inner side elevation from the opposite side of that shown in Fig. 1, parts being broken away and the oscillatory lever removed, but showing the cushioned joint at the upper end thereof. Fig. 5 is a detail view of the hinge from the side opposite that

shown in Fig. 2. Fig. 6 is a detail view of the seat arm and oscillatory lever, the standard being omitted. Fig. 7 is a detail view of the joint arm of the standard.

I carry out my invention as follows:  
A in the drawings represents the standards or uprights.

B is the seat back.

C is the seat.

D is the desk.

E denotes the arms supporting the seat.

A' denotes a joint arm of the standard, which may be formed in any desired shape. This joint arm is constructed with a flange "a" provided with gear teeth "a'." I do not, however, limit myself to this precise manner of providing the joint arm A' with the gear teeth. These gear teeth preferably form a segmental gear normally extending rearward on an incline, as shown. The joint arm is also provided with an orifice, as at "a<sup>2</sup>," above said gear teeth. The seat arms E are formed with a shoulder E' forming a loop A<sup>2</sup>. Said shoulder is provided with a segmental gear, as shown at E<sup>3</sup>, and with an orifice as indicated at E<sup>4</sup>.

F denotes an oscillatory lever constructed with a hub F' inserted, and having a jointed engagement, in the orifice E<sup>4</sup> of the shoulder E'. The opposite end of said lever is jointedly engaged with the joint arm A', as by a pivoting bolt G passed therethrough and through the orifice "a<sup>2</sup>." The joint arm adjacent to said orifice "a<sup>2</sup>" is constructed with a tubular extension "a<sup>3</sup>" through which said bolt passes, and upon which is located a projecting rubber ring H serving as a cushion. A washer H' separates said cushion from the adjacent face of the oscillating lever. The tubular extension "a<sup>3</sup>" is preferably reduced at its extremity to receive the rubber ring H, as shown in Fig. 3.

Upon the hub F' of the oscillating lever is located a rubber gasket I.

On each side of the shoulder of the seat arm I locate washers "e" "e'," the washer "e" extending between the face of the seat arm and the oscillating lever.

J denotes a cap located upon the inner end of the hub F', its edges bearing on said gas-

ket. A bolt K unites the oscillatory lever and cap upon the intermediate portion of the seat arm, the washers and the gasket.

Adjacent to the hub F' the oscillatory lever 5 is formed with a chamber F<sup>2</sup>, in which is located a spring F<sup>3</sup> engaged at its extremities with the oscillatory lever and with the shoulder of the seat arm, the spring exerting its tension to elevate the seat arm. In doing so, 10 it will be evident that the segmental gear upon the end of the seat arm is rotated and is consequently carried rearward along the geared portion of the joint arm of the stand- 15 ard, so that not only is the seat arm elevated, but it is also at the same time forced rearward. Thus two movements are communicated to the seat arm, the lifting movement of the seat arm, and the retracting or 20 rearward movement also, the two movements taking place simultaneously, while the inclined gear way on the arm of the standard facilitates the elevation of the seat arm, since, as will be apparent, the center of gravity of 25 the seat arm is changing with the retraction thereof, the weight of the seat arm being thrown more and more to the rear of the oscillatory lever. When the seat arm is in a downward position, the segmental gear there- 30 on is located forward on the geared portion of the standard, as indicated in Fig. 5, and the rear portion of the shoulder E' is thrown forward against the cushion or ring H. On the other hand when the seat arm is raised out of position for use, the segmental gear there- 35 on is rotated to the rear of the geared portion of the joint arm, and the forward part of the shoulder E' is thrown backward against the cushion H. Thus a single rubber ring H serves to cushion the seat arm in both its 40 downward and upward position, and renders its operation in either direction noiseless.

