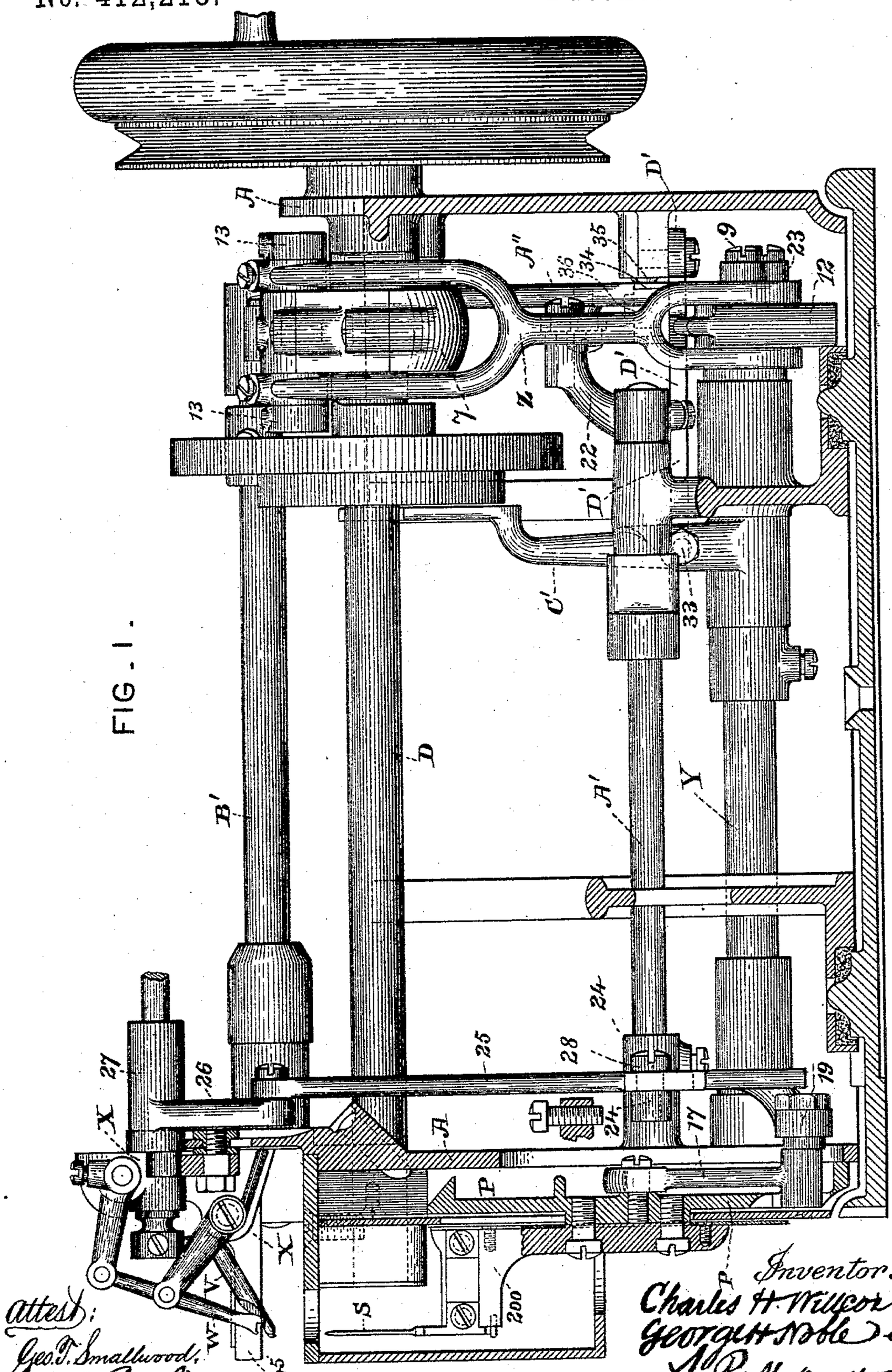
(No Model.) 4 Sheets—Sheet 1.

