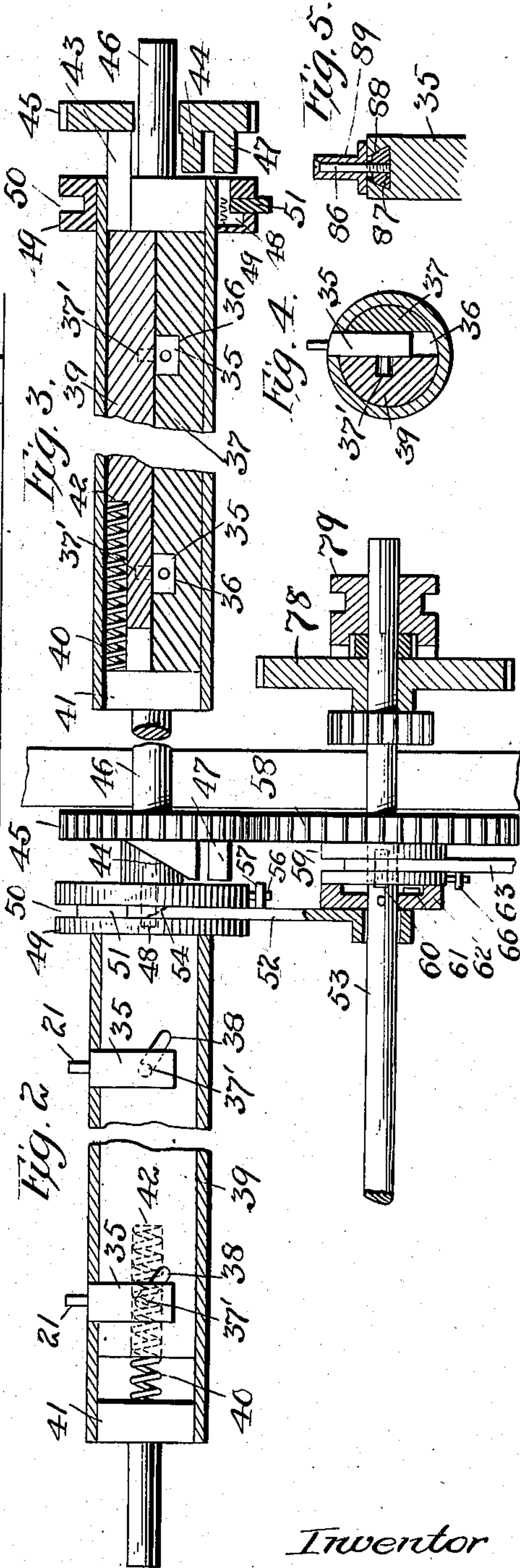
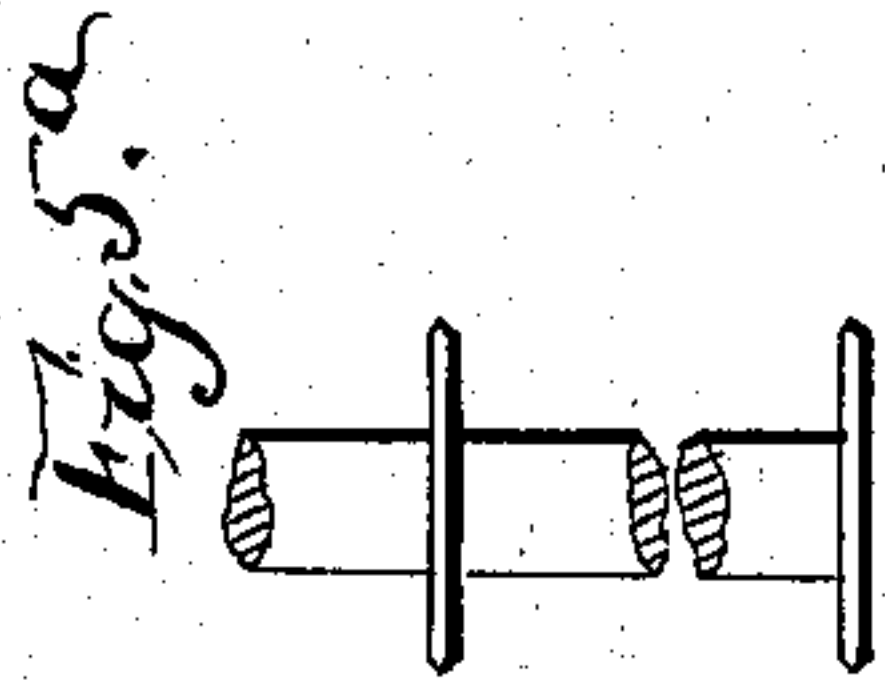
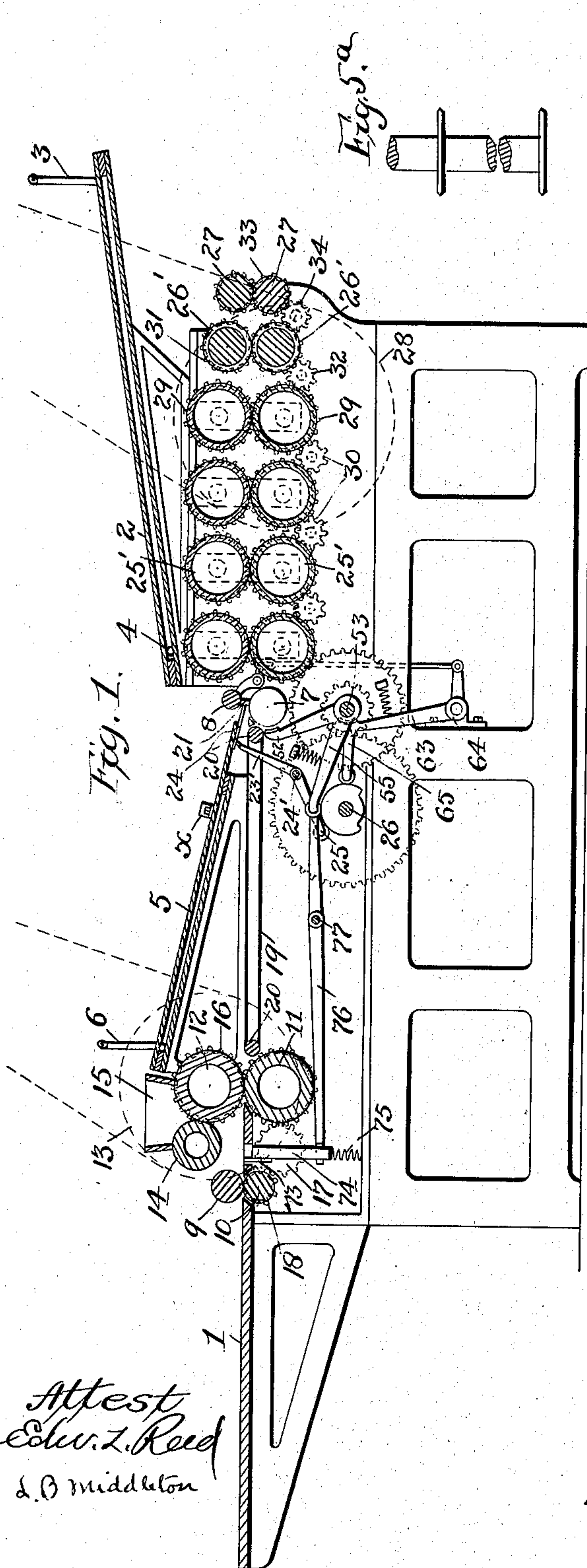


