Aug. 2, 1938. J. A. SINCLAIR 2,125,467

PRINTING PRESS SHEET DELIVERY MECHANISM

Filed May 6, 1936 8 Sheets-Sheet 1

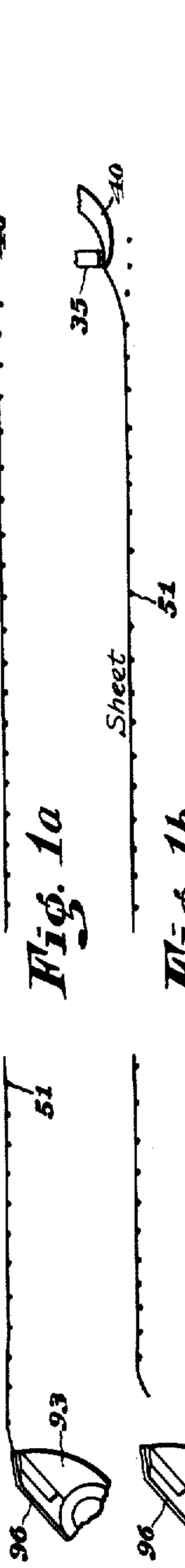

Fig. 1a

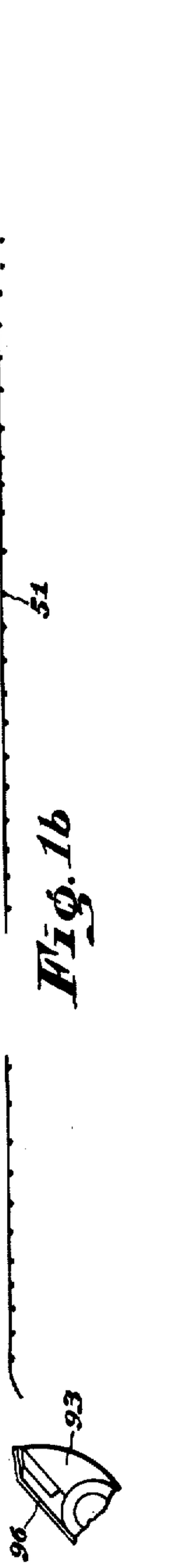

Fig. 1b

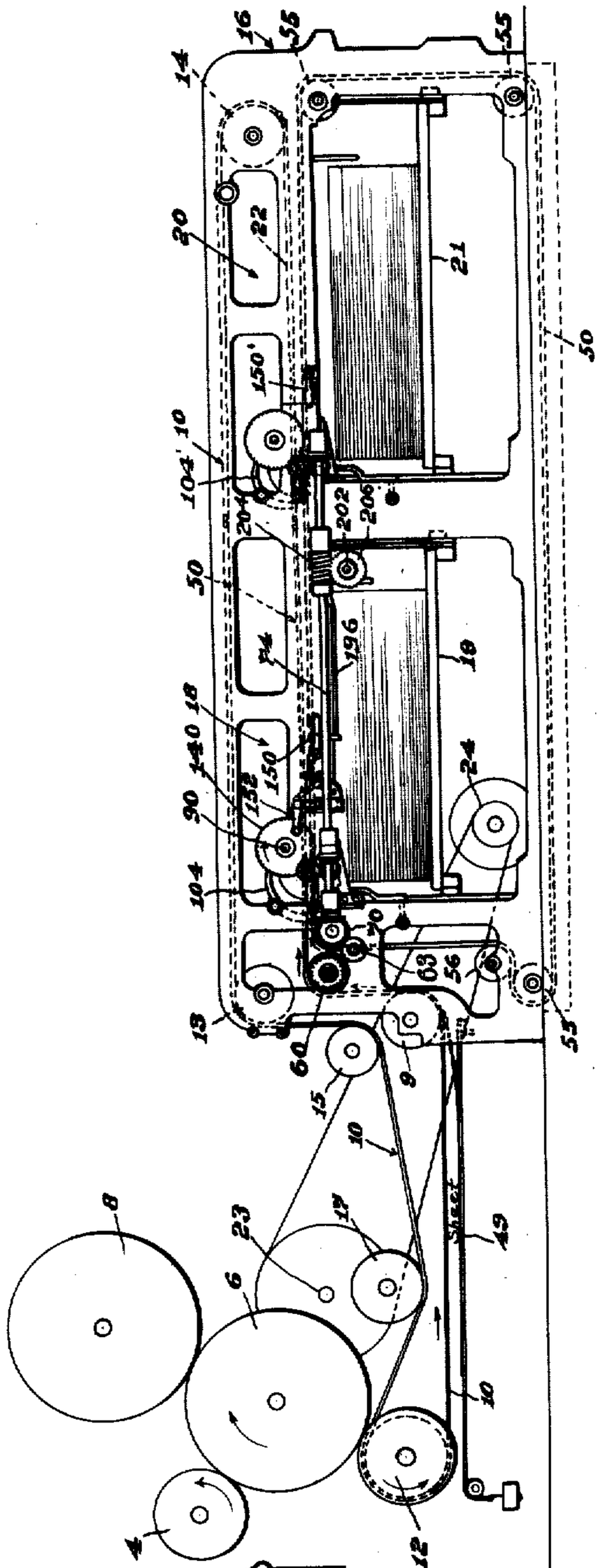

Fig. 1

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PRINTING PRESS SHEET DELIVERY MECHANISM

Filed May 6, 1936 8 Sheets-Sheet 2

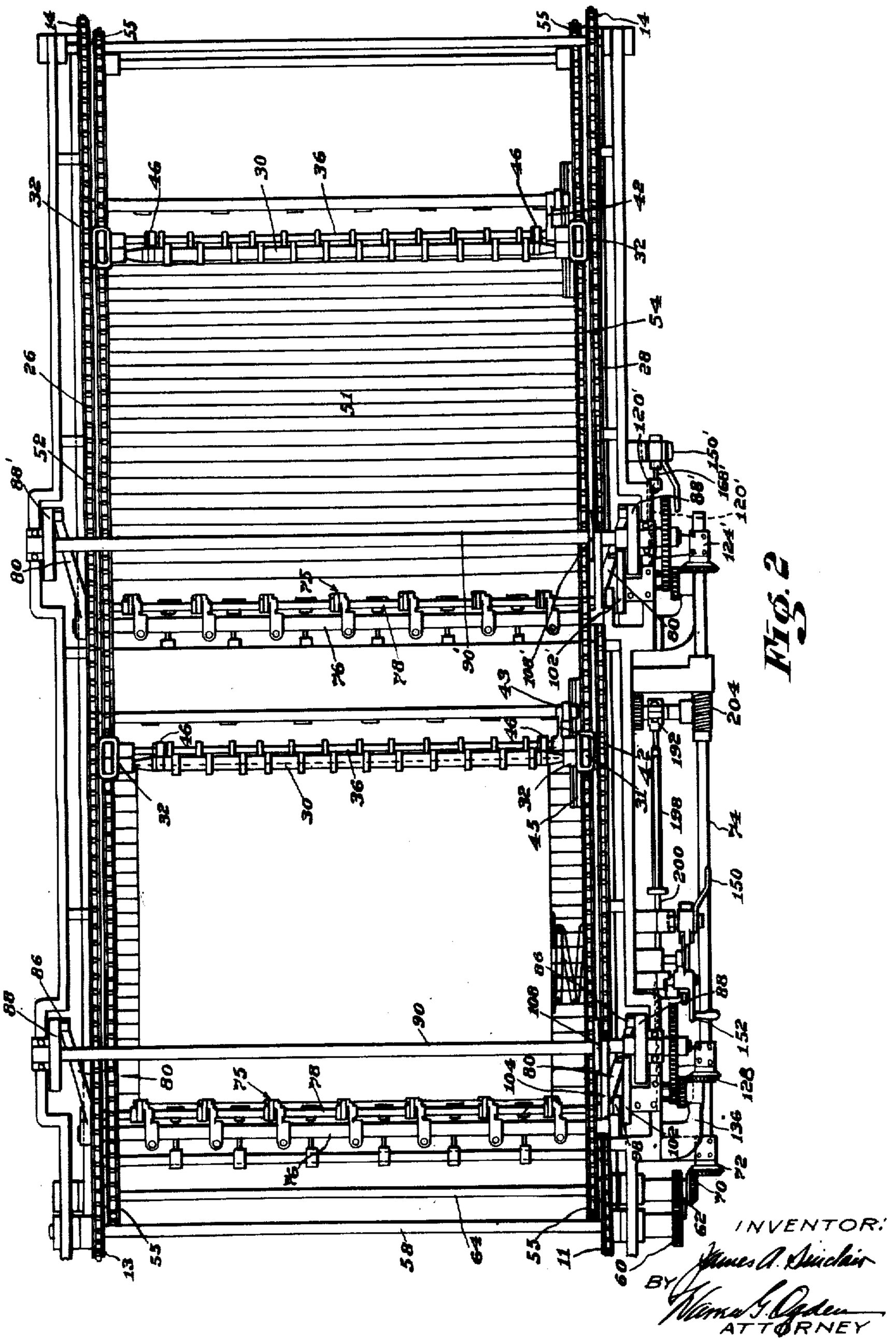

Fig. 2

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Aug. 2, 1938. J. A. SINCLAIR 2,125,467

