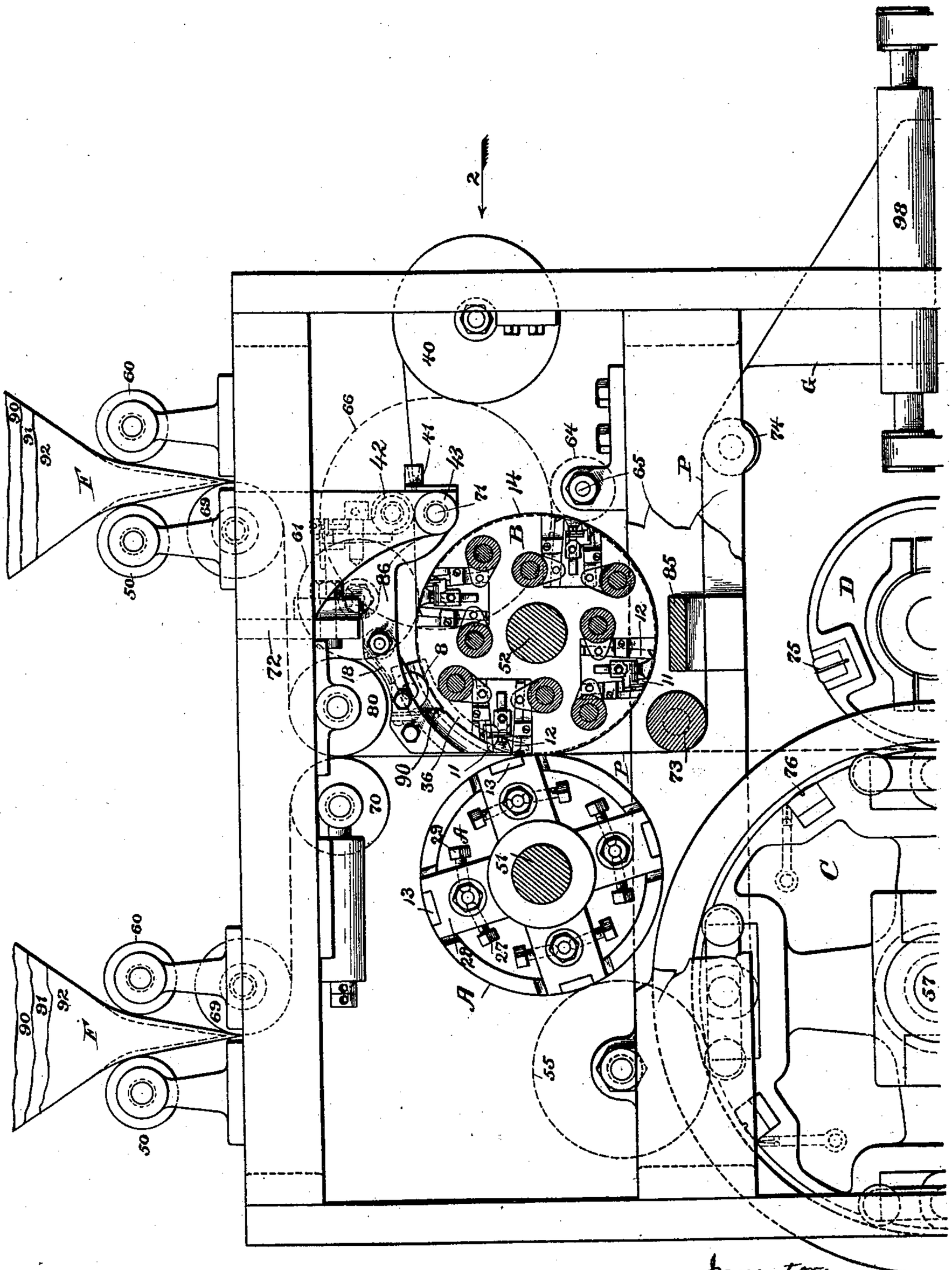
No. 615,258. Patented Dec. 6, 1898.

L. C. CROWELL.

STAPLE BINDING DELIVERY MECHANISM FOR PRINTING MACHINES.

(Application filed Dec. 31, 1897.)

(No Model.) 5 Sheets—Sheet 1.



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(No Model.) 5 Sheets—Sheet 2.