H. C. HUNTER, DEC'D.
A. HUNTER, ADMINISTRATRIX.
COMPOUNDING MACHINE FOR MANUFACTURING PAPER OR PASTEBOARD.
APPLICATION FILED SEPT. 29, 1902.

899,986.

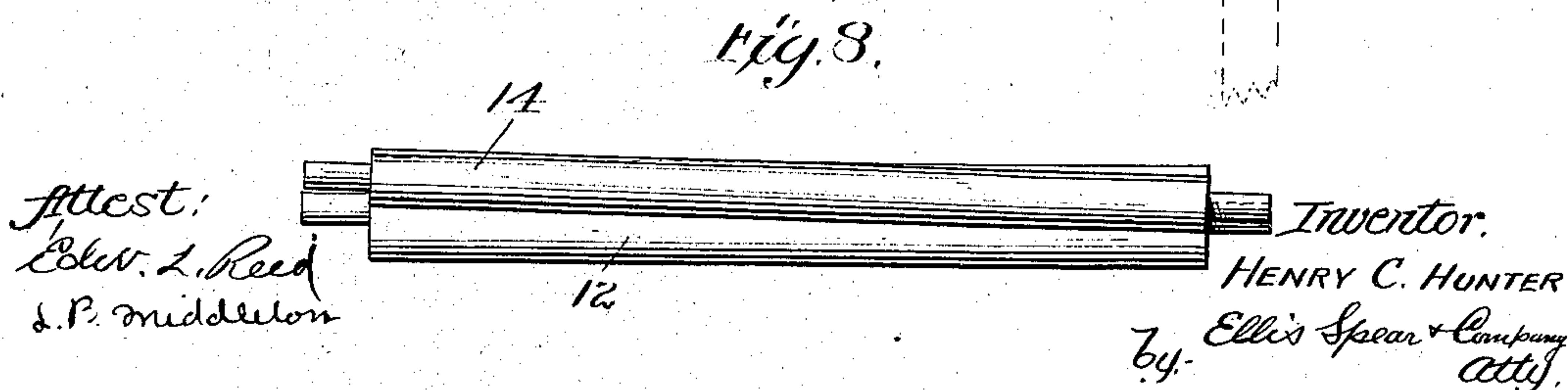
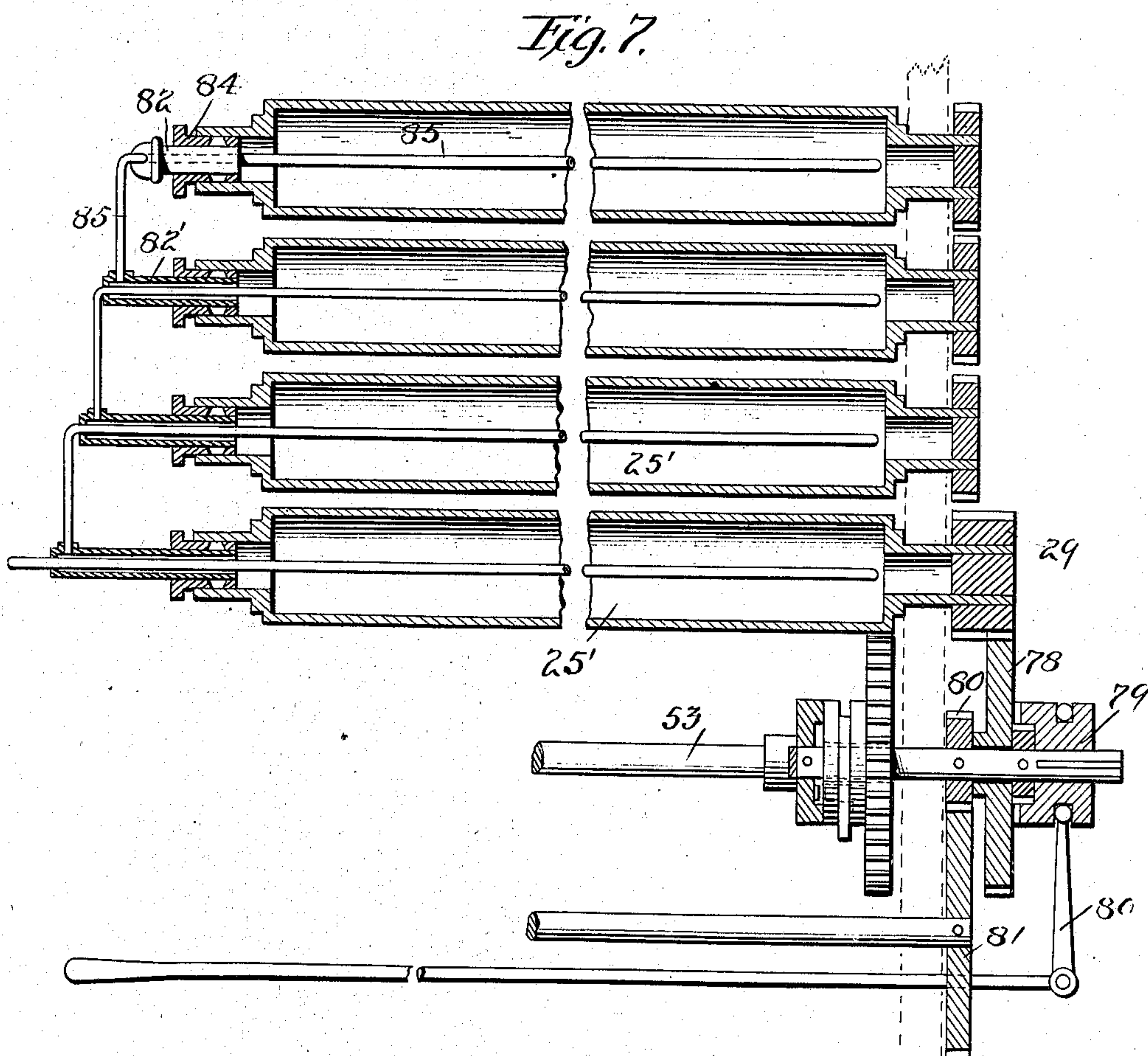
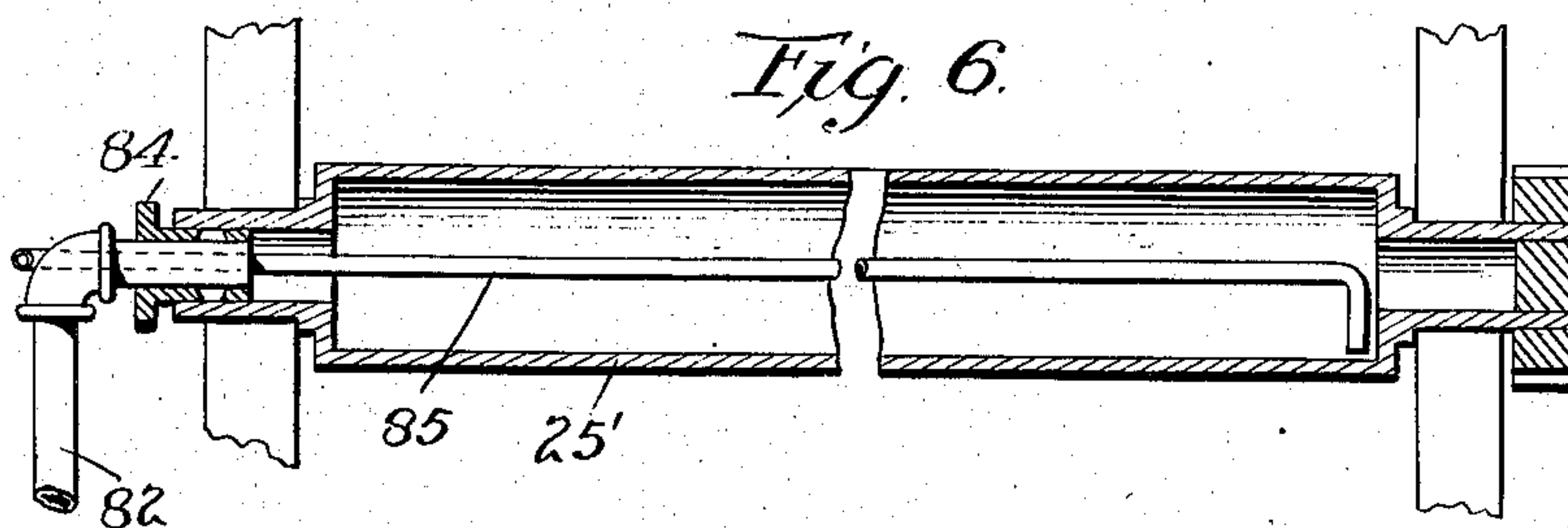
Patented Sept. 29, 1908.