PRINTING PRESS SHEET DELIVERY MECHANISM

Filed May 6, 1936 8 Sheets-Sheet 3

Fig. 3

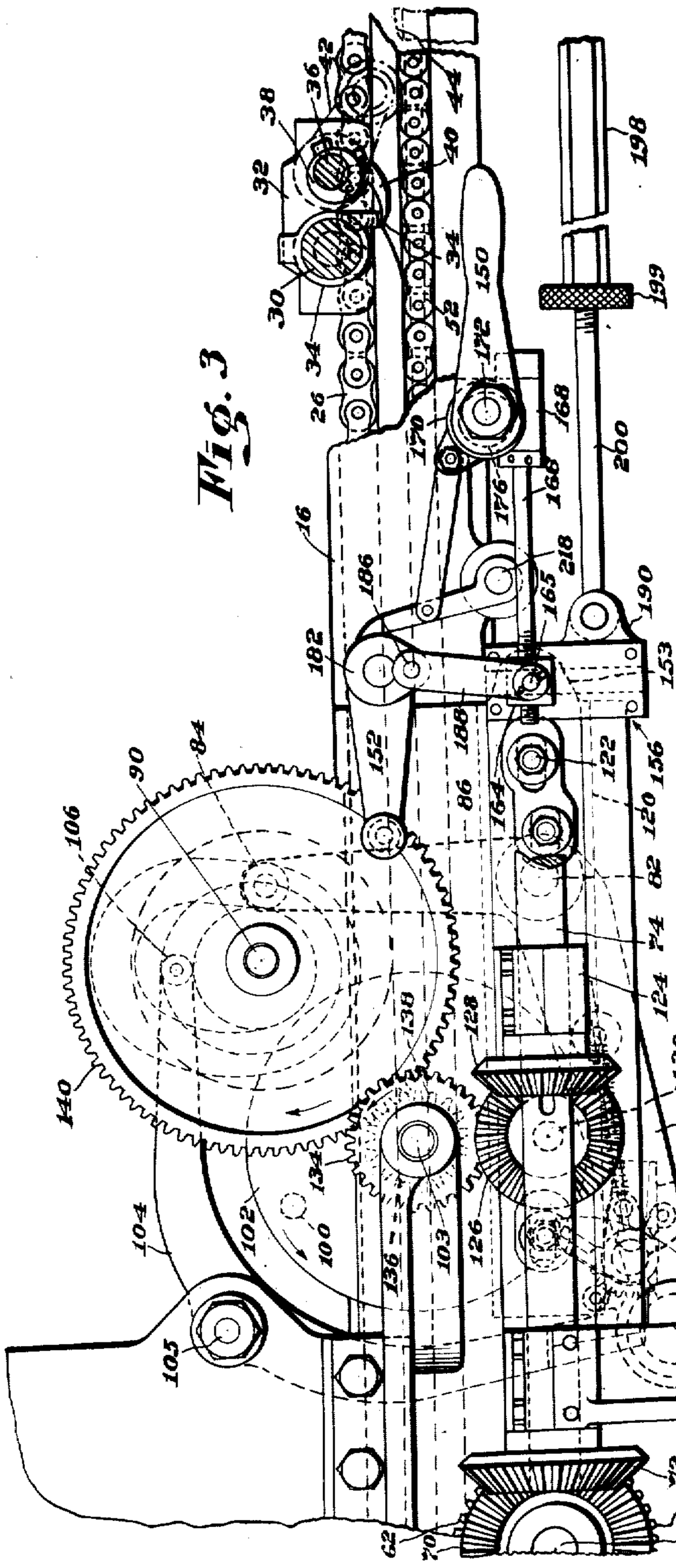
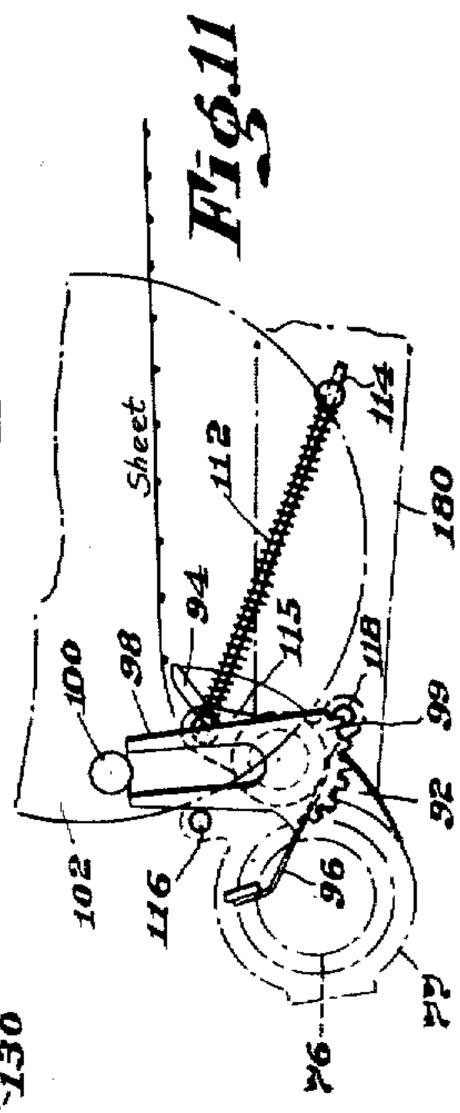


Fig. 11



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Aug. 2, 1938. J. A. SINCLAIR 2,125,467

PRINTING PRESS SHEET DELIVERY MECHANISM

Filed May 6, 1936 8 Sheets-Sheet 4

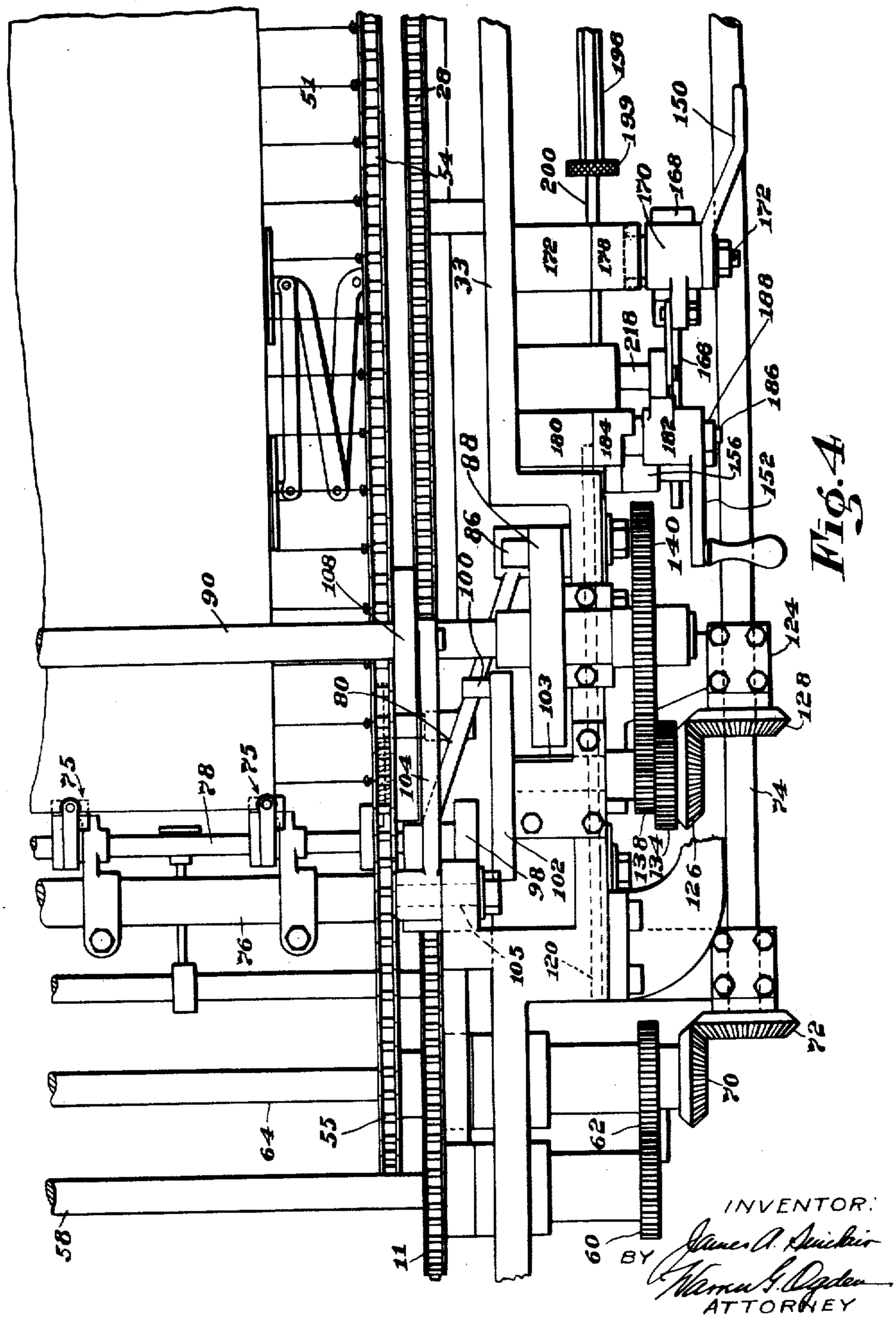

Fig. 4

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Aug. 2, 1938. J. A. SINCLAIR 2,125,467

PRINTING PRESS SHEET DELIVERY MECHANISM

Filed May 6, 1936 8 Sheets-Sheet 5

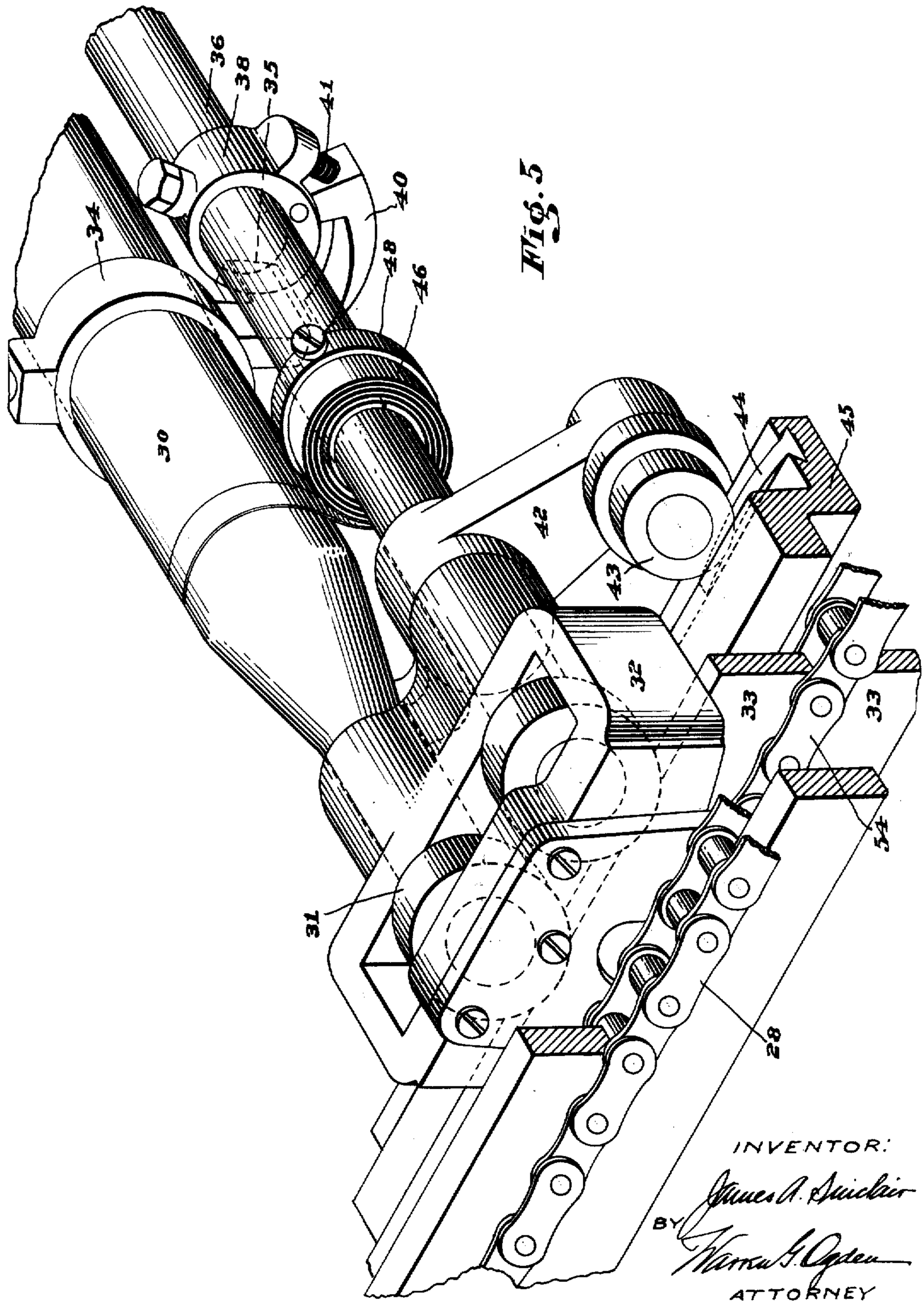

Fig. 5

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PRINTING PRESS SHEET DELIVERY MECHANISM