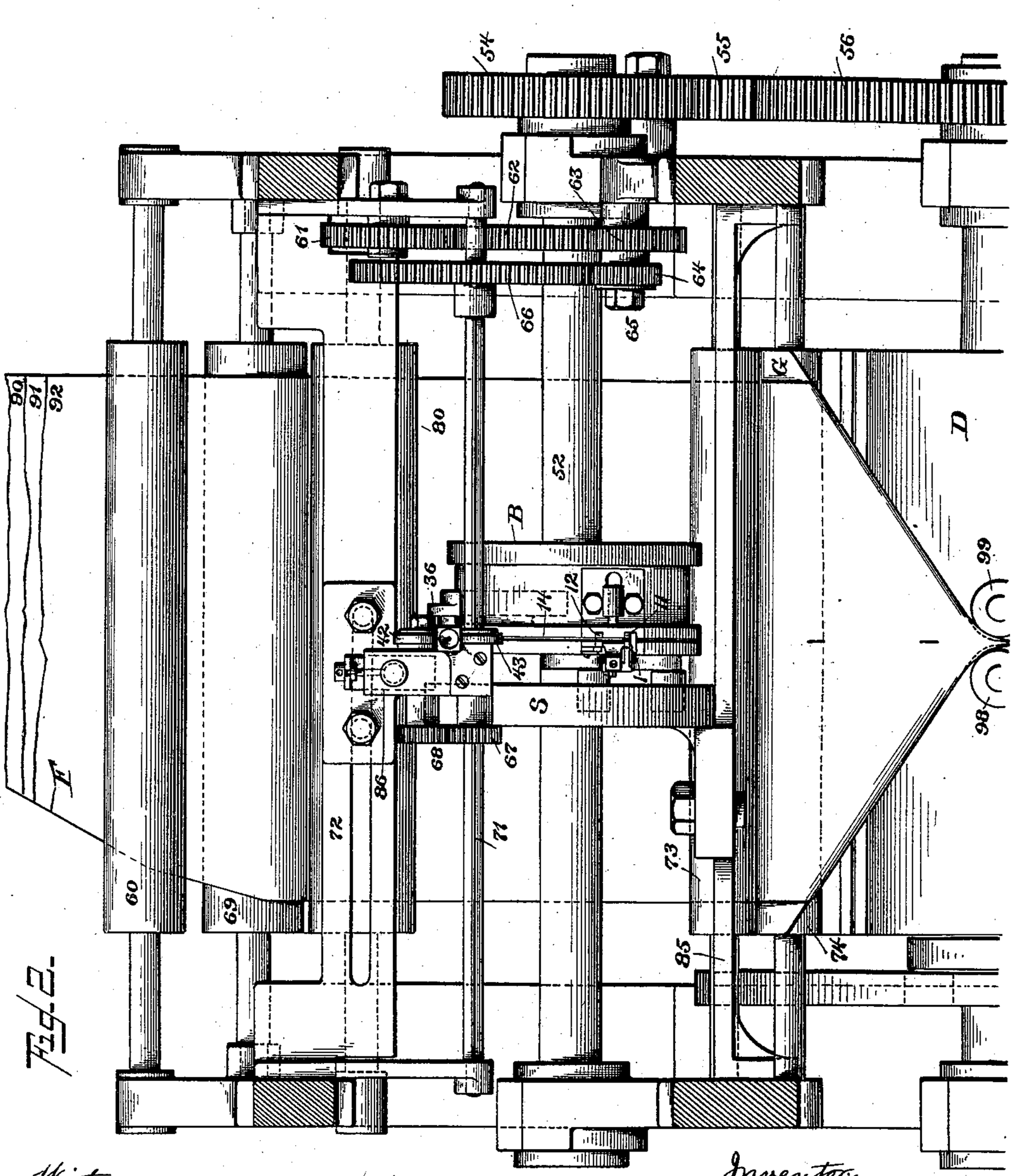

Fig. 2.

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(No Model.) 5 Sheets—Sheet 3.

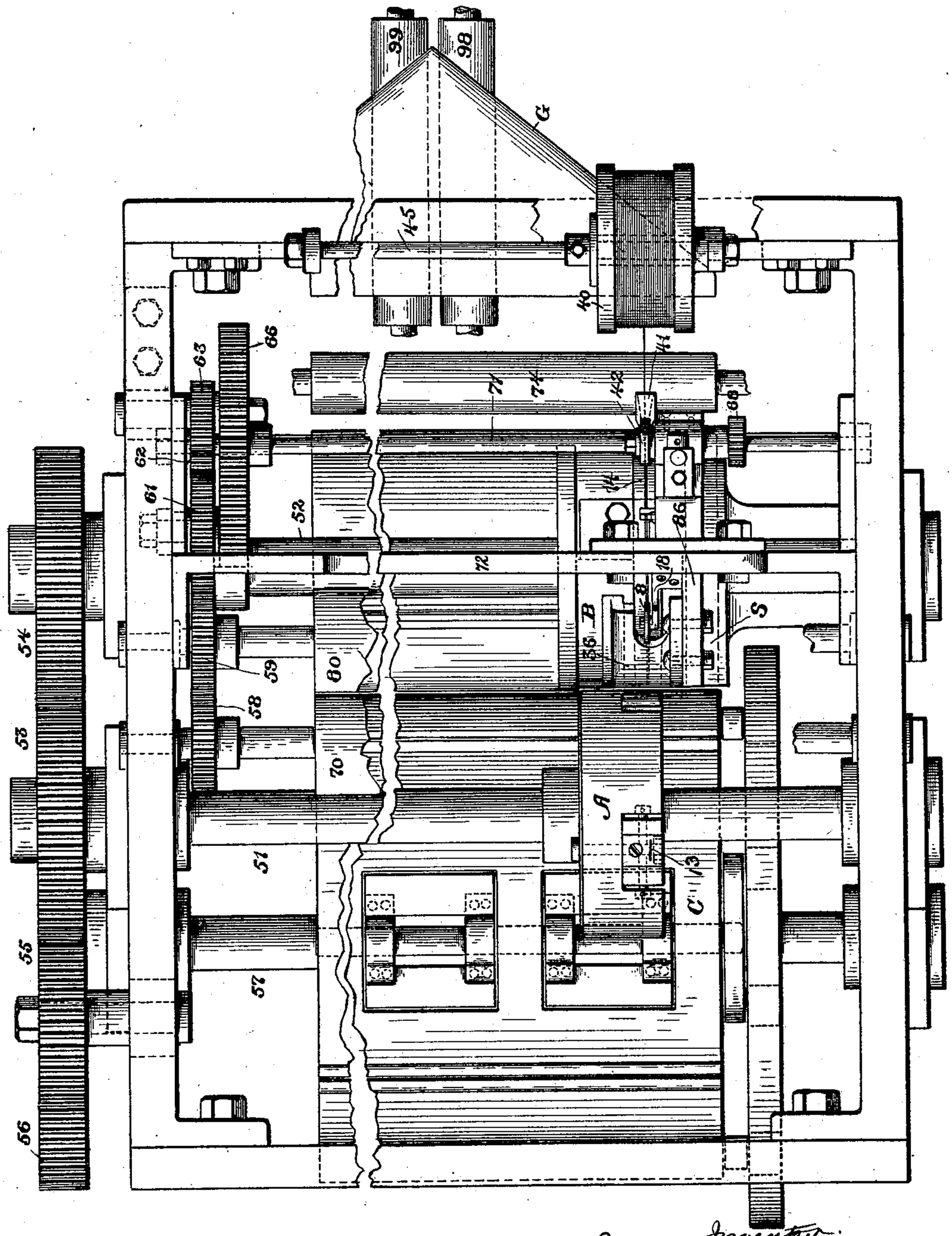

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Fig. 3.

