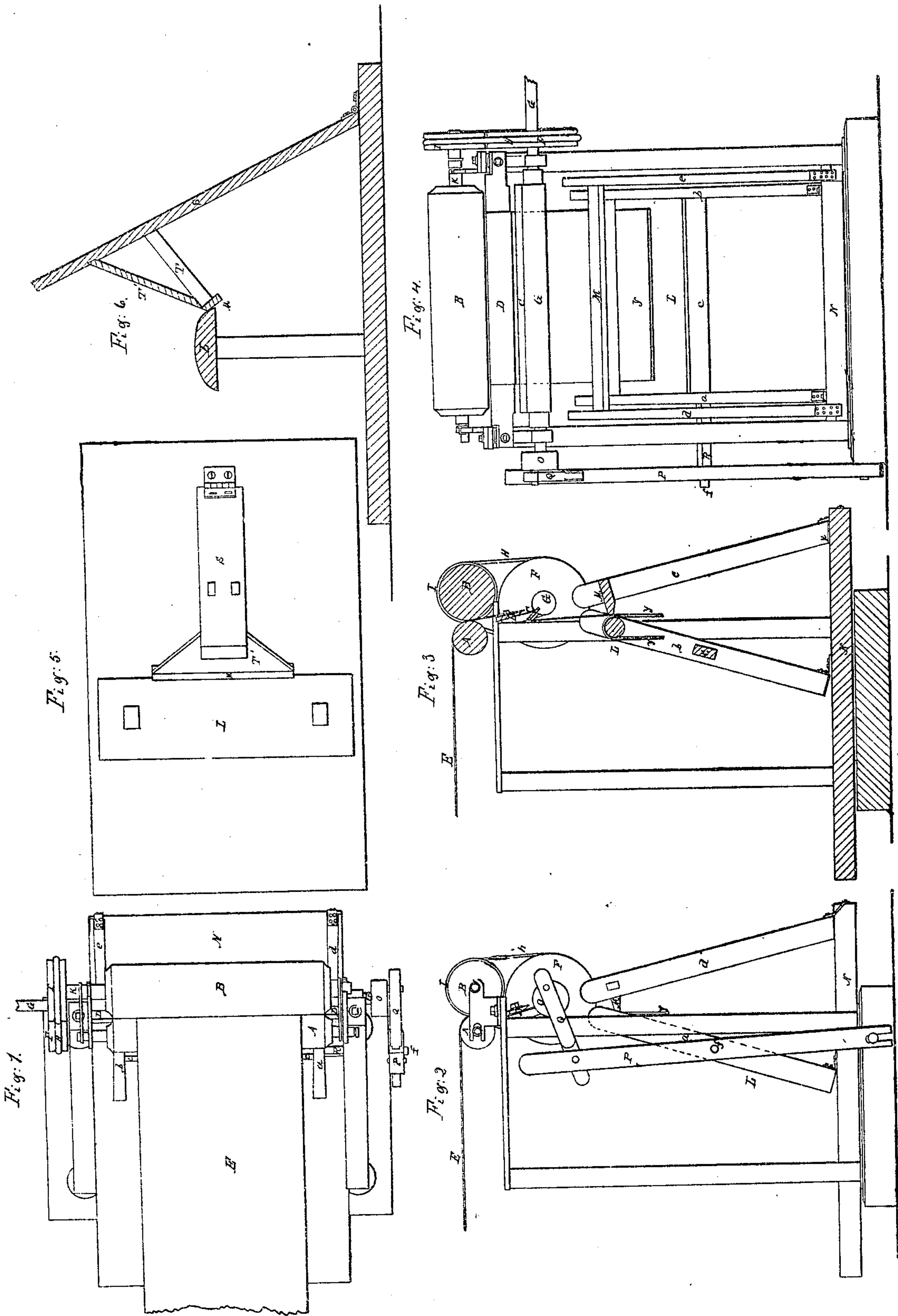


E. M. Crane.
Paper Cutting Mach.
N^o 5670. Patented Jul. 18. 1848.



UNITED STATES PATENT OFFICE.

