

No. 672,628.

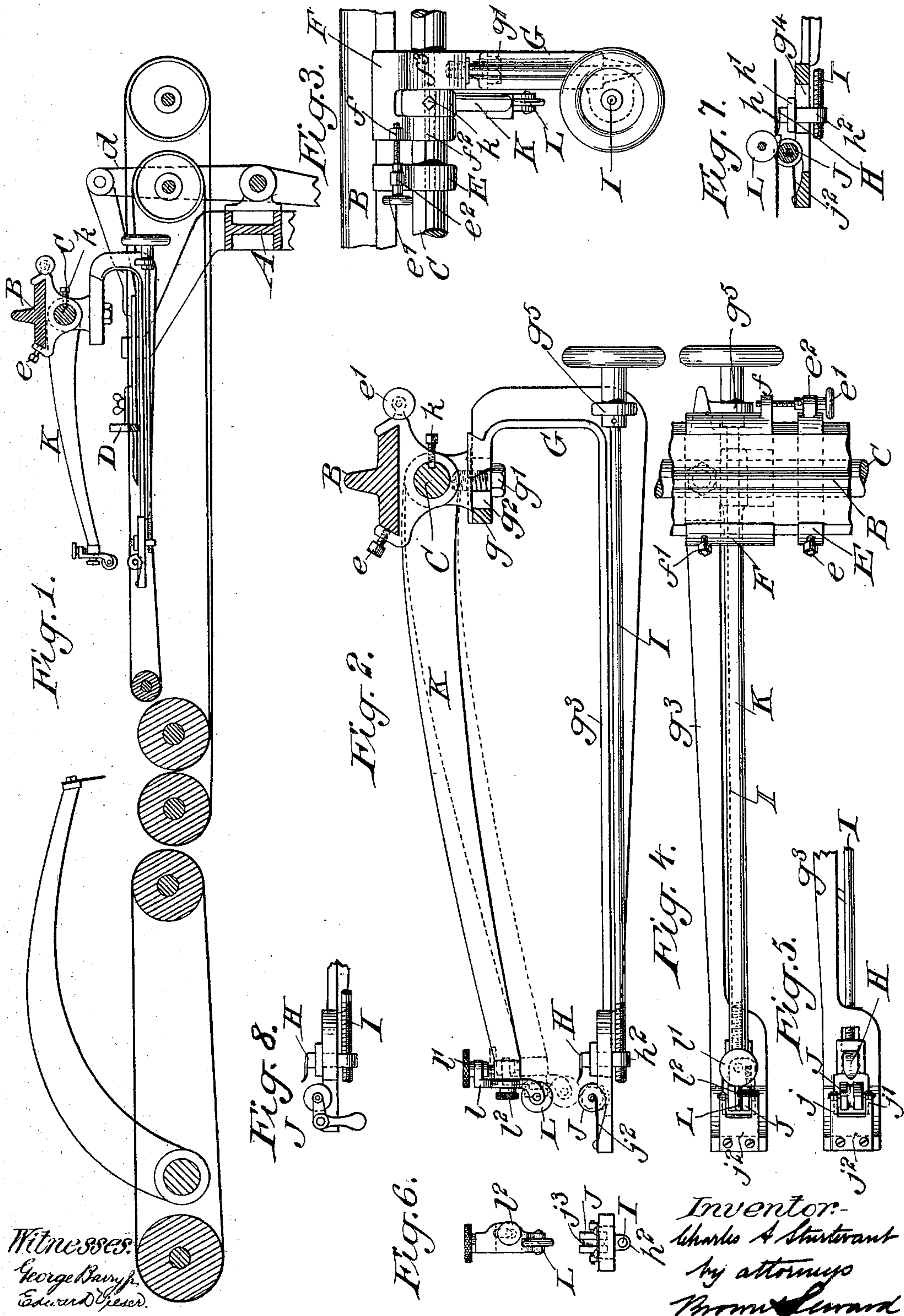
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C. A. STURTEVANT.

AUTOMATIC POINT FOR PAPER FOLDING MACHINES.

(Application filed Mar. 14, 1900.)

(No Model.)





# UNITED STATES PATENT OFFICE.

CHARLES A. STURTEVANT, OF NEW YORK, N. Y.

## AUTOMATIC POINT FOR PAPER-FOLDING MACHINES.

SPECIFICATION forming part of Letters Patent No. 672,628, dated April 23, 1901.