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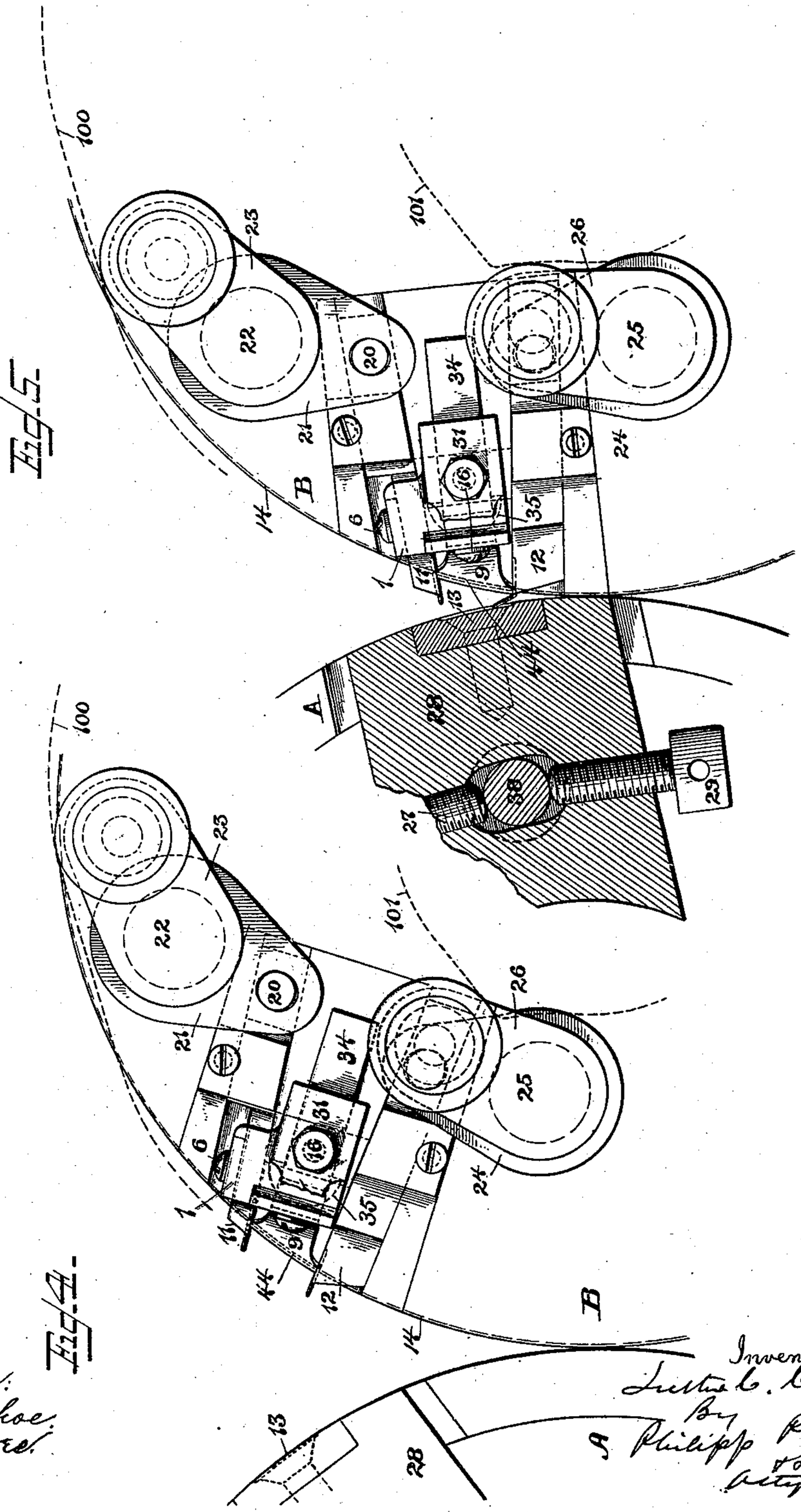
STAPLE BINDING DELIVERY MECHANISM FOR PRINTING MACHINES.

(Application filed Dec. 31, 1897.)

(No Model.) 5 Sheets—Sheet 4.



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No. 615,258. Patented Dec. 6, 1898.

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STAPLE BINDING DELIVERY MECHANISM FOR PRINTING MACHINES.

(Application filed Dec. 31, 1897.)

(No Model.) 5 Sheets—Sheet 5.