Filed May 6, 1936 8 Sheets-Sheet 6

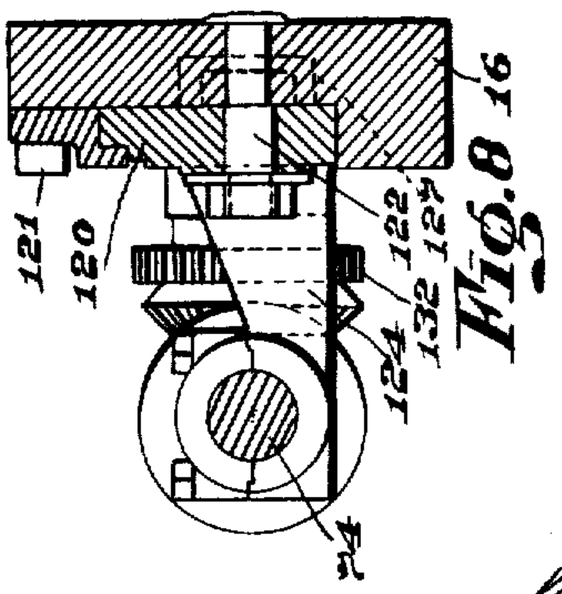

Fig. 8

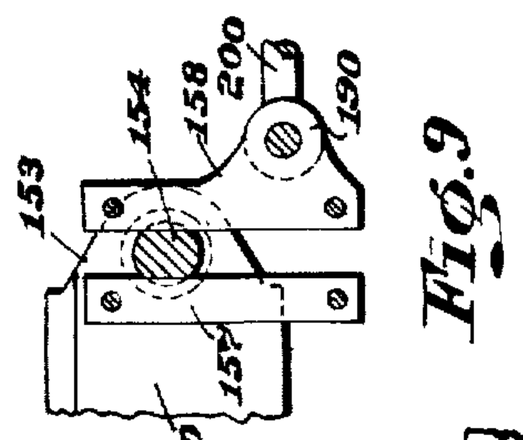

Fig. 9

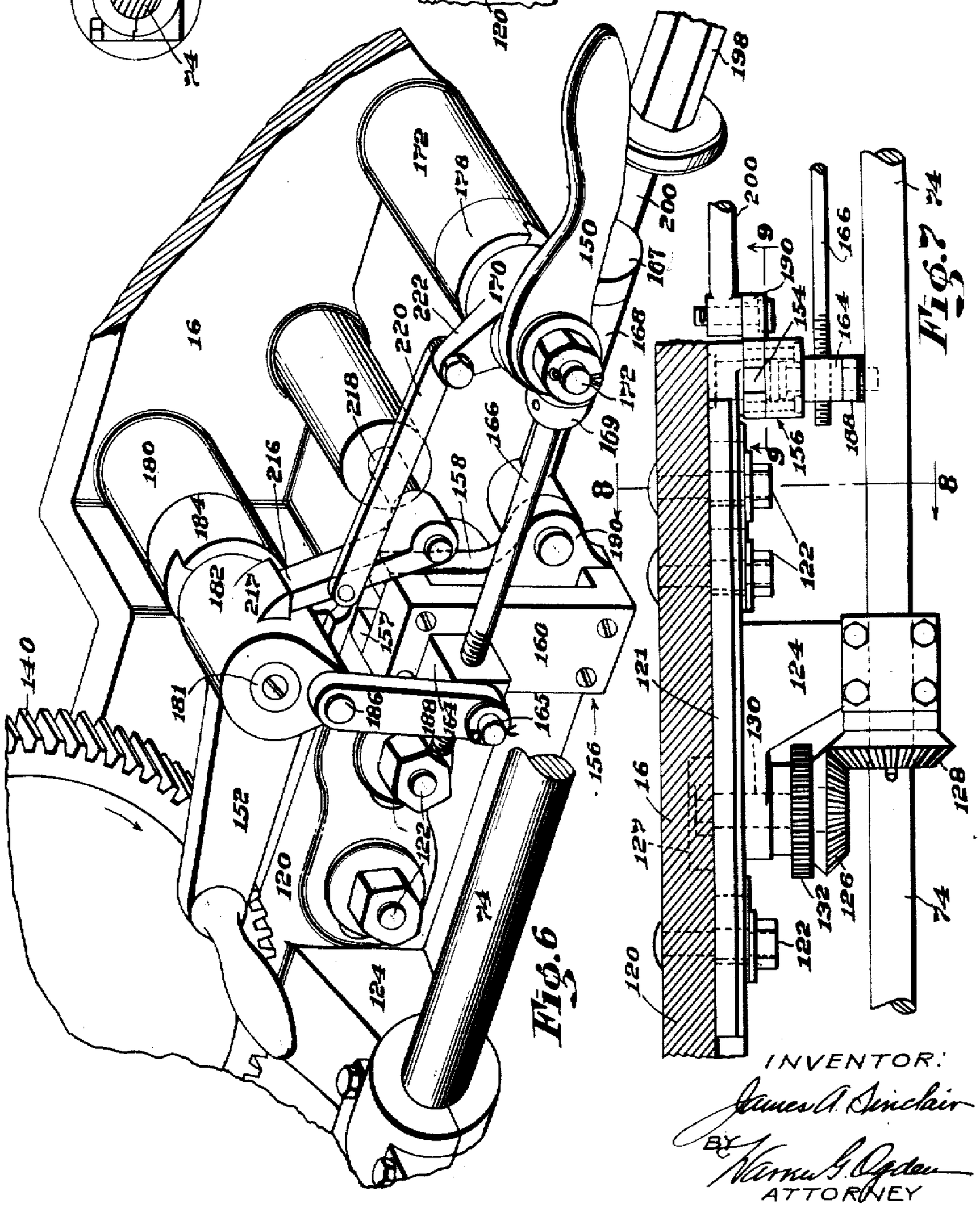

Fig. 6

Fig. 7

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Aug. 2, 1938. J. A. SINCLAIR 2,125,467

PRINTING PRESS SHEET DELIVERY MECHANISM

Filed May 6, 1936 8 Sheets-Sheet 7

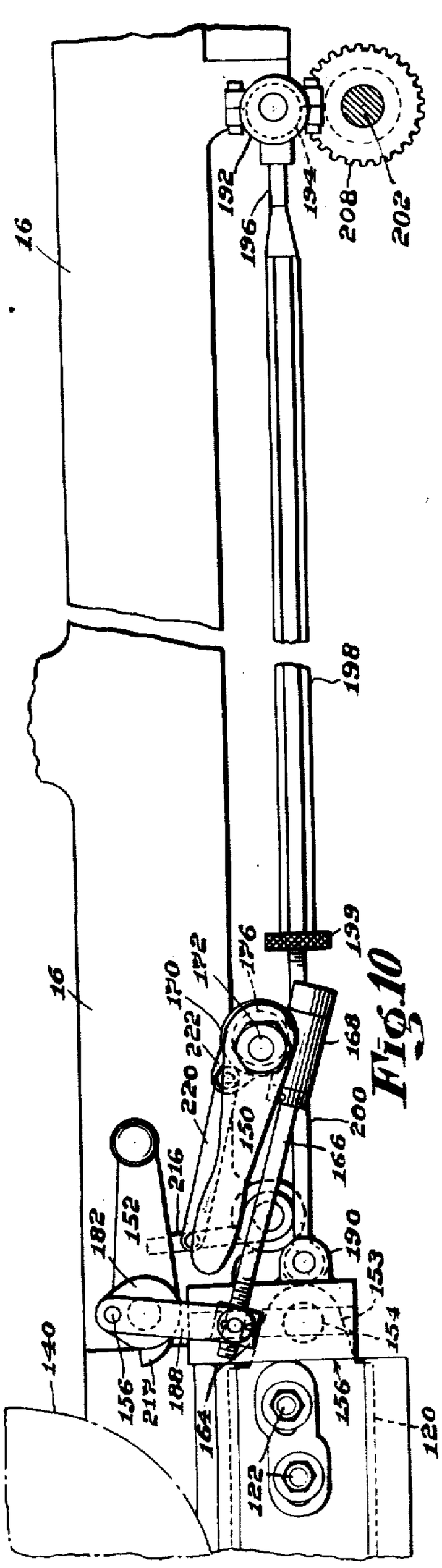

Fig. 10

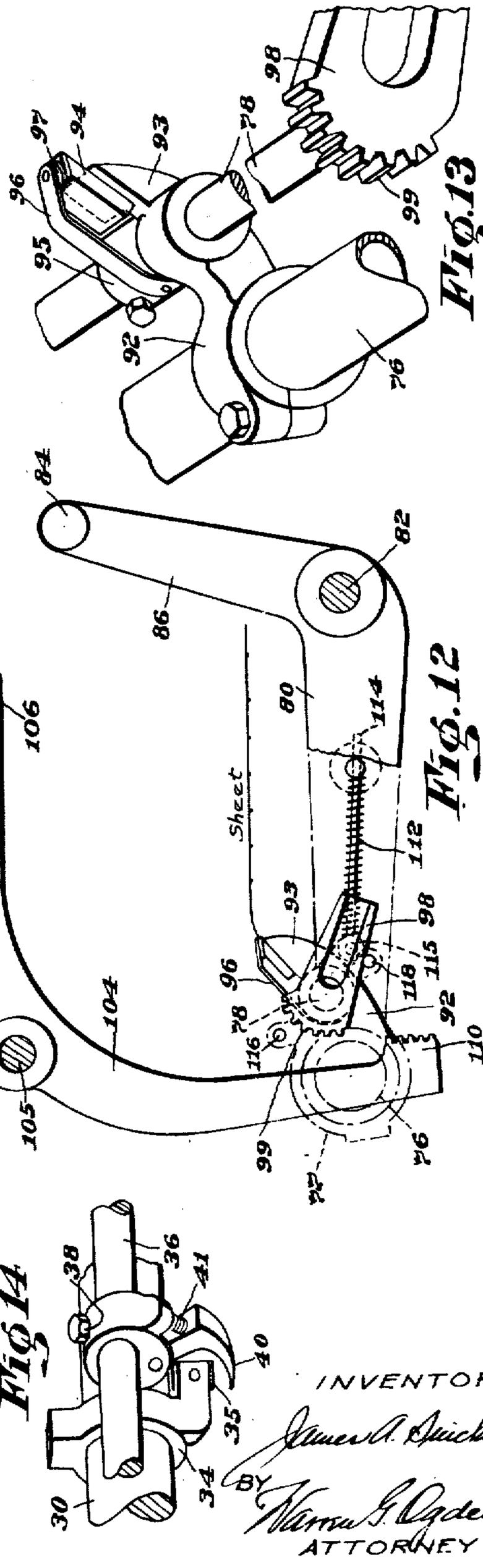

Fig. 13

Fig. 12

Fig. 14

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Aug. 2, 1938. J. A. SINCLAIR 2,125,467

