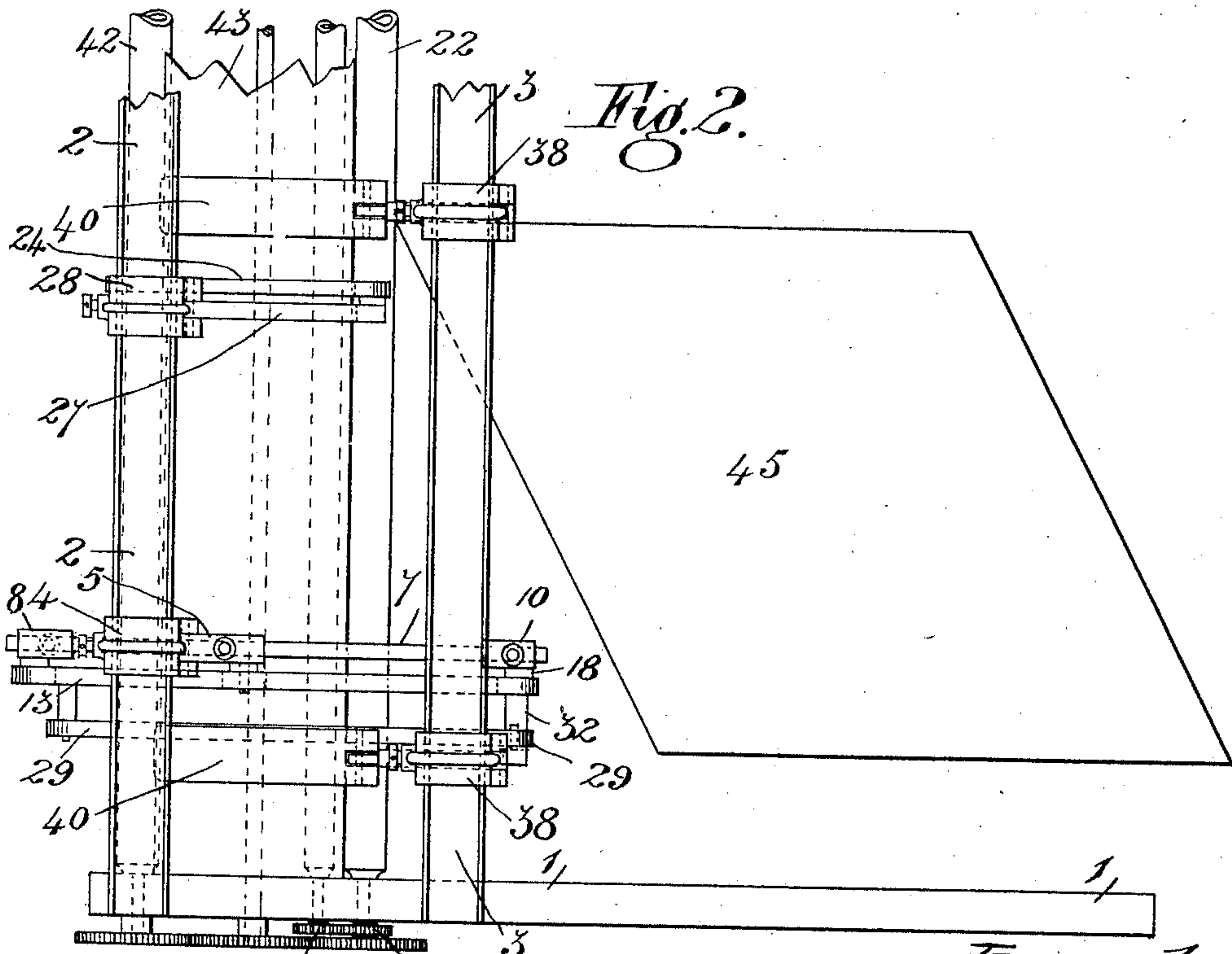
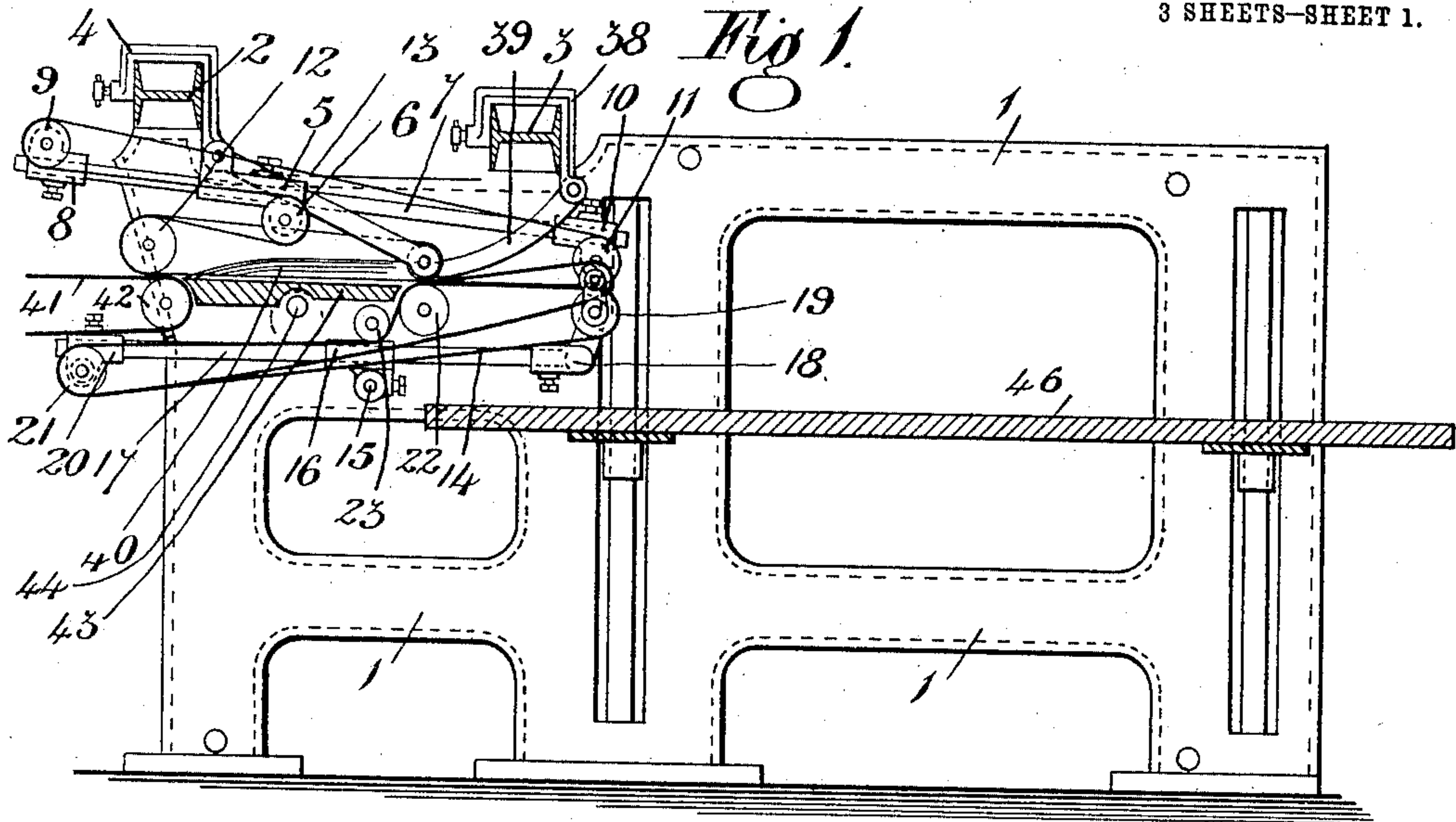