3 SHEETS—SHEET 1.



Attest
Edw. Z. Reed
L. B. Middleton

Inventor
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by Ellis Spear & Company
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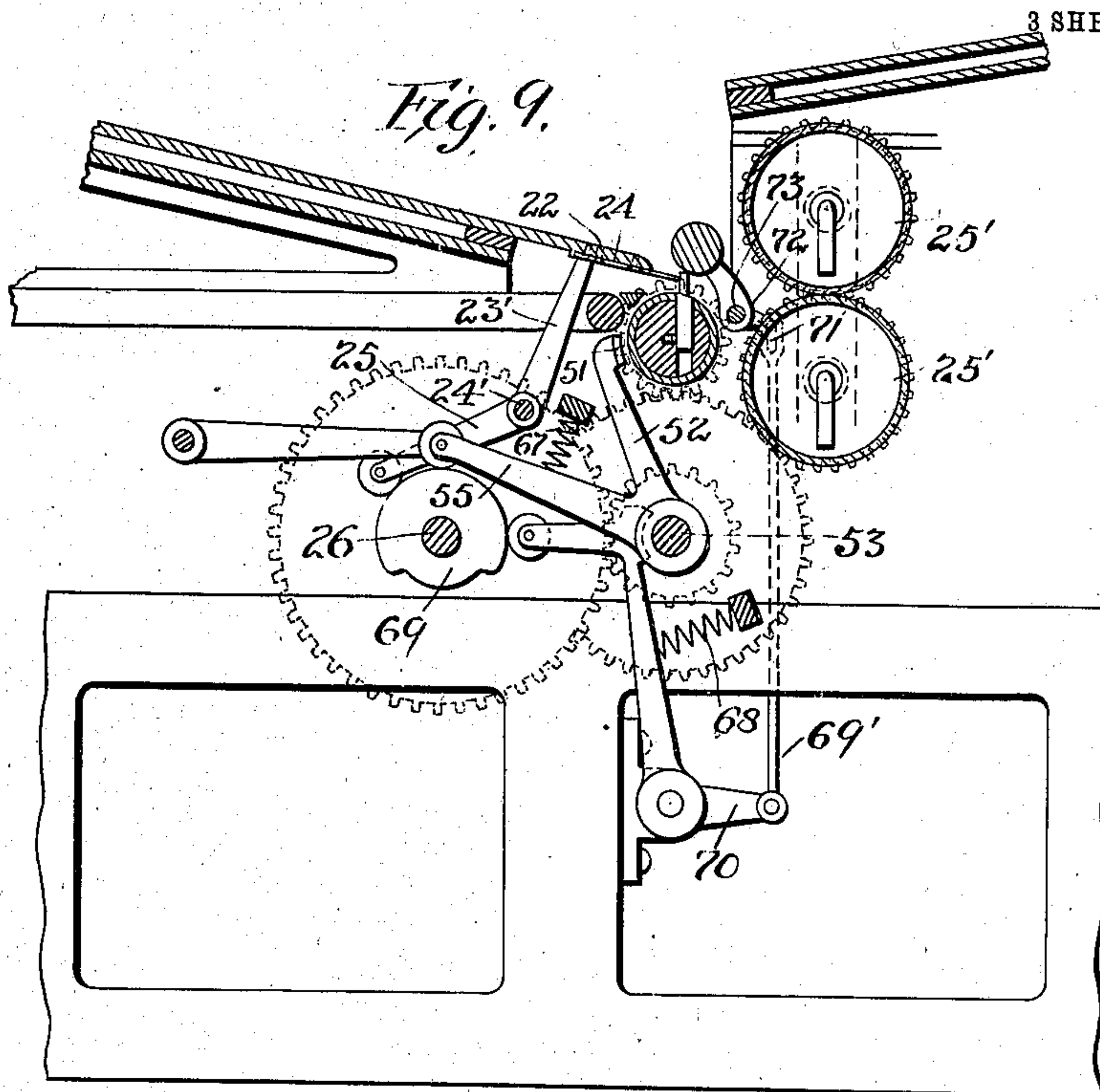
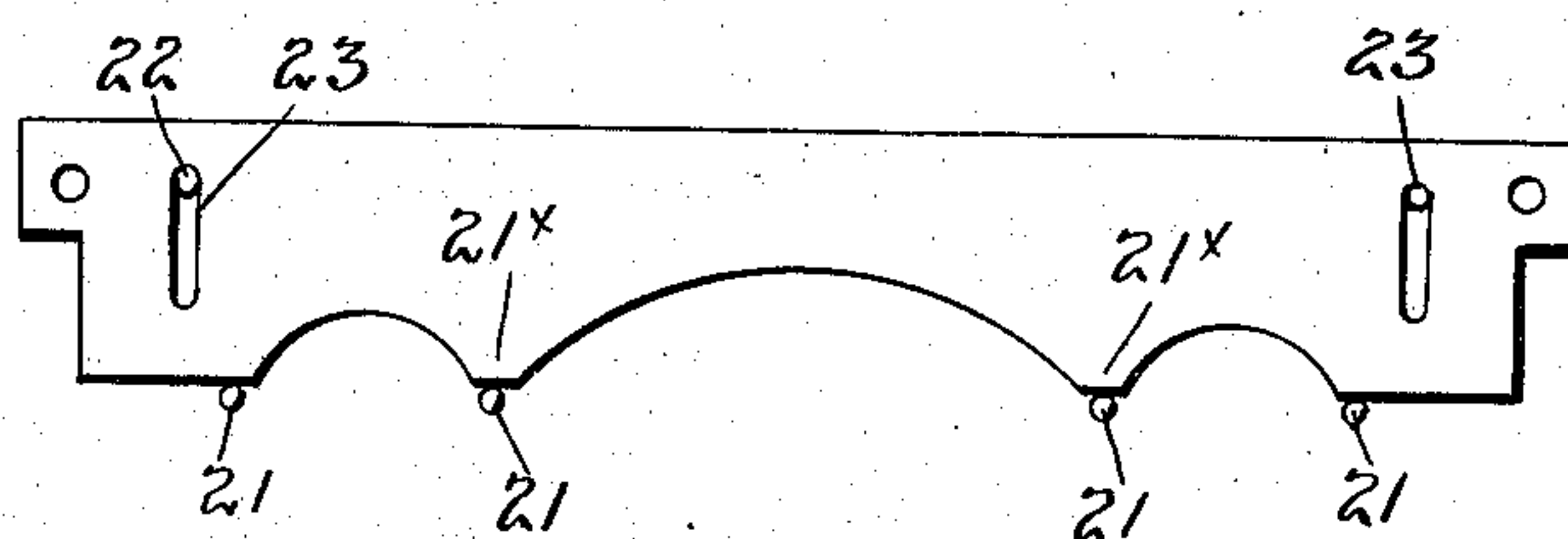


Fig. 10.



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UNITED STATES PATENT OFFICE.

HENRY C. HUNTER, OF JERSEY CITY, NEW JERSEY; AGNES HUNTER ADMINISTRATRIX OF SAID HENRY C. HUNTER, DECEASED.