PRINTING PRESS SHEET DELIVERY MECHANISM

Filed May 6, 1936 8 Sheets-Sheet 8

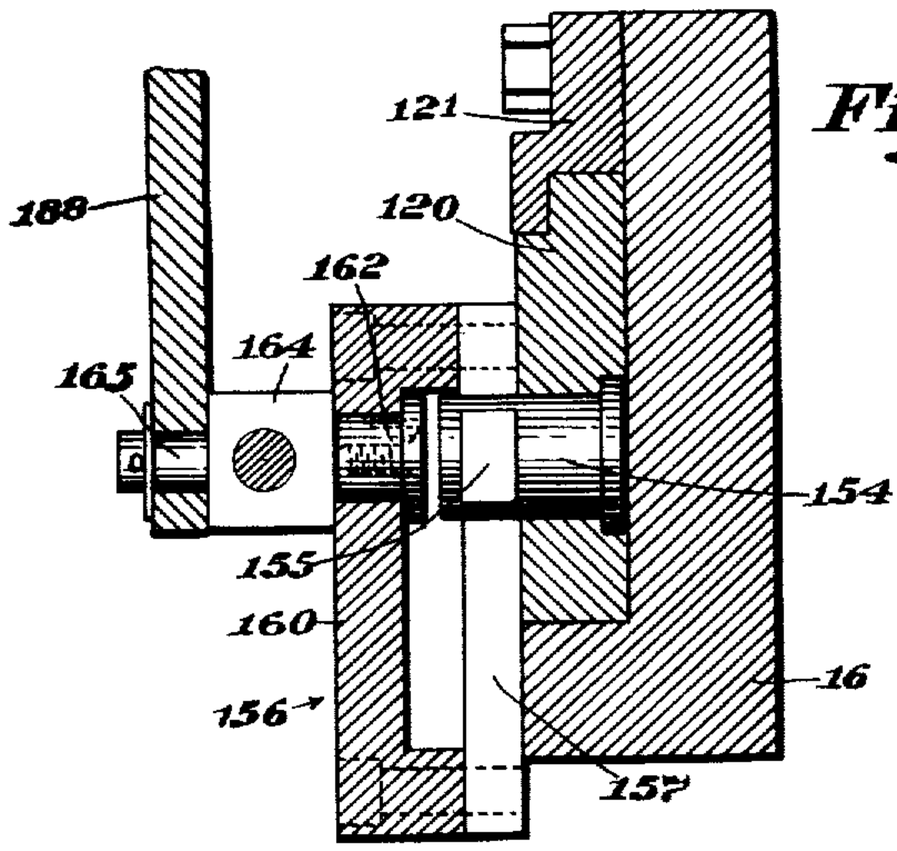


Fig. 15

Fig. 16

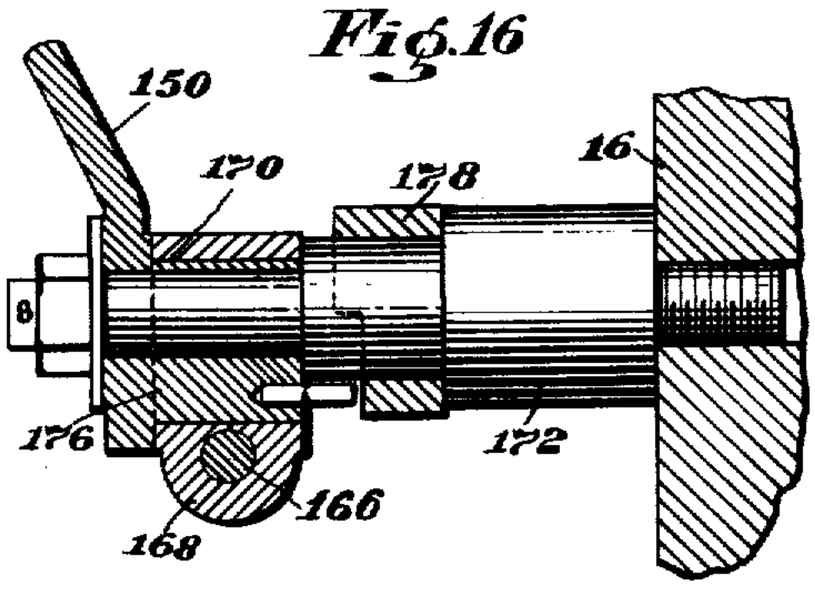


Fig. 17

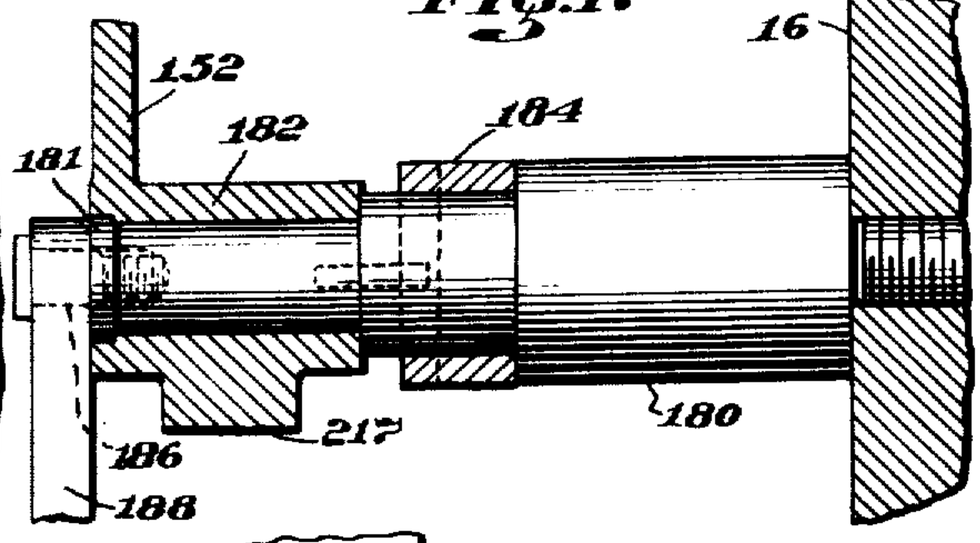
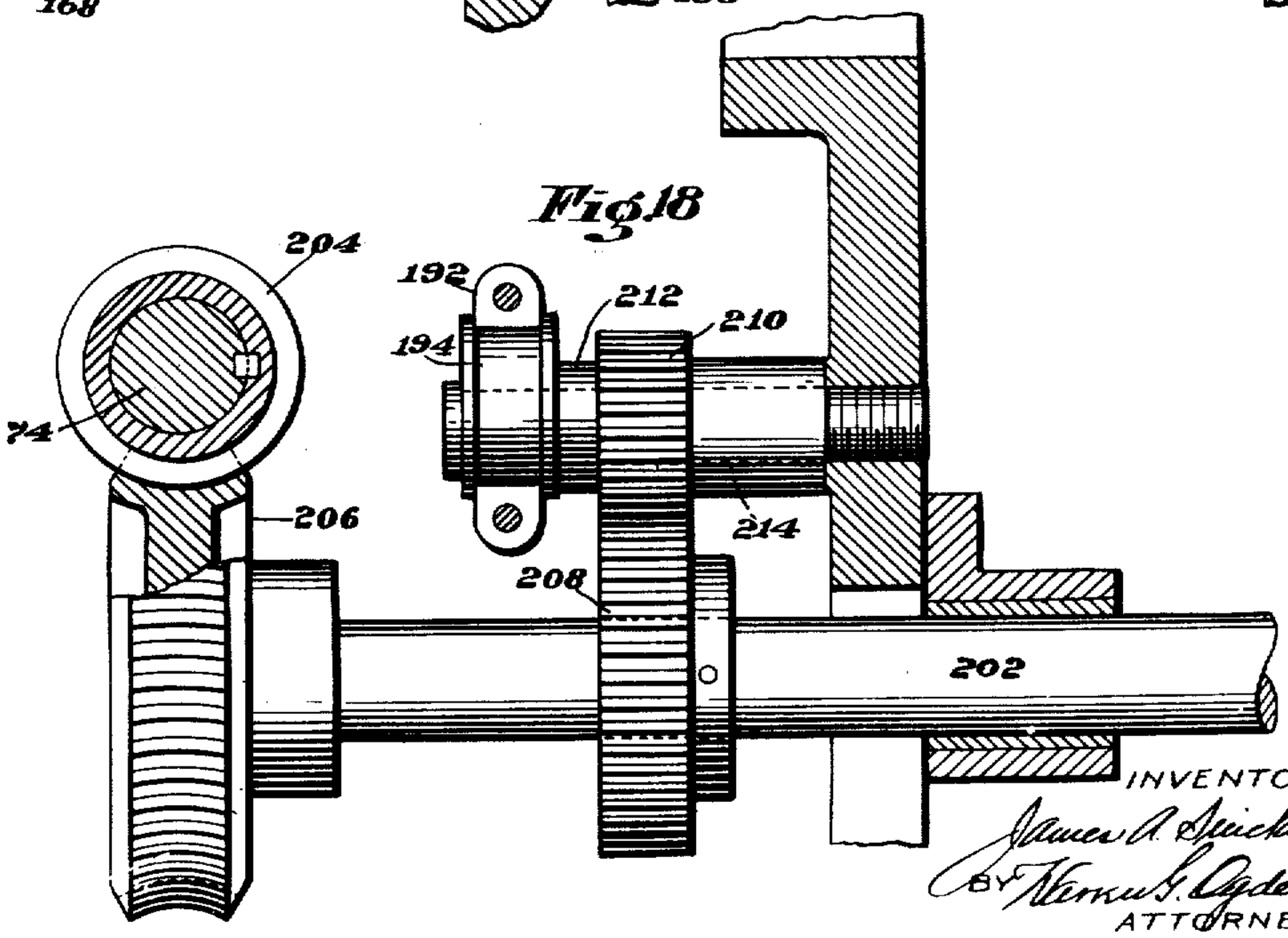


Fig. 18



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Patented Aug. 2, 1938 2,125,467

UNITED STATES PATENT OFFICE

2,125,467

PRINTING PRESS SHEET DELIVERY MECHANISM

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Application May 6, 1936, Serial No. 78,151

10 Claims. (Cl. 271—68)

This invention relates to printing presses and more particularly to improvements in the sheet delivery mechanism whereby the larger sized sheets, say 50'' x 60'' and 60'' x 80'', may be delivered without slowing down the high printing speed heretofore found to be available for the smaller sheets, say up to size 38'' x 52''. The range of the sheet delivery mechanism of the present invention will embrace sheets from 24'' x 36'' up to 60'' x 80''.

Due to the materially increased area of the larger sized sheets it takes longer for the escape of air that is entrapped as the sheet is settling on the pile in the receiving pocket. Hence, with a single sheet feed and delivery press as the size of the sheet was increased above a known standard a proportional slowing of the printing speed became necessary. With a two sheet feed and delivery press increased and sufficient time for a sheet to settle on the pile without decrease in printing speed may be had by delivering alternate sheets to different receiving pockets, that is, as each pair of sheets advance from the impression cylinder to the sheet delivery mechanism they are simultaneously deposited each in one of two receiving pockets. Thus a rapid delivery is maintained while each sheet will have the time ordinarily required for delivering two sheets to settle on the pile and to dry. Such delivery mechanism associated with a two sheet feed and delivery press and embodying the use of tail-grippers which provide for drawing the sheet from the advancing delivery chain, is disclosed in the Burt F. Upham United States Patent No. 1,125,218 of January 19, 1915.

Upham's solution of the problem did not go far enough because it is limited in its application to a two sheet feed and delivery press. The common type of rotary press for publishers using the larger sized printing plates, for example for printing Harper's Bazaar where 64 pages are printed on a single 60'' x 80'' sheet, has a single sheet feed and delivery to which Upham's invention for simultaneously delivering two sheets is not applicable.

One substantial advantage accruing to the publisher from printing on a single sheet feed and delivery press is that it enables the printing of a part of the pages of an issue while waiting for delayed copy. Those skilled in the art will understand that when printing with a two sheet feed and delivery press all of the copy must be on hand before the two plates for printing during one press cycle on the opposite sides of two different sheets can be mounted on the printing cylinder. A single sheet feed and delivery press allows the latitude of printing one side of the sheet for the entire issue before the plate for the other side needs to be finally made up. This has proved of great value to the publisher.

Accordingly a single sheet feed and delivery rotary press was developed having two delivery pockets and using the Upham tail-grippers but having additional controls that provide for delivering the printed sheets continuously into one of the two pockets and then continuously into the other pocket as contrasted to the Upham simultaneous delivery of two sheets, one to each pocket. Such a delivery permits the removal of one pile while the other is being formed. If the feeding time to one pocket is limited to the elapsed time for removing a pile from the other pocket then the printing press may be run continuously at the desired high speed, for example 3,000 sheets per hour. But even using this novel improvement the output is limited to a size of sheet that will settle during the very brief interval between sheet deliveries allowed by such high speed for settling and drying.