A. COLLIS.  
SHEET DELIVERING MECHANISM.  
APPLICATION FILED JAN. 28, 1910.

997,041.

Patented July 4, 1911.

3 SHEETS—SHEET 1.

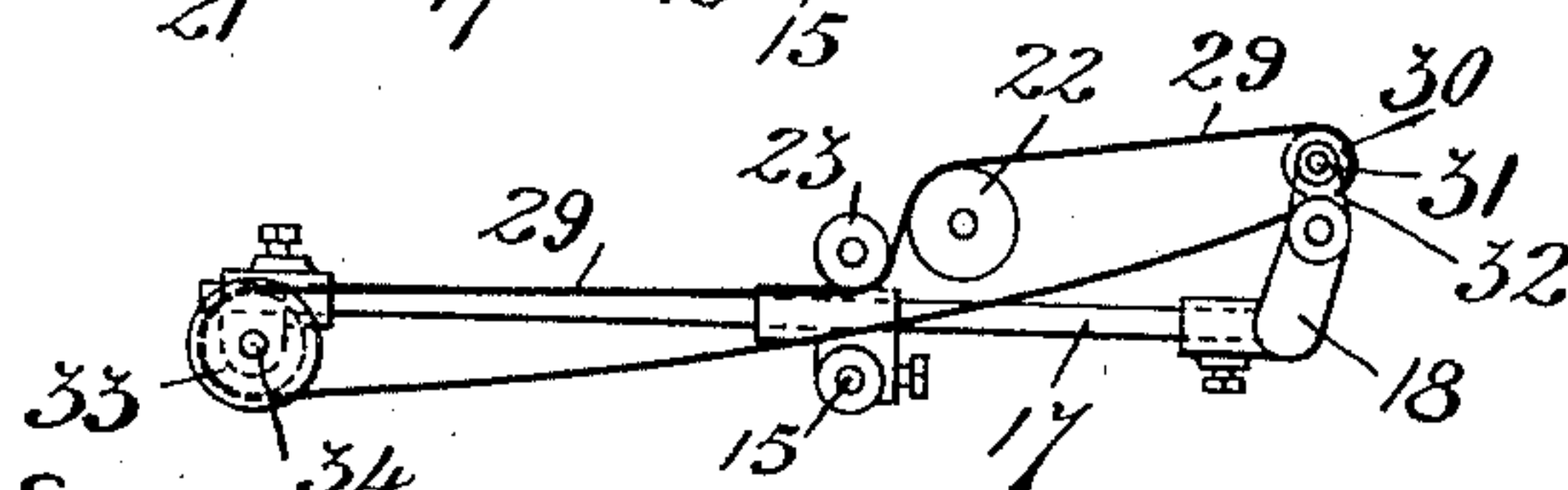
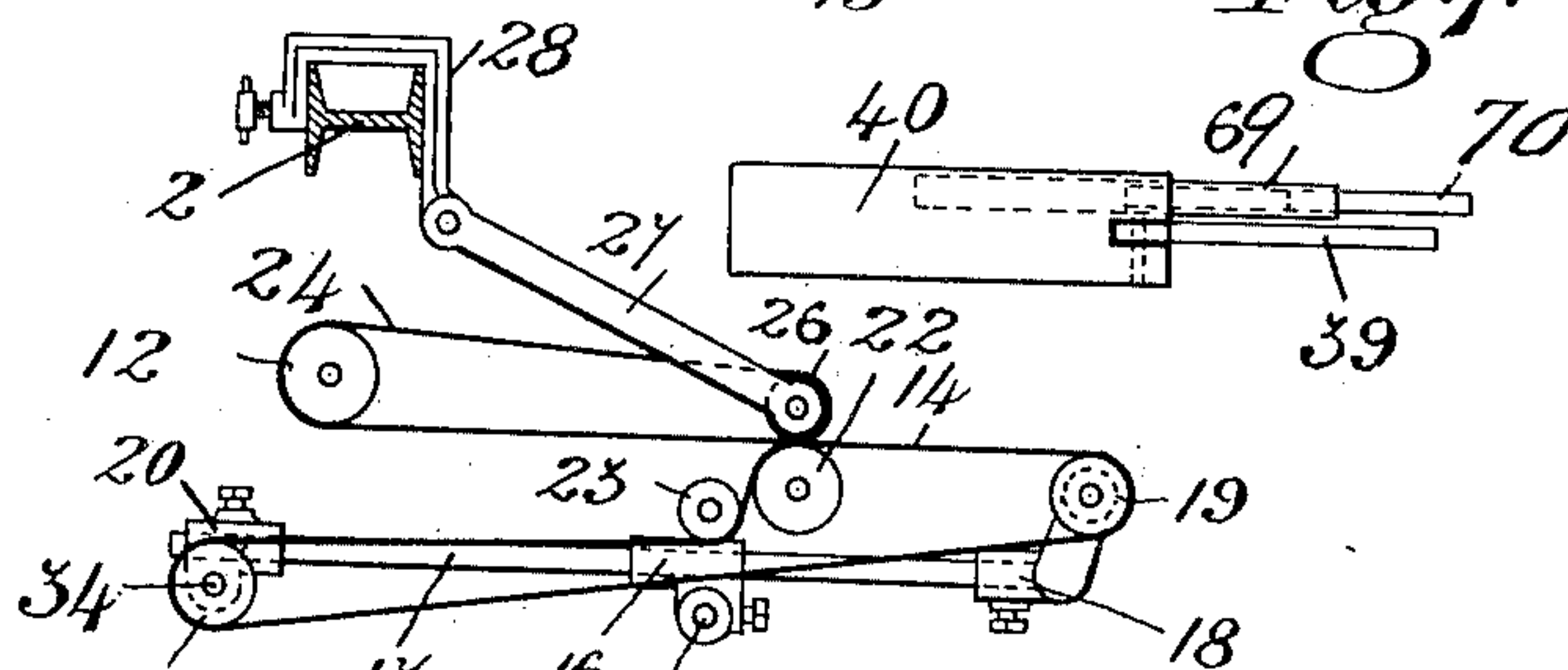
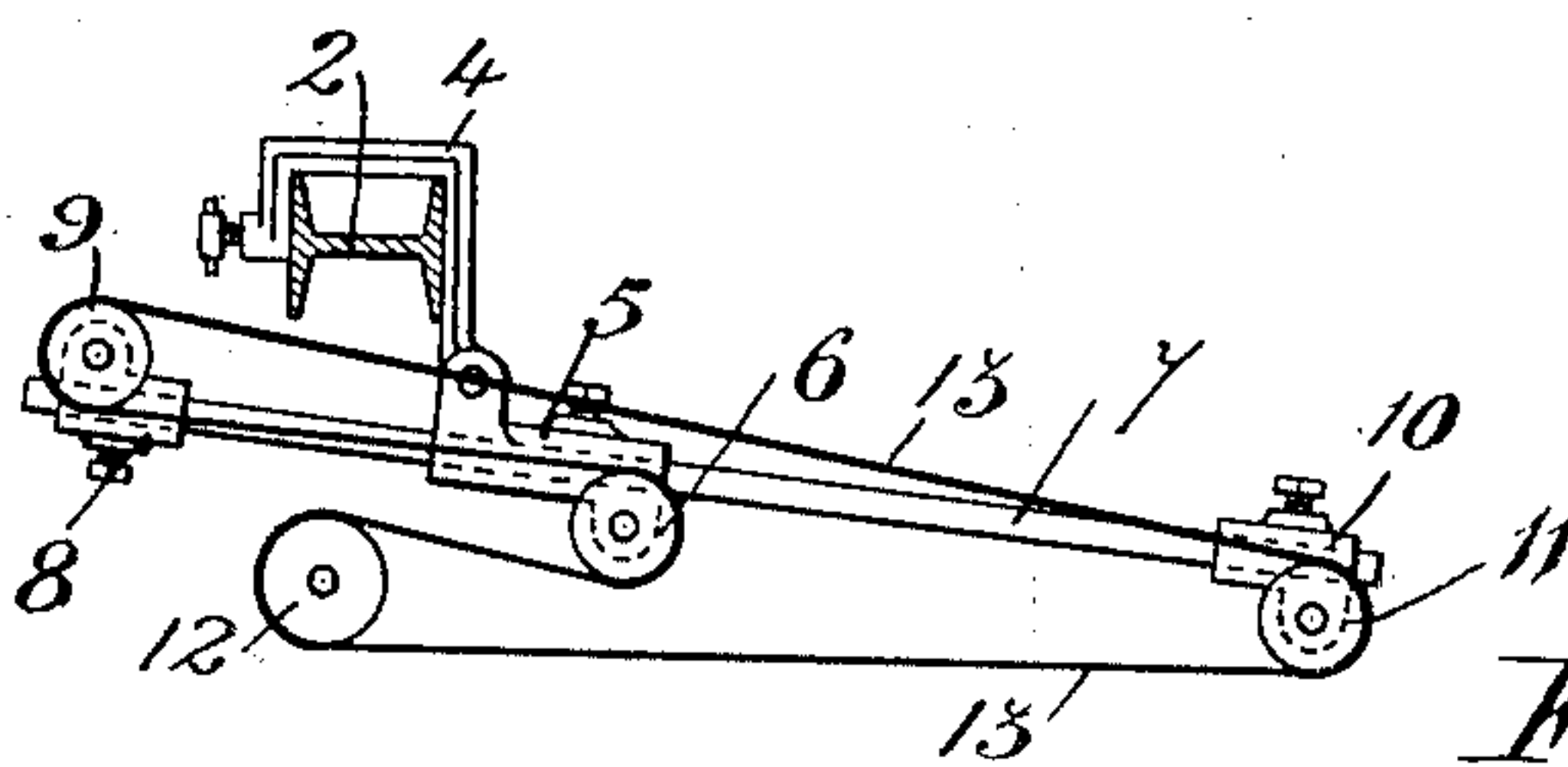