C. H. WILLCOX & G. H. NOBLE.

MACHINE FOR SEWING STRAW BRAID.

No. 412,218. Patented Oct. 1, 1889.

FIG. 1.



Attest:
Geo. T. Smallwood.
A. C. Rawlings.

Inventors:
Charles H. Willcox &
George H. Noble by
A. P. Ballor their atty

N. PETERS, Photo-Lithographer, Washington, D. C.

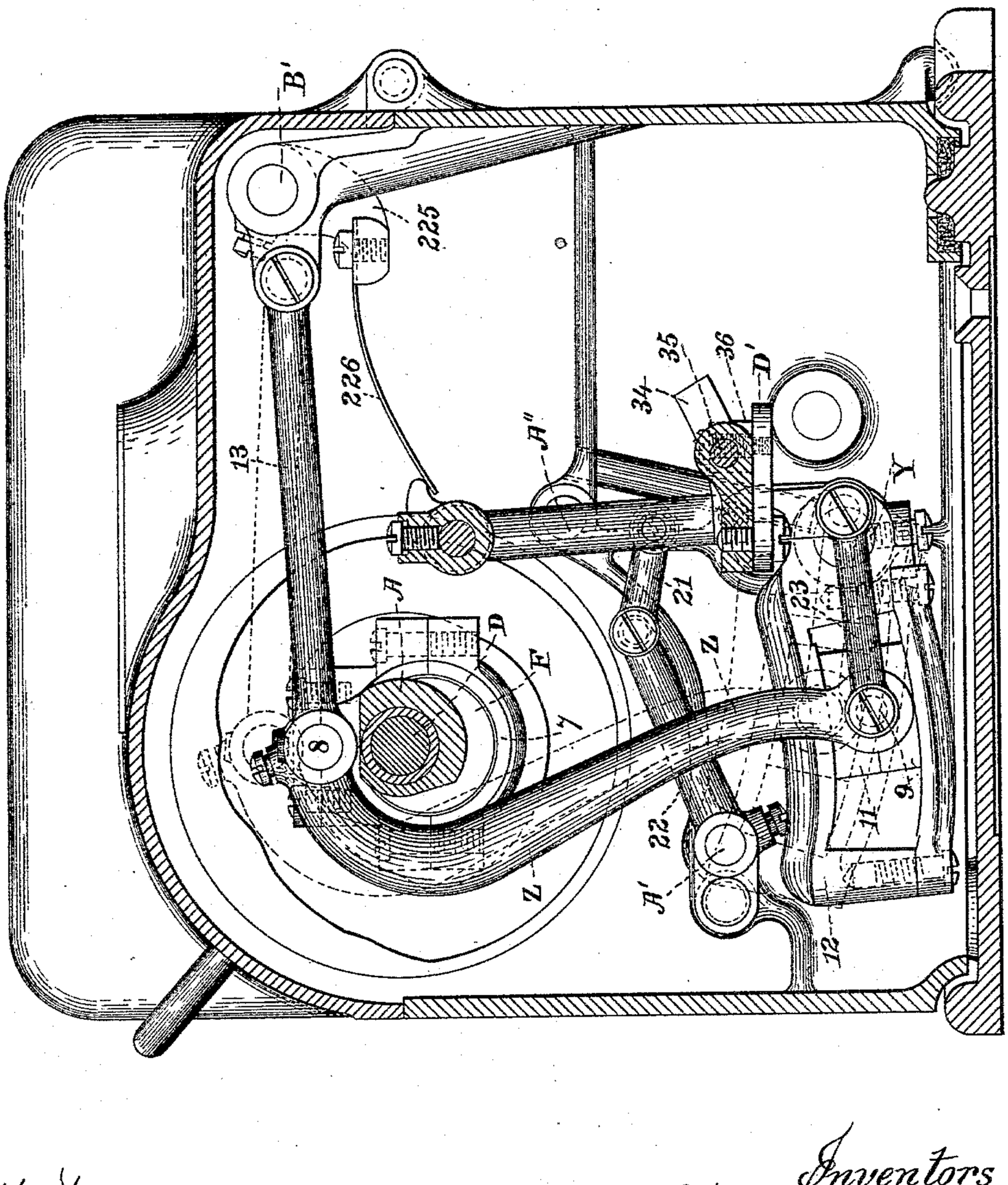
(No Model.) 4 Sheets—Sheet 2.