COMPOUNDING-MACHINE FOR MANUFACTURING PAPER OR PASTEBOARD.

No. 899,986.

Specification of Letters Patent.

Patented Sept. 29, 1908.

Application filed September 29, 1902. Serial No. 125,254.

To all whom it may concern:

Be it known that I, HENRY C. HUNTER, citizen of the United States, residing at Jersey City, Hudson county, New Jersey, have invented certain new and useful Improvements in Compounding-Machines for Manufacturing Paper or Pasteboard, of which the following is a specification.

My invention relates to a compounding machine by which a composite article is produced in the form of a fiber board having an adhesive substance incorporated with the fibrous structure of the board and a label sheet placed upon the face of the board and united therewith by the adhesive material.

By the use of my compounding machine the composite article is formed and cut at one operation, the adhesive material being incorporated with the structure of the board, and the label sheet being immediately applied thereto, so that it will be made to adhere strongly and be dried flat upon said board.

In the accompanying drawings: Figure 1 represents a longitudinal sectional view through the machine. Fig. 2 is a detail view relating to the compounding roller. Fig. 3 is a sectional plan view of the said roller. Fig. 4 is a transverse sectional view of the compounding roller. Fig. 5 is a detail relating to the compounding roller. Fig. 5^a is a detail view of the cutters. Fig. 6 is a detail sectional view of a heated pressure roller for pressing the label and fiber sheets together. Fig. 7 is a sectional plan view of the upper series of pressure rollers and certain driving connections. Fig. 8 is a detail view of the adhesive rollers. Figs. 9 and 10 are detail views.

The machine comprises a feed table 1 upon which the fiber boards are placed. The label sheets which are to be intimately associated with the fiber boards to make the composite article are preferably first placed upon an inclined feed board 2. This table is hollow and is heated by steam introduced through a pipe 3 and escaping through a suitable outlet 4. On this table the label sheets are piled and heated and they are transferred from this storage table, one by one, to an inclined feed table 5 which also may be heated, like the table 2 just mentioned, by steam let in through a pipe 6 and

escaping through a suitable outlet. On these two tables the label sheets are heated and are thus rendered, under certain circumstances, in better condition for the subsequent action of becoming united with the fiber board. The fiber board passes from the feed table 1 beneath the label feed table 5 to a compounding roller 7 where it receives upon its upper surface the edge of the label sheet to be united thereto, both sheets then passing between the compounding roller 7 and its pressure roller 8, by which the label sheet will be applied accurately throughout its whole extent to the fiber board as will be hereinafter referred to.

Previous to arriving at the compounding roller the fiber board first passes through feed rollers 9, 10, and thence between the adhesive applying rollers 11, 12. The upper one of these rollers is driven by a belt wheel 13 thereon and it rotates at the bottom of a fountain 15 so as to take the adhesive therefrom and grind the same into the fibrous structure of the board, so as to intimately incorporate the said adhesive with the fiber and form, as it were, a part of the board itself. In order to aid in this thorough incorporation of the adhesive substance with the fibrous structure of the board, the adhesive is ground before being applied to the board and for this purpose I use a roller 14 having slightly differential speed to that of the roller 12, bearing upon the said fountain roller 12 and forming therewith the bottom of the fountain. This grinding roller is set slightly at an angle to the main roller, as shown in Fig. 8, as I find that the tendency of this roller, being smaller than the main roller, is to spring at its central portion away from the surface of the main roller and with a parallel arrangement of rollers this allows the adhesive to pass through at this point in a greater quantity than at the ends of the roller and also without being thoroughly ground. With the angular arrangement, however, the roll 14 is set tightly against the main roller, which itself is not deflected by the pressure, because of its size, and when the middle portion of the smaller and weaker roller springs away the space between the rollers at this point will be the same as that between the rollers at their ends where the intermediate space results from

the angular arrangement of the roll 14 in respect to the roll 12, and thus a uniform film is delivered. When an adhesive is used which is influenced or is soluble by heat the
 5 applying rollers 11 and 12 are heated similarly to the pressure rollers to keep the adhesive in fluid condition.

When the fusible adhesive is already applied to the underside of the label sheet the
 10 fountain may be disused and the heat of the adhesive rolls 11 and 12 may be utilized to heat the fiber board and render it suitable for receiving the label sheet with its adhesive coating. Roll 14 is driven from roll 12.

15 The lower roll 11 is driven through gearing 16 from the shaft of the upper roll, and the lower feed roll 10 is driven through an idler 17 and gear 18 from lower roll 11.

After passing between the rolls 11 and 12
 20 and receiving the adhesive substance, the fiber board rests upon the endless traveling apron or series of tapes 19 passing around rolls 20 and driven in any suitable manner. This endless apron carries the board towards
 25 the rear of the machine until its leading edge strikes a series of register and stop pins 21 projecting up from the compounding roll 7 and disposed at different points along the same. These stop pins lie normally not only
 30 across the path of the fiber board but also across the plane of the inclined feed table 5 for the label sheets, so that the operator in order to register the label sheet in relation to the fiber board and also in relation to the
 35 cutting devices hereinafter referred to, simply feeds the label sheet against the register pins so that its leading edge will lie directly over the leading edge of the fiber board. In
 40 order to support the said edge of the label board and ready to be pressed thereon, I employ a supporting plate 24 forming an extension of the feed table 5. It has fingers
 45 21^x bearing upon the register pins and it is secured to the under side of the feed plate by screws 22 passing through slots 23 in the extension plate and into the feed plate. This
 50 extension plate is retracted at the proper moment to allow the leading edge of the label sheet to contact with the fiber board, and this retracting movement is effected by
 a lever 23', one at each side of the machine, fixed to a rock shaft 24' suitably journaled in the frame and operated by an arm 25
 55 from a suitable cam on the shaft 26 journaled in the frame. The purpose of this extension plate is to furnish a temporary support for the leading edge of the label sheet while the same is being properly registered
 60 in relation to the leading edge of the fiber board and the cutting devices, and when the board and label sheet have been properly registered against the pins 21 the temporary support 24 is retracted and the label sheet
 65 at its leading edge is free to contact with the