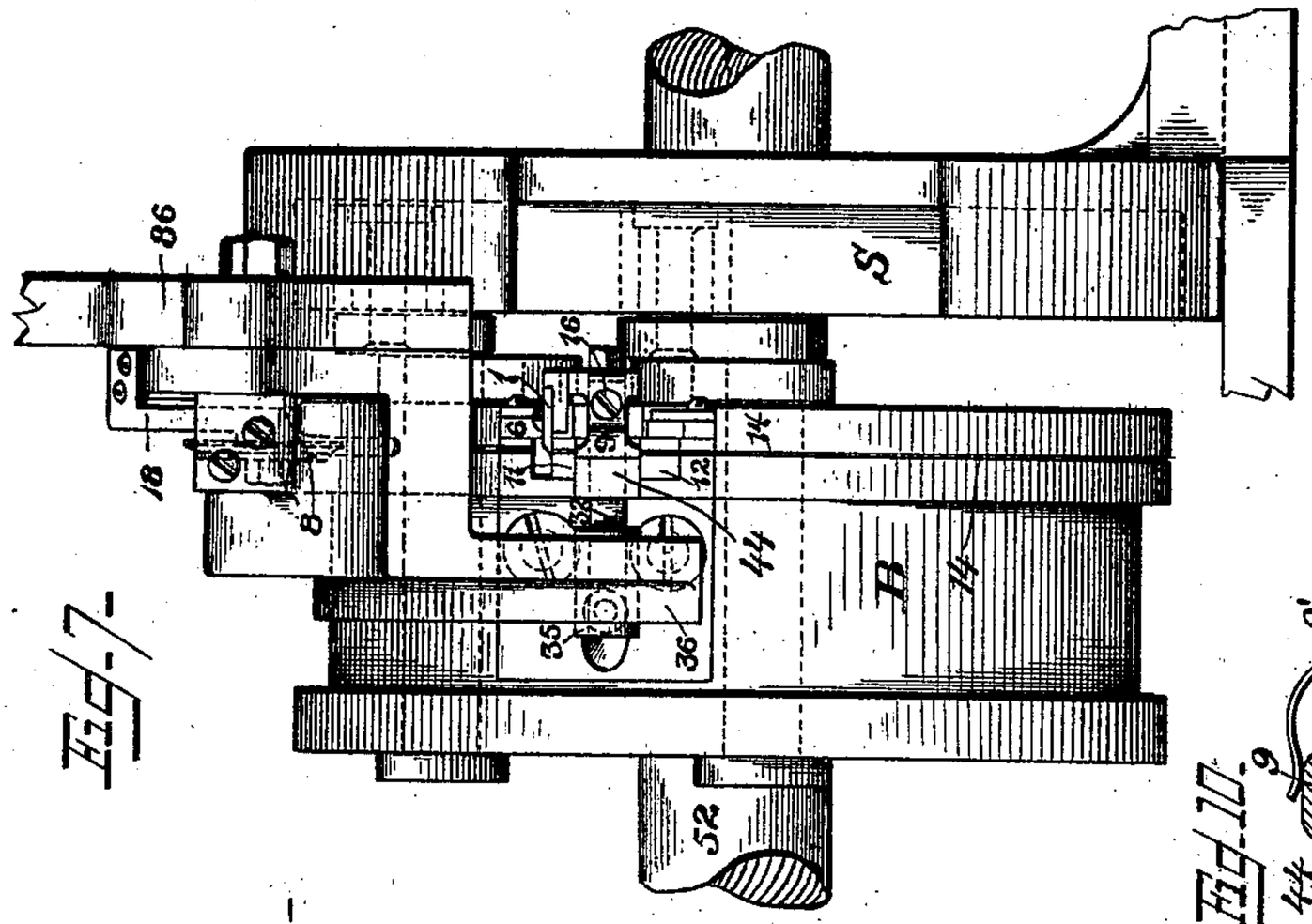

Fig. 7.

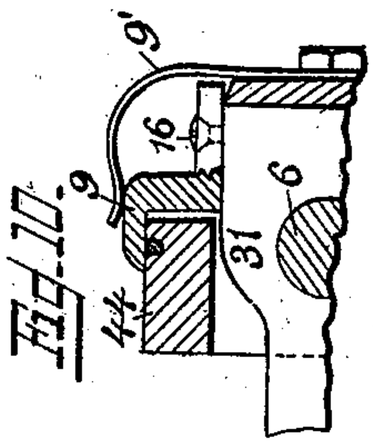

Fig. 10.

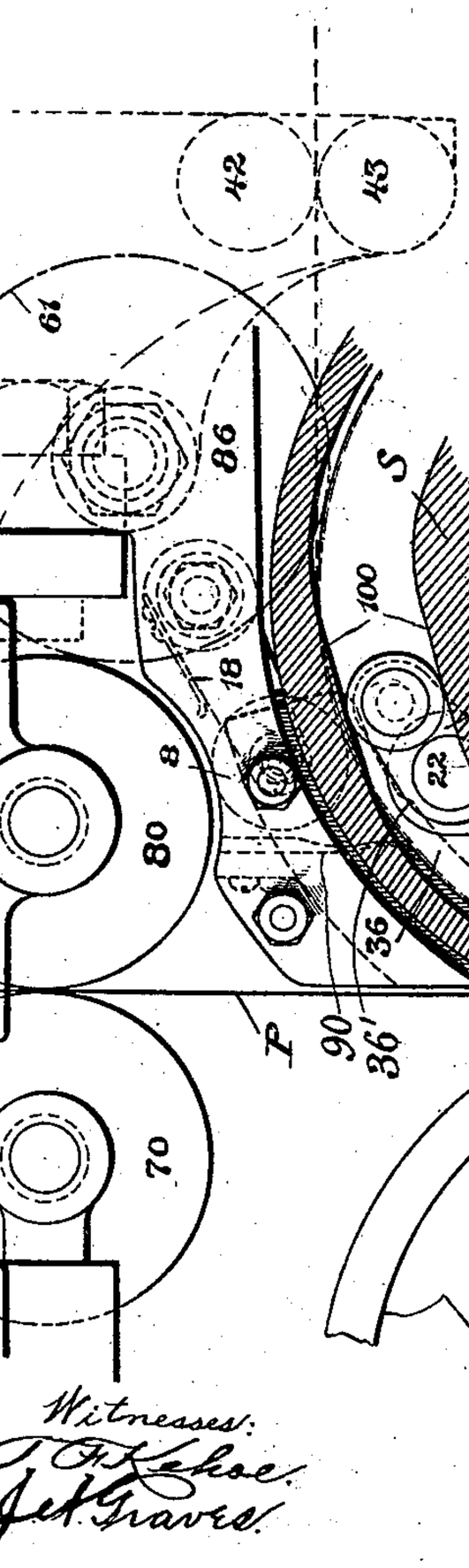

Fig. 6.

Fig. 8.

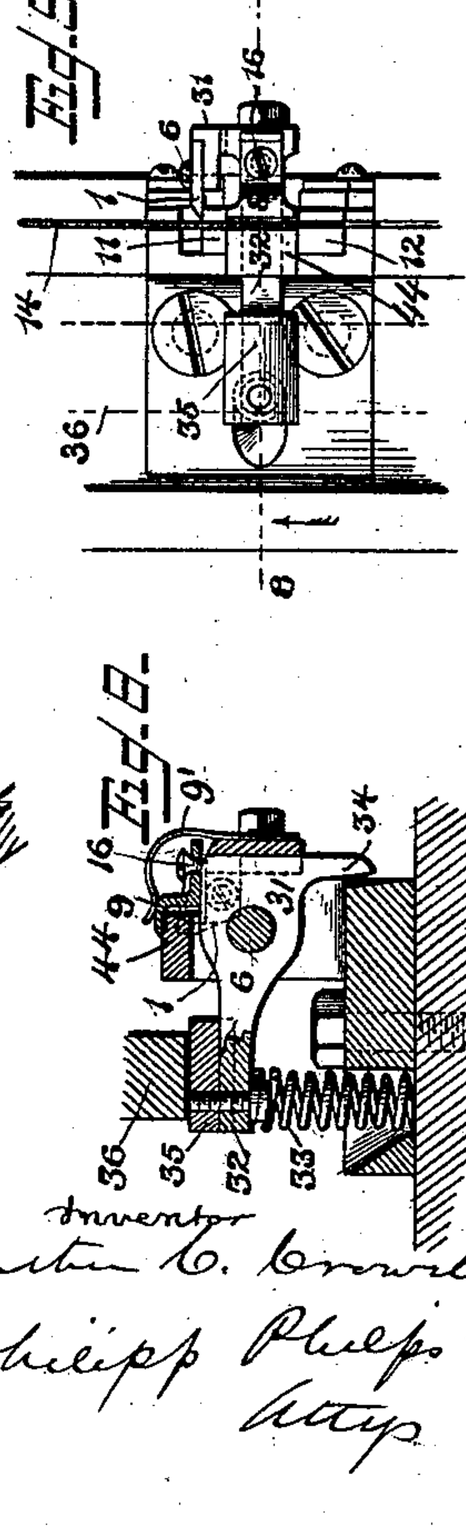

Fig. 9.