C. H. WILLCOX & G. H. NOBLE.

MACHINE FOR SEWING STRAW BRAID.

No. 412,218. Patented Oct. 1, 1889.

FIG. II.



Attest:
Geo. T. Smallwood.
A. C. Rawlings

Inventors
Charles H. Willcox &
George H. Noble by
A. Pollok
their attorney.

(No Model.) 4 Sheets—Sheet 3.

C. H. WILLCOX & G. H. NOBLE.

MACHINE FOR SEWING STRAW BRAID.

No. 412,218. Patented Oct. 1, 1889.

FIG. III.

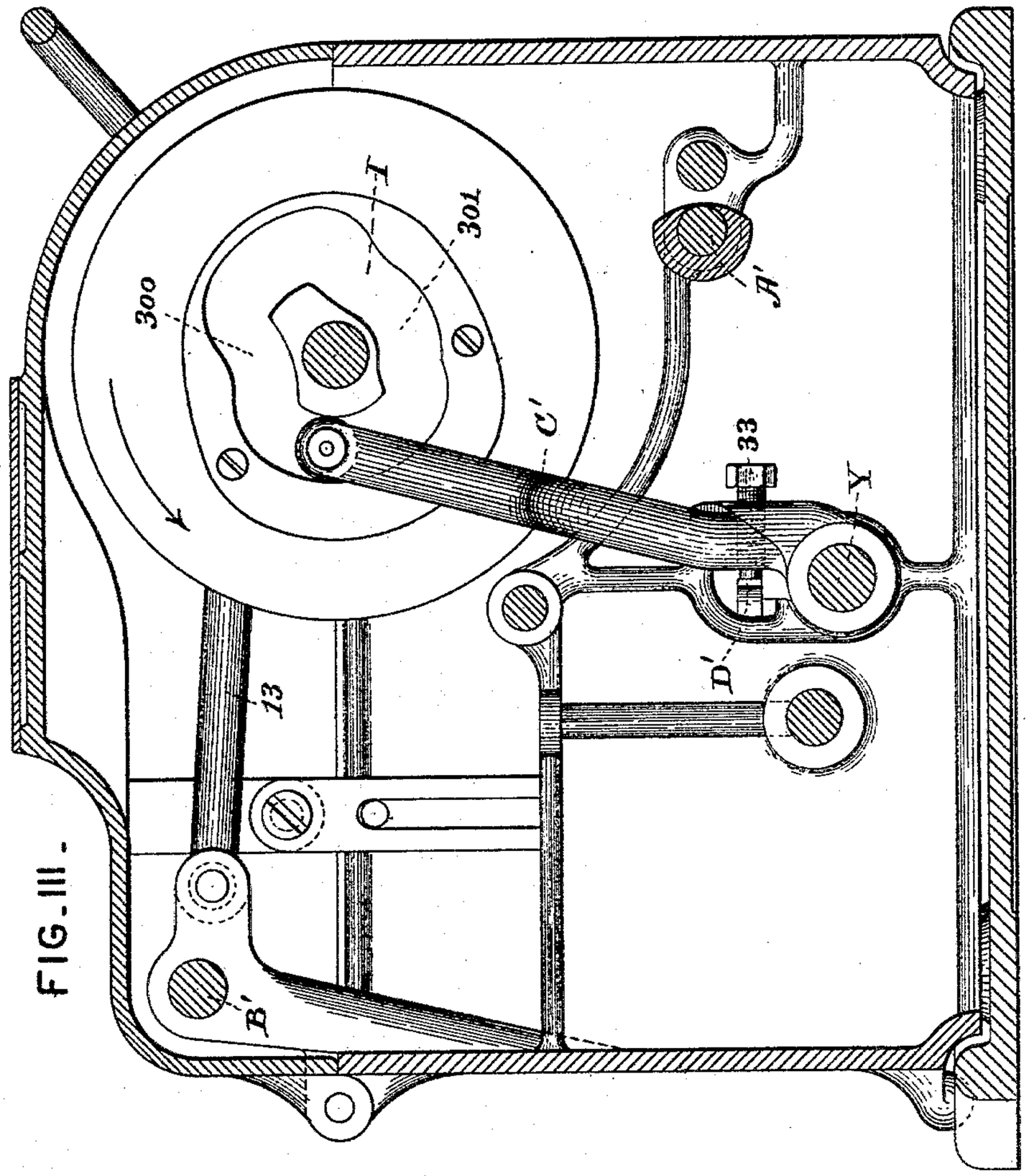
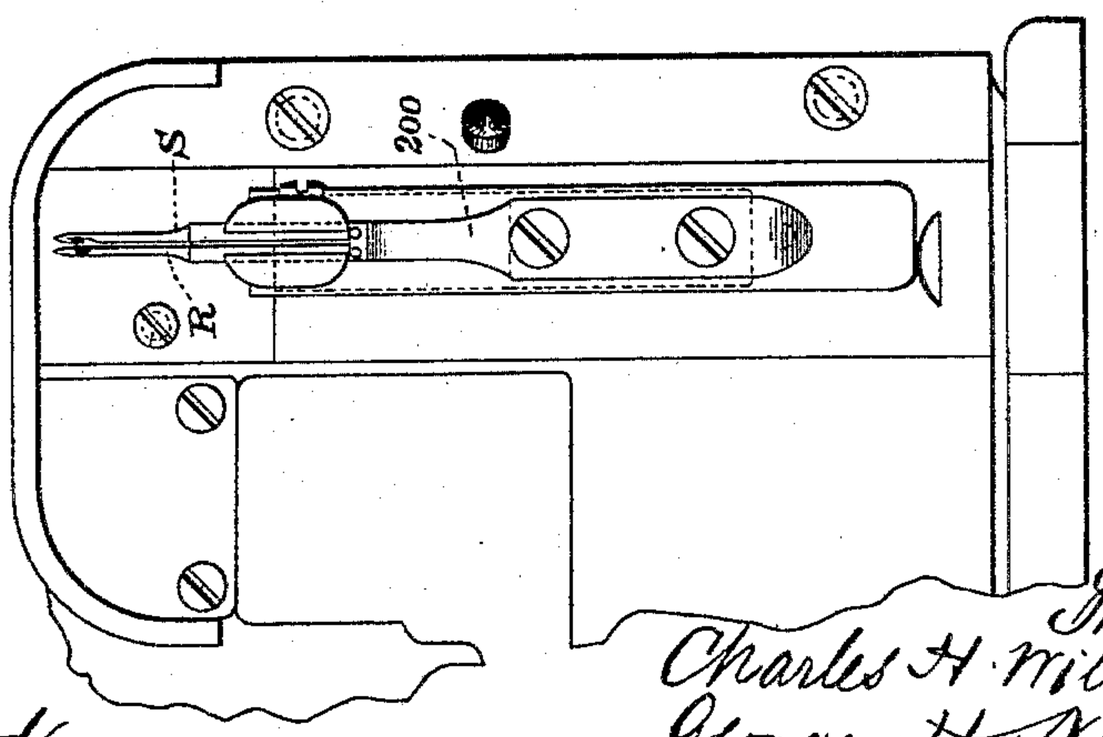


FIG. IV.



Attest:
Geo. T. Smallwood.
A. C. Rawlings.

Inventors
Charles H. Willcox &
George H. Noble by
A. Pollok their attorney.