Application filed March 14, 1900. Serial No. 8,597. (No model.)

*To all whom it may concern:*

Be it known that I, CHARLES A. STURTEVANT, a citizen of the United States, and a resident of the borough of Manhattan, in the city and State of New York, have invented new and useful Improvements in Automatic Points for Paper-Folding Machines, of which the following is a specification.

My invention relates to certain improvements in automatic points for paper-folding machines whereby the sheet of paper to be folded may be very quickly and readily engaged by the points for accurately alining the sheet before it is folded.

One object of my invention is to provide stationary adjustable points, means for protecting the points when not in use, and means for engaging the sheet for depressing a portion of the sheet at one side of the slits therein for permitting the stationary points to enter the slits without fail, this last-mentioned means also serving to depress the point-protecting devices.

A further object is to provide means for adjusting the several devices accurately with respect to each to insure the folding of the sheets at the proper places.

A practical embodiment of my present invention is represented in the accompanying drawings, in which—

Figure 1 represents a partial vertical section through a sheet-folding machine from front to rear with one of my improved automatic points applied thereto. Fig. 2 represents a side view of the point and its adjacent parts on an enlarged scale. Fig. 3 is a rear view of the same. Fig. 4 is a top plan view. Fig. 5 is a top plan view of the point proper and its yielding protecting device. Fig. 6 is a front view of the point-protecting device and the device for opening the slit in the sheet for permitting the point to enter the same. Fig. 7 is a detail sectional view showing the manner of opening the slit to permit the point to enter the same; and Fig. 8 is a detail view of a modified form of yielding point-protecting device, showing the protecting-roller yieldingly held in position by a counterbalance-weight instead of a spring, as in the other form shown.

I have only represented in the accompanying drawings so much of a paper-folding ma-

chine as will illustrate the location and operation of my improved automatic point, as my present invention is only directed to this particular attachment and not to the folding-machine.

A number of the paper-carrying tapes and their rolls are represented in the accompanying drawings and also the sheet-folder, which parts may be operated in the usual manner. One of the cross-beams of the machine is denoted by A and the other by B. A rock-shaft C extends across the machine at a point below but quite near the cross-beam B. The usual forward and backward reciprocating stop D is arranged in position to engage the advance edge of the sheet as it is fed into the machine when the stop is at the limit of its forward movement, serving to temporarily stop the movement of the sheet for permitting the sheet to be brought into engagement with the alining-points to be hereinafter described. This stop D is reciprocated by rocking levers *d*, one only of which is shown herein, fulcrumed on the cross-beam A.

As the two or more points which are located in the desired positions across the folding-machine are all quite similar in construction and operation, I will only describe one of them at length.

The automatic point and its adjacent parts are constructed and arranged as follows: A stationary hanger E is rigidly clamped on the cross-beam B at a point approximate to the position which the automatic point is intended to occupy. The rock-shaft C passes freely through the hanger and is partially supported thereby. A clamp-screw *e* serves to secure the hanger in its position on the cross-beam B. An adjustable hanger F is supported by the cross-beam B adjacent to the stationary hanger E, and the hanger F is adjusted along the cross-beam laterally to the machine by an adjusting-screw *e'*, mounted in a lug on the hanger E and having a screw-threaded engagement with a lug *f* on the adjustable hanger F. After the hanger F has been adjusted to the required position it may be securely clamped therein by a set-screw *f'*, which engages the cross-beam B. This hanger F has two depending branches *f*<sup>2</sup> *f*<sup>3</sup>, through which the rock-shaft C freely passes and rocks. The upper forwardly-ex-



tended arm  $g$  of a bracket  $G$  is secured to the bottom of the branch  $f^3$  of the hanger  $F$  by a screw-bolt  $g'$ . The arm  $g$  and branch  $f^3$  have a tongue-and-groove connection with each other, and the arm is further provided with an elongated slot  $g^2$ , through which the bolt  $g'$  passes, so that the bracket  $G$  may be bodily adjusted to the front or rear, as may be desired. The lower arm  $g^3$  of the bracket  $G$  is extended forwardly a considerable distance to the front of the temporary sheet-stop  $D$  and is located just beneath the sheet-carrying tapes. In the arm  $g^3$ , near its forward end, the stationary adjustable point  $H$  is mounted. This point has a forwardly-extended knife-edge  $h$ , located just above the carrying-tapes, a shoulder  $h'$  resting upon the top of the arm  $g^3$ , and a downwardly-extended shank  $h^2$ , which passes through an elongated slot  $g^4$  in the arm and projects a short distance below the same. The point is adjusted accurately to the front or rear by an adjusting-screw  $I$ , mounted at its rear end in a lug  $g^5$  on the bracket  $G$  and having its forward end in screw-threaded engagement with the shank  $h^2$  of the point.

