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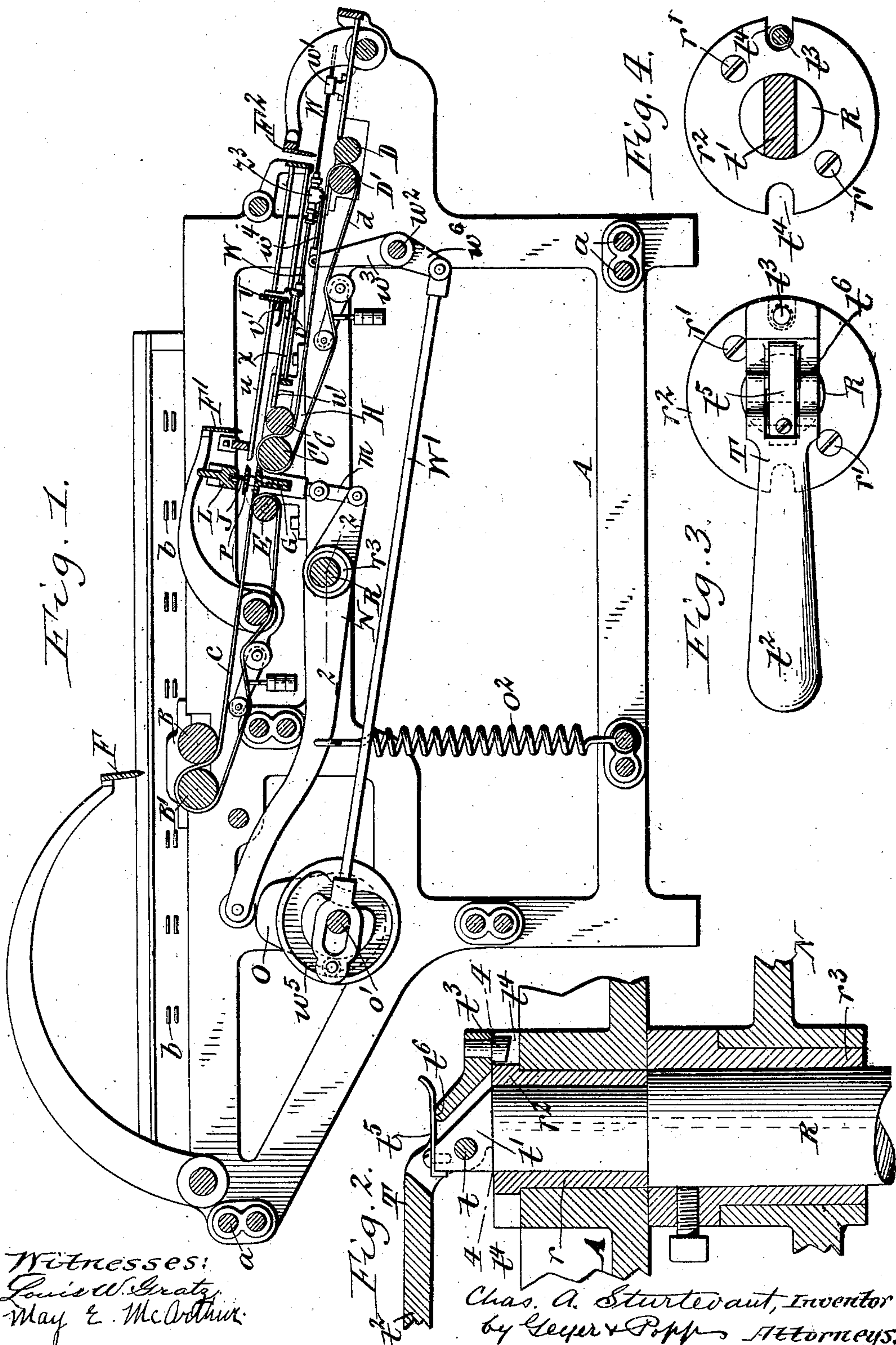
PATENTED JAN. 29, 1907.

C. A. STURTEVANT.

PERFORATING AND REGISTERING MECHANISM FOR SHEET FOLDING MACHINES.

APPLICATION FILED JULY 19, 1905.

4 SHEETS—SHEET 1.



Witnesses:
Louis W. Gratz
May E. McArthur

Chas. A. Sturtevant, Inventor
by Geyer & Popp Attorneys.