To provide for handling the larger sized sheets in a single sheet feed and delivery rotary press having two delivery pockets an additional control has been invented that permits a "skip-pocket" delivery, that is, the sheets forming the advancing stream on the delivery chain are automatically delivered alternately to the two pockets. A skip-pocket delivery doubles the sheet settling time thus preserving press operation at the desired high speed even when printing on the modern oversized sheets.

It will be understood from the foregoing that the main object of this invention is to provide settling and drying time for the larger sized sheets printed in a single sheet feed and delivery press when running at high speeds and while maintaining continuous, uninterrupted delivery throughout the run for the particular job on the press. According to this invention the sheet delivery mechanism is provided with certain controls such that sheets delivered from a single sheet feed and delivery press may be piled successively in a selected one of two pockets or, by means of a skip-pocket delivery, every other sheet of the advancing stream may be delivered to a different pocket whereby the two pockets are filled concurrently. In the former case the piles are quite low when removed from the elevator. In practice a 10 inch pile may be deposited on the elevator within the average time taken by the handler to remove a pile from pocket to truck.

In the latter case, when both pockets are filled concurrently, piles of greatly increased depth may be built on the elevators before being removed by the handler without stopping the operation of the press as was necessary in removing large piles from the elevators when using a sheet delivery mechanism such as disclosed in said patent to Upham. It is not essential that each kind of delivery has its own separate train of mechanism because the design of the controls is such that one kind of delivery may be transformed into the other at the will of the operator.

To the accomplishment of this object and such others as may hereinafter appear, as will readily be understood by those skilled in the part, the invention comprises the features and combinations of parts and the method of delivery and handling printed sheets hereinafter described and then particularly pointed out in the appended claims.

The nature and scope of the invention will best be understood from a description of the preferred embodiment thereof illustrated in the accompanying drawings, in which:

Figure 1 is a view, in left-hand side elevation, of a delivery chain from a single sheet feed and delivery rotary press, the two pockets to which the chain delivers sheets and the control mechanism assembly mounted on the frame for said pockets. In this view only the main cylinders of the press are indicated diagrammatically together with the forward end of the co-operating paper feeder;

Figs. 1*a* and 1*b* illustrate, respectively, the relative positions of the advancing sheet to the tail-grippers, in Fig. 1*a* when seized by said grippers for delivery to the first pocket, and in Fig. 1*b* when skipped at the first pocket to be later seized by the tail-grippers at the second pocket for delivery thereto.

Fig. 2 is a view, in plan, of the two pocket frame within which the sheet delivery chain travels;

Fig. 3 is a view, in side elevation, of the mechanism under control of the operator for delivering the sheets continuously to one pocket or continuously to the other, and of a part of the mechanism which, when set by the operator, delivers the sheets alternately to the two pockets;

Fig. 4 is a plan view of the tail-gripper operating and control mechanisms shown in Fig. 3 comprising an enlargement of the lower left hand corner of Fig. 2 except that certain overhanging parts are broken away to expose the underlying constructions;

Fig. 5 is a view, in perspective, of the head-line grippers, their mounting and their opening mechanism;

Fig. 6 is a view, in perspective, of the sheet delivery controls at the first pocket with the control for producing an alternating or skip-pocket delivery of the sheets, locked out of action. In this position of the controls all of the sheets are passing the first pocket for delivery to the second pocket.

Fig. 7 is a view, in plan, the frame being in section, of a portion of the mechanism shown in Fig. 6;

Fig. 8 shows a detail, in transverse section, taken at the line 8—8 of Fig. 7;

Fig. 9 shows a detail, in side elevation, taken at the line 9—9 of Fig. 7. In this view the cover plate of the sliding cage whose vertical position determines whether the skip-pocket delivery is in effect, is removed, its connecting bolts being shown in section;

Fig. 10 is a view, in side elevation, of the two sheet delivery controls at the first pocket with the mechanism for producing an alternating or skip-pocket delivery operative;

Fig. 11 is a view, in side elevation, of a portion of the mechanism for opening and closing the tail-grippers for drawing a sheet from the delivery chain, a gripper being shown about to close on the tail edge of a passing sheet;

Fig. 12 is a view, in elevation, of a portion of the mechanism for opening and closing the said tail-grippers, a gripper being shown closed on the tail edge of a sheet;

Fig. 13 is a view, in perspective, of a tail-gripper and its mounting;

Fig. 14 is a view, in perspective, of one of the head-line grippers carried by the sheet delivery chain, the lower movable jaw being shown opened sufficiently to drop the sheet, as when a sheet is to be passed out of the delivery frame for inspection by the operator;

Fig. 15 is a view, in vertical section, through the rocker cage that forms a part of the automatic skip-pocket delivery mechanism;

Fig. 16 is a view, in section, through the stud on which the pocket selector control lever is mounted:

Fig. 17 is a view, in section, through the stud on which the skip-pocket control lever is mounted; and

Fig. 18 is a view, in elevation, of the stud on which the automatic operating mechanism for the skip-pocket delivery is mounted showing also the driving train therefor in full lines and the driving shaft for said train in section.

In the embodiment of the invention illustrated in the drawings a single sheet feed and delivery rotary press has been shown diagrammatically in association with a detailed disclosure of the novel controls of this invention applied to a two pocket sheet delivery mechanism.

Referring to Fig. 1, and assuming the front of the apparatus to be at the right, the forward portion of a suitable paper feeder is indicated by 2 from which a sheet is taken by the usual head-line grippers on the feeder cylinder 4 and transferred to the impression cylinder 6 which rotates in printing relation to the plate cylinder 8 carrying a single printing plate of less length than the circumference of the cylinder. The printed sheets are successively transferred from the impression cylinder to suitably spaced head-line grippers carried by the endless delivery chain 10 the rear loop of which runs about the delivery cylinder 12 having the usual head-line grippers and located beneath the impression cylinder. The forward loop of the delivery chain runs about sprocket rolls 14 mounted at each side in the upper forward end (see Fig. 2) of a sheet delivery frame 16. The frame 16 provides a first delivery pocket 18 and second delivery pocket 20 within which pockets are elevators 19 and 21 respectively, each associated with a suitable mechanism (not shown) for lowering the elevator in time relation to the sheet delivery and then raising it after the handler has removed a pile.

The lower run of the delivery chain 10 travels forward in a horizontal plane between the delivery cylinder and the delivery frame, thence upward under sprocket rolls 9 on the frame 16 and again turns forward over sprocket rolls 11 providing a horizontal lower course 22 between said rolls 11 and the rolls 14 and above the pockets 18 and 20. Turning upward about the sprocket rolls 14 the delivery chain returns above the lower course 22

to sprocket rolls 13 (Fig. 2) at the upper rear end of the sheet delivery frame, thence downward under idler rolls 15 and take-up rolls 17 and thence about the delivery cylinder 12. The necessary and usual gearing is present for driving the delivery chain and for rotating the various cylinders of the press in their proper directions all forming trains from the driving shaft 23 which may be driven from any convenient source of power, as a motor 24 (Fig. 1). The mechanisms just described all may be, and preferably are, substantially the same as usual practice in delivering sheets with head-line grippers from a single sheet feed and delivery press to a single pocket or from a two sheet feed and delivery press simultaneously to two pockets.

In accordance with the present invention control mechanism for the delivery of the printed sheets is provided that permits (1) a continuous delivery of sheets from a single feed and sheet delivery press with a deposit of the advancing sheets all in one or all in the other of the two pockets, at the will of the operator, or (2) a delivery of sheets from a single sheet feed and delivery press with a deposit in one pocket of every other sheet of the advancing stream of sheets and a deposit in the other pocket of the sheets that have been skipped, that is, an automatic delivery of the continuously advancing stream of spaced sheets alternately to the two pockets. The controls for these two forms of sheet delivery, (1) selective pocket or (2) skip-pocket, for brevity, will be described herein in that order after first describing the delivery chain and its associated sheet gripping and delivering mechanisms.

Those skilled in the art will understand that the head-line gripper type of delivery chain is used because so many "bleed" pages are printed at present for both illustration and advertising. A multi-page printed sheet bearing a number of bleed pages eliminates the continuous unprinted gutters between pages and makes impossible the use of tapes for frictionally holding the printed sheet on the delivery chain. Obviously such tapes would smear the ink at the extreme margin of each bleed page. Accordingly, as has heretofore been the practice, the two spaced sprocket chains 26 and 28 (Fig. 2) constituting the delivery chain 10 are connected by transverse rods 30 spaced at suitable intervals for the largest size of sheet to be printed and having reduced ends inserted in bearing trucks 32 (Figs. 2 and 5) each secured by an outer face plate to the delivery chain links and having rolls 31 for rolling on a pair of tracks 33. Collars 34 provided with downwardly facing gripper pads 35 are spaced at intervals on the rod 30. A rock-shaft 36, parallel to the rod 30, is journaled in the trucks 32 and carries spaced gripper jaw collars 38. A pivoted gripper jaw 40 (Fig. 3) depends from each collar 38 in position below a gripper pad and is individually engaged therewith by pressure from a coiled compensating spring 41 (Fig. 5) there being a stop for each gripper jaw to limit its opening movement when all are simultaneously withdrawn from the pads to release their grip on the sheet. To accomplish a release of the sheet a depending crank arm 42, secured to the rock shaft 36, carries a roll 43 adapted to ride over the riser of a release cam 44 (Figs. 3 and 5) mounted on a short bracket 45 secured at the inner side of one of the two tracks 33 upon which the bearing trucks 32 roll. There are two release cams, one near the forward edge of each pocket. The cam roller crank arm 42 is yieldingly pressed downward and is held by a tail-stop in position permitting its roll 43 to ride lightly over the cam 44. This is accomplished by suspending the rock-shaft 36 within two clock-springs, one at each end of the shaft (see Fig. 2). Each clock-spring 46 has the end of its inner coil flanged and set into a slot in the circumferential face of a tension collar 48 fast on the rock-shaft, and has its outer coil reversely curved and passed over the rod 30 (Fig. 5). Accordingly any lifting of the crank arm 42 will wind up the clock-springs increasing the tension for holding the roll 43 down on the cam 44 while riding thereover. Consequently as the cam lifts the crank arm the shaft 36 is rocked in a direction to depress the gripper jaws 40 or withdraw them from against the overlying gripper pads 35. When the shaft 36 is rocked as described all of the gripper jaws 40 are withdrawn from their pads 35, but at the first pocket very slightly, only enough to loosen the grip on the sheet and permit it to be frictionally withdrawn, without damage, by tail-grippers which are timed to seize the sheet at this critical moment. It will be understood that the clock-springs 46 serve to apply a like pressure upon all of the gripper jaws, the jaw springs 41 serving to compensate for inequalities; and that the truck rolls 31 rotate on the ends of the gripper pad rod 30 and gripper jaw shaft 36. The gripper opening cam, like the cam 44, at the second pocket may be designed to open the grippers wide to permit delivery of a sheet from the machine when an inspection is desired. A release cam, as is common practice, located at the delivery cylinder end of the delivery chain lifts the crank arm 42 to an extent to open the grippers for accurate transfer of the printed sheet from the usual grippers that retain it upon the impression cylinder 6.

Co-operating with the head-line grippers are tail-grippers (Figs. 11 to 13) timed, when the head-line grippers release the sheet, to seize its tail edge and stop its advance due to the fact that the tail-grippers are in a fixed position. Thus the sheet is pulled out of the loosened head-line grippers as the latter continue to advance with the delivery chain.