Fig. 5.

Witnesses:
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UNITED STATES PATENT OFFICE.

LUTHER C. CROWELL, OF NEW YORK, N. Y., ASSIGNOR TO ROBERT HOE, THEODORE H. MEAD, AND CHARLES W. CARPENTER, OF SAME PLACE.

STAPLE-BINDING DELIVERY MECHANISM FOR PRINTING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 615,258, dated December 6, 1898.

Application filed December 31, 1897. Serial No. 665,170. (No model.)

To all whom it may concern:

Be it known that I, LUTHER C. CROWELL, a citizen of the United States, residing at New York, (Brooklyn,) county of Kings, and State of New York, have invented certain new and useful Improvements in Staple-Binding Delivery Mechanism for Printing-Machines, fully described and represented in the following specification and the accompanying drawings, forming a part of the same.

The present improvements relate to that class of stapling apparatus embraced in Patent No. 510,528, whose mechanisms in the operation of forming a staple, transferring it to the setting-point, and inserting it in the material are performed by movements which are rotative in character, whereby the same is especially adapted for use as a part of the delivery apparatus of a web-printing machine, whose movements are likewise rotary, and whereby the printed product is delivered with great rapidity, having its binding-line secured by clenched staples, and it more especially relates to that class of such stapling mechanisms whereby the staple is set longitudinally in the product or parallel with the run of the material, an example of which longitudinal stapling mechanism is shown and described in Patents Nos. 510,841 and 510,842.

A practical embodiment of the said improvements is illustrated by the accompanying drawings, in which—

Figure 1 represents an end elevation, as seen in the direction of the arrow 1 of Fig. 2, of so much of a delivery apparatus of a web-printing machine as is necessary to illustrate the relation of the stapling apparatus thereto, an outside cam being removed and some of the parts being shown in section. Fig. 2 is an elevation of the same as seen looking in the direction of the arrow 2 in Fig. 1, one side frame and the wire-spool being omitted, so as to illustrate other parts more perspicuously. Fig. 3 is a plan view of the same, but showing the stapling mechanisms adjusted in positions differing from the illustrations in Figs. 1 and 2. Figs. 4 and 5 are enlarged partial views of the rotative carriers supporting the stapling mechanisms, Fig. 4 representing the mechanism as the staple approaches the setting-point, and Fig. 5 when the same is nearer to the setting-point, with one leg of the staple partially clenched. Fig. 6 is an enlarged view of the same parts, the outside cams being in section, to which are added the fold-laying rollers of a longitudinal folding mechanism. Fig. 7 is a side elevation of the carrier B and parts associated therewith as seen looking in the direction of the arrow 7 in Fig. 6. Fig. 8 is a sectional elevation, and Fig. 9 a plan view, of the wire-cutting mechanism. Fig. 10 is a view, on an enlarged scale, of a portion of Fig. 8 made expressly for the purpose of showing the wire-holding groove and the wire in it.

That a ready understanding of this invention may be had a preliminary and general description of the delivery apparatus to which this stapling mechanism is attached will first be given. The primary part of this delivery apparatus consists of longitudinal folders, which may be of any construction, preferably substantially like that described in Letters Patent No. 331,280, and here represented by the lower parts of their "internal guides" or "formers" F, their external turners in the form of guide-rollers 50 60, and fold-laying devices in the form of a single roller, as 69. Two such primary longitudinal folders are shown, and they are arranged to have their products conveyed to the stapling mechanisms by means of delivery-rollers 70 80, one, 70, of which is spring-seated, the pair thus becoming drawing-rollers for advancing the material. It will be understood that either one of said longitudinal folders may be separately used, that only one need be provided, and that the material to be stapled may be delivered to the stapling mechanisms from any other mechanisms and in the form of webs or sheets; but the embodiment of longitudinal folders shown is selected as a good exemplification of the present improvements. Beneath the said delivery-rollers the rotative carriers A B, which support the stapling-tools, are mounted to revolve in suitable bearings, and below the said carriers, in like manner mounted in bearings, are rotating carriers C D, provided with cutting and folding mechanisms of the general construction and operation shown and described in the first-named patent, and at one side of the apparatus an ad-

ditional or secondary longitudinal folder is shown. Its structure is the same as that of the primary longitudinal folders, although only the internal guide or former G and external turners 98 99 are shown.

The shafts 51 52 of the carriers A B are geared together by wheels 53 54 of equal size, the wheel 53 being driven through an intermediate 55 from a wheel 56 on the shaft 57 of the carrier C, which wheel 56 will be driven by gearing connecting with that of the printing-machine, so that the mechanisms of this delivery apparatus may move concertedly with those of said printing-machine. The shafts of the delivery-rollers 70 80 are geared together by pinions 58 59, the latter being driven by an intermediate 61, which engages a wheel 62 on the shaft 52 within the side frame, the wheel 62 also driving, through companion intermediates 63 64, mounted on a stud 65, carried by a bracket, a wheel 66, fast on the shaft 71. The wire-feeding mechanism is arranged to be adjustable horizontally on this shaft 71 and a slotted bracket 72, and the wire-feeding rollers thereof are geared together and driven concertedly by pinions 67 68, the lower pinion 67 of the pair being splined on said shaft 71. It should also be preliminarily understood that the material or paper P to be operated upon is, in passing through the longitudinal folding apparatus, doubled or folded longitudinally as it emerges therefrom, and thence it passes through the rollers 70 80 and between the carriers A B. This product, consisting of any number of plies from any source, has in the construction illustrated three plies 90 91 92 from each of the longitudinal folders shown or six plies from the two longitudinal folders shown and is to be bound together by means of staples set longitudinally in it while it is passing between the carriers A B and the stapling mechanisms which they support. This stapled material in passing between the carriers C D, as indicated in dotted lines in Fig. 1, is cut transversely into suitable sheets or lengths, and the same is folded transversely to reduce its size into proper handling or packaging dimensions by the mechanisms supported by said carriers C D. Instead of passing between the carriers C D the stapled material or paper P may be diverted in its course by means of rollers 73 74, whereby it is fed outward and from which it is led over the internal guide or former G of a longitudinal folding mechanism, by which it will be again folded longitudinally and on the stapled line.