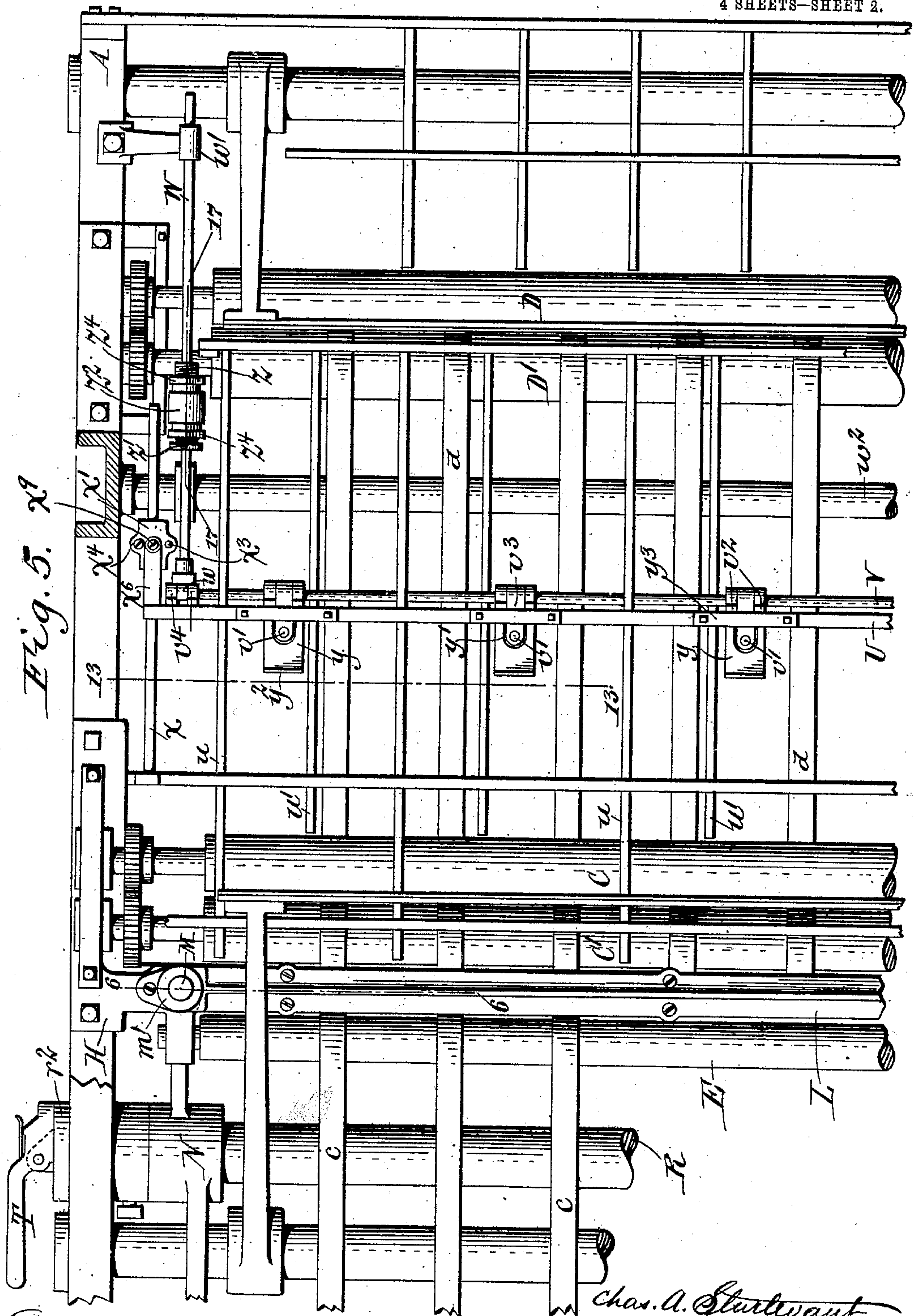
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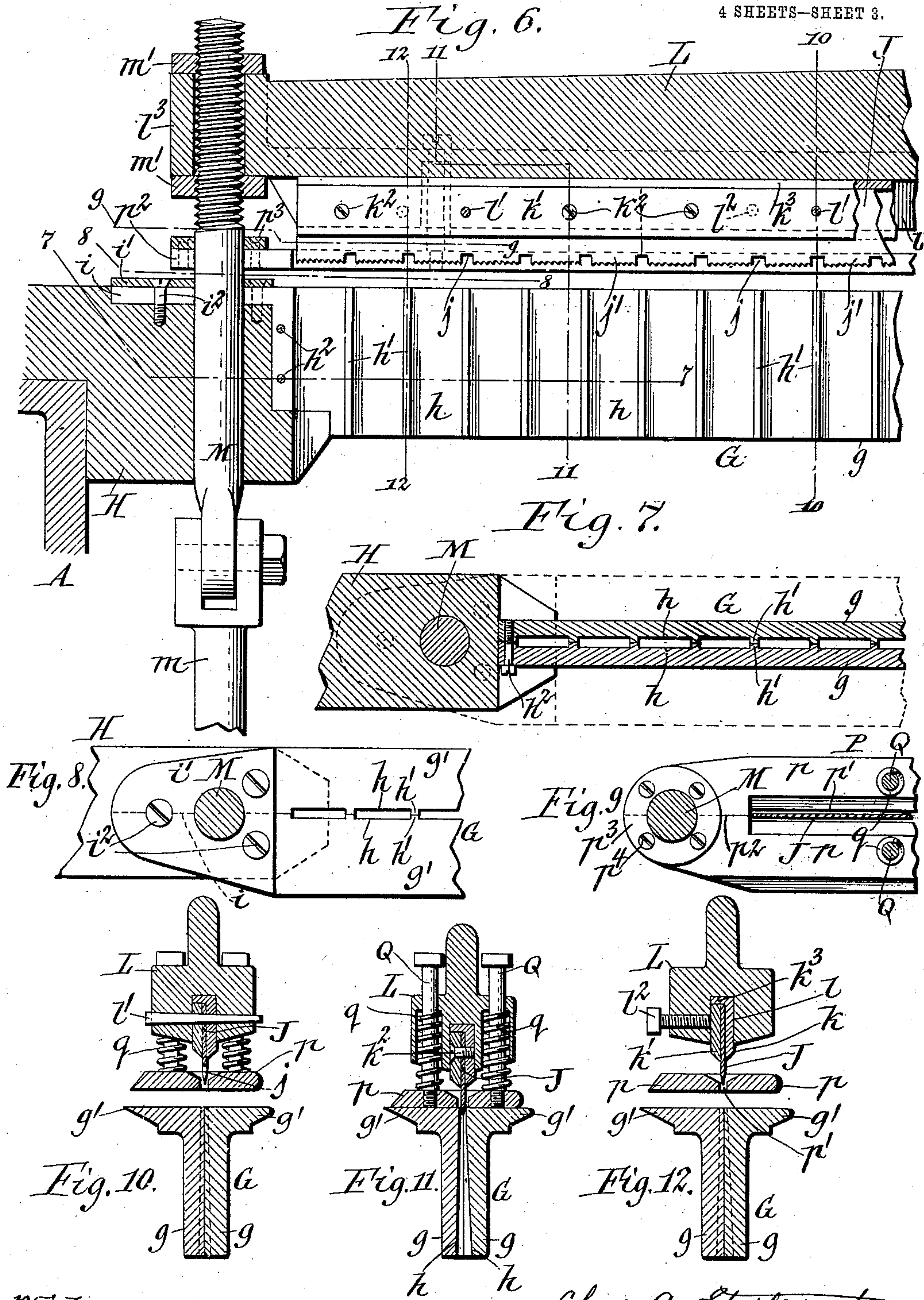