upper surface of the fiber board at the leading edge thereof. At the moment the temporary support is withdrawn the register pins 21 are retracted into the compounding roll 7 and at the same time a pressure roll
 70 8 descends and presses the leading edge of the label sheet upon the fiber board. This action takes place while the compounding roll 7 is stationary, and as soon as the two
 75 sheets at their leading edges are pressed together by the pressure roll 8 the compounding roll 7 begins to rotate and carries the fiber board and the label sheet to the rear, the pressure roll 8 pressing the label sheet
 80 as it comes off the inclined table 5 down upon the fiber board. The compounding roll 7 makes a number of revolutions during the passage over it of the fiber board and during
 this time the register pins 21 remain retracted within the compounding roll as will
 85 be hereinafter described. In rear of the compounding roll, a series of pairs of heated pressure rolls 25' are arranged, between which the composite board passes after leaving the compounding roll, and by these pres-
 90 sure rolls the label sheet is pressed firmly upon and most intimately associated with the fiber board so that the article as it leaves the machine is of a substantially homogeneous
 95 structure, flat and dry, the adhesive material being incorporated with the fibrous structure and the label sheet being closely united to the fibrous structure by the adhesive material.

After leaving the pressure rolls the com-
 100 posite board passes between a pair of cutter rolls 26' which cut the board into a number of strips exactly as registered by the registering pins and side guide α , so that the
 105 printed design may be cut square and true in the same manner that an additional color would be registered thereon, the board being so registered that the cutters will operate be-
 110 tween the designs on the label sheet, so that after leaving the machine the strips will be accurately cut as printed to the proper size for making the can tubes or like articles which carry labels on their outer sides. The
 115 cutter rolls are made up of circular cutting blades mounted upon a roller and are of ordinary form. In rear of the cutter rolls 26' I arrange a pair of delivery rolls 27. The pressure rolls are driven from the
 120 belt wheel 28 on the shaft of one of them and the members of each pair of pressure rolls are connected by gears 29, while idler pinions 30 communicate the motion between the gears of the lower set of pressure rolls. The cutters are connected by gears 31 and
 125 are driven from one of the pressure rolls through an idler 32. The delivery rolls are also geared together, as at 33, and are driven through an idler pinion 34. All the rolls are suitably journaled in the frame of the
 130 machine as well as the idler pinions.

Referring now more particularly to the action of the compounding roll it has been stated that the said roll is at rest while the fiber board and label sheet are being registered in relation to each other. The first action which takes place in connection with this roll is the retraction of its register pins 21, for which purpose the said pins are carried by blocks 35, Figs. 2-4, arranged to move substantially radially of the roll and guided in ways 36, Fig. 3, of a stationary filling piece 37 within the said roll. The blocks have laterally projecting pins 37' entering inclined slots 38 in the slide 39, arranged to move longitudinally of the roll. This slide, as shown in Fig. 4, is of substantially semi-circular form in cross section and is fitted against the filling piece 37. It is normally pressed in one direction to hold the blocks 35 with pins 21 projected from the roll, by means of a spring 40 bearing at one end against a block 41 fixed in one end of the roll and at its other end upon a shoulder 42 formed on the slide 39. The slide has a pin 43, Fig. 3, at its end projecting beyond the end of the roll and in the path of a cam 44 carried by a gear 45, loose on the journal 46 of the compound roll. This gear is rotated at proper intervals and its first action when starting from its position of rest is to bring the cam 44 against the pin 43 of the slide and move the latter so that its incline slots working upon the pins 37' will retract the registering pins 21 within the compounding roll. As soon as this is effected and the leading edge of the label sheet has been pressed upon the fiber board by the descent of the pressure roll 8, as will be hereinafter described, the compounding roll is set in rotation. For this purpose a clutch connection is provided between the gear 45 and the compounding roll, consisting of a projection 47 on the gear and a clutch pin 48, adapted to engage the same and carried by a collar 49 fixed to the compounding roll and having a groove 50 across which the clutch pin 48 extends. This groove 50 is intended to receive a crescent 51 on the end of a lever 52 loosely pivoted upon the main driving shaft 53, as shown in Fig. 2.

The crescent controls the clutch pin 48 and when it is removed from groove 50 the clutch pin 48 will be forced by its spring 49, Fig. 3, into the path of the projection 47 on the gear 45 which is now in rotation and consequently the compounding roll will be rotated in unison with the said gear. This rotation takes place, as before stated, after the registering pins have been retracted and, in order to control this timing of the parts, the crescent carrying arm 52 is controlled by a cam on the shaft 26 from which all automatic motions are derived and thus easily kept in unison, the said cam acting upon a roller

carried upon an arm 55 connected with the crescent arm 52.