The material to be operated upon is supposed to be composed of many plies, (indicated in the drawings by the webs 90 91 92,) which in passing over the longitudinal folders will be folded longitudinally one within the other, and two longitudinally-folded packs of these plies are brought together at the rollers 70 80, the same requiring to be fastened together to retain them in this association, in which case their doubled edges will be secured by staples passing through all of the plies near such doubled edge if the stapling mechanisms are arranged as is shown in Fig. 3; but it is to be understood that this binding-line may be the edges of several webs formed by slitting said webs as they pass over the said longitudinal folder or be the product of several longitudinal folders having doubled or cut edges or be associated plies from any other web or sheet associating mechanism.

The mechanisms for performing the stapling operations will now be specifically described.

It will be observed from an inspection of the drawings that the carriers A B are provided with four sets of stapling mechanisms. (See Fig. 1.) This is for the reason that since the staples are set longitudinally or parallel with the run of the material they must be inserted therein in close proximity, so as to form a continuous longitudinal seam, (see Fig. 2,) and while four sets are shown three, or even two, might suffice, or five or any other number be used, according to their nearness to each other desired as fastening-points for the material, and while only one of these duplicated mechanisms will be specifically described it is to be understood that this description applies equally to all, although for convenience the singular number will be used in said description.

The carrier B supports the wire receiving, holding, wire-cutting, staple forming, and setting mechanisms or devices, while the carrier A supports the staple-leg-clenching devices, and as the stapling mechanisms operate to provide the material with staples as a binding means on a line to constitute a longitudinal seam said mechanisms and the carriers therefor are preferably made only wide enough to constitute supports for said mechanisms; but, if desired, said carriers may be made wide enough to afford support for the passing material throughout a considerable portion of its widthwise dimensions, although this is not requisite. On the contrary, it is most desirable to have the carriers narrow and adjustable longitudinally on their carrying-shafts, so that said longitudinal binding-seam may be made in a longitudinal line in any position desired relative to the widthwise dimensions of the passing material; and, again, as it is preferable many times to form said longitudinal binding-seam adjacent to the fold or edge nearest the observer in Fig. 1 the operation will now be described generally without regard to the adjustability of the stapling mechanisms, which will hereinafter be more fully referred to.

The wire from which the staples are to be formed is drawn from a reel, as 40, has its end passed through a guide 41, and entered between the wire-feeding rollers 42 43, by which it is regularly fed forward at a suitable speed to protrude a length of wire in the path of the stapling mechanisms in the proper fraction of the time occupied by one revolu-

tion of the carrier A—in this instance one-fourth. In thus being carried to the stapling mechanisms it is in the construction shown directed so as to lie in a guiding-channel 14, with which the carrier B is provided in its periphery, and when laid in and guided by this channel 14 the forward end of said wire will be controlled in position by means of the laying or pressure wheel 8, which is slightly pressed to this duty by a leaf-spring 18, which constantly presses it lightly downward.

Each set of the stapling mechanisms supported by the carrier B consists of arms 11 and 12, supported to slide in suitable guide-ways formed in the carrier B, so that said arms may be periodically protruded from and be moved within the periphery of said carrier. These arms are supported in said carrier a distance apart equal to the length of the crown of each staple, and that portion 44 of the channel 14 which intervenes between the guideways for these arms becomes, as will presently appear, the setting-bed or driver for the staple.

The stock of the arm 11 is secured by a pin 20 to a rock-arm 21, fast on a stud 22, which is mounted so as to revolve freely in the carrier B, which arm 21 is rocked at suitable intervals to move the arm 11 by means of a rock-arm 23, attached to said stud 22 and appropriately moved by the driving-face of a cam-slot 100 in the cam S, and the arm 12 is likewise pinned to a rock-arm 24, splined to a shaft 25, which latter is vibrated by a rock-arm 26, that is suitably moved by a slot 101 in said cam S, this cam S being secured in front of the carrier B, as is shown in Fig. 2, the said cam being shown in partial section in Fig. 6, in elevation in Figs. 2 and 7, and in plan in Fig. 3. Between the said arms 11 12 a clamping-jaw 9, which is shown herein as reinforced by spring 9′, is pivoted so as to swing laterally with respect thereto and press the wire into the said setting-bed or driver 44 and clamp the same therein, said jaw 9 being adjustably secured by the screw 16 to a bracket 31, through which passes the pivot 6, by which said jaw 9 and the other parts carried by the bracket 31 are pivoted to swing in the carrier B. The arms 11 12 have facial grooves (see Fig. 9) in continuation of the channel 14 to admit of the passage of the wire. The bracket 31 also carries a cutter 1, (see Figs. 7 and 9,) the cutting edge of which moves in shearing contact with the outer surface of the arm 11, so as to coöperate therewith or with the slight groove therein in severing the wire.

The swinging or vibrating movements of the bracket 31 and the tools which it carries are accomplished by means of a rock-arm 32, which rock-arm is provided at its free end with a spring 33, which constantly presses it upward, and thus throws said tools outward or out of their active position, said arm also being provided with a stop 34, which limits such movement. The movement of the bracket 31 and the tools it carries through the arm 32 is accomplished in the opposite direction by means of a shoe 35, attached to the arm 32 and having a curved upper or bearing surface that makes contact with the raised portion 36′ of the under surface of a curved arm or horn 36, fixedly placed upon the frame to overhang the carrier B and along the curved pathway of which the shoe 35 travels. After the wire is severed the free end of the main portion of the wire is held down in the groove by the pressure of the roller 8, while the rear end of the severed portion of the wire is held down by the pressure of the spring 90.

The carrier A is provided with setting or clenching dies 13, corresponding in number with the stapling mechanisms supported by the carrier B, and each of these clenching-dies has a stem by which it is secured in a stock 28. This stock 28 has at its inner end a curved seat by which it rests upon the hub of the carrier A and is provided with a central elongated recess, (see Fig. 5,) through which passes its holding-bolt 38, set fast in in the carrier. This stock 28 is pierced laterally by screw-sockets, in which set-screws 27 29 are provided. By this construction the stock 28, and with it the setting-die 13, may be adjusted circumferentially and a nice adjustment of the setting-die with respect to the staple-presenting devices is attained. This is an important improvement, for the reason that the wire used in making the staples may vary in size or hardness, and thus require fine adjustment in order that the setting-die may properly act in projecting and bending down the legs of the staple. Of course the clenching-die may be stationary, as provided in Patent No. 510,840.