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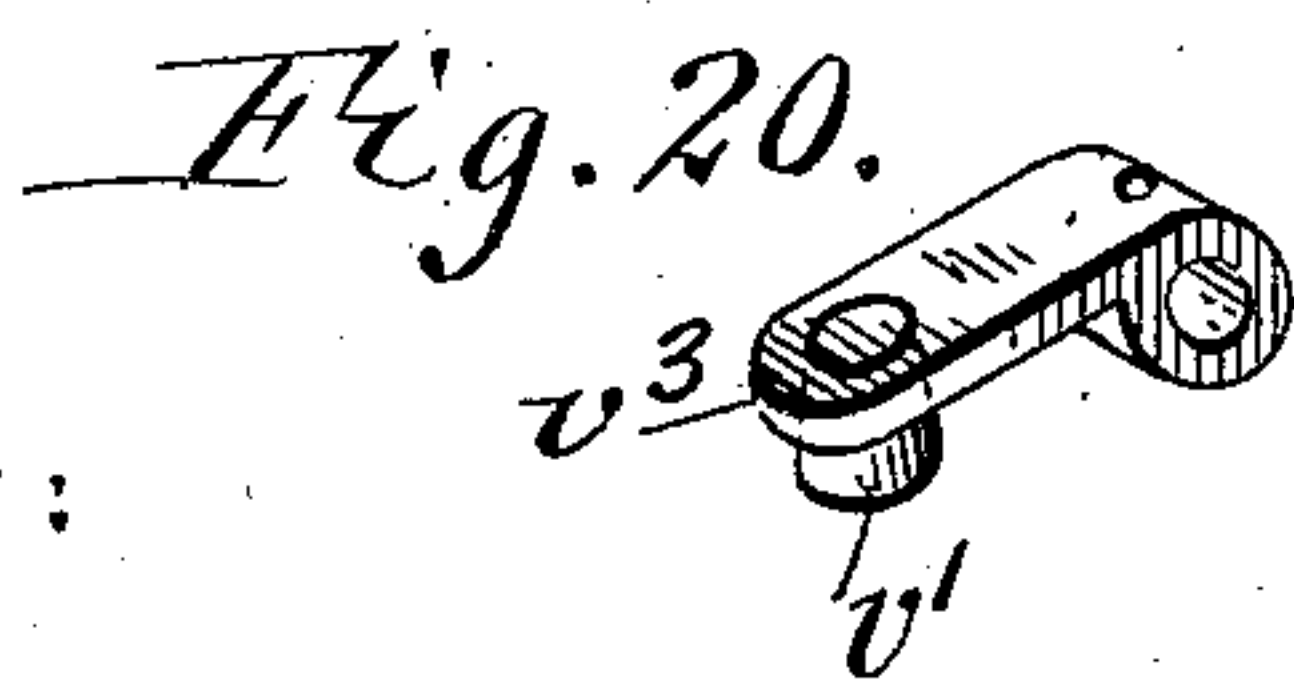
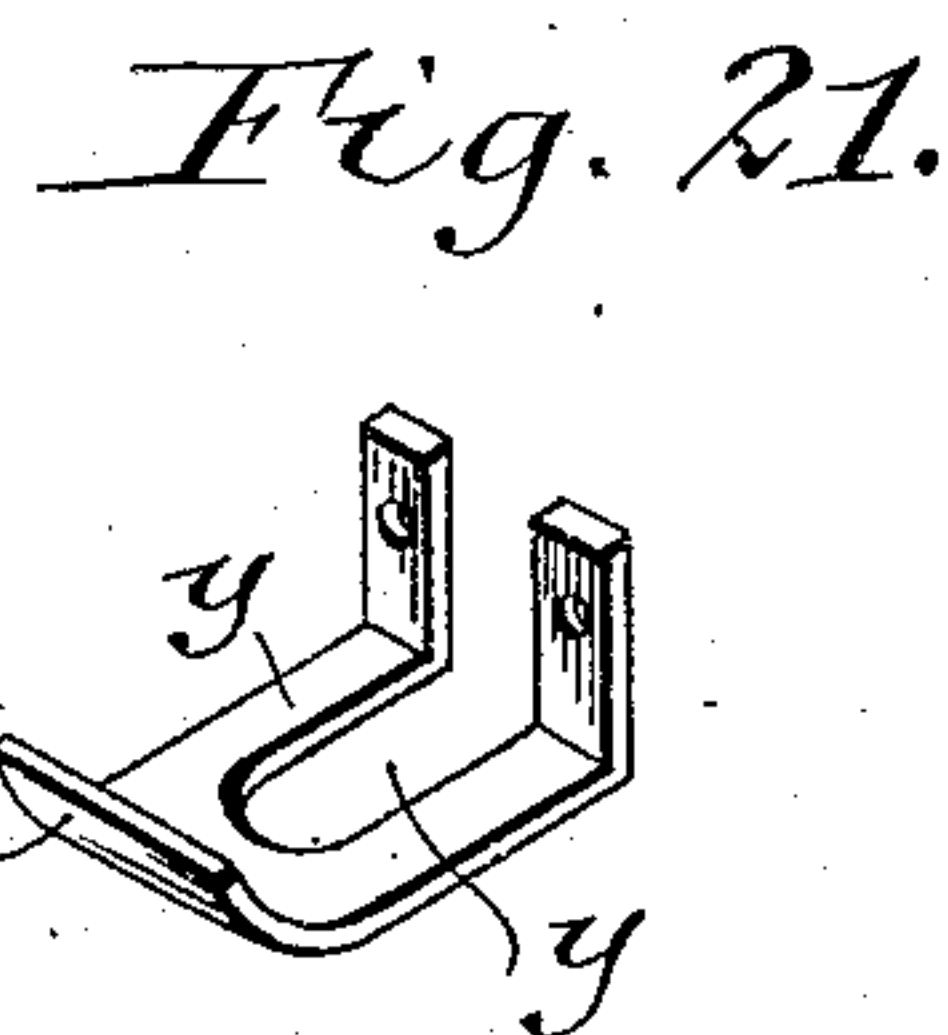
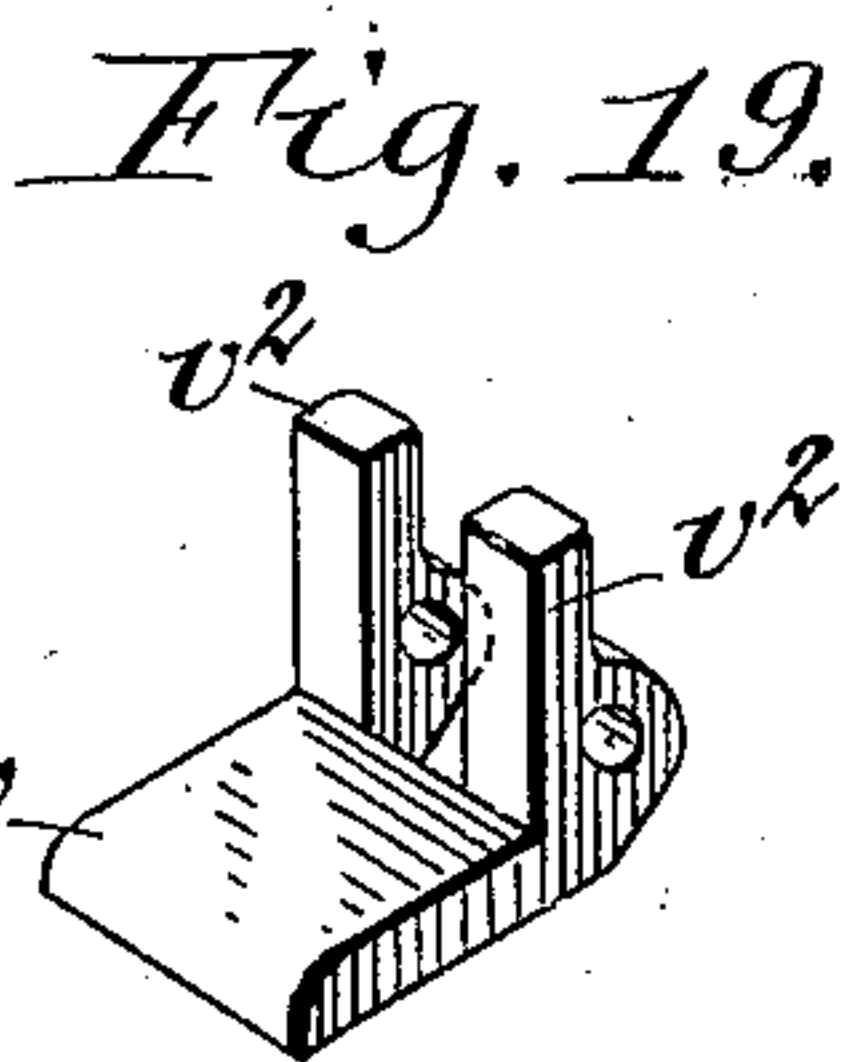