(No Model.) 4 Sheets—Sheet 4.

C. H. WILLCOX & G. H. NOBLE.

MACHINE FOR SEWING STRAW BRAID.

No. 412,218. Patented Oct. 1, 1889.

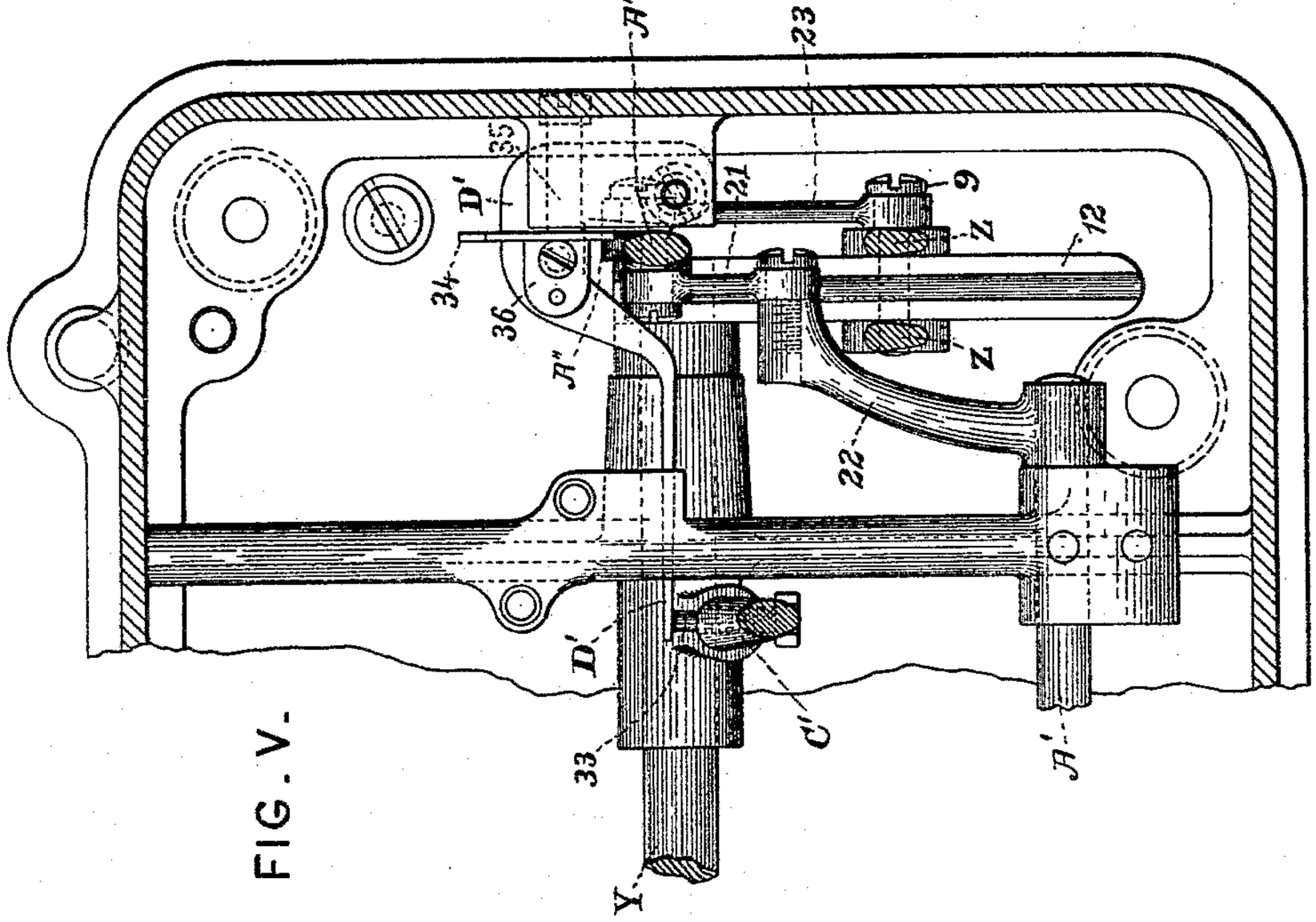


FIG. V.