Inasmuch as the wire used in the stapling operation is very small and has little resisting strength, it is desirable that it should be supported until it penetrates the paper. This is done without difficulty in those cases where the staple is presented with both its legs in the same horizontal plane; but in the present case, where the two legs are in the same vertical plane, the crown of the staple lying in the direction of the longitudinal novement of the webs being stapled, it is more difficult, since in order to accomplish this result the two legs must have separate and independent supports, which are withdrawn at different times to permit the successive complete entry of each of the two legs of the staple in the material being stapled. In my Patent No. 510,842 I have shown a mechanism for setting staples in this manner in which the staple-support consists of two swinging members. These members are moved from the same shaft; but one of them is attached to the shaft through a spring, and therefore can move to a certain extent independently of the other member. Thus as the advanced leg of the staple is driven the spring-pressed member of the staple-support

moves backward under the push of the carrier which supports the clenching-die, and the member supporting the rear staple-leg remains in its supporting position until its leg is properly inserted. My present invention supplies an improvement to this mechanism in that both members of the staple-support are given a positive motion in each direction independently of each other, which is more satisfactory than movement derived from the clenching-die carrier. This arrangement has the further advantage that the parts which bend and support the staple-legs, since they slide instead of swinging, may be caused to move in directions angular to each other, so as to cause the staple-legs to be inclined toward each other—that is, beyond a position of parallelism—before they pass into the material being stapled. In this manner both legs of the staple may be given a greater initial bending preliminary to insertion into the material being stapled than is possible in the use of the device of my said patent, and their final clenching by the clenching-die will be more certain and perfect than it would be if the legs were pressed down from a position of parallelism solely by the operation of the clenching-die. The sliding, bending, and supporting arms also have an advantage over the swinging arms in that a sliding arm may be given more readily any desired direction of movement than a swinging arm.

The stapling operation is as follows: The wire from the reel 40 is constantly fed onward by the feeding-rolls 42 43 at such a speed as to protrude into the channel 14 of the carrier B a length of wire sufficient for the formation of a single staple during the period of time elapsing between successive stapling operations. In this case the feeding-rolls 42 43 are driven at a surface speed sufficient to furnish the required amount of wire in one-fourth of a revolution of the carrier B, for the reason that said carrier is provided with four sets of stapling mechanisms in the circumference thereof. When each of these stapling mechanisms is carried to the point where it is brought into contact with the wire, the wire guided by the channel 14 and held by the pressing-wheel 8 will be engaged by said mechanism and lie in the slight grooves of the arm 12 11 and setting-bed 44 between them, the cutter 1 and clamping-jaw 9 then standing in their outward or open positions, as in Fig. 9. When the proper point has been reached in the revolution of the carrier, the forward end of the wire being in proper relation to the stapling mechanism, the shoe 35 of the arm 32, which has in its circular travel come into contact with the under or operating face of the horn 36, is depressed thereby, thus simultaneously rocking the clamping-jaw 9 down onto the wire lying in the arms 12 11 and setting-bed 44, as in Fig. 8, and forcing the cutter 1 into contact with said wire, which, in connection with the arm 11, severs a wire length therefrom. The stapling-tools, with the clamping-jaw 9, holding said detached wire length by pressing the same onto the setting-bed, now travel onward in their rotative movement toward the setting-point, which is at or near the place where the carriers A B most nearly approach each other, and while thus moving from the point where the wire length was detached to the setting-point the following operation will take place, caused by the cam S: The arms 11 12 will be moved outward by the operation, respectively, of the rock-arms 23 26, as in Fig. 4, which movements may be simultaneous, nearly so, or successive, thus operating to bend the ends of the wire lengths at angles to the crown, the jaw 9 operating as a bending-anvil, and the inclination heretofore described of these legs will thus be imparted to them, said legs then being sustained by lying in slight grooves in the inside faces of the arms 11 12, as is well understood in this art. As the setting-point is being approached the arm 12 by the shape of the cam 101 will be withdrawn, so as not to protrude beyond the periphery of the carrier B, as shown in Fig. 5, and the staple-leg, which the arm 12 and the jaw 9 then supports, will be carried into contact with a setting-die 13, and by the rolling pressure caused by the nearer approach of the carriers A B said leg will be bent downward toward the crown of the staple, as in Fig. 5, and when the staple-leg supported by the jaw 9 and the arm 11 is by the further movement of the carriers brought into contact with said setting-die and by the rolling contact and nearer approach of the said carriers A B this leg is bent toward its ultimate clenched position said arm 11 will be retracted or drawn within the carrier B by the operation of the cam 100, and as soon as or after the staple-legs are in contact with the setting-die according to the construction of the parts the shoe 35 will leave the horn 36, and thus relieve the clamping-jaw and cutter, so that the same may be retracted by the action of the spring 33. As the carriers A B continue to move and carry the stapling mechanisms beyond the clenching-point, the staple will have been completely clenched, its crown lying on one side and its legs on the other side of the material operated upon, which thus fastened together by the staple will be carried onward for delivery to the mechanisms which are to subsequently operate upon it, and each succeeding stapling mechanism will in like manner operate to form a staple, carry it to the setting-point, and set and clench the same in the material, thus successive staples being formed and set in the material operated upon and binding it together with a continuous longitudinal seam.

Where the product consists of a large number of leaves or sheets or packs of folded material bound together on their outer edge, (that edge nearest to the observer in Fig. 1,) the same will be bound in book-like form and only require to be cut into suitable lengths and delivered. Of course these cutting mech-

anisms might be combined with the carriers A B; but as it is sometimes desirable to impart a further longitudinal fold to the stapled material before it is severed transversely it is preferable to provide a cutting mechanism separate from the carriers A B. In this instance such cutting mechanism is shown as provided in the carriers C D. These carriers C D are shown to be provided with cutting mechanisms constituted by cutting-knives 75 and cutting recesses or sockets 76, by which the passing material will be severed transversely.

In addition to the cutting device with which the carriers C D are provided they may also carry folding mechanisms, by which the stapled product passing between them will be given a transverse fold. The subsequent longitudinal folding of the stapled material heretofore referred to is provided for herein by the secondary longitudinal folder represented herein by its internal guide or former G and external turners 98 99. This secondary folder may be made laterally adjustable to conform to any lateral adjustment of the stapling mechanism.