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997,041.

3 SHEETS--SHEET 2.



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3 SHEETS—SHEET 3.

Fig. 8.

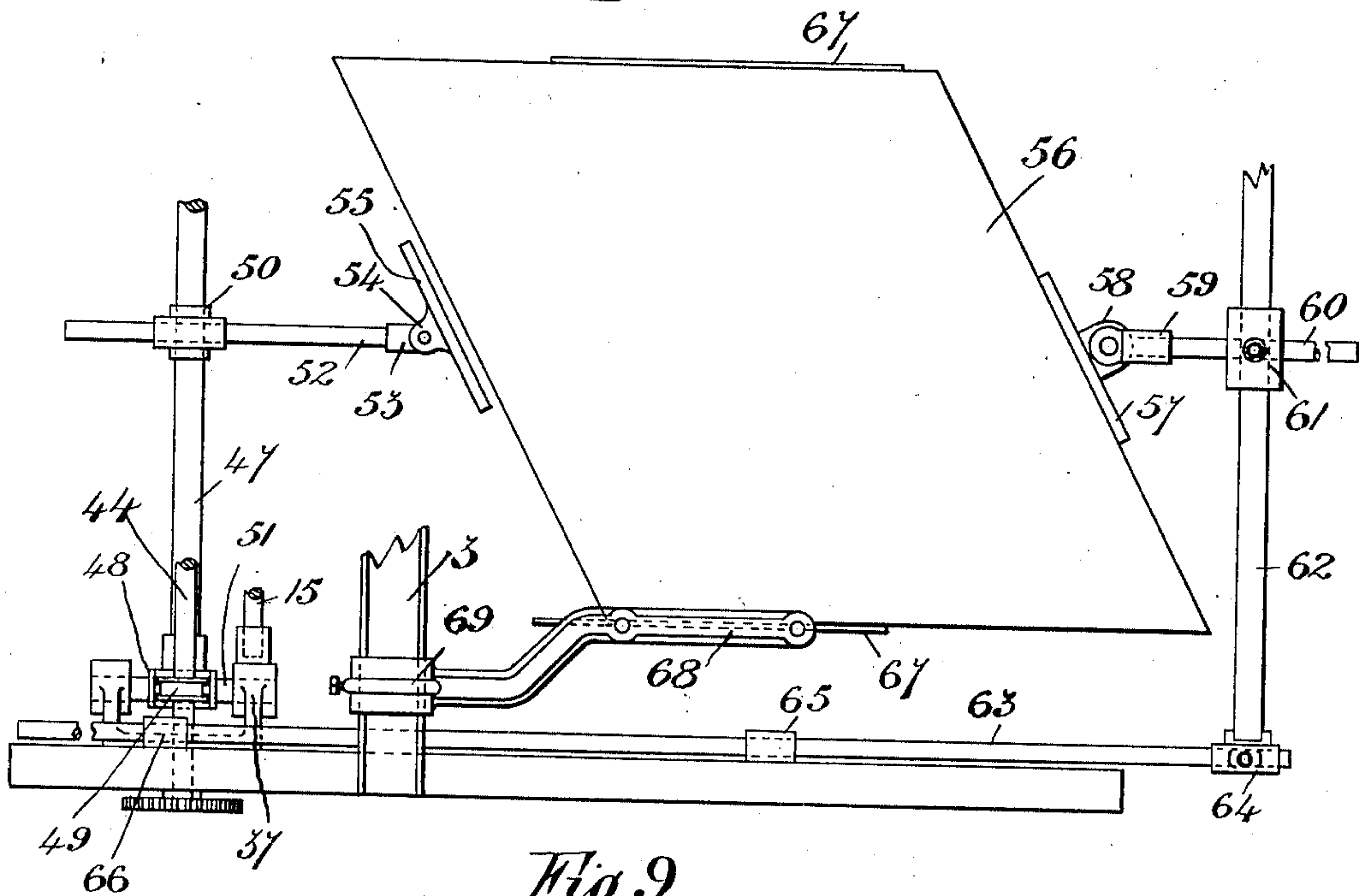
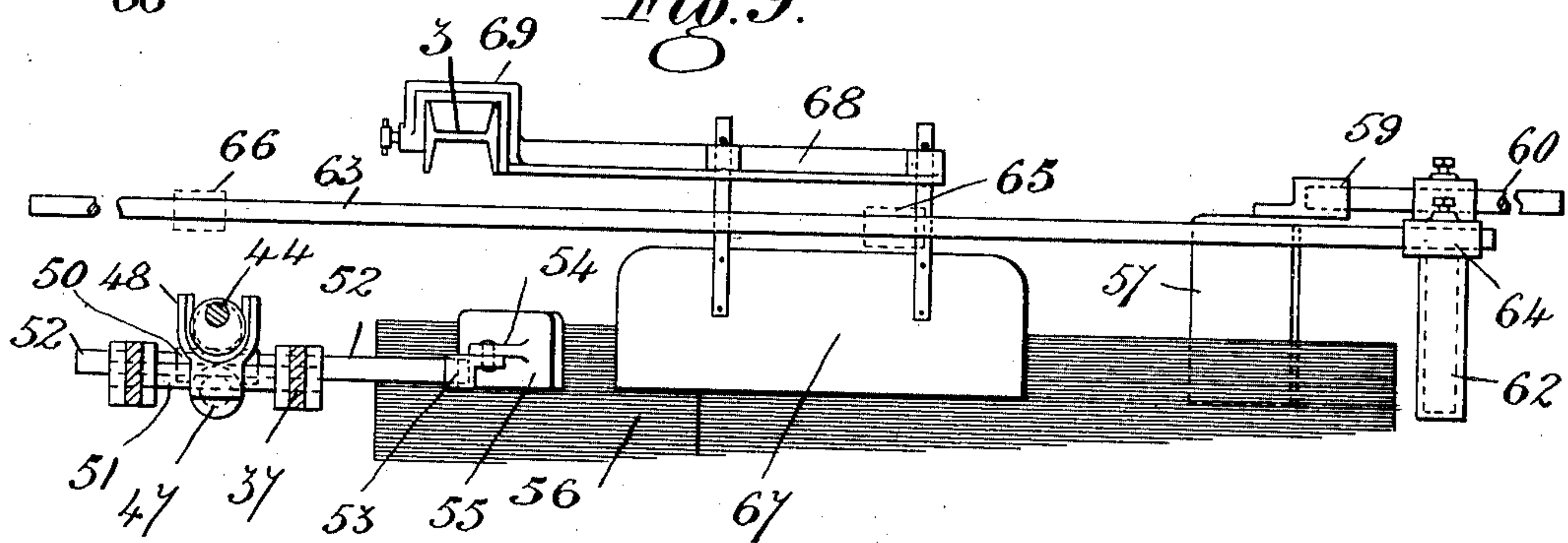


Fig. 9.



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# UNITED STATES PATENT OFFICE.

ALFRED COLLIS, OF LONDON, ENGLAND.

SHEET-DELIVERING MECHANISM.

997,041.

Specification of Letters Patent.

Patented July 4, 1911.

Application filed January 28, 1910. Serial No. 540,663.

*To all whom it may concern:*

Be it known that I, ALFRED COLLIS, a subject of the King of Great Britain, residing at London, England, have invented certain new and useful Improvements in Sheet-Delivering Mechanism, of which the following is a specification.

This invention relates to mechanism and system of tapes employed for controlling, laying, and delivering lozenge or other shaped sheets of paper on to tables, trucks, or other receiving receptacles.

Reels of paper are usually slit longitudinally into various widths and lateral cuts likewise made so that the webs of paper are cut into sheets, and for this purpose a cutting machine, or what is termed a clamp cutter, is employed which cuts the sheets by means of either a reciprocating or a revolving blade, the latter type of blade being mostly employed in the United States. One or more reels of paper are placed into the reel frames attached to the cutter, and the paper is then drawn through measuring and nip rolls, over the dead knife where a lateral cut is made by the revolving or other knife. Prior to reaching the dead knife, the web of paper may be slit longitudinally so that a number of sheets are cut in width if required. These sheets after being cut fall on to a felt or tapes and are carried to a table where they are caught or piled up. In the case where lozenge or other shape sheets are required to be cut, the knives can be brought around on a quadrant and set to any degree that is required for the sheets to be cut.

