No. 739,105. PATENTED SEPT. 15, 1903.

I. F. PECK.

MACHINE FOR SETTING LACING STUDS.

APPLICATION FILED JUNE 4, 1900.

NO MODEL. 4 SHEETS—SHEET 1.

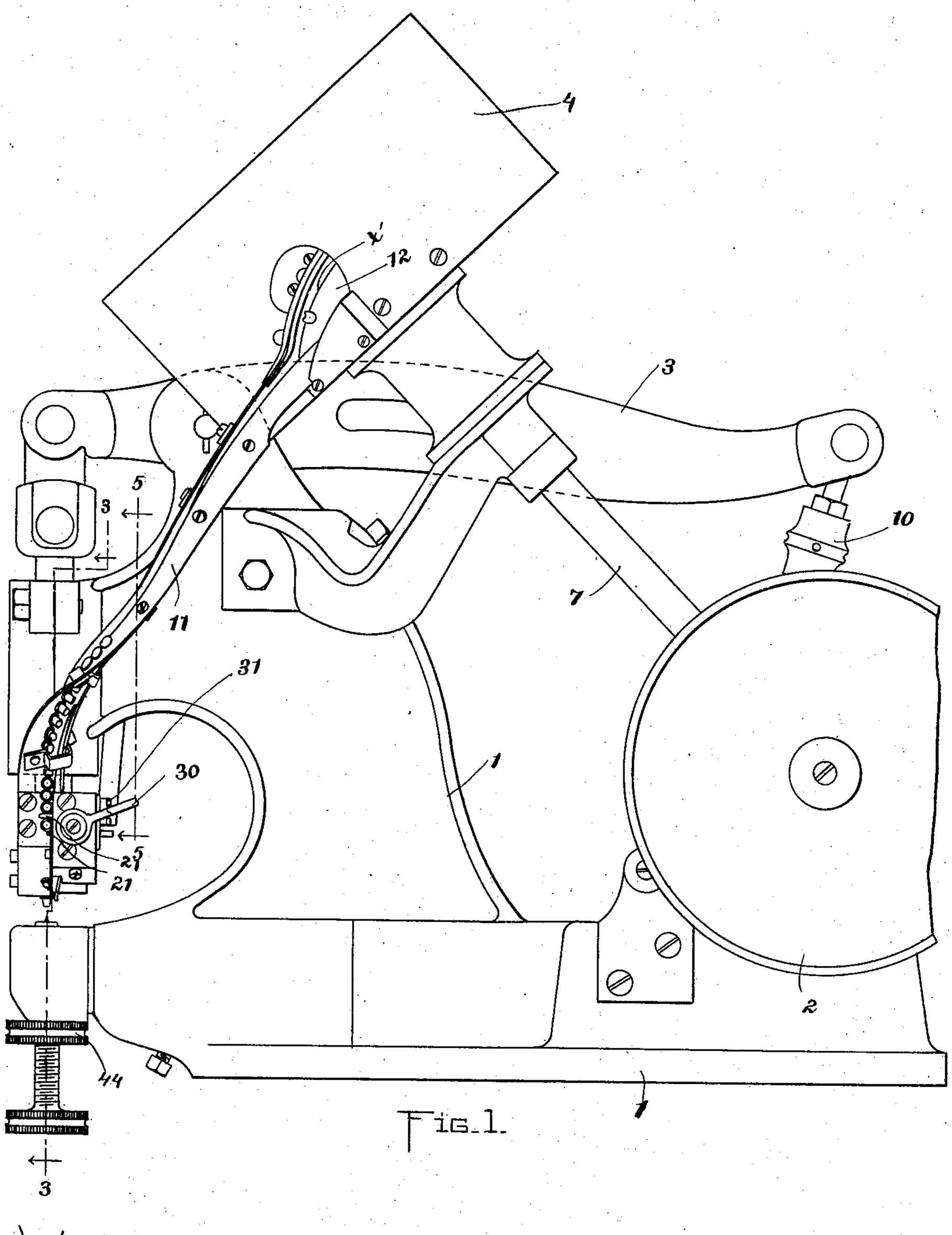

Fig. 1.

WITNESSES:
Walter P. Abell.
P. H. Pezzetti.

INVENTOR:
Ira F. Peck.
by Wright, Brown & Quinby
Attys.