Attest:
Geo. T. Smallwood.
A. C. Rawlins

Inventors
Charles H. Willcox by
George H. Noble by
A. Pollok their attorney.

UNITED STATES PATENT OFFICE.

CHARLES H. WILLCOX, OF NEW YORK, N. Y., AND GEORGE H. NOBLE, OF PROVIDENCE, RHODE ISLAND, ASSIGNORS TO THE WILLCOX & GIBBS SEWING MACHINE COMPANY, OF NEW YORK, N. Y.

MACHINE FOR SEWING STRAW BRAID.

SPECIFICATION forming part of Letters Patent No. 412,218, dated October 1, 1889.

Application filed November 7, 1887. Serial No. 254,522. (No model.) Patented in England October 14, 1887, No. 13,969.

To all whom it may concern:

Be it known that we, CHARLES H. WILLCOX, of New York city, in the county and State of New York, and GEORGE H. NOBLE, of Providence, in the county of Providence and State of Rhode Island, have invented a new and useful Improvement in Machines for Sewing Straw Braid, which improvement has been patented in Great Britain by Patent No. 13,969, dated October 14, 1887, and is fully set forth in the following specification.

This invention relates more particularly to the machine described in the specification of our application for Letters Patent of the United States, filed June 8, 1886, and officially numbered 204,546, for sewing straw braid by means of stitches resembling those made by hand, in that on the right side of the work they are in distinct loops separated by spaces; and it has for its object to modify and improve the construction and operation in certain particulars. In the said machine needles or sewing implements are attached to a reciprocatory carrier below the work-plate, are thrust up through the work, and co-operate with certain looping devices which are carried by the presser-foot above the work-plate. Since these looping devices are raised and lowered with the presser-foot, whose position in operation depends upon the thickness of the work beneath, it was found desirable to make the needles rise higher or not so high, according to the higher or lower position of the presser-foot, in order uniformly to present the looped thread in the best position to receive the looper. The necessary variation in the needle-stroke is effected by a controller mechanism, which is connected with the presser-foot, so as to be automatically set or adjusted thereby, and which properly governs or controls the motion imparted to the needles or sewing implements by the needle-operating mechanism. In the said machine this controller mechanism is clamped, so as to prevent its being shifted, except at one period in the formation of each stitch—namely, after the feed has gone out of action and before the needles are thrust through the work. It is desirable, then, to unclamp it only for a short time in order to have it properly clamped before the needles get well into the work. A suitably short release, while sufficient to permit the adjustment of the controller mechanism when the machine is running slow, is inadequate, or not always adequate, when the machine is running fast, and the controller mechanism may not always properly adjust itself before it is again clamped.

The present invention provides means which release the controller mechanism after the needles have reached the top of their stroke. At this time it is not only possible to leave the controller mechanism unclamped for a longer time, but forces generated by the needle-operating mechanism are or may be effectively utilized to shift the controller mechanism.

In the accompanying drawings, which form part of this specification, Figure I is a view, in longitudinal section and front elevation, of a straw-sewing machine containing the improvements which constitute the invention, certain mechanism which has no immediate connection with the invention being omitted. Figs. II and III are cross-sections of said machine. Fig. IV is a partial end elevation, and Fig. V is a partial view in horizontal section.

The omitted mechanism and a large part also of the mechanism shown is or may be the same as in our said application.