The point-protecting device comprises a roller  $J$ , which is mounted in the free ends of a pair of yielding arms  $j j'$ , projecting rearwardly from a plate  $j^2$ , secured to the top of the arm  $g^3$  at its forward end, the roller being located in close proximity to the knife-edge  $h$  of the point. The arm  $g^3$  is preferably cut away beneath the arms  $j j'$ , so as to permit the roller to be depressed by the device for opening the slit in the sheet. The roller  $J$  is normally in a position with its top in substantial alinement with the knife-edge of the point, so as to direct the advance edge of the sheet over the said point to permit it to be fed until its advance movement is arrested by the stop  $D$ . The roller  $J$  is provided with a circumferential groove  $j^3$ . In Fig. 8 I have shown the roller  $J$  mounted on the upper arm of a counterbalance-lever, which is hinged to the end of the arm  $g^3$  of the bracket  $G$ , the weighted arm of the said lever tending to hold the roller yieldingly in its normal position.

The device for opening the slit in the sheet at the proper time is constructed and arranged as follows: A swinging arm  $K$  is mounted upon the rock-shaft  $C$  between the branches  $f^2 f^3$  of the hanger  $F$  and extends forwardly therefrom over the arms  $g^3$  of the bracket  $G$  and above the sheet-carrying tapes. This arm  $K$  has a feather-and-groove connection with the shaft  $C$ , so that the arm is fixed to rock therewith and yet may be adjusted laterally along the shaft when the hanger  $F$  is thus adjusted. In the accompanying drawings I have shown the shaft  $C$  as having the groove and the hub of the arm  $K$  as being provided with a screw  $k$ , fitted to enter the said groove. A roller  $L$  is carried by the free end of the arm  $K$  in position to be swung down into engagement with the sheet, and it is so arranged that it will depress the roller  $J$

at the same time that it depresses one edge of the slit, thus opening the slit sufficiently to insure the knife-edge of the point entering the same as the paper is further advanced. This roller is preferably narrower than the roller  $J$  and has a convex periphery fitted to enter the groove  $j^3$  in the said roller  $J$ , thus insuring a wider opening of the slit in the sheet. The roller  $L$  is made vertically adjustable by mounting it in a plate  $l$ , which plate is provided with an adjusting-screw  $l'$ , engaging the arm  $K$ , and a set-screw  $l^2$ , engaging the said arm for clamping the plate, and thereby the roller, in the desired adjustment.

The operation of my invention is as follows: The sheet to be folded is fed into the machine until the advance edge of the sheet is arrested by the stop  $D$ . When the sheet is thus temporarily arrested, the slit in the sheet will be located just in front and above the stationary point. The shaft  $C$  is then rocked in a direction to swing the arm  $K$  downward, thus causing the roller  $L$  to engage the rear edge of the slit and depress it into the groove in the roller  $J$  and also depress the roller  $J$ . This operation will cause the open slit to be presented in front of the point, so that the further advance movement of the sheet causes the point to enter the slit, and thus finally aline the sheet ready to be folded.

In the structure hereinabove described the several parts may be adjusted to the finest degree with respect to the stationary point, and the arrangement of the parts for opening the slits in the sheet is such that the slit may be made of a lesser length than has been hitherto necessary, as it is not now required to allow for any play in the sheet whatever.

What I claim is—

1. Means for alining sheets of paper having slits therein comprising means for feeding a sheet, means for temporarily arresting the advance movement of the sheet and a stationary point arranged to enter a slit in the sheet as the advance movement of the sheet is completed, substantially as set forth.

2. Means for alining sheets of paper having slits therein, comprising means for feeding a sheet, means for temporarily arresting the advance movement of the sheet, a stationary point arranged to enter a slit in the sheet as the advance movement of the sheet is completed and means for adjusting the point to the front or rear, substantially as set forth.