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NO MODEL. 4 SHEETS—SHEET 2.

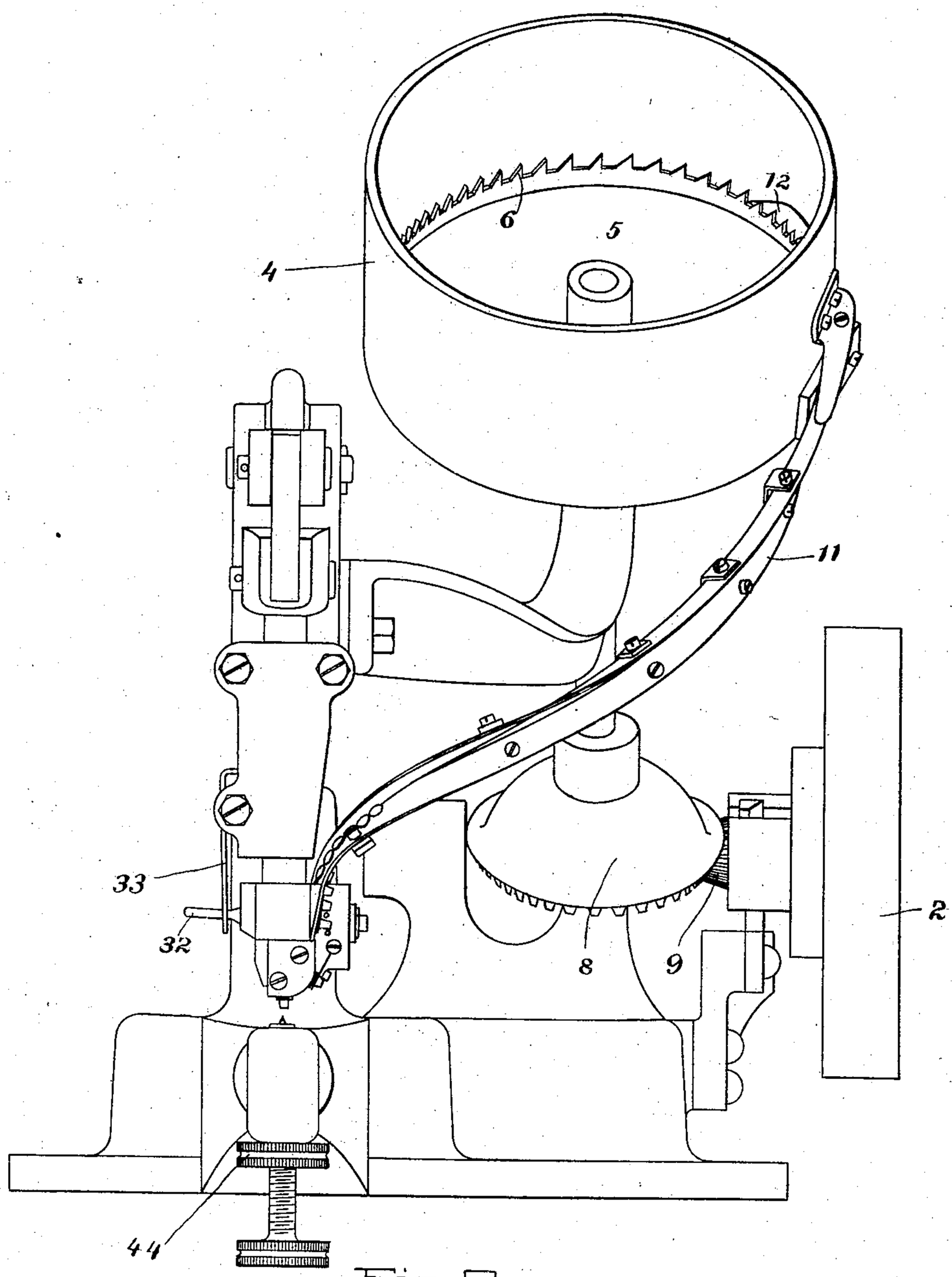

Fig. 2.

WITNESSES:
Walter C. Abell
P. W. Pezzetti

INVENTOR:
Ira F. Peck
by Wright, Brown & Quinby
Attys

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NO MODEL. 4 SHEETS—SHEET 3.