It will be convenient first to describe this old machinery or such parts thereof as is deemed useful, using the marks of reference previously employed, and referring to our application for a full description of any details omitted. The looper V and the threader W are carried by a vertically-movable arm X, to a lateral projection 145 of which the presser-foot (not shown) is attached. The rear end of the presser-arm X is attached to the rock-shaft B′. When the needles R S have been thrust through the work, after reaching the top of their stroke they are drawn down so as to throw a loop from the eye-pointed needle R in the path of the looper V, which is thereupon caused to advance by mechanism not shown, and to enter and then to stretch

the loop in front of the threader W, which catches the upper side of the loop, and by an outward movement (to the left in Fig. I) introduces it under the barb of the needle S. The looper and the threader then retire, the needles descend, the feed takes place, and the needles rise, the eye-pointed needle R passing through the loop held on the barb-needle S, and the latter afterward releasing said loop, which is driven around the eye-pointed needle and is eventually locked by the thread pushed through it by said needle R. The needle-carrier P, Fig. I, is reciprocated through the rock-shaft Y and other connections by an eccentric F, (see Fig. II,) fixed on and revolving with the main shaft D, which is journaled in bearings of the frame A, and is driven by any suitable means. The eccentric F acts through the strap 7, pin 8, (in the outer end of a guide-arm 13,) link Z, pin 9, and block 11 to move the arm 12 up and down, and thus to vibrate the rock-shaft Y, and the motion is conveyed from the rock-shaft Y to the needle-carrier P through the lever-arm 19 and link 17. By placing the block 11 in the slotted arm 12 nearer the rock-shaft Y the latter is turned through a larger angle and the needle-carrier P is given a longer stroke. By placing it nearer the outer end of the slotted arm 12 the length of stroke is diminished. The position of the block 11 is controlled by a connection with the presser-foot or presser-arm X through the controller-shaft A′. When the block 11 is too near the rock-shaft, the presser-arm X, being drawn down by the presser-spring, (not shown,) acts through the boss 27 and depending projections 26 (both fixed on the presser-arm) and the link 25 upon the screw-pin 28, in the outer end of lever-arm 24, and pushes it down, thereby turning the controller-shaft A′, moving the arm 22 up, and through the link 21, lever A″, link 23, and pin 9, shifting the block 11 away from the shaft Y until the further motion of said presser-arm is arrested by the presser-foot resting upon the work. When the block 11 is too far from the rock-shaft Y, then the flat controller-spring 226 (whose near end is fastened to the arm 225 on rock-shaft B′) draws back the lever A″, and with it, of course, the block 11, turning the controller-shaft A′ and lifting the arm 24 and pin 28 until the latter comes into contact with the upper end of the slot in the link 25, and further motion is arrested. The parts are so proportioned and adjusted that so long as the pin 28 is at the top of said slot the needle-operating mechanism gives to the needle-carrier P such a stroke as will present the needles in proper position relatively to the looper mechanism or looper V and threader W at the time the loop is taken. During the time the needles are being thrust through the work, and also during the operation of the feed, the controller mechanism is prevented from moving by clamping the tail 34 on lever A″. The lever C′, mounted loosely on the shaft Y, so as to turn freely thereon, is provided with a screw 33, bearing against the elastic arm of the horizontal lever D′, and when moved backward presses upon said lever D′, so as to clamp the tail 34 on lever A″ between the stationary screw 35 and the block 36 on the lever D′.

So far there is nothing new in the machinery or its operation.