My invention more particularly applies to the laying of these lozenge-shaped sheets, and it comprehends the production of devices for enabling them to be laid in a pile with all the edges true, but it is also applicable for use in connection with square cut sheets.

In the annexed drawings—Figure 1 is a side elevation of my apparatus with one side frame removed. Fig. 2 is a plan view showing part of the mechanism and tapes used on each sheet or set of sheets in width. Fig. 3 is a front elevation of same, a part of the machine being broken away. Fig. 4 is a side elevation of the upper endless tape and mechanism for carrying same. Fig. 5 is a side elevation of the under tape and

mechanism for carrying same, and Fig. 6 is a side elevation of the tape employed for supporting the edge of the sheet or sheets. Fig. 7 is a plan view of the bender showing the telescopic extension. Fig. 8 is a plan view showing the mechanism for “knocking up” the sheets true. Fig. 9 is a side elevation of same, with part of the framework removed in order to more clearly show the means employed for giving a reciprocating motion for knocking up the sheets.

1 is the side frame of the laying machine, across which are placed the supports 2 and 3 and upon the support 2 are sliding brackets 4 to each of which is swiveled or pivoted a bracket sleeve 5 carrying a tape guide wheel 6, through which sleeve passes the sliding spindle 7 which is fixed at any desired position by a set screw as shown. The sliding spindle 7 carries an adjustable bracket 8 with tape guide wheel 9. On the opposite end of the spindle 7 is an adjustable bracket 10 carrying a tape guide wheel 11.

12 is a roller running across the machine.

The foregoing mechanism of sliding spindle, brackets, and tape guide wheels constitute the gear for carrying the upper endless tape 13 which follows the course more clearly shown in the detail Fig. 4.

The mechanism of the under tape 14 more particularly shown in Fig. 5 consists of the transverse shaft 15 on which is mounted the bracket 16 and its sliding sleeve which receives and carries the spindle 17, said spindle having at one end the adjustable end piece 18 carrying the tape guide wheel 19, and at the other end, the adjustable bracket 20 and its tape wheel 21. 22 and 23 are the delivery roller, and a tape guide roller respectively. The course of the under tape 14 may be clearly followed by reference to the detail Fig. 5, which also shows an endless tape 24 running around the transverse tape roller 12 and a tape guide wheel 26 carried by lever 27 connected to sliding bracket 28 on the cross support 2.

The bending tape 29 employed for supporting the edge of the sheet or sheets, is more clearly shown in Fig. 6; it is carried at one end by tape wheel 30 mounted on a pin or axle 31 carried by an extension 32 of the adjustable end piece 18 and at the other end by a flanged wheel 33 mounted on



pin or axle 34. This tape 29 like the tape 14 also passes between the delivery roller 22 and the tape guide roller 23.

35 and 36 are gear wheels, and 37 is a reciprocating spindle bracket.

Upon the cross support 3 are sliding brackets 38, 38, carrying rods or irons 39, 39, which support and adjust the bending boards 40, 40, that are pivotally connected to the lower ends of said rods.

41 is the traveling felt, 42 the felt roller, 43 is the board.

44 is a transverse shaft carrying an eccentric 49, 45 represents a sheet of paper which has been cut at an angle and delivered by the laying machine onto the table 46.

47 is the reciprocating shaft, 48 is an eccentric fork acted upon by the eccentric 49 on shaft 44; 50 is a boss on reciprocating shaft 47; 51 is a guide spindle for fork 48 and 52 is a reciprocating rod or spindle fitted with an end piece 53 carrying a swinging angle bracket 54 to which is attached the "knocking up" board 55.

56 represents a pile of sheets of paper which have been delivered by the laying machine; 57 is the back stop board attached to the bracket 58 on the end piece 59 of the spindle 60 which fits slidably in the back board bracket 61 on the back board 62. 63 is an extension bar (of which there are two) carrying bracket 64 for holding the back board.

65 and 66 are slide brackets for the extension bars.

67 is a side gage (of which there are two, one at each side of the sheets 56) the side gages being carried by arms 68 on sliding brackets 69 mounted on the cross support 3.

The construction and working of the mechanism is as follows:—The sheets after being cut by the cutting knife of the cutter, travel along felt 41 and between the boards 40 which bend the edges of the sheets as clearly shown in Fig. 3. In their travel over the boards 43 they pass under tape 24, this tape going around tape roller 12 and wheel 26 which is carried on the end of the lever 27 on the sliding bracket 28. The tape exerts a pull on the sheet and, being driven by the tape roller 12, carries the sheet along and delivers it against the back paper stop 57.

The foregoing describes the arrangement used on the far side of the sheet as shown in Fig. 2. On the near side of the sheet where the edge is farther away from the roller the sheet passes along over the board 43 in the same way, but passes in between the upper tape 13 and the under tape 14, but as soon as the leading edge of the sheet passes the delivery roller 22 it will need some support to bend the edge up to stiffen it; this edge is supported by the tape 29, the upper side of which is higher than the under tape 14.