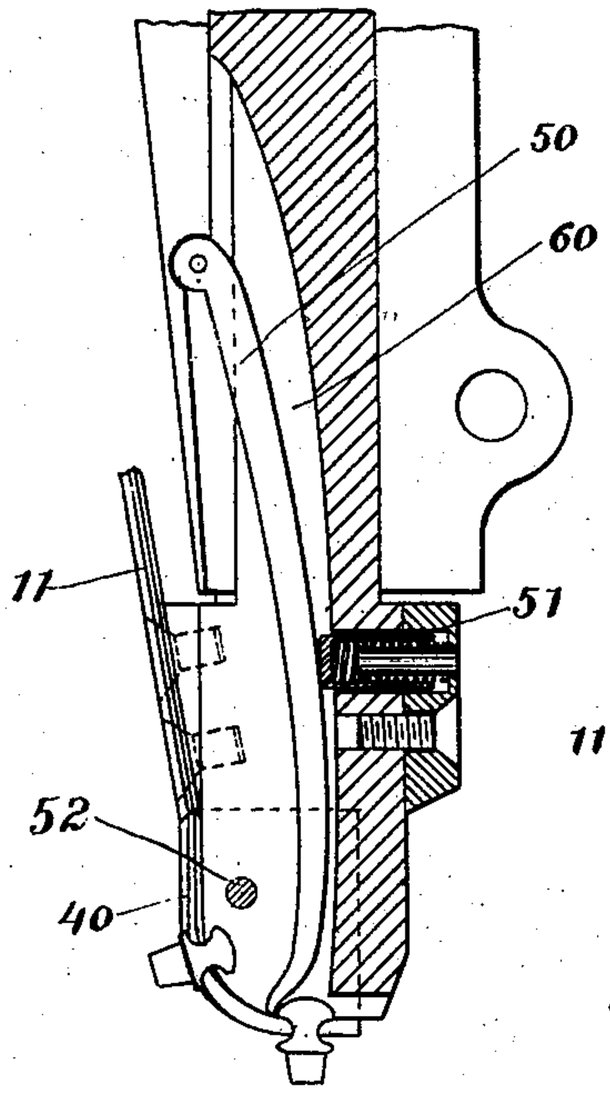

Fig. 3.

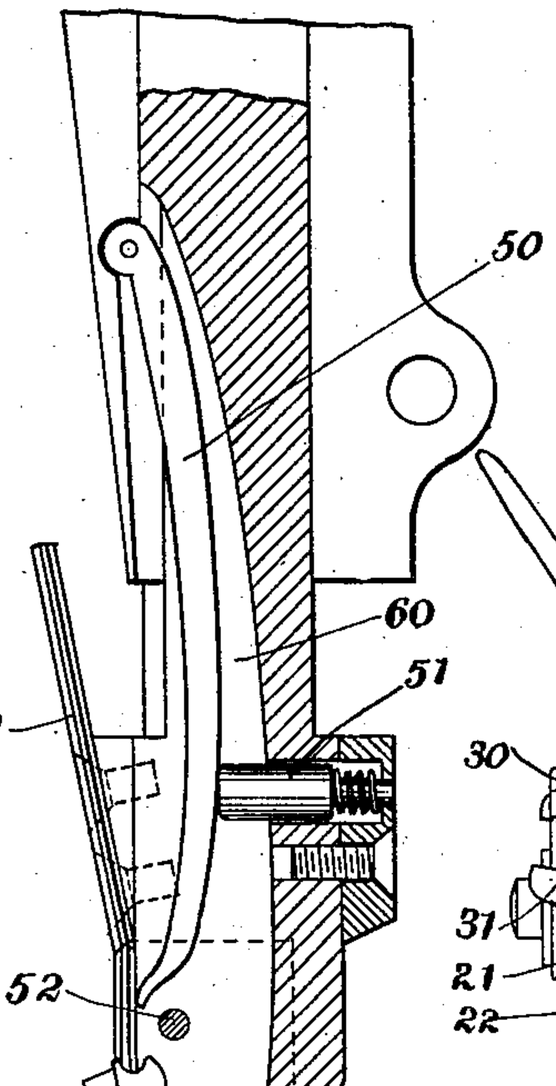

Fig. 4.