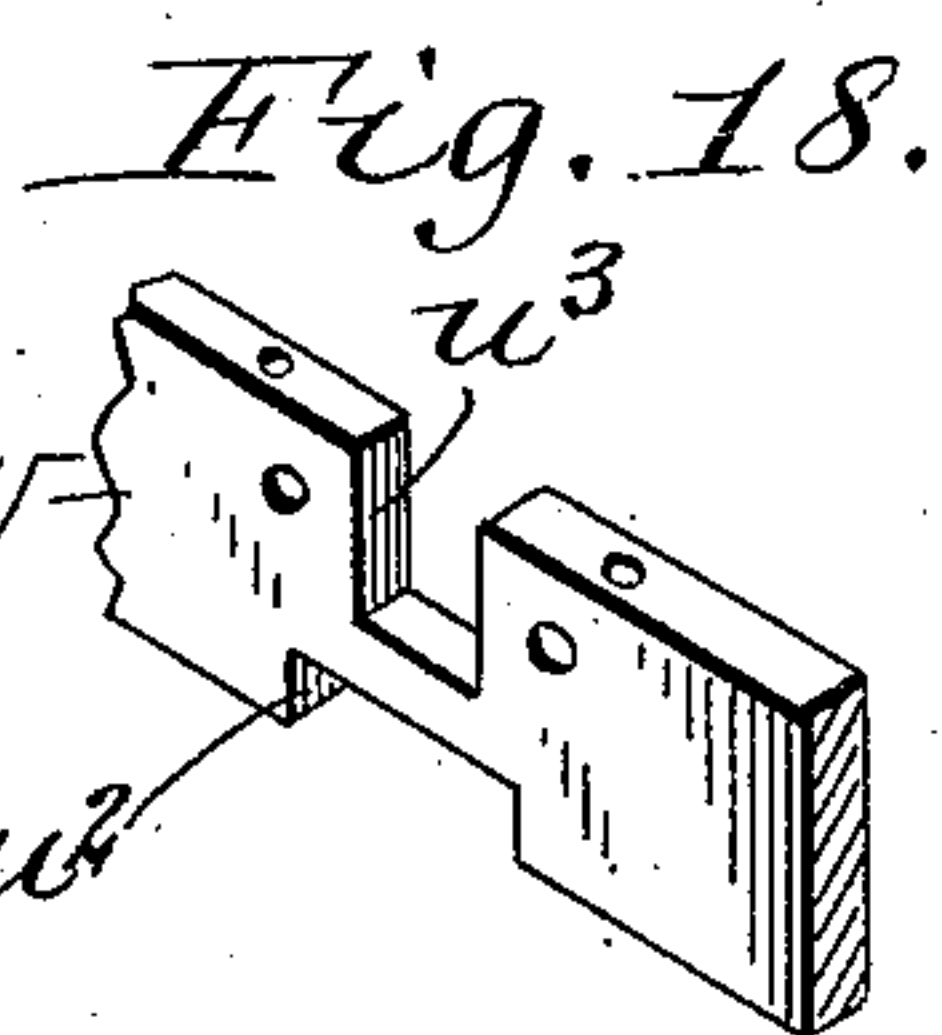
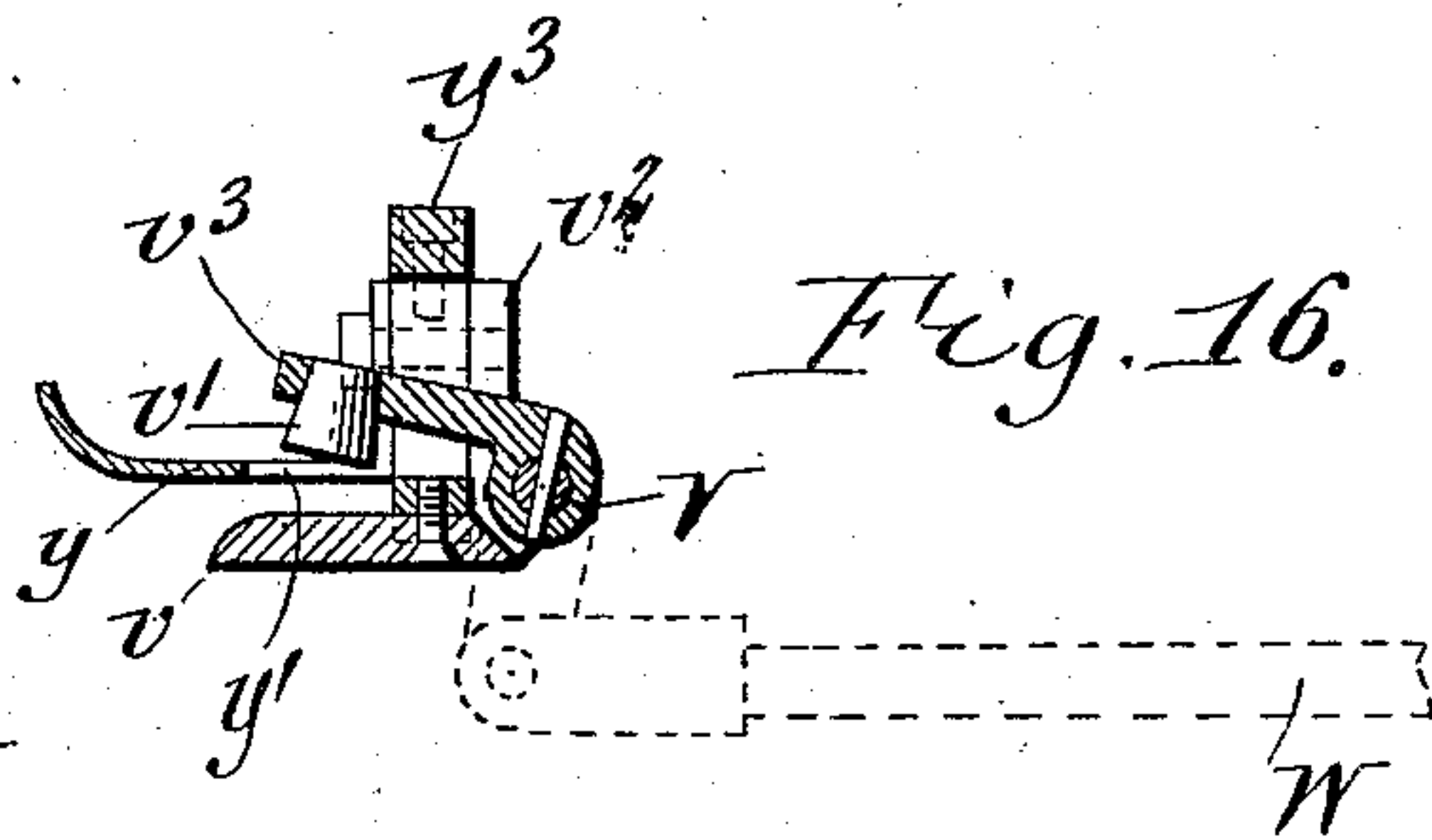
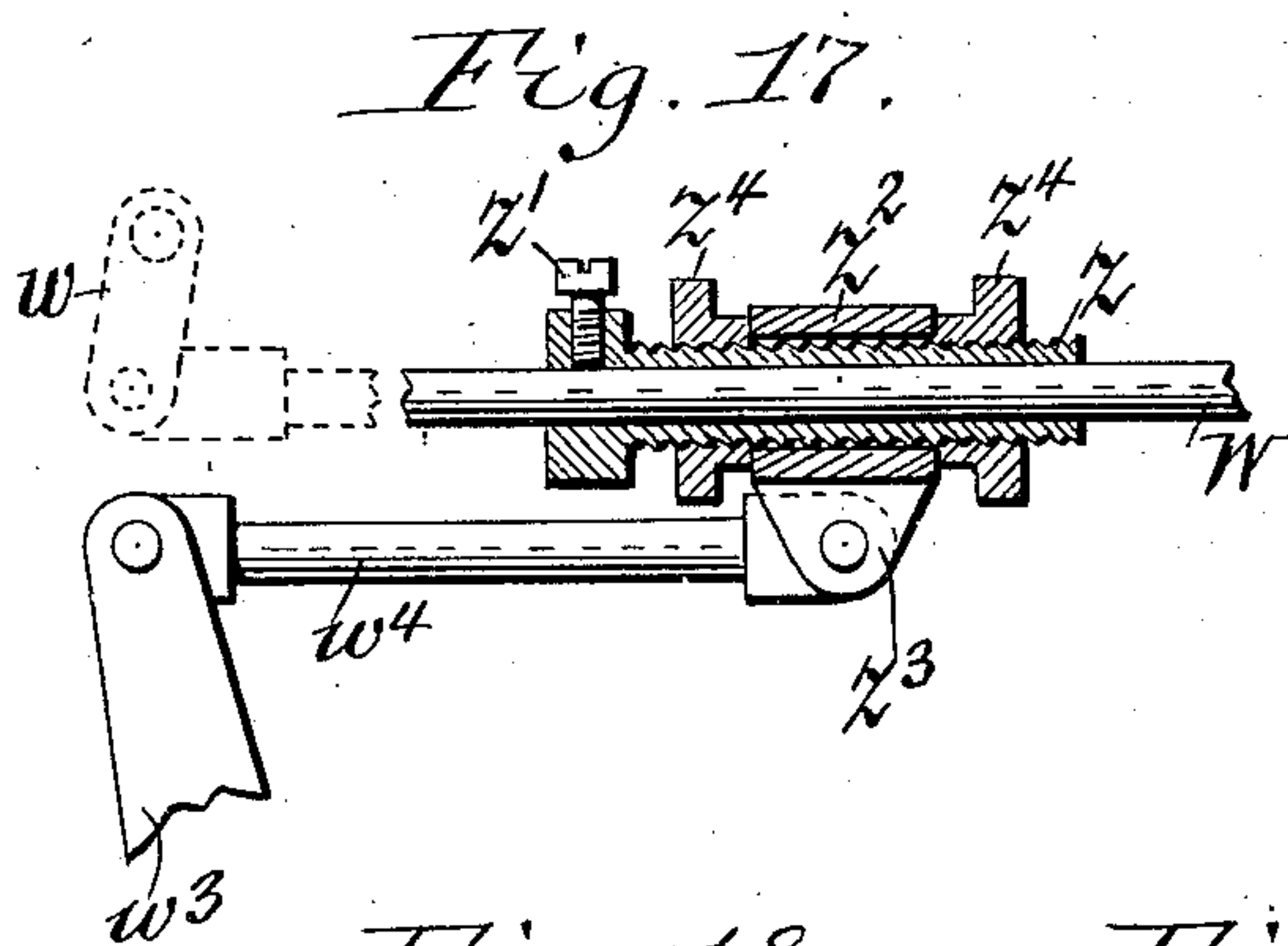
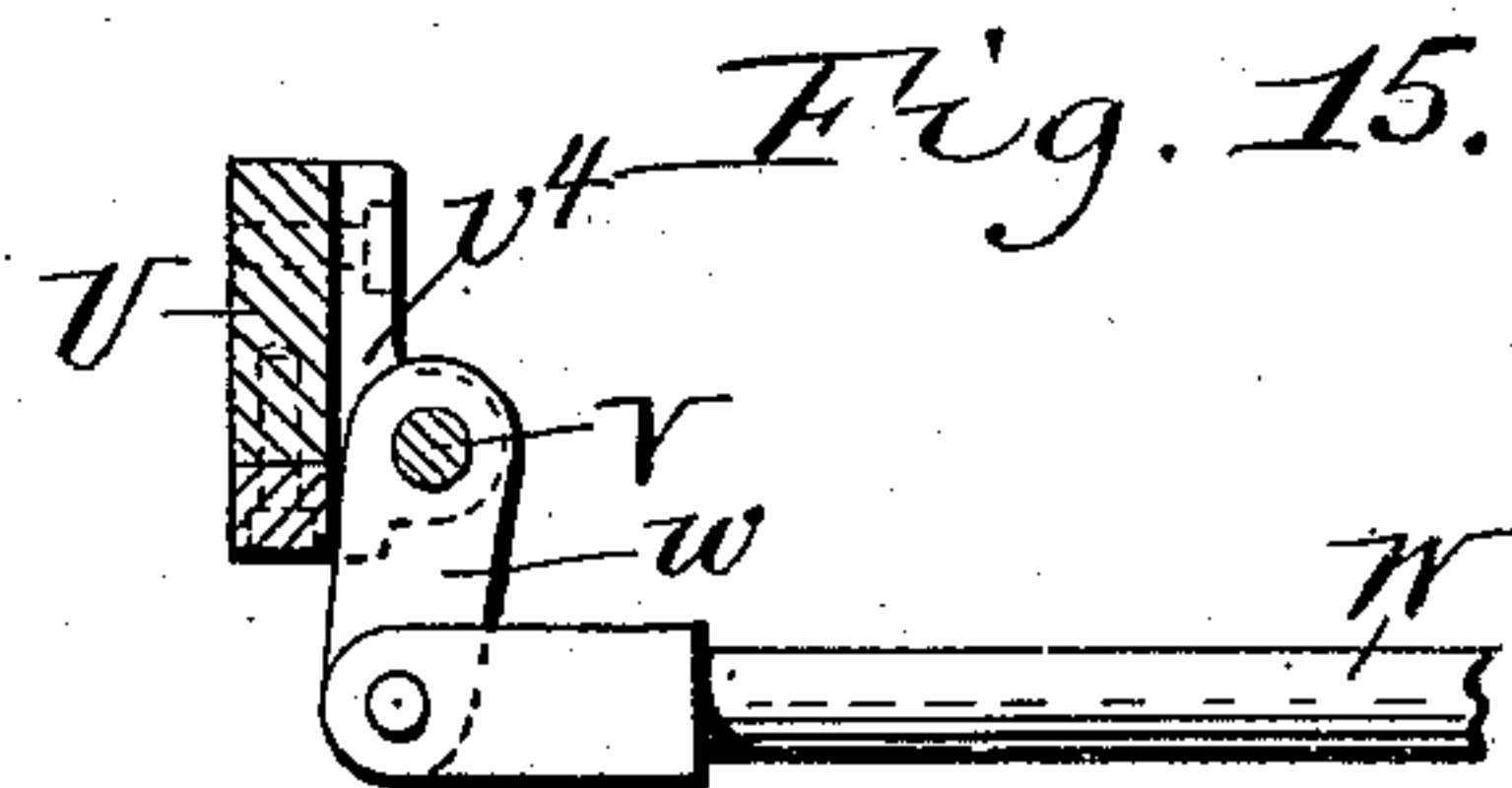