This is more clearly shown in Fig. 1. Tape 29 can be raised at the delivery point by adjustment of the extension 32 for the purpose of bending the sheet at its edges more or less as required, and the bending boards 40, 40, may also be adjusted vertically by raising or lowering the rods 39 to which they are pivoted.

It will be seen by the foregoing explanation that the sheet is controlled at each side from the point of entry, to the tapes, until it is delivered on to the receiving appliance. As soon as the sheet is delivered it is knocked up against the back paper stop 57 by means of the knocking up board 55 which knocks up the edges, with the result that the whole of the pile is knocked up true.

For the purpose of guiding the sheets sidewise, any form of guide may be used and set at the width of the sheet being delivered. The knocking up board 55 receives a reciprocating motion, being attached to the end of the reciprocating spindle 52 which receives its motion by means of the eccentric 49 on the eccentric shaft 44, which shaft is worked by gearing on one end thereof, said eccentric transmitting motion to the eccentric forks 48 attached to the reciprocating spindle 51 in the bracket 37. The knocking up board 55 can be placed either square or at any angle by adjustment of the bracket 54 which is attached to the end piece 53. Further adjustment of said board can also be effected by sliding the spindle through the cross boss 50, which is likewise adjustable laterally on the reciprocating shaft 47, thus enabling the knocking up board to be placed in any position desired according to the width of the sheets. The back paper stop 57 is attached to the bracket 58 which is also made to swivel on end piece 59. This back board stop is also adjustable both in and out and laterally, the spindle 60 passing through the bracket 61, which in turn can be moved laterally along the back board 62. In the back board 62 an iron bar is provided to take the pressure of the screw which holds the bracket 61. The foregoing will be clearly seen by reference to Figs. 8 and 9. To allow for a large range in the size of the sheets, the extension bars 63 are provided which slide through the brackets 65 and 66 carrying at one end the back board holders 64. It will be seen that the extension bars can be slid in when short sheets are being laid and pulled out when laying long sheets. The sheets after passing through the tapes are led to any receiving appliance such as the table 46.

In Fig. 4 it will be seen that tape 13 passes around tape roller 12, wheel 11 on bracket 10, wheel 9 on adjustable bracket 8, and wheel 6 on swiveling bracket sleeve 5, the endless tape 13 receiving its drive from



roller 12. Swinging bracket 5 is carried by sliding bracket 4 on joist or support 2 allowing of the tape to be positioned wherever desired. The adjustable bracket 8 is for the purpose of taking up the stretch of the tapes. The spindle 7 may be moved either in or out according to the angle at which the sheets are being cut.

In Fig. 5 the under tape passes over the delivery roller 22 around tape wheel 19 carried by end bracket 18 on the spindle 17 and around wheel 21 and under tape guide roller 23 which is provided for giving the drive to tape 14, roller 23 being driven by the gears 35 and 36; this tape is likewise adjustable in and out by sliding spindle 17 through bracket 16, it can also be moved laterally along the shaft 15. The upper tape carried by the mechanism in the swiveling bracket 5 rests with pressure between the wheels 11 and 19, and in consequence the sheet is under control from the moment it enters the tapes at the roller 12.

In Fig. 6 the tape 29 passes over the delivery roller 22, and the wheel 30, around flanged wheel 33, and under tape guide roller 23. The wheel 30 revolves on pin or axle 31 carried on end bracket 18 shown in plan Fig. 2. The wheel 21 and flanged wheel 33 revolve on pin or axle 34 in adjustable bracket 20. The wheel 30 and flanged wheel 33 around which the tape 29 passes, are adjustable sidewise permitting of the sheets being curved more or less on the edges as required, as in laying sheets of paper a thick sheet does not require to be curved at its edges so much as a thin sheet, as naturally the thicker sheet is stronger, and in consequence a less curve will be required to stiffen it in its delivery.

A telescopic extension may be added to the bender board 40 as shown in Fig. 7 for supporting the outer edge of the sheet while it is being delivered, and consists of two hollow tubes 69 and 70 which will telescope into the creaser 40. This telescopic extension may be extended to any distance within its range which would be according to the angle being cut, and so that it supports the edges of the sheet until its actual delivery. In the place of the telescopic extension constituted by tubes 69 and 70, I may have pieces of wood or other suitable material of varying lengths to suit the angle being laid, these pieces being detachable from the end of the bender.

I employ one set of apparatus as described for each sheet laid in width and it matters not whether there is one or any number of sheets in width, as only additional apparatus is required.

As regards the thickness, this apparatus operates equally well with one or a number of sheets and it is customary to lay several sheets in thickness at the one time. The

apparatus can be drawn in so that the tape wheel 11 will lie above the delivery roller 22 in which case it can be used for laying square sheets, and the upper and under tapes 13 and 14 will not be required. The end bracket and spindle 17 can be pushed back when square sheets are being laid.

If the sheets are very wide I may use more than one knocking up board 57.

It is not essential that the spindles 17, 7, 52 and 60 be adjustable, although they are preferably so, but they can be used as fixed spindles; more especially would this be the case where the sheets are always cut at the same angle. Even apart from this, for varying angles different length rods could be employed.

I do not limit myself to the use of tapes, as I may use their equivalents in lieu thereof.

The bender 40 which is used on that side of the angle sheet which has its end at the nearest point to the delivery roller when delivered, and in consequence does not want supporting beyond the delivery roller, is not provided with an extension or tapes.