In order that the stapling mechanisms may coöperate with a subsequent longitudinal folder, as the secondary longitudinal folder described, or with primary longitudinal folders, or other web or sheet producing or delivering mechanism, the said stapling mechanisms are provided with means for their adjustment longitudinally with respect to said primary and secondary mechanisms. Thus the carriers A B are respectively secured to the shafts which revolve them by being splined thereon and provided with holding-screws to secure their position of adjustment on said shafts.

The cam S, by means of which the moving mechanisms in the carrier B are operated, has its bracket arranged to slide on or in a way in the cross-bar 85. The bracket 86, carrying the wire-guide 41 and feeding-rollers 42 43, is arranged to slide in the cross-bar 72, as is also the arm or horn 36, and the wire-spool 40 is likewise adjustable on its supporting-rod 45, all of these parts being capable of being secured in any position of their adjustment. When the stapling mechanism is arranged in the center, as is shown in Fig. 3, the compound product will be stapled centrally in its passage between the carriers A B, and thus stapled will pass under the roller 73, over the roller 74, and onward over the secondary longitudinal folder, by the operation of which it will be folded or doubled centrally on its longitudinal stapled line, and thus bound and folded it will be passed through a cutting mechanism for severing it transversely into suitable lengths, as before described, or it may pass between carriers, as C D, provided with both cutting and folding mechanisms, as will be readily understood. Of course a great variety of delivery mechanisms may be used for dealing with this stapled web, and according to its intended use it may be delivered in long lengths and rolled up or lapped in zigzag folds or be cut into short lengths, as may be desired.

A printing-machine has been referred to herein as a means for producing webs which are plicated by the longitudinal folder shown; but it is to be understood that the material to be bound together by a running line of staples may be fed to this stapling mechanism in any manner, and such material may be in the form of packs of sheets or webs suitably fed thereto by any mechanism suitable for the purpose, and said mechanism may be capacitated to associate the webs or sheets either with doubled or raw edges or in packs of either.

Carriers A B need not have a continuous surface, although that is a convenient form, especially where a multiplicity of stapling mechanisms are used, as herein. If carrier A is so made as only to amount to merely a carrier for the stapling mechanisms, a conductor-plate having a groove 14, extending between the feeding-rollers 42 43 and the wire-severing point, may be added, if found necessary.

What I claim is—

1. The combination of means for feeding plicated material onward past staple-inserting means, means for holding the staple in position to be driven, movable supports for each staple-leg while being driven, and means for positively advancing each support and withdrawing it independently of the other, substantially as described.

2. The combination of means for feeding plicated material onward past staple-inserting means, means for holding the staple in position to be driven with its crown lying in the direction of the run of the material being stapled, movable supports for each staple-leg, and means for advancing and withdrawing said supports, the means for withdrawing the support of the leading leg being so timed as to act before that for withdrawing the support of the rear leg, substantially as described.

3. The combination of means for feeding plicated material onward past staple-inserting means, means for holding the staple in position to be driven, movable sliding arms for supporting each staple-leg while being driven, and means for advancing and withdrawing each support independently of the other, substantially as described.

4. The combination of means for feeding plicated material onward past staple-inserting means, means for holding the staple in position to be driven with its crown lying in the direction of the run of the material being stapled, movable sliding arms for supporting each staple-leg while being driven, and means for advancing and withdrawing each support independently of the other, substantially as described.

5. The combination of means for feeding plicated material onward past staple-insert-

ing means, means for feeding, cutting and holding a staple length of wire, said wire lying in the direction of the run of the material being stapled, and means for bending over the ends of the wire length to form legs beyond a position of parallelism to each other before they are inserted, substantially as described.

6. The combination of means for feeding plicated material onward past staple-inserting means, means for feeding, cutting and holding a staple length of wire, said wire lying in the direction of the run of the material being stapled, means for bending over the ends of the wire length to form legs beyond a position of parallelism to each other before they are inserted, and means for clenching the staple upon the material being stapled, substantially as described.

7. The combination of means for feeding plicated material onward past staple-inserting means, means for feeding, cutting and holding a staple length of wire, said wire lying in the direction of the run of the material being stapled, and two sliding arms moving to bend over the ends of the wire length in directions inclined to each other, substantially as described.

8. The combination of a rotating carrier for stapling mechanism, means for holding the staple in position to be driven, movable supports for each staple-leg while being driven, and means for positively advancing each support and withdrawing it independently of the other, substantially as described.

9. The combination of a rotating carrier for stapling mechanism, means for holding the staple in position to be driven with its crown lying in the direction of the run of the material being stapled, movable supports for each staple-leg, and means for advancing and withdrawing said supports, the means for withdrawing the support of the leading leg being so timed as to act before that for withdrawing the support of the rear leg, substantially as described.

10. The combination of a rotating carrier for stapling mechanism, means for holding the staple in position to be driven, movable sliding arms for supporting each staple-leg while being driven, and means for advancing and withdrawing each support independently of the other, substantially as described.

11. The combination of a rotating carrier for stapling mechanism, means for holding the staple in position to be driven with its crown lying in the direction of the run of the material being stapled, movable sliding arms for supporting each staple-leg while being driven, and means for advancing and withdrawing each support independently of the other, substantially as described.

12. The combination of a rotating carrier for stapling mechanism, means for feeding, cutting and holding a staple length of wire, said wire lying in the direction of the run of the material being stapled, and means for bending over the ends of the wire length to form legs beyond a position of parallelism to each other before they are inserted, substantially as described.

13. The combination of a rotating carrier for stapling mechanism, means for feeding, cutting and holding a staple length of wire, said wire lying in the direction of the run of the material being stapled, and two sliding arms moving to bend over the ends of the wire length in directions inclined to each other, substantially as described.

14. The combination of a rotating carrier for stapling mechanism, means for feeding, cutting and holding a staple length of wire, and two sliding arms moving to bend over the ends of the wire length in directions inclined to each other, substantially as described.

15. The combination of the rotating carrier, the stock carried by the same, and seated upon its shaft, the clenching-die mounted in the stock, and means for accurately adjusting the stock, substantially as described.

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

LUTHER C. CROWELL.

Witnesses:
T. F. KEHOE,
G. M. BORST.