I do not limit myself to the use of the spring F<sup>3</sup> alone, nor to any definite number and arrangement of washers and gaskets in 45 putting the main portions of the device together. The ring H not only serves to cushion the operation of the seat arm at two points, but also keeps the joint tight at that point. The gasket I also serves, if used, to 50 keep the joint tight at that point. The oscillatory lever may, however, be jointly engaged with the seat arm at the lower end, and with the standard at the upper end in any desired manner, without departing from 55 the principle of my invention. It will be observed that the union of the oscillatory lever with the standard at the upper end of the lever extends through the loop A<sup>2</sup>.

I prefer not to have the seat rise to a perfectly erect position, but to about the position shown in dotted lines in Fig. 4. When 60 its erect position is limited to such a position, it is evident that a person desiring to use the seat, need not throw down the seat by hand, but may force it down into horizontal position 65 by simply sitting down, as the outer edge projects forward from the back a sufficient

distance for the accomplishment of this result in this manner. The seat leaving the pupil, when the pupil rises, on a backward 70 movement at the same time that it rises, readily frees itself from the clothing, and the upward pull of the clothing, as of a dress, when the pupil rises will ordinarily be sufficient to give the seat a start on its upward and back- 75 ward movement. The tension of the spring, if employed, may be adjusted as required in any desired manner.

A special feature of this invention is noticeable in the fact that the weight of the pupil 80 instead of coming upon the joint comes upon the gear.

By tightening the bolt K more or less friction may be afforded to the operation of the seat arm to make the joint tighter or looser 85 as may be required. Should the joint at any time become loose, it may be tightened up readily by turning the bolt K.

The shoulder E' may be formed with a flange "a'" within which are engaged the 90 gasket I, washer "e'" and inner edge of the cap J.

What I claim as my invention is—

1. In a seat, the combination, with a standard provided with a geared portion, of an oscillatory lever pivotally secured to the stand- 95 ard, and a seat arm jointly connected with the lever and engaging with the gear portion of the standard, substantially as set forth.

2. In a seat, the combination, with two 100 standards, each provided with a joint arm having a geared portion upon its inner surface, an oscillatory lever pivotally secured to each arm at its upper end a seat arm jointly connected with the lower end of each of 105 said levers and engaging with its standard, and a seat secured to the said seat arms, substantially as set forth.

3. In a seat, the combination, with two 110 standards, each provided with a joint arm having a geared portion and a perforation above and to the rear of the geared portion, an oscillatory lever pivotally connected at its upper end to each arm at the perforation, a seat arm pivotally secured to the lower end 115 of each of the levers and engaging with its standard, and a seat secured to said seat arms, substantially as set forth.

4. In a seat, the combination, with two 120 standards, each provided with a joint arm having a downwardly and rearwardly extended geared portion upon its inner face, an oscillatory lever pivotally secured at its upper end to each arm, a seat arm pivotally secured to the lower end of each of the levers 125 and engaging with its standard, and a seat secured to said seat arms, substantially as set forth.

5. In a seat, the combination, with two 130 standards, each provided with a joint arm and a geared portion, said arm having a tubular extension, a cushion on said extension, an oscillatory lever, pivotally secured to each extension at its upper end a seat arm pivot-

ally secured between each lever and its respective joint arm, each of said seat arms being provided with a geared portion to engage with the geared portion of the standard, and provided with a loop through which the extension of the joint arm projects and by means of which loop the movement of the seat arm is regulated, and a seat on the seat arms, substantially as set forth.

10 6. In a seat, the combination, with a standard provided with a joint arm and with a geared portion of an oscillatory lever pivotally secured to said arm at its upper end, and having its lower end provided with a chamber and a tubular hub projecting from the  
15 bottom of the chamber, a seat arm pivotally

secured on said hub, and provided with a gear to engage with the geared portion of the standard a spring within the chamber one end of which engages with the lever and the other end engages with the seat arm, a cap over the end of the hub, a yielding washer between the cap and the seat arm and a bolt through the hub and the cap to hold the parts together, substantially as set forth.

25 In testimony whereof I sign this specification in the presence of two witnesses.

EDWARD M. DENNIS.

Witnesses:

N. S. WRIGHT,  
JOHN F. MILLER.