The bracket 61 with its attachment can be taken off of the back board 62 when it is required to lay square sheets; the sheets will then be laid up against this back board which of course will be adjustable to the length of sheet being laid. The knocking up board will be adjusted parallel with the delivery roller when square sheets are being laid and brought back against delivery roller when at its innermost position.

What I do claim as my invention, and desire to secure by Letters Patent is:—

1. Sheet delivering mechanism comprising, in combination, extensible and adjustable bending devices consisting of a system of tapes for controlling the feed of the sheets, said tapes being adjustable and extensible to different positions, to enable them to lay either square or lozenge-shaped sheets; guide wheels around which said tapes travel; brackets carrying said guide wheels; an adjustable back board; and adjustable means for leveling the sheets and for pushing the same against said back board.

2. In a sheet delivering mechanism, the combination, with a lower endless tape, an upper endless tape resting thereupon, rollers around which said tapes pass, brackets carrying said rollers, and adjustable spindles on which said brackets are mounted; of an endless tape for supporting and bending one edge of the sheet, guide wheels around which said tape passes, brackets carrying said guide wheels, and spindles on which said last-named brackets are mounted, said spindles being adjustable both endwise and laterally without varying the length of said last-named tape.

3. In a mechanism for delivering lozenge-



shaped sheets, the combination, with a series of delivering devices; of a vertically adjustable member for bending up one edge of the sheet during its delivery movement, said member being provided with a telescopic extension variable to the angle at which the sheets are cut, for supporting said edge.

4. In a mechanism for delivering lozenge-shaped sheets, the combination, with upper and lower endless delivering tapes between which one side of the sheet passes; of an endless tape located adjacent the first-named tapes for acting directly on the edge of said side, to bend the same, and for supporting said edge, the last-named tape having the delivery end thereof adjustable vertically relative to the corresponding ends of said first-named tapes, to raise the sheet at its delivery point.

5. In a mechanism for delivering lozenge-shaped sheets, the combination, with a board, and an elevated support extending thereover; of means for delivering the sheets across said board; a pair of spaced brackets mounted on said support; a depending rod pivoted to each bracket; and a pair of members for bending the edges of the sheets during their delivery movement, said members being pivoted to the lower ends of said rods for movement in a vertical plane when the rods are raised and lowered.

6. In a mechanism for delivering lozenge-shaped sheets, the combination, with a board, and means for delivering the sheets thereacross; of a pair of spaced members disposed above said board for bending up the adjacent edges of the sheets; and an endless tape disposed beneath said board and having its forward portion projecting upwardly beyond the front edge of the same in alignment with the adjacent bender member.

7. In a mechanism for delivering lozenge-shaped sheets, the combination, with a board and means for delivering the sheets thereacross; of a pair of spaced members disposed above said board for bending up the adjacent edges of the sheets; an endless tape disposed beneath said board and having its forward portion projecting upwardly beyond the front edge of the same in alignment with the adjacent bender member; and means for raising and lowering said projecting portion.

8. In a mechanism for delivering lozenge-shaped sheets, the combination of a board; a pair of spaced endless delivering tapes arranged thereabove; a pair of members located adjacent said tapes for bending the corresponding edges of the sheets; and a pair of juxtaposed endless tapes disposed beneath said table for cooperation with one of the first-named tapes, one of the second-

named tapes having its forward portion vertically adjustable.

9. In a sheet delivering mechanism, the combination of upper and lower tapes; a tape for bending one edge of the sheets; and individual supports for said tapes, said supports being separately adjustable both laterally and longitudinally to different positions, to enable said tapes to deliver either square or lozenge-shaped sheets.

10. In a mechanism of the character described, the combination, with a receiving table for lozenge-shaped sheets, and with means for delivering the sheets thereto; of a back board located at one end of the table; a spindle carried by said board; a shaft located at the opposite end of said table; a spindle carried by said shaft; stops pivoted to the confronting ends of said spindles for swinging movement about vertical axes to conform to the inclination of the adjacent edges of the pile of sheets; and means for reciprocating said shaft.

11. In a mechanism of the character described, the combination, with a receiving table for lozenge-shaped sheets, and with means for delivering the sheets thereto; of a back board located at one end of the table; a bracket slidable longitudinally upon said board; a shaft located at the opposite end of the table; a bracket slidable longitudinally upon said shaft; a spindle carried by each bracket for movement laterally with the same; stops pivoted to the confronting ends of said spindles for swinging movement about vertical axes to conform to the inclination of the adjacent edges of the pile of sheets; and means for reciprocating said shaft.

12. In a mechanism of the character described, the combination, with a receiving table for lozenge-shaped sheets, and with means for delivering the sheets thereto; of a back board located at one end of the table; a laterally and longitudinally adjustable spindle carried by said board; a shaft located at the opposite end of said table; a laterally and longitudinally adjustable spindle carried by said shaft; stops pivoted to the confronting ends of said spindles, for swinging movement about vertical axes to conform to the inclination of the adjacent edges of the pile of sheets; and means for reciprocating said shaft.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

ALFRED COLLIS.

Witnesses:

FREDK. L. RAND,  
H. D. JAMESON.