It will be observed (Fig. 1) that after the delivery chain has obtained control of a sheet said sheet extends rearward from the head-line grippers and, during the first part of its travel forward from the delivery cylinder, is supported on tapes 49 just below the delivery chain. After making the turn the sheet is supported by one of a series of string platforms 51 (Fig. 2) which constitute a string chain 50 of known type. The string chain comprises two sprocket chains 52 and 54 which traverse a generally rectangular path within the delivery frame 16 being guided by corner sprockets 55 and a take-up roll 56. The upper run of the string chain is slightly below and parallel to the lower course 22 of the delivery chain (Fig. 1). Power for advancing the string chain in time relation to the advance of the delivery chain is obtained from the rear delivery chain sprocket shaft 58. This shaft is extended outside the delivery frame and carries a gear 60 which, through an intermediate gear 63, drives an equal gear 62 in the same direction of rotation. The gear 62 is carried by the rear string chain sprocket shaft 64. Thus the delivery chain and the underlying string chain both advance at the same rate of speed.

The arrows on Fig. 1 indicate the direction

of travel of the mechanisms and it will be understood that as the head-line grippers holding a sheet pass on to the lower course 22 of the delivery chain they are met by the forward end of a string platform the relation being such that the head line of the sheet lies just inside of the first string and its tail edge laps somewhat beyond the last string of a string platform (see Figs. 2 and 4). The length of each string platform is that of the maximum length of sheet to be printed. For handling a sheet shorter than the maximum the string chain may be disconnected and inched forward until the tail edge of such shorter sheet laps the last string. This may be accomplished by removing the driving gear 60 on the shaft 58 which frees the string chain 50 from the delivery chain 10. The string chain can then be advanced by inching over the way shaft 74 with a hand crank until the last string of each platform 51 is the correct distance from the associated head-line grippers to accommodate the shorter sheet. In this way the timing of the rise and closing of the tail-edge grippers just after the last string of a platform passes the tail-edge gripper stations (see Fig. 1a) is preserved. The delivery chain cannot be shifted because its grippers are in time with the delivery cylinder of the press but the head-line gripper operating cams 44 are each moved rearward in their dove-tail slots, by which means they are slidably mounted in their brackets 45 (see Fig. 5), to a position for momentarily lifting the crank arm 42 at the proper time according to the shorter sheet length and to the closing of the tail-grippers on its rear edge.

Referring now to Figs. 3 and 4, power for operating the tail-grippers is derived from the string chain driving-shaft 64. A bevel gear 70, fast to the shaft 64 outside the gear 62, meshes with a bevel gear 72 fast to the rear end of a way shaft 74 the rotation of which operates suitable mechanism designed to open and close the tail-grippers in time relation to the passage thereover of a sheet lying on the string chain. Two sets of tail-grippers (indicated generally by 75, Fig. 2), are employed, one set for each sheet receiving pocket. Accordingly each pocket has a like associated tail-gripper operating mechanism connected to the way shaft 74 (see Figs. 1 and 2), but it will be sufficient to describe in detail only the mechanism at the first pocket which includes an additional selective control for effecting a skip-pocket delivery of the sheets at the will of the operator.

Referring now to Fig. 13 the set of tail-grippers are carried by two floating shafts, a tubular gripper-pad shaft 76 and a gripper rock-shaft 78. The gripper-pad shaft is supported by clamping its ends within rear end sleeves 77 of the horizontal arms 80 of two bell-cranks each pivoted on a pin 82 projecting inward from the wall of the delivery frame (dotted circle Fig. 3). The rock-shaft 78 may turn within bearings on the arms 80 just forward of the sleeves 77. Each horizontal arm of the bell-cranks lies oblique to the axes of the supported shafts 76 and 78 to permit engagement of a cam roll 84, at the upper end of each vertical arm 86, each with a path cam at the inner face of a cam disk 88 outside the chains and set in a recess of the delivery frame (see Fig. 4). The two cam disks 88 are mounted on a cam shaft 90 extending across the delivery frame and journaled in bearings in the frame adjacent the upper edges of said cam recesses of the delivery frame.

Each tail-gripper comprises a gripper-pad bracket 92 (Fig. 13) through which the shafts 76 and 78 extend, the bracket being fast on the shaft 76 and loose on the shaft 78 so that the latter may be rocked within said bracket. The bracket has a pad support 93 at its forward end carrying a gripper-pad 94 on its upper face. A collar 95 is fast on the rock-shaft 78 adjacent the bracket 92. This collar has curled under it and secured thereto the curved tail of a spring gripper 96 so shaped that a gripper-pad 97 on its head will overlie the gripper-pad 94 when the spring gripper 96 closes down.

A tumbler 98 having gear teeth 99 at its closed end is fast at one end of the rock-shaft 78. Co-acting with this tumbler at a predetermined time in the cycle of operations is a rotatable tumbler pin 100, carried at the inner face of a tumbler disk 102 (Figs. 3 and 4), on a shaft 103 journaled in a bracket at the upper edge of said frame recess. A rocker 104 (Figs. 3 and 12) is pivoted to the frame at 105 and carries a cam roll 106 on its horizontal arm engaging with a path cam at the outer face of a gripper-opening cam disk 108 fast on the cam shaft 90. The lower end of the depending arm of the rocker 104 is provided with a rack 110 which, at a predetermined time, moves inward to be engaged by the gear teeth 99 as the tumbler 98 rises. This, as will be described, opens all of the tail-grippers for depositing a sheet on the pile and preparatory to seizing and delivering another printed sheet.

The operation and timing of the tail-grippers in seizing a sheet and depositing it on the pile in a pocket will be explained before describing the operating mechanism and the controls combined therewith.

At the beginning of the cycle of operations now to be described the travelling head-line grippers carrying a series of spaced sheets delivered from the press, have passed and are somewhat in advance of the fixed position of the tail-edge grippers. The delivery chain will be advanced during each cycle a distance equal to the length of a sheet plus the length of a gap in the string chain. When printing a 60 inch long sheet 95 inches of travel constitutes one cycle. About ¼ of the cycle time is consumed in raising the tail-grippers from their lowered sheet releasing position within a pocket (see dotted lines in Fig. 3) to their raised, sheet seizing position just below the string chain (see Fig. 11) and the remaining ¾ of the cycle time is consumed in closing and lowering the tail-grippers thus withdrawing the sheet from the string chain through a gap, carrying it down and depositing it on the pile in a pocket. Therefore, when printing and delivering 60 inch long sheets the head-line grippers have, at the beginning of a cycle, lapped the sheet over the tail-edge grippers about 36 inches leaving about 24 inches, or ¼ of the 95 inches of cycle travel, to be advanced by the head-line grippers during the time the tail-grippers are rising to sheet seizing position. At the beginning of the cycle the gripper operating cam roll 84 is at the low point on its cam, the bell-crank thus holding the tail-gripper supporting shafts 76 and 78 well below the plane of the string chain (see dotted lines in Fig. 3). The tail-grippers are closed, a sheet having just been pulled off of the string chain and drawn down into the pocket with which said tail-grippers are associated. At this moment the gripper-opening cam turns the rocker 104 in a direction to move its rack 110 over into engagement with the gear

teeth on the tumbler 98 which serves, as the grippers move upward, to rotate the rock shaft 78 in a direction to turn the tumbler 98 to an upright position and to lift the spring gripper 96 from the fixed pad 94 (Fig. 11). The rack 110 then withdraws from the path of the tumbler and is held withdrawn for the remainder of the cycle. A common type of automatic snap switch, employed to hold the grippers opened, is indicated in Figs. 11 and 12 by the caged spring 112 coiled about a rod 114 having its inner end pivoted on a lug 116 of a collar fast to the rock-shaft 78 beside the lifting lever arm 80, and having its outer end slidable through an inner boss on said arm 80. After the rack 110 has drawn the spring lug across dead center the spring then expands and, by its leverage on the collar, completes the throw of the spring gripper 96 to its fully opened position and holds it there (see Fig. 11).

At the end of this movement the gripper pad 94 has been lifted to a plane just below that of the advancing string platform carrying a sheet and the tumbler 98 upright beside the tumbler disk with its mouth in the path of the descending tumbler pin 100. The tumbler pin now enters the throat of the tumbler and rocks it and the rock-shaft 78 in a direction for closing the spring grippers 96 on their gripper-pads 94. The timing is such that the snap switch rod is moved downward past center just after the last string has passed the grippers bringing the unsupported tail edge of the sheet above the gripper-pads 94. The quick expansion of the coil spring 112 which now occurs throws the spring grippers down on the pads firmly gripping the tail edge of the sheet. As already described, at this moment the track cam 44 lifts the crank arm 42 associated with the head-line grippers which (at the first pocket) lowers these grippers 40 just enough to relieve their pressure on the sheet which they hold as illustrated by Fig. 1*a*. This leaves the sheet under the sole control of the tail-grippers which begin to descend as the gripper operating cam moves its cam roll 84 inward on the cam disk 88, slipping the sheet from the loosened head-line grippers, dragging it downward through a gap in the string chain and finally depositing it on the pile in the pocket. The continued rotation of the gripper operating cam upon entering on the next cycle then opens the grippers and releases the sheet as above described. Stop pins 116 and 118 (Figs. 11 and 12) carried by the hub of the gripper supporting bell-crank lever retain the tumbler 98 under pressure of the snap switch spring 112 in its up and down positions for exact entry and exit of the tumbler pin 100.

Upon the deposit of a sheet on the pile in the pocket its head line is jogged into position, while escape of entrapped air proceeds, against the usual adjustable headers by the usual side and end joggers which will be recognized on Fig. 2. The jogger operating mechanisms are not illustrated since they may be, and preferably are, the same as now in common use.

Power for rotating the various cams is derived from the way shaft 74 which (see Figs. 1 and 2) serves both pockets. Describing the duplicate mechanism at only the first pocket as heretofore, the delivery frame 16 is rabbeted at its outer face to receive a slide 120 retained by an upper flanged guide gib 121 (Fig. 8) and by three bolts 122 passing into the frame through elongated slots in the slide. Thus the slide may be shifted past said bolts within its way longitudinally beneath the tail-gripper mechanism or, for a skip-pocket delivery, may be reciprocated therein. The time in the cycle at which the tail-grippers are brought to a position to close on the sheet is determined by the position of this slide in its way, that is, when in its forward position the tail-grippers are operative but when in its rearward position they arrive at the string chain just after the sheet has passed, too late to grip its tail edge. Since the position of the slide which is associated with the first pocket determines to which pocket the sheet shall be delivered it may be termed the "pocket selector slide". When this slide, associated with the second pocket, is shifted to its rearward position then the ungripped sheet is passed by the string chain out of the delivery frame. This latter control is used when it is desired to inspect the quality of the printing, therefore the slide associated with the second pocket may be termed the "inspection slide".

The pocket selector slide 120 carries a lateral bracket 124 terminating in a sleeve slidable on the way shaft. A bevel gear 128 is keyed to the way shaft at the rear end of the sleeve and meshes with a bevel gear 126 rotatable on a stud 130 bolted to the slide 120, there being a recess 127 in the frame (dotted lines Figs. 7 and 8) within which the bolt head may travel as the slide is shifted from one position to another. The bevel gear 126 drives a small gear 132, just behind it (Fig. 7), which meshes with an intermediate gear 134 (Fig. 3) fast on the tumbler disk shaft 103. A side bracket 136 projecting from the rear end of the delivery frame provides an end bearing for the shaft 103. Behind the gear 134 on the shaft 103 is a smaller gear 138 (dotted lines on Fig. 3) which drives the large gear 140 on the tail-gripper cam shaft 90. Thus both cam disks 88 together with the cam disk 108 and the tumbler pin disk 102 are driven through the described trains from the way shaft 74.