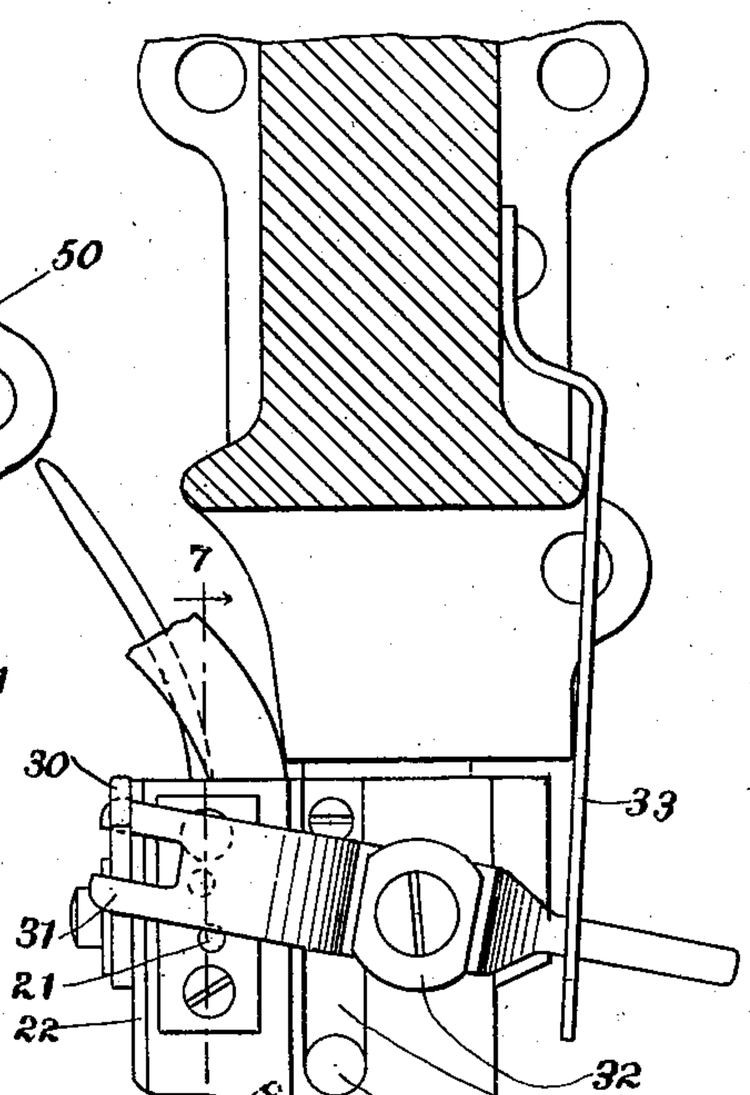

Fig. 5.

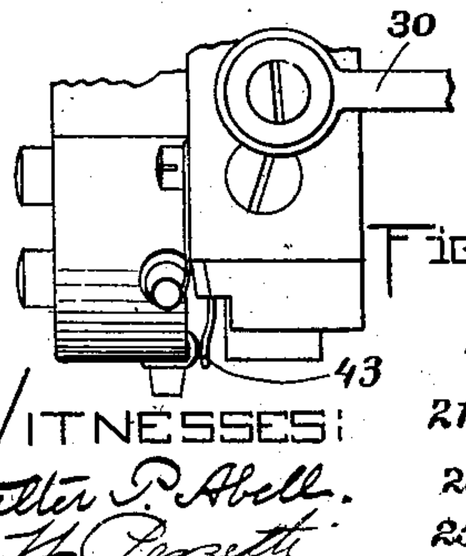

Fig. 6.

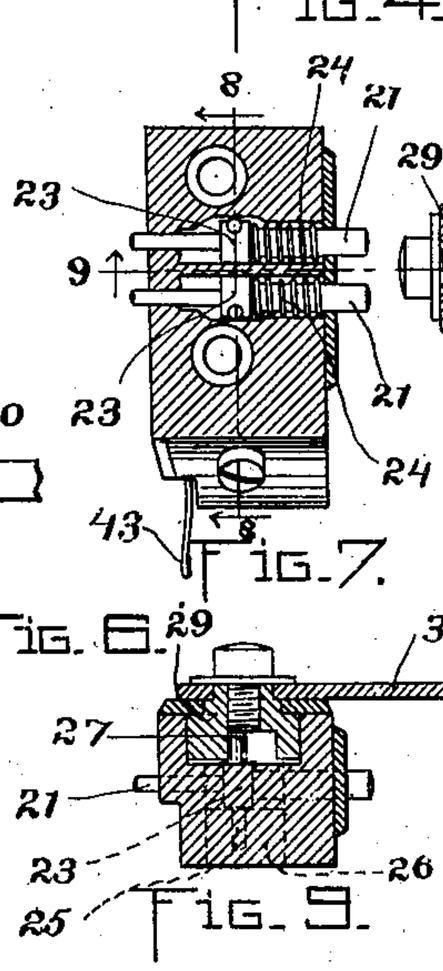

Fig. 7.