After the fiber board and label sheet have passed over the compounding roll, the rotation of the said roll is stopped and the register pins 21 are projected to stop and register the next fiber board and label sheet. For this purpose the crescent carrying arm 52 is moved by its cam to throw the crescent into the groove 50. The crescent has an incline 54, Fig. 2, up which the head of the clutch pin 48 will now ride, thus retracting said pin from engagement with the clutch projection on the rotating gear 45, and as soon as this disengagement takes place a pin 56 on the clutch collar will contact with the pin 57 on the crescent carrying arm and thus the roll will be arrested when its register pins 21 come exactly where wanted. After the compounding roll is at rest the gear wheel 45 continues to rotate long enough to carry the cam 44 away from the pins 43, and this allows the spring 40 to exert itself to move the slide 39 longitudinally and project the registering pin by means of the incline slot and pin connection 38-37 before described. As soon as this has been accomplished the rotation of the gear wheel 45 is stopped for a predetermined length of time sufficient to allow the operator to properly feed and register the label sheet and fiber board. For this purpose the clutch gear 45 is driven from a gear 58 loose on the main drive shaft 53 and carrying a clutch collar 59 similar to that described above, the clutch pin 60 of which coöperates with the clutch projection 61 on a clutch block 62 fixed to the main drive shaft 53. This clutch is controlled by a crescent similar to that described above carried on an arm 63 suitably pivoted on a bracket 64 on the main frame and having an extension carrying a roller engaged by a cam on the cam shaft 26. The gear wheel 58 is arrested accurately in the desired position by means of stop pins 66 similar to those described. By means of this arrangement the gear 45 will be given an intermittent movement, the intervals between its actions being properly determined for the feeding in and registering of the label sheet and fiber board. It will be seen that the said gear wheel 45 is started in rotation earlier, and remains in rotation longer, than the compounding roll, its excess of movement being utilized to move the register pins in and out after the compounding roll has ceased to rotate. The crescent levers are pressed in opposition to their cams by means of springs 67, 68. The cam shown at 69 is representative of any suitable cams on the shaft 26.

The pressure roller 8 is lifted positively by a rod 69' connected to an arm 70, which is in turn connected to and operated by the crescent arm 63, the said rod 69' at its upper

end is slotted as at 71 and receives a pin on the arm 72 which carries the pressure roller, the said arm being fixed on a shaft 73 suitably journaled to rock in a frame.

5 When the crescent arm 63 is moved to stop the rotation of the parts, the pressure roller 8 is lifted, but when the crescent arm is thrown backward to first retract the register pins and then start the parts in rotation, the
10 rod 69' is thrust upwardly and its slotted connection 71 allows the pressure roll 8 to fall by gravity as the register pins are retracted, so that the said pressure roll will follow the downward movement of the pins
15 and will accurately press the leading edge of the label sheet onto the fiber board, this action taking place at just the moment that the register pins free themselves from the label sheet and fiber board. This lifting
20 pressure roll 8 may be driven through suitable gearing, but I prefer to let it remain idle, and I also prefer to control its weight by any suitable means of counter-balancing. As shown in the drawings the normal position of the register pins when projected and
25 at rest is slightly to the right of the vertical axial plane of the compounding roll, the purpose of which is to insure a substantial contact of the pressure roller 8 with the label sheet. In other words, the leading
30 edge of the label sheet is thus made to extend slightly across the vertical axial plane of the compounding roll, so that the pressure roller will make a good contact therewith when
35 it is lowered to a position directly over the axis of the said compounding roll.

In order to control the feeding in of the fiber boards, I provide a stop 73 immediately in rear of the feeding-in rolls 9 and
40 10, carried by a block 74 arranged to move vertically in a suitable guide way in the frame and pressed normally upwardly by a spring 75. The block is connected with a lever 76 pivoted at 77 and having a roller
45 at its rear end acted on by a cam shaft 26. The arrangement is such that, when the register pins 21 are projected and are in the position shown in Fig. 1, the forward stop 73 is down and the fiber board can be
50 fed into the machine, but when the registering pins are retracted and the compounding roll is in action the forward stop 73 will be elevated to prevent the feeding in of a fiber board until the compounding roll has ceased
55 to rotate and its registering pins have been projected to arrest and register the label and board, at which time the forward stop is lowered and the next board can then be fed in, or the exact relation between these stops
60 and the registering pins may be easily adjusted by turning the cam on its shaft so that the board is made to come in at the right time to receive the new label sheet.

The drive shaft 53 is operated through a

gear 78, Fig. 7, meshing with one of the 65 gears 29 on the forward lower pressure roll. This gear 78 is loose on the shaft 53 but may be connected with the same to drive it by means of a clutch 79, Fig. 7, controlled by a lever 80 extending to any convenient point 70 for operation by the attendant.

The cam shaft 26 is driven from the shaft 53 by means of a pinion 80 on the said shaft 53 and a gear 81 on the cam shaft. All of the rolls as well as the apron or tapes 19 are 75 driven at the same surface speed.

The pressure rolls 25' are heated to better unite the label sheet with the fiber board and dry the same and also to assist the union when a fusible adhesive is used, and for these 80 purposes they are formed hollow and into the ends of one of them, as shown in Fig. 7, a steam pipe 82 enters through a stuffing box 84 arranged in the hollow journal of the said roll. From this roll the steam passes out 85 through a pipe 85, the end of which is bent down as shown in Fig. 6, and is located at the far end of the roll from the steam inlet pipe 82. The pipe 85 passes out through the pipe 82 and connects with an inlet pipe 82' 90 of the next adjacent roll, which inlet pipe extends through a stuffing box in the journal of the roll in a manner similar to that described above and through the whole system of rolls it proceeds similarly and is finally 95 discharged through a suitable outlet. In a similar manner the steam may be applied to the adhesive set of rolls to heat them when required or any convenient method of applying heat to all the rolls and tables at will 100 and as the circumstances of the work requires may be used.

In Fig. 5 I show the preferred form of register pins consisting of a screw 86 threaded into a dove-tailed block 87 fitting in a recess 88 in the upper end of the block 35. 105 The screw is surrounded by a clamping sleeve 89, the foot of which rests upon the upper end of the block.

It will be understood that I use the terms 110 label sheet for convenience of description, as it will be understood that the sheets to be united with the fiber board may not always carry a label.

I claim as my invention:

115 1. In combination in a compounding machine for making composite material, an adhesive applying mechanism comprising the roller for grinding the adhesive into the fibrous structure of the board and the roller 120 acting in conjunction with the grinding roller and with a reservoir, said roller serving to grind the paste into a finely divided condition, substantially as described.

125 2. In combination in a compounding machine, an adhesive applying roll and a grinding roll for the adhesive acting in conjunction with the adhesive roll and arranged at

an angle in respect thereto, substantially as described.