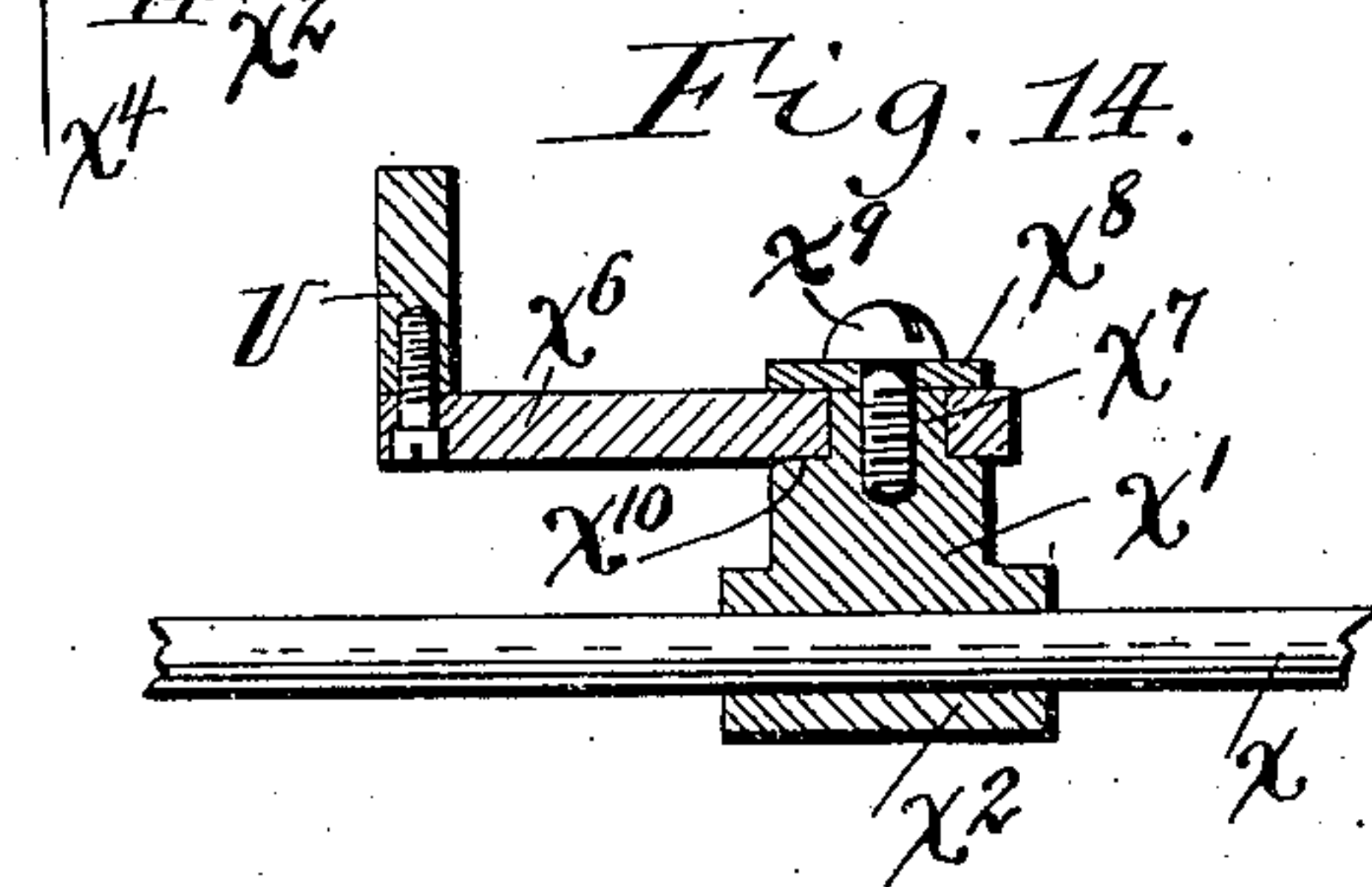
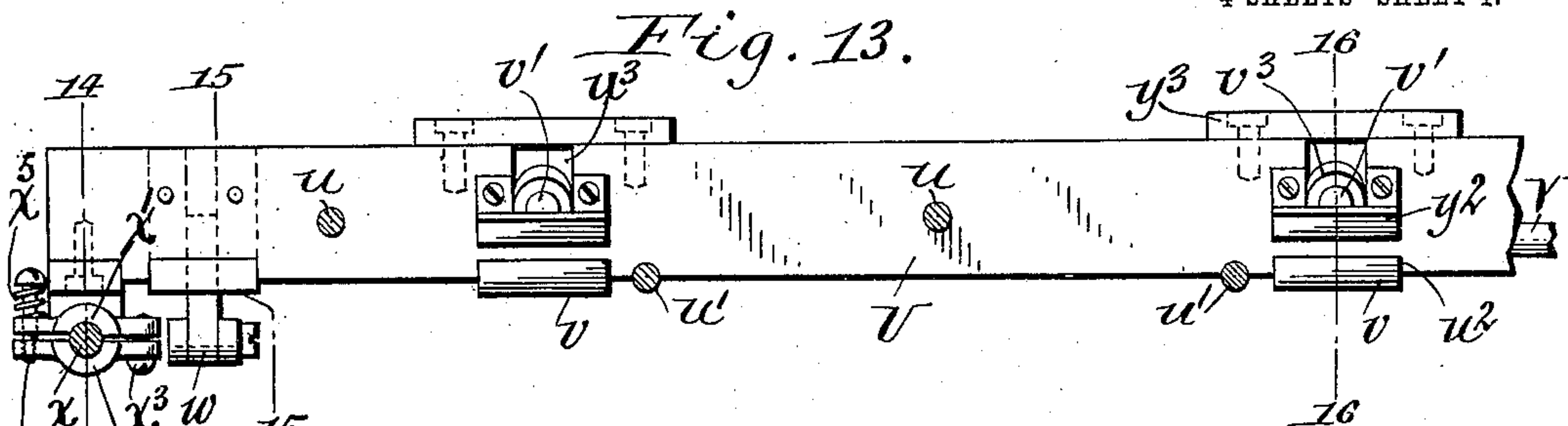
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4 SHEETS—SHEET 4.