ZENAS M. CRANE, OF DALTON, MASSACHUSETTS.

MACHINERY FOR CUTTING PAPER.

Specification of Letters Patent No. 5,670, dated July 18, 1848.

To all whom it may concern:

Be it known that I, ZENAS MARSHAL CRANE, of Dalton, in the county of Berkshire and State of Massachusetts, have invented a new and useful Improvement or Contrivance to be Applied to Machines for Making Paper in a Continuous Strip or Web, the said improvement or contrivance (which may be termed an "Automatic Lay-Boy") being for the purpose of receiving the sheets of paper cut off by the shears and laying or piling them on one another in a pack and by so doing rendering unnecessary the employment of an attendant or person usually denominated the "lay-boy."

My said improvement may also be used to advantage, in connection with automatic printing machines for the purpose of removing therefrom and piling or packing the sheets of paper after they are successively printed.

The said improvement is fully described and represented in the following specification and accompanying drawings, letters, figures and references thereof.

Of the said drawings, Figure 1, exhibits a top view of my said apparatus as disposed under the shears of a paper making machine. Fig. 2, is a side elevation of it. Fig. 3, is a central vertical and transverse section of it. Fig. 4 is a front elevation of it. Fig. 5, denotes a top view, and Fig. 6 a vertical central and transverse section of a modification of my said invention.

In said drawings A, B, represents the drawing rollers of a paper making machine. D the stationary blade, and C the revolving blade of the shears, the whole being arranged and supported by the frame work in the usual manner.

E indicates the continuous web of paper, supposed to be passing from the paper making vats, cylinders etc., of the machine, and between the draw rollers, and stationary and revolving knives of the shears.

The rotating knife C, has a grooved pulley F, fixed upon its shaft or axle G, around which (pulley) an endless band H passes to and about a grooved pulley I, placed on the shaft K, of one of the draw rollers, the said two pulleys and band being for the purpose of giving motion to the draw rollers, the shaft G, being put in revolution by any convenient and proper means.

Under the shears, is what I term the receiver L, which consists of a round rod or

roller, supported by two swords, or upright bars *a*, *b*, see Figs. 3, 4. The said bars *a*, *b*, are connected together by a horizontal cross bar *c*, and are hinged at their lower ends to the bottom board or floor or frame of the machine, in such manner as to allow the receiver to be moved toward, and away from, or in the direction of a holding board M, which is arranged parallel to and in front of the receiver L, and is supported in position by one or more bars *d*, *e*, the said bars being hinged to the floor or base board N, in such manner as to allow of their being moved forward, or in a direction away from the web of paper, which is made to pass downward, between the said receiver L, and holding board M, as seen in the drawings.

When at rest the holding board or bar M, stands in the inclined position as seen in Figs. 1, 2, 3, 4, it being prevented from falling farther backward, or toward the receiver, by having the lower ends of its swords or supports *d*, *e*, beveled off or cut in manner as seen at *x*, in the drawings, whereby they rest upon the base board and act as a stop to prevent the holding boards from falling too far backward. Any other suitable stop may be used in lieu of the above to determine the back movement of the holding board.

On one end of the shaft G, is a crank or crank pulley O, which is connected to an upright bar P, by a rod or bar Q, jointed to both in such manner as when the crank pulley is revolved to create a reciprocating vibratory movement of the said bar P, and also of the receiver and its supporting frame or swords, which are connected to the bar, by a bar R, projecting from them, (as seen in Fig. 4) and having a journal *f*, made to extend through and move in the upright bar P.

I do not consider the mechanism for moving the receiver as constituting any part of my invention, as there are various other combinations which may be employed, and I make use of any such as may be proper to produce the effect intended, viz, the giving to the receiver a reciprocating movement toward and away from the holding board or bar.