3. Means for alining sheets of paper having slits therein comprising means for feeding a sheet, means for temporarily arresting the advance movement of the sheet, a stationary point, and a device for opening the slit whereby the point is caused to enter the slit as the advance movement of the sheet is completed, substantially as set forth.

4. Means for alining sheets of paper having slits therein comprising means for feeding a sheet, a stationary point, a yielding protecting device for the point, means for temporarily arresting the advance movement of



the sheet and means for opening the slit in the sheet whereby the point is caused to enter the slit as the advance movement of the sheet is completed, substantially as set forth.

5 5. Means for alining sheets of paper having slits therein comprising means for feeding a sheet, means for temporarily arresting the advance movement of the sheet, a stationary point, and means for guiding the slit in  
10 the sheet into engagement with the point as the advance movement of the sheet is completed, substantially as set forth.

6. Means for alining sheets of paper having slits therein comprising means for feeding a sheet, a stationary point, a yielding point-protecting device located in front thereof and means for depressing the point-protecting device and opening the slit whereby the point is caused to enter the slit as the  
20 sheet is advanced, substantially as set forth.

7. The combination with a cross-beam of a paper-folding machine, of a stationary point, a support therefor, a slit-opening device, a support therefor and means for adjusting the  
25 two supports laterally along the beam, substantially as set forth.

8. The combination with a cross-beam of a paper-folding machine, of a stationary point, a support therefor, a slit-opening device, a  
30 support therefor and means for adjusting the point-support to the front and rear, substantially as set forth.

9. In a paper-folding machine, a point, a stationary support therefor, a slit-opening device arranged above and to the front of the  
35 said point and a vertically-swinging support for the said slit-opening device, substantially as set forth.

10. In a paper-folding machine, a point, a stationary support therefor, a slit-opening device arranged above and to the front of the said point, a vertically-swinging support  
40 therefor, and means for adjusting the said slit-opening device vertically with respect to its swinging support, substantially as set forth.

11. In a paper-folding machine, a cross-beam, a rock-shaft, a stationary point, a bracket for supporting the point carried by  
50 the said cross-beam, a slit-opening device and a swinging arm for supporting the said slit-opening device carried by the said rock-shaft, substantially as set forth.

12. In a paper-folding machine, a cross-beam, a stationary hanger secured thereto,  
55 an adjustable hanger supported by the cross-beam, a stationary point, a bracket for supporting the point secured to the said adjust-

able hanger and an adjusting device connecting the stationary and adjustable hanger for  
60 adjusting the point laterally with respect to the machine, substantially as set forth.

13. In a paper-folding machine, a cross-beam, a rock-shaft, an adjustable hanger supported by the cross-beam and provided with  
65 a pair of depending branches which embrace the rock-shaft, a stationary point, a bracket for supporting the point secured to one of the said depending branches, a slit-opening device, an arm for supporting the device, the  
70 said arm having a feather-and-groove connection with the said rock-shaft between the branches of the said hanger and means for sliding the hanger and thereby the point and slit-opening device laterally with respect to  
75 the machine, substantially as set forth.

14. In combination a stationary point, a support therefor and a point-protecting device comprising a yielding roller mounted on the  
80 said support in front of the point and normally in position to protect the end of the said point, substantially as set forth.

15. In a paper-folding machine, a stationary point and a device for opening a slit in the paper to be folded for causing it to engage  
85 the said point, consisting of a roller arranged to engage one edge of the slit and depress it, substantially as set forth.

16. In a paper-folding machine, a stationary point, a yielding protecting-roller mounted  
90 in front of the said point and a device for opening the slit in the paper to be folded consisting of a roller arranged to depress the protecting-roller and also one edge of the slit as the said slit-opening device is moved down-  
95 wardly, substantially as set forth.

17. In a paper-folding machine, a stationary point, a protecting-roller mounted in yielding supports in front of the said point, the said protecting-roller having a circumfer-  
100 ential groove therein and a slit-opening device consisting of a roller arranged to engage one edge of a slit in the paper to be folded and depress the said edge into the circumferential groove for positively opening the slit,  
105 as the slit-opening device is moved downwardly, substantially as set forth.

In testimony that I claim the foregoing as my invention I have signed my name, in presence of two witnesses, this 9th day of March,  
110 1900.

CHAS. A. STURTEVANT.

Witnesses:

FREDK. HAYNES,  
EDWARD VIESER.