Witnesses:
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UNITED STATES PATENT OFFICE.

CHARLES A. STURTEVANT, OF PLAINFIELD, NEW JERSEY, ASSIGNOR TO
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PERFORATING AND REGISTERING MECHANISM FOR SHEET-FOLDING MACHINES.

No. 842,721.

Specification of Letters Patent.

Patented Jan. 29, 1907.

Application filed July 19, 1905. Serial No. 270,330.

To all whom it may concern:

Be it known that I, CHARLES A. STURTEVANT, a citizen of the United States, residing at Plainfield, in the county of Union and State of New Jersey, have invented new and useful Improvements in Perforating and Registering Mechanism for Sheet-Folding Machines, of which the following is a specification.

10 This invention relates to a perforating and registering mechanism for sheet-folding machines, whereby a line of perforations may be produced in the sheet along the folding-line, so as to permit the air confined between the
15 doubled sheet to escape more freely and enable the sheet to be folded in correct register.

The object of this invention is to produce a sheet perforating and registering mechanism of this character which is comparatively simple and durable in construction and reliable
20 in operation and which insures a correct register of the sheets at all times.

In the accompanying drawings, consisting of four sheets, Figure 1 is a vertical longitudinal section of a parallel folding-machine equipped with my improved perforating and registering mechanism. Fig. 2 is a fragmentary horizontal section, on an enlarged scale, taken in line 2 2, Fig. 1, and showing the
25 means whereby the perforating device may be rendered operative or inoperative. Fig. 3 is a side elevation of the mechanism shown in Fig. 2. Fig. 4 is a vertical section in line 4 4, Fig. 2. Fig. 5 is a fragmentary top plan view, partly in section and on an enlarged scale, of the folding-machine provided with my improvements. Fig. 6 is a fragmentary vertical section of the perforating device on an enlarged scale, taken in line 6 6, Fig. 5.
30 Figs. 7, 8, and 9 are horizontal sections in lines 7 7, 8 8, and 9 9, Fig. 6, respectively. Figs. 10, 11, and 12 are vertical sections taken in lines 10 10, 11 11, and 12 12, Fig. 6, respectively. Fig. 13 is a fragmentary cross-section in line 13 13, Fig. 5. Figs. 14, 15, and 16 are vertical sections taken in lines 14 14, 15 15, and 16 16, Fig. 13, respectively. Fig. 17 is a vertical section, on an enlarged scale, taken in line 17 17, Fig. 5. Figs. 18, 19, 20, and 21
35 are perspective views of the gripper-bar, the lower gripper-jaw, the upper jaw, and the gripper-guard, respectively.

Similar letters of reference indicate corresponding parts throughout the several views.

In the drawings only one side of the machine is shown; but it will be understood that both sides of the machine are substantially the same. The main frame of the machine may be of any suitable construction, that shown in the drawings consisting, essentially, of upright side pieces A and cross-pieces a, connecting the side pieces.

Although my improved perforating and registering mechanism is applicable to various types of folding-machines, the same as represented in the drawings is applied to a machine whereby a plurality of parallel folds are successively produced in the sheets.

The essential parts of the folding-machine shown in the drawings consist of a pair of first rollers B B', which produce the first fold in the sheet, a pair of second rollers C C', arranged in front of the first pair and adapted to produce a second fold in the sheet, and a third pair of rollers D D', arranged in front of the second pair and adapted to produce a third fold in the sheet. The sheets are carried to the first rollers by tapes b. As the sheets issue from the first pair of rollers the same are carried to the second pair of rollers by means of tapes c, which pass with their receiving portions around the rear member B' of the first pair and around a delivery-roller E. The sheets upon issuing from the second pair of rollers are carried to the third pair by means of tapes d, which pass with their receiving portions around the rear member C' of the second pair and with their delivery portions around the rear member D' of the third pair. These three pairs of folding-rollers are arranged transversely in the machine, and the sheets are fed downwardly between the same by oscillating folding-blades F F' F², which are arranged parallel with these rollers and cooperate therewith in a well-known manner.

The perforating device shown in the drawings is adapted to perforate the sheets preparatory to producing the second fold in the same, so as to permit a free escape of the air from between the folds of the sheets while producing these subsequent folds in the same. This perforating device is best shown in Figs 1 to 12 and is constructed as follows: G repre-

sents the perforating-die, which is arranged horizontally and transversely in the machine in the space between the delivery-rollers E of the tapes c and the rear member C' of the second pair of folding-rollers. This die is composed of two vertical bars g g, which are arranged transversely side by side and provided at their upper ends with flanges g' g', which project laterally in opposite directions. The opposing vertical sides of the two die-bars are provided with two horizontal series of vertical recesses or grooves h, which extend from the upper to the lower edges of the bars and are separated by intervening ribs or solid portions h', which alternate with the grooves. The two bars of the die are connected by screws h² passing their end portions or by any other suitable means so that the grooves and ribs of one pair register with those of the other, and thereby form a row of vertical perforations or openings which are parallel with the folding-rollers and blades. The die may be supported in its proper position relative to the adjacent blade and folding-rollers F C' of the machine in any suitable manner, but preferably by means of brackets H, mounted on the adjacent part of the main frame, which brackets also serve to support the bearings of the delivery-roller E and the pair of the second folding-rollers C C'. For this purpose the ends of the die-bars are constructed at their outer ends to form divided eyes or perforated lugs i, which rest upon the brackets and are secured thereto by means of coupling plates or caps i', resting on the eyes or ears, and screws i², passing through said cars, coupling-plates, or caps and into the brackets. The top of the die is in line, or nearly so, with the top of the delivery-roller E and the rear member of the second pair of folding-rollers, as shown in Fig. 1.

Above the die is arranged the transverse perforating-blade J, which coöperates with the die for perforating the sheets which are fed between the same. The perforating-blade is preferably constructed of a number of comparatively short sections, each of which is provided at its lower edge with a plurality of deep notches j, which are adapted to receive the ribs of the die, and with a plurality of teeth j', which alternate with said notches and which are constructed to enter the openings of the die. The blade-sections are secured end to end in a holder, so that they together form practically one continuous piece. This blade-holder consists of two clamping or holding plates k k', which are secured to opposite sides of the blade along the upper longitudinal edge thereof by means of screws k². One of said plates is preferably provided at its upper edge with a horizontal flange k³, which extends over the upper edge of the perforating-blade and the other holding-plate, as shown in Figs. 6 and 12. The blade-holder is arranged with its

upper part in a horizontal groove l, formed in the under side of a vertically-movable cross-head L, the holder and blade being secured in this groove by means of taper pins l' passing through corresponding openings in the cross-head, blade-holder, and blade, and also by means of set-screws l², arranged in the cross-head and bearing against the outer side of one of the plates of the perforating-blade holder, as shown in Figs. 10 and 12. The cross-head may be raised and lowered, together with the parts mounted thereon, by any suitable mechanism, that shown in the drawings consisting of vertical sliding bars or rods M, guided in the eyes i and the brackets H and supporting the cross-head at their upper ends, rock-levers N, having their front arms connected by links m with the lower end of the slide-rods, rotary cams o, arranged on the main driving-shaft o' and engaging with the rear arms of the rock-levers N, and springs o², connecting the rock-levers with the main frame. The cams o operate to lower the head and the perforating-blade mounted thereon, and the springs o² operate to lift these parts.

The lower edge of each perforating-tooth j' is serrated or provided with numerous fine teeth j², like those of a saw, so that the same will readily penetrate the sheets upon being depressed. Means are provided for adjusting the cross-head so as to take up wear on the perforating-blade and also for adjusting the same with reference to the die in setting up the machine. The preferred means for this purpose shown in the drawings consist in providing the end of the cross-head with eyes l³, which receive the guide-rods M, and screw-nuts m', arranged on the upper screw-threaded ends of the guide-rods and bearing against the upper and lower sides of said eyes. By loosening the screw-nuts of one side of the cross-head eyes and tightening the others the cross-head may be raised or lowered relatively to the slide-rods for adapting the perforating-blade to the die. While the sheets are being fed over the die the perforating-blade is elevated above the path of the sheets. After each sheet comes to rest the cross-head is lowered sufficiently to cause the teeth of its blades to penetrate the sheet, leaving connecting-webs between those portions of the sheets opposite the notches or non-cutting portions of the perforating-blade. After the perforations have been thus formed in the sheet the perforating-blade is raised, permitting the sheet which has just been operated upon to be carried away and replaced by another. The openings in the die are enlarged or flared from the upper or inlet ends toward the lower or outlet ends thereof, as shown in Fig. 11, whereby any small pieces of paper which may be pushed down through these openings free themselves and drop out through the lower large end, thereby preventing these openings from becoming clogged.