3. In combination, the converging tables for the board and label, the adhesive applying means and means at the converging ends of the tables to unite the label with the board, substantially as described.

4. In combination, the converging tables for the fibrous board and label sheets, registering means at the converging ends of said tables and rolls for uniting the label sheet with the fibrous board, substantially as described.

5. In combination in a compounding machine, the rolls between which the boards and labels pass, means for gaging the position of the boards consisting of the register pins, said pins acting alternately to obstruct and clear the passage between the rolls, substantially as described.

6. In combination in a compounding machine, a pair of rollers, one of which is vertically movable to unite the label of the fibrous board, means for periodically, positively and automatically operating the said movable roller vertically, and means for directing the labels and fibrous board thereto, substantially as described.

7. In combination in a compounding machine, a pair of rolls one of which is a pressure roll and is vertically movable, movable means acting therewith as gages or registers for the fiber boards, the said means being depressed simultaneously with the downward movement of the pressure roller, substantially as described.

8. In combination, registering devices for the label sheets and fiber boards, means for directing the said sheets and boards thereto, means for retracting the registering devices and means for pressing the label sheet onto the fiber board, substantially as described.

9. In combination, registering pins for the label sheets and fiber boards, stop means for obstructing the path of the fiber boards and means for controlling the registering means and stop means whereby when the registering pins are advanced across the path of the fiber board the stop means will be retracted, substantially as described.

10. In combination, the means for uniting the labels with the boards, means for directing the boards thereto and the feed table for the labels with the temporary supporting means to hold the projecting ends of the labels over the boards and means for operating the temporary support, substantially as described.

11. In combination, the compounding roll, the vertically movable roller 8, the inclined feed table for the labels and the temporary supporting means for the projecting ends of the labels projecting beyond the feed table

with means for retracting the same, substantially as described.

12. In combination, the compounding roller, the vertically movable pressure roller, the gage pins movable vertically, the feed table for the labels, the temporary support projecting beyond the edge of the feed table and means for retracting said support and pins, the said pressure roller moving down with the pins, substantially as described.

13. In combination in a compounding machine, means for applying adhesive to the fiber boards, a compounding roller, means for rotating the same intermittently, registering means and means for advancing and retracting the same intermittently, the said registering means being advanced when the compounding roll is at rest and means for pressing the label sheet onto the fiber board when these parts have been registered, substantially as described.

14. In combination in a compounding machine, a compounding roll having automatic intermittent rotation, register pins with means for automatically advancing and retracting the same, means for directing the label sheets and fiber boards to said registering means and compounding roll, a temporary support for the leading edges of the labels and means for automatically withdrawing said temporary support, substantially as described.

15. In combination with a compounding roll, registering pins carried thereby and means for automatically advancing and retracting said registering pins, substantially as described.

16. In combination, a compounding roll having registering pins and means for giving the said roll an intermittent movement and for advancing and retracting the said pins consisting of a gear wheel having a clutch connection with the roll and a cam for controlling the operation of the registering pins, substantially as described.

17. In combination with a compounding roller, registering pins carried thereby and means for advancing and retracting the same comprising a slide movable longitudinally of the roller and means for operating the same, substantially as described.

18. In combination, a compounding roller, registering pins carried thereby, a gear wheel having a clutch connection with the said roll to rotate the same intermittently and having means for controlling the position of the registering pins and means for driving the said gear intermittently, substantially as described.

19. In combination in a compounding machine, means for applying adhesive to a fiber board, means for registering the label sheets with the fiber board and for applying the

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same thereto and cutting means, substantially as described.

20. In combination, adhesive applying means, registering means for registering the fiber board and the label sheet, presser means and cutting means, substantially as described.

21. In combination, cutting means, and means for registering a label sheet with a fiber board and with said cutting means, said cutting means acting to sever the fiber board with the label, substantially as described.

22. In combination, cutting means, registering pins for registering a label sheet with said cutting means and means for applying the sheet so registered to a fiber board, said cutting means serving to sever the fiber board with its registered label sheet, substantially as described.

23. In combination, means for applying adhesive to the fiber board, means for registering the label sheets with the fiber board, means for initially joining the label sheets with the fiber board, pressure applying means and cutting means, substantially as described.

24. In combination, means for uniting a label sheet with a fiber board, and means for heating the said board before it reaches the uniting means, substantially as described.

25. In combination, means for uniting a label sheet with a fiber board and means for heating the said label sheet before it reaches the uniting means, substantially as described.

26. In combination, means for uniting a label sheet with a fiber board and means for heating the fiber board as a preliminary step to the uniting action, substantially as described.

27. In combination, a fountain for ad-

hesive, heated rollers operating in conjunction therewith and between which the fiber board passes and means for uniting a label sheet with the previously heated fiber board, substantially as described.

28. In combination, means for heating a fiber board and means for uniting with said heated fiber board a sheet having a fusible adhesive substance applied thereto, substantially as described.

29. In combination, means for heating a fiber board and means for uniting with said heated fiber board a sheet having a fusible adhesive substance applied thereto and means for further heating and uniting the label sheet and fiber board, substantially as described.

30. In combination in a compounding machine, means for uniting the label sheets with the fiber boards and a plurality of heated tables for the label sheets, substantially as described.

31. In combination in a compounding machine, means for uniting the label sheets with the fiber board, means for directing the fiber boards thereto and a table for the label sheets arranged on each side of the uniting means, substantially as described.

32. In combination, a compounding roller, a table for directing the fiber boards thereto, an inclined feed table for the label sheets, registering means, pressure rolls in rear of the compounding roller and a table extending over said pressure rolls for the label sheets, substantially as described.

In testimony whereof, I affix my signature in presence of two witnesses.

HENRY C. ^{his} X HUNTER.
mark

Witnesses:

HENRY L. REYNOLDS,
ERNEST E. MATHISON.