In practically applying the improvement in the controller-clamp, the controller-clamping cam I is altered to effect a very short release of the controller-clamp before the needles or sewing implements R S are thrust through the work, and a considerably longer release just after they reach the top of their stroke. A suitable form of cam is shown in Fig. III. In the position shown (the needles being at the bottom of their stroke) the controller mechanism is clamped and shifting of the block 11 is prevented. The portion 300 of the cam-groove acts upon the lever C′ to release the controller mechanism before the needles enter the work, and to restore the clamp very soon after the release, while the portion 301 acts to release the clamp just after the needles reach the top of their stroke. During this second release the arm 12 of the rock-shaft Y is inclined upward, as indicated in dotted lines in Fig. II, and the downward thrust of the needle-operating eccentric F, being conveyed through the link Z, tends to shift the block 11 (whose position regulates the needle movement) toward the rock-shaft Y—that is to say, in the direction to adjust said block 11 and the controller mechanism for a higher position of the presser-foot. The controller-spring 226 tends to shift said block 11 and the controller mechanism in the same direction. Consequently, if during the operation of the machine the presser-foot has been lifted by the work becoming thicker and the controller mechanism fails properly to adjust itself during the release of the controller-clamp by the portion 300 of the operating-cam I, then so soon as the said clamp is released by the portion 301 the thrust of the needle-operating eccentric F, (which thrust is greater as the speed of the machine is greater,) or the tension of the spring 226, or both said forces, act upon the controller mechanism and shift the block 11 inward to the required extent (determined by the pin 28 striking the top of the slot in the link 25) by the time the looper V is operated to take the loop from the eye-pointed needle, which operation is made to take place a suitable time after the needles have reached the top of their stroke. This shifting of the block 11 toward the rock-shaft Y causes, or may cause, a supplementary rise of the needles, and since it takes place after the needles have reached the top of their stroke, when if the controller mechanism had adjusted itself at the first release of the controller-clamp the revolution of the needle-operating eccentric F would produce a downward motion of the needles,

it diminishes the amount of downward motion which is given to the needles prior to the advance of the looper V; but it nevertheless allows some such motion to occur, in order that a loop may be thrown out in the path of the looper. Should the work become thinner, the presser-spring forces down the presser-arm X and presser-foot, which carry with them the controller mechanism, while the latter is unclamped against the pressure of any counteracting forces. By the form shown of the portion 301 of the clamping-cam the clamp is released for a considerable part of the revolution, so that the box 11 can be slipped outwardly—that is, away from the rock-shaft Y—until the feed-surface is about to rise and take hold of the work, at which time the clamp is restored to prevent any change in the position of the controller mechanism which might be caused by the rise of the feed lifting the presser-foot and presser-arm.

The needles R S are attached to the needle-carrier P by means of a bracket 200, to which the needles are or may be secured, as in the aforesaid application.

Incidentally, new or improved means are shown for preventing entrance of straw into the machinery. They form no part of the present invention, but constitute the subject-matter of our application filed May 1, 1888, and serially numbered 272,451.

The invention is not restricted to the precise construction and arrangement shown.

We claim as our invention or discovery—

1. In combination with the needle-operating mechanism having a part adjustable to regulate the needle-stroke, the controller mechanism for adjusting said part, and the controller-clamping devices, means whereby said clamping devices are released after the needles reach the top of their stroke, said means comprising a moving part of the machine—such as a rotary cam-surface—which releases and restores the clamp periodically and comes into position to effect such release after the needles reach the top of their stroke, substantially as described.

2. The combination, with the needle-operating mechanism, comprising a rock-shaft provided with an operating-arm, a box adjustable lengthwise of said arm, an eccentric and link for vibrating said arm and rock-shaft through said box, and the controller mechanism for adjusting said box, of an automatic intermittent clamp whose pressure is relieved when said operating-arm, eccentric, and link are in position for the force of said eccentric to move the said box in the direction for increasing the needle-stroke, said intermittent clamp having a suitable moving part—such as a rotary cam-surface—which periodically releases and restores the clamp, and which comes into position to effect such release at the time just mentioned, substantially as described.

3. In combination with the looper mechanism, the needle-operating mechanism having a part adjustable to regulate the needle-stroke, the controller mechanism for adjusting said part and the devices for clamping the controller mechanism, and the cam which acts upon said devices and causes them to release the said controller mechanism before the needles are thrust through the work to clamp the same during this operation, to release the clamp after the needles have reached the top of their stroke and before the looper mechanism takes the loop, and to restore the clamp during the time of action of the feed, said cam having inclines which act in succession upon the clamping devices and release and restore the clamp at the respective times stated, substantially as described.

In testimony whereof we have signed this specification in the presence of two subscribing witnesses.

CHAS. H. WILLCOX.
GEORGE H. NOBLE.

Witnesses:
GILMAN E. JOPP,
LEONARD P. HASKINS.