The control for delaying the closing of the tail-grippers and its operation will now be described. This control is connected to the pocket selector slide 120 and, when operated to shift the position of this slide, determines whether the sheets are all to be delivered to the first pocket or are to pass the first pocket and are all to be delivered to the second pocket. It will be termed the "selective pocket delivery". A like control is found connected to the inspection slide at the second pocket but in that relation it serves merely to free the sheet from engagement by the tail-grippers so that when the head-line grippers open its forward edge will fall upon the string chain which then shoots it out at the open end of the delivery frame into the hands of the operator for inspection.

The selective pocket delivery is so intimately combined with the control mechanism for delivering sheets to the two pockets alternately, i. e., the skip-pocket delivery, that it will be necessary to include some parts of the latter mechanism in the description of the former mechanism.

Fig. 3 illustrates the two control mechanisms set for delivering sheets continuously to the second pocket, that is, with the selector-lever 150 thrown to the right which, as will be explained, holds the pocket selector slide 120 in its rearward position; and with the skip-lever 152 thrown to the left which, as will be explained, decommissions the continuously active automatic mechanism governing the skip-pocket delivery. The slide 120 has a central lug 153 (Fig. 9) at its rear end bored to receive a pivot stud 154 for connecting a rocker cage 156 thereto. This cage con-

sists of two vertical, spaced track bars 157 and 158 (Fig. 9) secured across the channeled inner face of a cover plate 160 (Fig. 15). The stud 154 has an inner head seated in a recess at the inner face of the slide lug 153 and a two-side slabbed shank 155 which forms a guide on which the cage 156 may be moved up and down relatively to said stud. The unslabbed portion beyond the slabbed area of the stud 154 forms a head for holding the cage to the slide 120. After the stud 154 has been passed through the slide-lug 153 the cage 156 may be built about its shank, the fit being such that the cage readily slides and swings on the stud. Before applying the cover plate 160 an adjusting stud 162 is seated in a bore through the upper portion of the plate and held in fixed position by a head having a steady pin, screwed to the inner end of the stud. The stud 162 carries a block 164, having a threaded horizontal bore, at the outer face of the cover plate and also provides a pin 165 projecting from said block. The function of the pin 165 will be described later because it, as well as the cage, are a part of the skip-pocket delivery driving train.

The mechanism for shifting the slide 120 forward or backward to commission or decommission the tail-grippers and thus cause the sheet deliveries to be changed from one pocket to the other will now be described. A rotatable eccentric hub 176 on the selector-lever 150 (Fig. 16), is supported on a reduced outer portion of a stud 172 projecting from the frame 16. A sleeve 170 (see also Fig. 6) in the nature of an eccentric strap surrounds the eccentric hub. The sleeve 170 has a horizontal tube 168 at its lower side. An adjustable connecting rod 166 (Fig. 6) has a threaded rear end, a removable head 167 forming a circular shoulder at its forward end and a fixed intermediate slip collar 169 radially drilled for taking the end of an adjusting pin. These parts are assembled by passing the forward end of the rod 166 through the tube 168 until its collar 169 abuts the rear end thereof. The head 167 is then pinned to the projecting forward end of the rod to clamp the tube (i. e., eccentric strap 170) between said head and the collar 169. The threaded rear end of the rod 166 is screwed into the block 164 at the outer face of the cage 156, and the proper relation of the slide 120 to the throw of the eccentric 170 is determined by slipping the rod 166 through the block 164 by means of the collar 169. As stated the lever 150 is rotatably mounted on the stud 172 and is held thereon by a nut. Back of the lever hub the stud carries a fixed, two-shouldered stop collar 178 as is common practice, and the eccentric has a projecting pin which engages one or the other of these shoulders to limit the movement of the selector lever as it is swung in one direction or the other. The two stop shoulders are substantially horizontal in this setting.

When the cage 156 is dropped as in Figs. 3 and 6 (compare with its position in Fig. 10) its stud 162 is in axial alignment or centered with the pocket selector slide stud 154 (see Fig. 15) so that either a thrust or pull on the rod 166 will move the slide in its ways without binding. When the lever 150 is thrown to the left as in Fig. 10 its eccentric hub will cause the sleeve 170 to shift to the right on the stud 172. This exerts a pull on the connecting rod 166 which draws the pocket selector slide to its forward position. In this position of the slide the tail-gripper operating train is so timed as to cause said grippers to seize and deliver each sheet advanced by the delivery chain.

When the lever 150 is thrown to the right, as in Figs. 3 and 6, its eccentric hub is turned 180° from its position in Fig. 10 exerting a thrust on the connecting rod 166 which moves the pocket selector slide rearward. The slide carries back with it its gear 132 (Fig. 7) and the two bevel gears 126 and 128 the latter sliding on the way shaft 74. The tumbler disk and the gripper operating cam driving gears 134 and 138 (see Fig. 3) are thus turned backward a distance, in practice, equal to one tooth. This is transmitted to the cam disks 88 and 108 and to the tumbler disk 102 and serves to retard the action of the tail-gripper operating train causing these grippers to close too late to seize a sheet (see Fig. 1*b*). If the selector lever is thrown to the right while the press is idle the slide gear 132 acts as a rack to turn the gears 134 and 138 backward; if so thrown while the press is running the backward movement of the rotating gear 132 on the pocket selector slide while enmeshed with the rotating gear 134 causes the gear train to lose time.

Proceeding now to a description of the skip-pocket delivery control, this also operates by a pull or thrust on the pocket selector slide 120 through the intermediate cage 156. Its operation is automatic, alternately moving the slide 120 forward and backward at each tail-gripper cycle with the result that each alternate sheet on the delivery chain is missed by the tail-grippers at the first pocket, and passing said first pocket is seized by the tail-grippers at the second pocket and delivered to said second pocket.

The skip-pocket delivery mechanism is continuously operating while the press is running, but idly so long as the skip-lever 152 is thrown to the left as in Figs. 3 and 6. This control lever is loose on the outer end of a stud 180 (Fig. 17), its hub 182 being held thrown by a flush cap-screw 181. Back of the hub 182 the stud carries a fixed, two-shouldered stop collar 184, like the stop collar 178 on the stud 172. The hub has a projecting pin for engaging one or the other of these shoulders, both of which are substantially vertical in this setting, to limit the movement of the skip-lever as it is swung from side to side. The skip-lever hub is pear-shaped having a wrist-pin 186 at the pointed end. A link 188 connects the wrist-pin 186 with the pin 165 (Fig. 15) at the outer face of the block 164 on the rocker cage 156. This mechanism provides for shifting the position of the rocker cage relatively to the pocket selector slide 120. When the skip-lever is turned to the right (Fig. 10) its wrist-pin rotates 180° and, through the link 188, slides the rocker cage 156 upward on its stud 154 until a lug 190 on the forward side of its track bar 158 (Figs. 3 and 9) is brought into the horizontal plane of said stud 154 or centered with the end of the pocket selector slide 120 (Fig. 10). This upward movement of the rocker cage rotates the selector lever sleeve 170 slightly by reason of its connection to the cage by the rod 166.

Proceeding with a description of the automatic skip-pocket delivery the cage lug 190 is connected to the eccentric strap 192 of an eccentric 194 (Fig. 10) running constantly at ½ of a revolution to one cycle. The driving connection between the cage 156 and the eccentric 194 is adjustable. A short stud 196 is screwed at one end into a socket on the eccentric strap 192 and has its other end screwed into the forward end of a turn-buckle 198. A rod 200 is pivoted at its rear end on the

cage lug 190 and has its other end screwed into the rear end of the turn-buckle. A turn-buckle lock nut is indicated by 199. The rotation of the eccentric 194 produces an alternate pull and push on the cage 156 which, due to the above described position of the cage lug 190 when the skip-lever 152 is turned to the right, is transmitted to the pocket selector slide 120. The effect is to decommission the tail-grippers at the first pocket at each alternate cycle, so that every other sheet on the delivery chain passes on to the second pocket where the tail-grippers associated therewith remain operative at each cycle. When the skip-lever 152 is thrown to the left, lowering the rocker cage 156 and leaving the pocket selector slide under control of the operator through the selector lever 150, the effect of the continuously reciprocating turn buckle connection is merely to rock said cage idly on the stud 154 (Fig. 3) without any effect on the slide. It will also be observed (see Fig. 10) that when the automatic skip-pocket delivery is operative the cage 156 and link 188 serve as a toggle to relieve the thrust and pull on the fixed connecting rod 166.

Power for rotating the eccentric 194 is taken from the elevator operating shaft 202 (Figs. 1 and 10). A worm 204 on the way shaft 74 meshes with an underlying worm gear 206 at the outer end of the elevator shaft and drives this shaft in time with the cycle of operations. A large spur gear 208 (Fig. 18), fast on the elevator shaft at a point between the way shaft and the delivery frame, meshes with a small spur gear 210 above it formed integral with a sleeve 212 rotatable on a headed stud 214 projecting from the delivery frame. The eccentric 194, which is integral with and forms the outer end of the sleeve 212, is so located that the connected turn-buckle lies inside of the plane of the two track bars at the back of the rocker cage 156 (see Fig. 6).

A safety device, shown in Figs. 3, 6 and 10, prevents the operator from placing the automatic skip-pocket delivery in operation whenever sheets are being delivered solely to the second pocket. It will be remembered that by turning the selector lever 150 to the right the pocket selector slide 120 is pushed backward thus delaying the action of the tail-grippers at the first pocket and causing them to miss seizing the tail-edge of the passing sheet which is then advanced by the head-line grippers to the second pocket for seizure by the tail-grippers associated with that pocket. The safety device comprises a latch bar 216 which is thrown under a shelf 217 on the hub of the skip-lever 152 by the rotation of the selector lever 150. The latch bar is pivoted by its lower end on a stud 218 fast in a boss on the delivery frame and is connected by a link 220 to an ear 222 on the eccentric strap sleeve 170. The rearward movement of the sleeve 170, due to rotation of the eccentric 176 in a direction to shift said strap to the left (Fig. 3) as the selector lever is turned to the right, throws the latch-bar 216 rearward under the shelf 217 thus preventing rotation of the skip-lever. Conversely, a rotation of the selector lever to the left shifts the eccentric strap 170 to the right (Fig. 10) which pulls the latch-bar forward sufficiently to permit the shelf 217 to clear it on rotation of the skip-lever to the right. Consequently, operation of the automatic skip-pocket delivery can be initiated only when the rocker cage 156 is in a position to make such a delivery effective.

The tail-gripper control mechanism at the second pocket is illustrated in Figs. 1 and 2 to an extent sufficient to recognize that it is a duplicate of that at the first pocket except for the absence of the automatic skip-pocket delivery mechanism. The way shaft 74 extends beyond the rear edge of the second pocket and its forward end has a bearing in a bracket 124' extending laterally from the inspection slide 120' which is moved in its ways by rotating a control lever 150' having its connecting rod 168' connected, in this instance, directly to the end lug of the slide instead of indirectly through a rocker cage as at the first pocket. The same gear train as at the first pocket drives the shaft 90' carrying the two tail-gripper operating cam disks 88' and the rack operating cam disk 108', and also rotates the tumbler pin disk 102'. The same obliquely arranged cam levers as at the first pocket are shown in twin delivery frame recesses. In Figs. 1 and 2 the inspection control lever 150' is shown as thrown to the left, in which position, as at the first pocket, the inspection slide is in its forward position with the tail-grippers operative to seize and deliver any sheets which the head-line grippers carry over to the second pocket. When both control levers 150 and 150' are turned to the right then both sets of tail-grippers miss the advancing sheet (Fig. 1*b*) and, after release from the head-line grippers, such a sheet is shot out from between the delivery and string chains at the forward end of the apparatus for inspection of the quality of the printing.