For the purpose of preventing the sheet after the same has been penetrated by the perforating-blade from rising with the latter a stripping device is provided, which is constructed as follows: P represents a stripper composed of two transverse bars p p , which are arranged lengthwise side by side, but separated to form a longitudinal slot p' between the same through which the lower portion of the perforating-blade projects. The ends of the stripper-bars are guided to move lengthwise on the sliding rods M by constructing these ends so as to form divided guide-eyes p^2 , which receive said rods. These parts of each guide-eye are connected by means of a coupling-ring p^3 , which receives the adjacent guide-rod M and is secured to the eye-sections p^2 by means of screws p^4 or otherwise. The downward movement of the stripper-plate relatively to the perforating-blade is limited by means of stop-rods or screws Q passing loosely through the cross-head on opposite sides of the perforating-blade and secured at their lower threaded ends to the stripper-bars, while the heads at their upper ends bear against the upper side of the cross-head. In its elevated position the under side of the stripper is slightly below the lower edge of the perforating-blade. The stripper is yieldingly held in this position by means of springs q , surrounding the supporting rods or screws and bearing at their opposite ends against the top of the stripper-bars and the under side of said cross-head, as shown in Fig. 11. As the cross-head descends the paper resting upon the die is engaged, first, by the stripper, and during the continued downward movement of the cross-head the stripper remains at rest on the paper while the perforating-blade penetrates the paper and enters the die, whereby the paper is securely held in place during the perforating operation. During the subsequent upward movement of the cross-head the stripper remains at rest on the paper until the perforating-blade has been withdrawn from the paper and recedes within the slot of the stripper. After the blade has been thus removed from the paper the stripper is elevated by the cross-head during the last portion of its upward movement with the perforating-blade.

In order to permit of quickly and early throwing the perforating device out of working condition, so as to avoid the formation of perforations in the sheets when getting the machine ready or for other purposes, a throw-off device is provided, which is preferably constructed as follows: R represents a horizontal rock-shaft which is journaled transversely at its ends in bushings r . These bushings are secured in openings in the main frame, preferably by means of screws r' passing through external plates or flanges r^2 arranged at the outer ends thereof. Near opposite ends the rock-shaft R is provided with

eccentrics r^3 , upon each of which one of the rock-levers N is journaled. Upon turning this shaft so that the salient parts of the eccentrics are on the lower side thereof the fulcrum of the levers N will be so located that the rocking movement of the levers will cause the cross-head to move the perforating-blade downwardly and upwardly across the path of the sheet lying on the die. If the shaft R is turned half-way around, so that the salient parts of its eccentrics are on the upper side thereof, then the pivot of these levers will be so shifted that the latter when rocked by the cams o and the springs o^2 will not move the blade downwardly and upwardly across the path of the sheet. Although the cross-head and the parts mounted thereon continue to reciprocate while in an elevated or inoperative position, the same will be without effect, because the entire stroke of these parts at this time is above the path of the sheets. For conveniently turning the rock-shaft and holding it in either position a hand-lever T is provided, having a bifurcated central part, which is pivoted transversely by a pin t on a lug t' , projecting from one end of the shaft and provided on one side of its pivot with a handle t^2 for manipulating the lever and on the opposite side thereof with a locking tooth or lug t^3 , which is adapted to engage with one or the other of two notches or recesses t^4 , formed on diametrically opposite sides of the locking plate or flange r^2 on the adjacent bushing. The hand-lever is yieldingly turned in the direction for holding its tooth in engagement in one of said notches by means of a spring t^5 , secured at one end to the lug t' of the shaft, while its opposite end bears against a nose t^6 on that side of the lever which carries the tooth t^3 . When it is desired to turn the rock-shaft in one direction or another for moving the cross-head either to its operative or inoperative position, the handle of the lever T is pushed inwardly sufficiently to disengage its tooth from the respective locking-notch on the flange. The lever, together with the shaft and the eccentrics, is now turned half-way around, whereby the tooth of the lever is brought opposite the other notch of the bushing-flange r^2 , with which it is interlocked by the spring t^5 upon releasing the lever, thereby holding the shaft and the parts connected therewith in this reversed condition. As each sheet is fed between the die and the perforating-blade and over the members of the second pair of rollers the same is first arrested in position to receive the row of perforations along the line where the next fold will take place, and then the sheet, while still in a correctly-registered position, will be grasped and moved forward until the line of perforations are brought into the path of the blade of the folding device, which produces the next fold in the sheet.

The preferred construction of the means for thus registering the sheet and continuing the forward movement thereof while registered is constructed as follows: U represents a gripper-bar, arranged transversely in the path of the sheet in front of the second pair of folding-rollers. This bar is movable bodily back and forth in a direction lengthwise of the movement of the sheet. During this movement of the gripper-bar the same is guided on the stationary upper and lower guide-rods u u' , which are arranged lengthwise above and below the path of the sheets in front of the second rollers and serve to confine the sheets against displacement on the tapes d . The vertical front side of the gripper-bar serves as a gage or face against which the front edge of the sheet is registered preparatory to perforating the same and effecting the second fold therein. Upon this gripper-bar are mounted gripping devices whereby the front end of the sheet is grasped and caused to move forwardly with the bar. This gripping device preferably consists of a plurality of grippers, each of which comprises a lower gripper-jaw v and an upper gripper-jaw v' , movable forwardly toward and from the lower jaw. Each lower jaw projects forwardly from the bar, and its rear end is seated in a notch u^2 , formed in the under side of the gripper-bar, and provided with two upwardly-projecting lugs v^2 , which are secured to the rear side of the gripper-bar. The upper gripper-jaw consists of a block of rubber or other elastic material, which is secured to the front end of a vertical swinging gripper-arm v^3 . This arm projects forwardly through a notch u^3 in the upper edge of the gripper-bar and is secured at its rear end to a transverse rock-shaft V, which is journaled in the lugs of the lower jaw, and also in bearings v^4 on the end portions of the gripper-bar. This shaft connects all of the arms of the upper gripper-jaws and is provided at opposite ends with depending rock-arms w . To the lower end of each of these rock-arms is connected the rear end of a shifting-rod W, which latter is guided at its front end in a bracket w' , secured to the main frame. These shifting-rods are actuated by means of a rock-shaft w^2 , provided with upper arms w^3 , each of which is connected by a link w^4 with the respective shifting-rod, and a cam-rod W' operatively engaging at one end with a cam w^5 on the main driving-shaft and connecting at its opposite end with a lower rock-arm w^6 on the rock-shaft w^2 . Means are provided for holding or retarding the gripper-bar and the parts mounted thereon frictionally against longitudinal movement relatively to the path of the sheets. The preferred means for this purpose consists of stationary friction-rods x , arranged lengthwise of the path of the sheets at opposite ends of the gripper-bar, a pair of clamping-plates

x' x^2 bearing against the upper and lower sides of each friction-rod, a screw x^3 loosely connecting said clamping-plates on one side of the friction-rod, a screw x^4 secured to one of said plates and passing loosely through an opening in the other plate on the opposite side of said rod, a spring x^5 surrounding said last-mentioned screw between the head thereon and said last-mentioned plate, and arms x^6 connecting the ends of the gripper-bar with the upper clamping-plates.

When the gripper-bar is in its rearmost position, the grippers thereon are open and prepared to receive a sheet, as represented in Figs. 1, 5, 13, and 16. While the parts of the registering device are in this position, a sheet is fed forward by the tapes c between the die and blade of the perforating device, the rollers and blade of the second folding device, and against the gage-face of the gripper-bar between the several pairs of gripper-jaws thereon. Immediately after the sheet engages the front gage the perforating device comes into operation and produces a line of perforations in the same. At the same time the cam w^5 begins to move the shifting-rods forwardly, whereby the rock-arms w , gripper-shaft V, and gripper-arms v^3 are moved in the direction for closing the upper gripper-jaws against the lower gripper-jaws and gripping the sheet between the same. The gripper-bar and the parts mounted thereon are held against bodily movement while the grippers are being thus closed by the friction between the clamping-plates x' x^2 and the friction-rods x ; but when the grippers have been closed the continued forward pull upon the shifting-rods overcomes the frictional coupling between the clamping-plates and the friction-rods and permits these parts, together with the gripper-bar and jaws, to move forwardly to the end of the stroke in that direction, whereby the sheet is carried forward for shifting its row of perforations from the perforating device to the next following folding device. The instant the sheet reaches its foremost position under the action of the front registering grippers the movement of the shifting-rods is reversed. During the first part of this reversed or backward movement of the shifting-rods the gripper-bar and grippers are held against bodily movement in that direction by the friction between the clamping-plates x' x^2 and friction-rods x , whereby this movement of the shifting-rods is caused to turn the rock-arms w and gripper-shaft backwardly and lift the upper gripper-jaws from the sheet, thereby releasing the latter. After the sheet is released at its front edge from the front registering grippers the second folding-blade F' descends upon the same along its line of perforations and feeds the same between the second folding-rollers C C', whereby the sheet is folded on the line of perforations and car-

ried to the third folding device for producing the front fold in the same. While effecting the second fold in the sheet, its front edge is moved backwardly away from the front registering grippers. At the same time the rock-arms w during their continued backward movement engage with the front side of the gripper-bar, as shown in Fig. 15, causing the clamping-plates x' x^2 to slip on the friction-rods x and compelling the gripper bar and jaws to move backward with the shifting-rods to the end of their stroke in this direction. When the gripper bar and jaws reach this rearmost position, as indicated in Figs. 1 and 5, these parts are ready for registering and gripping the next sheet, for which purpose they remain at rest a sufficient time to permit of feeding this sheet to the same.