The receiver should be so placed and made to operate as to permit the lower part of the sheet of paper, which is to be severed from the web by the shears to move down somewhat below its upper edge or part or to a

distance below the same, equal to about one third of the length of the sheet, before it, (the receiver) has moved up against the sheet, and pressed it forward. This being
 5 done the receiver should be made to move forward sufficiently in advance of the center of gravity of the upper part of the sheet, or that portion thereof between the receiver and the shears, to allow the said part of the
 10 said sheet, immediately after being separated from the web of paper by the shears, to freely fall down and over the rear side of it, and in such manner as to cause the middle part of it (the sheet) to rest or lay upon the
 15 receiver, while the two ends thereof, depend therefrom on opposite sides of it as seen at γ , in the drawings. The purpose of the holding board is to hold the sheets against the receiver, and prevent them from falling off or
 20 slipping upon the same, after they are cut from the web. I do not consider such a contrivance to be necessary at all times. It is very useful however particularly as it causes the sheets to be laid very evenly upon one
 25 another, that is, it produces a pack of sheets whose edges seldom require any readjustment.

In Figs. 5 and 6, I have exhibited a modification of my improved lay boy. In the
 30 said figures, the receiver L, is made stationary and immovable, and has a holding bar or board M, connected with it, and made simply to rest against it, and be hinged to the base board or floor, as before described,
 35 and made moveable toward and from the receiver. For this purpose the holding board M is applied to a bar or lever S, connected to it by one or more bars T. The said lever is made to extend upward, in
 40 front of the rotating blade of the shears, and in such manner that during each revolution of said blade it (the blade) or any mechanical substitute therefor shall be so brought into contact with the lever, or any
 45 projection from it, as to cause said lever to move forward, and carry the holding board or bar off or away from the receiver, and afterward to permit it to fall back upon or toward the same, and to do the same, in such
 50 manner as will allow the lower part of a sheet of paper to pass downward between the said holding board and receiver, and the holding board to fall back upon the same, and hold or confine it against the receiver,
 55 while it is cut from the web, and falls over backward upon, and is received upon the receiver. In order to direct the sheet of paper between the receiver and holder, while it is passing from the drawing rollers I apply an
 60 inclined board T', to the holder, which I extend upward therefrom, as seen in the drawings. The lower edge of the sheet will strike

against it and be directed by it in the manner required. The position of the stationary receiver should be such that its front edge, 65 should be at a distance from the sheet of paper, when it hangs vertically about equal to the thickness of the pack or pile of sheets to be laid on the receiver.

From the above it will be seen that my receiver may be used without a holding board or bar M, in which case it must be arranged and made movable with respect to the shears as above described. The said receiver may also be used with a holding board or 75 bar and be arranged and made stationary or movable in such case as specified.

I am aware that an attempt has been made to evade my invention by using a series of rotating and gravitating receivers. Although I lay no claim to the invention of such a revolving and gravitating series, so far as it does not or may not embrace my improvement yet I do consider the use of a single receiver made movable in such manner 85 as to catch and receive, and hold the sheet of paper previous to and after its separation from the web, by the shears, as my invention. In other words I consider the said rotating series of gravitating receivers to embody my discovery. 90

I sometimes make use of a rod or receiver properly arranged under the shears to receive the sheet of paper, and I throw the sheet over the same by means of the impetus 95 of the revolving blade of the shears or some equivalent thereto made to operate against the said sheet or upper part thereof, immediately after its separation from the web by the shears. 100

I do not confine my invention to the precise form or forms of any of its above represented elementary parts, but I vary the same in such manner as circumstances may require. 105

What I claim therefore as my invention is—

1. The employment or combination of the receiver L, with the shears or apparatus for delivering the sheets, substantially as above 110 specified.

2. And I also claim the combination of the holding board or bar M, with the receiver L and apparatus for cutting off or delivering the sheets of paper, to operate there- 115 with substantially in manner and for the purpose as herein before explained.

In testimony whereof I have hereto set my signature this first day of October, A. D. 1847.

ZENAS MARSHAL CRANE.

Witnesses:

G. D. WESTON,
SEYMOUR CRANE.