The press may be fed by either a pile or a continuous paper feeder. When fed by a pile paper feeder the ordinary charge will be 4 tons of paper which, with the skip-pocket sheet delivery continuously in operation, will produce a pile of printed sheets on each elevator about 20 inches deep. The time required for reloading the paper feeder gives ample time for clearing both elevators and re-setting them for the next run of the press. When fed by a continuous paper feeder the handler may first load a single elevator with a short pile of sheets, say 5 to 10 inches deep, and then throw in the skip-pocket delivery for the remainder of the run or, if the run is started with the skip-pocket delivery a short pile on one of the elevators, built up after a run of 5 or 6 minutes, may first be removed by the handler. In this operation of the press the elevators are cleared alternately at intervals as each elevator receives a 20 inch pile.

While the skip-pocket sheet delivery has been developed more particularly for the advantage of publishers having single sheet feed and delivery presses, it is within the scope of the invention to apply it to a two sheet feed and delivery press when such a press is provided with four pockets instead of the usual two. In such case the first and second pockets which simultaneously receive two delivered sheets would be the equivalent of the first pocket of a two pocket single sheet feed and delivery press, and the third and fourth pockets would likewise be the equivalent of the second pocket of a single sheet feed and delivery press.

It will be understood from the foregoing description that the invention combines in a single machine selective control mechanisms through which either of two pockets for receiving the delivered sheets may be selected for receiving all of the printed sheets or the normal operation of the sheet delivering mechanism may be so changed that both pockets will be filled concur-

rently, alternate sheet deliveries from the press being deposited in different pockets. It is believed that this combination of controls applied to a duplex pocket sheet delivery mechanism is broadly new and patentable herein. It is believed also that the automatic skip-pocket control mechanism for delivering sheets, which may by an obvious change be connected directly to the pocket selector slide rather than operate through the pocket selector train, is novel in itself.

Nothing herein contained is to be interpreted as limiting the invention herein described in the scope of its application to use in connection with the particular apparatus illustrated as the best embodiment of the invention at present known. While the mechanisms herein described are well suited to one mechanical form of the invention it is not limited to these details of construction, nor to the conjoint use of all of its features, nor is it to be understood that these details are essential since they may be variously modified within the skill of the artisan without departing from the true scope of the actual invention, characterizing features of which are set forth in the following claims by the intentional use of generic terms and expressions inclusive of various modifications.

What is claimed as new, is:

1. A sheet delivery mechanism having two receiving pockets in series, a device for advancing a stream of sheets in a plane above said pockets, a set of tail-edge grippers at each pocket normally operating synchronously to close upon and deposit a sheet in each pocket once each cycle, mechanism for delaying the closing operation of the tail-edge grippers at the first pocket with relation to the closing operation of the tail-edge grippers at the second pocket, and selective hand controls for said mechanism for causing said delayed operation to occur at each cycle or at every other cycle.

2. A sheet delivery mechanism having two receiving pockets in series, a device for advancing a stream of sheets in a plane above said pockets, tail-edge grippers at each pocket for seizing and depositing the advancing sheets in their respective pockets, separate trains of gripper operating mechanism at each pocket, each having its own adjustable timing device normally causing said tail-edge grippers to act in time relation with the arrival of the tail-edges of the advancing sheets at the gripper station, and mechanism operated by the machine for re-timing the action of the tail-edge grippers at the first pocket to cause them to miss every other sheet whereby said missed sheets continue to advance for seizure and deposit by the tail-edge grippers at the second pocket.

3. A sheet delivery mechanism having two receiving pockets in series, a delivery chain travelling above said pockets and adapted to advance sheets in a continuous stream, tail-edge grippers at each pocket, a separate tail-edge gripper operating train at each pocket operating normally automatically to raise said tail-edge grippers in unison, close them on a sheet as its tail-edge passes the tail-edge gripper station, withdraw said sheet and deposit it in a pocket, and mechanism operating automatically through said tail-edge gripper operating train at the first pocket for delaying the closing of the tail-edge grippers at said pocket, relative to the time of said closing at the second pocket, at each second cycle of operations thereof whereby every other sheet passes the first pocket for withdrawal from the delivery chain and deposit in the second pocket at the next cycle of operations.

4. A sheet delivery mechanism according to claim 3 in which means is provided for disconnecting said automatic mechanism for delaying the closing of the tail-edge grippers at the first pocket at the will of the operator.

5. A sheet delivery mechanism having two receiving pockets in series, a sheet delivery chain moving forward continuously above said pockets, a plurality of sets of head-line grippers carried by said chain the spacing between sets being the same as to the head-line spacing of the sheets forwarded to said chain, a second chain above said pockets but below and moving in time relation with the delivery chain comprising spaced platforms so related to the head-line grippers that each sheet seized and advanced thereby is supported on a platform with its tail-edge lapping the rear edge of the platform, a set of tail-edge grippers at the rear portion end of each pocket, timing means for each of said sets of tail-edge grippers to cause them to rise in unison into position for simultaneously seizing the lapped tail-edges of the sheets as said tail-edges simultaneously reach the tail-edge gripper stations, seize said tail-edges and then descend to deposit the seized sheets in their respective pockets, means for momentarily loosening the clamp of said sets of head-line grippers on the sheets then above the pockets in time relation with the seizure of their tail-edges to permit withdrawal of said sheets from the delivery chain, and mechanism operating automatically at each second cycle of operations through said tail-edge gripper operating means at the first pocket for mistiming the closing of said grippers with relation to the arrival of the tail-edge of a sheet at the tail-edge gripper station, permitting the re-clamped head-line grippers to advance the missed sheet to the second pocket for deposit therein by the tail-edge grippers at that pocket at the next cycle of operations.

6. A sheet delivery mechanism according to claim 5 in which said means for momentarily loosening the head-line grippers comprises a cam block for each pocket set adjustably in the delivery frame in advance of said tail-edge grippers, and head-line gripper opening means on the advancing delivery chain associated with each set of head-line grippers to be actuated by each successive engagement with said cam blocks, and means for accommodating the effective length of each sheet supporting platform to the length of sheet forwarded to the delivery chain such that the tail-edge of any length will lap the rear edge of the platform.

7. A sheet delivery mechanism for printing presses delivering a single sheet at each cycle of operations having two receiving pockets in series, a sheet delivery chain provided with a plurality of sets of spaced head-line grippers moving forward continuously above said pockets the advance at each cycle being equal to the distance between pocket head line positions, means below said delivery chain and advancing at the same rate of speed for supporting the two sheets extending rearward from the two sets of head-line grippers successively arriving above said pockets, an independently controlled set of tail-edge grippers at the rear portion of each pocket, means for operating both sets normally to rise in unison into a position simultaneously to seize the tail-edges of said two sheets and then to descend to deposit

the sheets in said two pockets, means for momentarily relieving the clamping pressure of said head-line grippers as the tail-edges of said two sheets simultaneously reach the tail-edge gripper stations, and means operated by the machine for decommissioning said tail-edge grippers at the first pocket every other cycle, thereby causing a single sheet to be advanced to and to remain above the first pocket at one of each two successive cycles and causing a sheet to be advanced to each of said pockets and said sheets to be seized and simultaneously deposited by the normal operation of both sets of tail-edge grippers at the other of each two successive cycles, whereby each sheet deposited has the time of two cycles to settle and dry.

8. A sheet delivery mechanism according to claim 7 having means for adjusting the timing of the operation of the tail-edge grippers with relation to the passage past them of the head-line grippers for seizing the tail-edges of and depositing sheets of varying length.

9. A sheet delivery mechanism having two receiving pockets in series, a device for advancing a stream of sheets in a spaced series in a plane above said pockets, the head line spacing of the sheets being equal to the spacing of the sheet head line positions in the pockets, an independently controlled set of tail-edge grippers at each pocket, the grippers of both sets normally closing simultaneously once each cycle upon the arrival of the head line of a sheet above the header of either pocket, and mechanism actuated by the operator while the delivery mechanism is in operation for automatically, on alternate cycles, decommissioning the set of tail-edge grippers at the first pocket and then permitting their normal operation in unison with the set of tail-edge grippers at the second pocket.

10. A sheet delivery mechanism comprising two receiving pockets in series, a sheet delivery chain moving continuously above said pockets and arranged to pass them successively, means on said chain for connecting the head lines of each sheet to the chain and for passing a continuous stream of sheets over said pockets with their head lines spaced the same as their pocket head line positions, a set of independently controlled tail-edge grippers associated with each pocket for seizing the tail edge of a sheet on the delivery chain and depositing said sheet in a pocket, means for simultaneously releasing the devices for connecting the sheets to the delivery chain when pairs of said devices simultaneously reach a position above the head line stations of the pockets, said sets of tail-edge grippers normally closing simultaneously upon the release of said devices, and means actuated by the operator and thereafter operated by the machine for causing said tail-edge grippers at the first pocket to miss gripping every second sheet of the advancing stream of sheets whereby alternate sheets thereof are deposited in different pockets.

JAMES A. SINCLAIR.

CERTIFICATE OF CORRECTION.

Patent No. 2,125,467. August 2, 1938.

JAMES A. SINCLAIR.

It is hereby certified that error appears in the printed specification of the above numbered patent requiring correction as follows: Page 3, first column, line 20, for the words "feed and sheet" read sheet feed and; page 6, second column, line 40, for "thrown" read thereon; and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 30th day of August, A. D. 1938.

Henry Van Arsdale

(Seal) Acting Commissioner of Patents.

the sheets in said two pockets, means for momentarily relieving the clamping pressure of said head-line grippers as the tail-edges of said two sheets simultaneously reach the tail-edge gripper stations, and means operated by the machine for decommissioning said tail-edge grippers at the first pocket every other cycle, thereby causing a single sheet to be advanced to and to remain above the first pocket at one of each two successive cycles and causing a sheet to be advanced to each of said pockets and said sheets to be seized and simultaneously deposited by the normal operation of both sets of tail-edge grippers at the other of each two successive cycles, whereby each sheet deposited has the time of two cycles to settle and dry.

8. A sheet delivery mechanism according to claim 7 having means for adjusting the timing of the operation of the tail-edge grippers with relation to the passage past them of the head-line grippers for seizing the tail-edges of and depositing sheets of varying length.

9. A sheet delivery mechanism having two receiving pockets in series, a device for advancing a stream of sheets in a spaced series in a plane above said pockets, the head line spacing of the sheets being equal to the spacing of the sheet head line positions in the pockets, an independently controlled set of tail-edge grippers at each pocket, the grippers of both sets normally closing simultaneously once each cycle upon the arrival of the head line of a sheet above the header of either pocket, and mechanism actuated by the operator while the delivery mechanism is in operation for automatically, on alternate cycles, decommissioning the set of tail-edge grippers at the first pocket and then permitting their normal operation in unison with the set of tail-edge grippers at the second pocket.

10. A sheet delivery mechanism comprising two receiving pockets in series, a sheet delivery chain moving continuously above said pockets and arranged to pass them successively, means on said chain for connecting the head lines of each sheet to the chain and for passing a continuous stream of sheets over said pockets with their head lines spaced the same as their pocket head line positions, a set of independently controlled tail-edge grippers associated with each pocket for seizing the tail edge of a sheet on the delivery chain and depositing said sheet in a pocket, means for simultaneously releasing the devices for connecting the sheets to the delivery chain when pairs of said devices simultaneously reach a position above the head line stations of the pockets, said sets of tail-edge grippers normally closing simultaneously upon the release of said devices, and means actuated by the operator and thereafter operated by the machine for causing said tail-edge grippers at the first pocket to miss gripping every second sheet of the advancing stream of sheets whereby alternate sheets thereof are deposited in different pockets.

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