For the purpose of directing the front end of the sheet underneath the gripping-jaws and preventing the same from interfering with said jaws a guard or guide y is provided for each gripper. Each of these guards is secured to the front side of the gripper-bar and provided at its inner or front end with a recess y' , through which the upper gripper-jaw moves vertically, while its outer or rear end y^2 is curved upwardly for directing the sheet underneath the same.

y^3 represents cleats which are secured to the upper edge of the gripper-bar and connect the parts thereof on opposite sides of its notches u^3 , thereby reinforcing the gripper-bar and compensating for the loss of strength caused by the formation of these notches in the bar.

For the purpose of permitting the grippers to be adjusted to various sizes of sheets the shifting-rods are adjustably connected with the links w^4 , preferably by the following means: z , Figs. 5 and 17, represents an adjusting-sleeve mounted on each shifting-rod and having an external screw-thread and a set-screw z' , whereby the same is secured to the rod. z^2 represents a coupling-sleeve which has a smooth bore engaging with the adjusting-sleeve and a depending lug z^3 , to which the front end of the adjacent link w^4 is pivotally connected. At opposite ends of the coupling-sleeve jam or screw nuts z^4 are mounted on the adjusting-sleeve. In adjusting the grippers from one sized sheet to another the set-screws z' of the adjusting-sleeves are loosened. The shifting-rods are now moved lengthwise through the adjusting-sleeve until the grippers are approximately in the position which they should occupy. Then the said screws z' are tightened, thereby effecting a coarse adjustment of the grippers. An accurate adjustment of the grippers is now produced by loosening one of the jam-nuts z^4 and tightening the other adjacent to the adjusting-sleeve, whereby the shifting-rods are moved lengthwise through the coupling-sleeve until the grippers are in position for correctly regis-

tering the sheets. In order to prevent the gripper-bar and connecting parts from becoming cramped if both ends of the gripper-bar are not adjusted simultaneously, the arms x^6 of the gripper-bar are connected with the upper clamping-plates by a swivel connection consisting, preferably, of a vertical stud or wrist x^7 , arranged on each upper clamping-plate, and a washer x^8 , secured to the upper end of the wrist by a screw x^9 . The rear end of each arm x^6 is pivoted horizontally on said wrist and is confined against vertical movement thereon between the shoulder x^{10} at the base of the wrist and the washer on the upper end thereof. If the gripper-bar while adjusting the same is not maintained exactly at right angles to the path of the sheet, the arms x^6 will turn horizontally on the clamping-plates, and thus prevent binding of these parts.

In the operation of the folding-machine the sheet engages at its front end with the gage U in the rearward position thereof for arresting the same in the perforating position and is again arrested by the gage when the same is moved into the forward or folding position. When grippers are used in connection with the gage U for holding the sheet in its registered position, the grippers cooperate with the tapes c and d in moving the sheet forward. If desired, the grippers may be omitted, in which case the sheet is propelled against the gage U in its rearward and forward position solely by the tapes c d . The use of grippers, however, is preferred on account of the greater accuracy in the register of the sheet which is possible by their use.

I claim as my invention—

1. In a sheet-folding machine, the combination of a perforating device constructed to produce a row of perforations in a sheet, a folding device constructed to fold the sheet along said row of perforations and arranged parallel to said perforating device, means for moving the sheet successively to said perforating and folding devices, and a single longitudinally-movable gage which is engaged by the front edge of the sheet and operates to arrest the sheet first in the perforating position and then in the folding position, substantially as set forth.

2. In a sheet-folding machine, the combination of a perforating device constructed to produce a row of perforations in a sheet at one operation, a folding device constructed to fold the sheet along said row of perforations and arranged parallel to said perforating device, means constructed and operating to first move the sheet to said perforating device and then advance the sheet in the same direction to said folding device, a single longitudinally-movable gage which is engaged by the front edge of the sheet and operates to arrest the sheet first in the perforating position and then in the folding position, and

actuating means operating to move said gage alternately and intermittently forward and backward into the perforating and folding positions, substantially as set forth.

5 3. In a sheet-folding machine, the combination of a perforating device which is constructed and operates to produce a transverse row of perforations in the sheet, a folding device arranged parallel to said perforating device and operating to fold the sheet along said
10 line of perforations, a propelling device for carrying the sheet to said perforating and folding devices, a single gage which is arranged to be engaged by the sheet at the
15 front edge thereof and which has a forward-and-backward movement in the plane of the movement of the sheet and is adapted to arrest the sheet first in the perforating position and then in the folding position, means for
20 actuating said gage constructed to move the gage into its rearward position for arresting the sheet when in position to be operated upon by said perforating device and then moving the gage into its forward position for
25 again arresting the sheet in position to be operated upon by said folding device, a gripper moving with said gage, and means operating to close said gripper on said sheet while being perforated and until the folding operation,
30 tion, substantially as set forth.

4. In a sheet-folding machine, the combination of a perforating device which is constructed and operates to produce a transverse row of perforations in the sheet, a folding device arranged parallel to said perforating device and operating to fold the sheet along
35 said line of perforations, a propelling device for carrying the sheet to said perforating and folding devices, a single gage which is arranged to be engaged by the sheet at the
40 front edge thereof and which has a forward-and-backward movement in the plane of movement of the sheet and is adapted to arrest the sheet first in the perforating position and then in the folding position, means for
45 actuating said gage constructed to move the gage into its rearward position for arresting the sheet when in position to be operated upon by said perforating device and then
50 moving the gage into its forward position for again arresting the sheet in position to be operated upon by said folding device, a gripper moving with said gage, and actuating means for said gripper constructed to close the same
55 upon the sheet after the same engages with the gage in the rearward position thereof and to release the gripper from the sheet in the forward position of the gage, substantially as set forth.

5. In a sheet-folding machine, the combination of a fixed sheet-perforating device constructed and operating to produce a
60 transverse row of perforations in a sheet at one operation, a fixed folding device for producing a fold in the sheet along the line of perforations therein and arranged parallel with
65 said perforating device on the front side thereof, carrying-tapes for propelling the sheet to said perforating and folding devices, means for actuating said perforating and folding devices intermittently and successively,
70 a single gage arranged in front of the folding device in position to be engaged by the front edge of the sheet and having a forward-and-backward movement in the plane of movement of the sheet while being presented to the perforating and folding devices
75 and adapted to arrest the sheet first in the perforating position and then in the folding position, means for actuating said gage constructed to move the same into its rearward
80 position for arresting the sheet in position to be perforated and then moving the gage into its forward position in which the same again arrests the sheet in position to be operated
85 upon by the folding device, a gripper mounted on the gage and moving forward and backward with the same, and actuating means for said gripper constructed to close the same upon the sheet after the same engages the
90 gage in the rearward position thereof and to release the gripper from the sheet in the forward position of the gage, substantially as set forth.

6. In a sheet-folding machine, the combination of a perforating device, means operating to carry the sheet to said perforating device comprising a roller arranged in rear of the perforating device and tapes passing around said roller, a folding device comprising a pair of folding-rollers arranged in front
95 of the perforating device and a blade cooperating with the said folding-rollers, carrying-tapes passing over the rear roller of said pair and under the front roller thereof, and a register and gripper constructed to engage with
100 the front edge of the sheet and reciprocating lengthwise of the path of the sheet in front of said pair of folding-rollers, substantially as set forth.

Witness my hand this 14th day of July, 1905.

CHARLES A. STURTEVANT.

Witnesses:

THEO. L. POPP,
I. B. JACKSON.