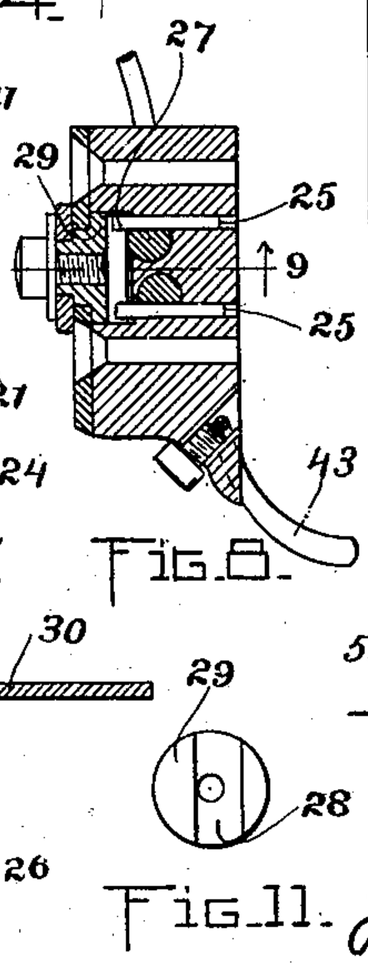

Fig. 8.

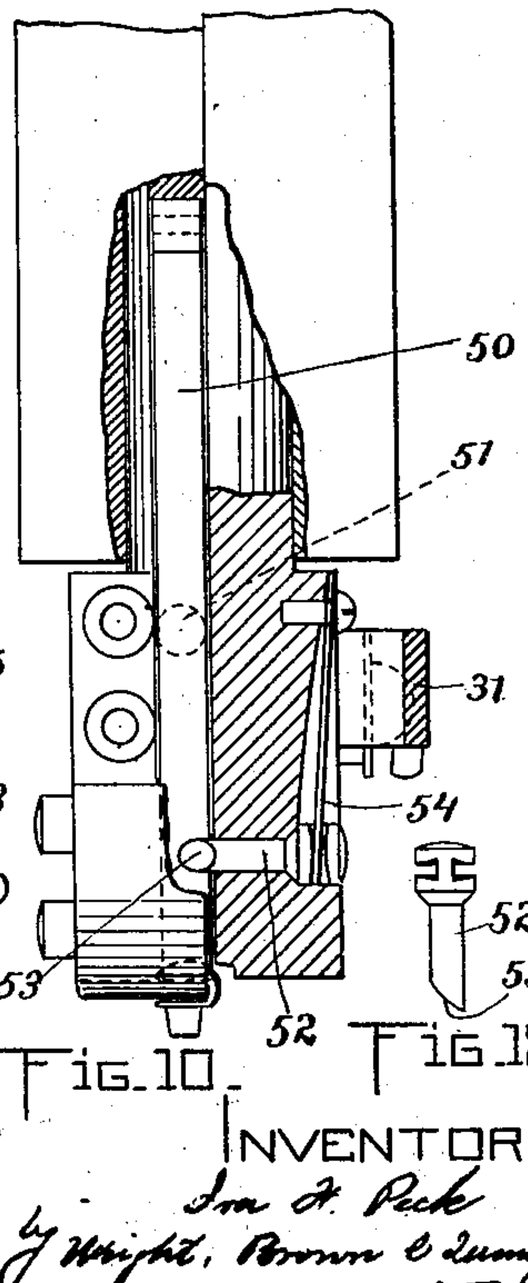

Fig. 10. Fig. 12.

Fig. 9.

Fig. 11.

WITNESSES:
Walter P. Abell.
P. H. Peggett.

INVENTOR:
Ira F. Peck.
by Wright, Brown & Quinby
Attys.

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APPLICATION FILED JUNE 4, 1900.

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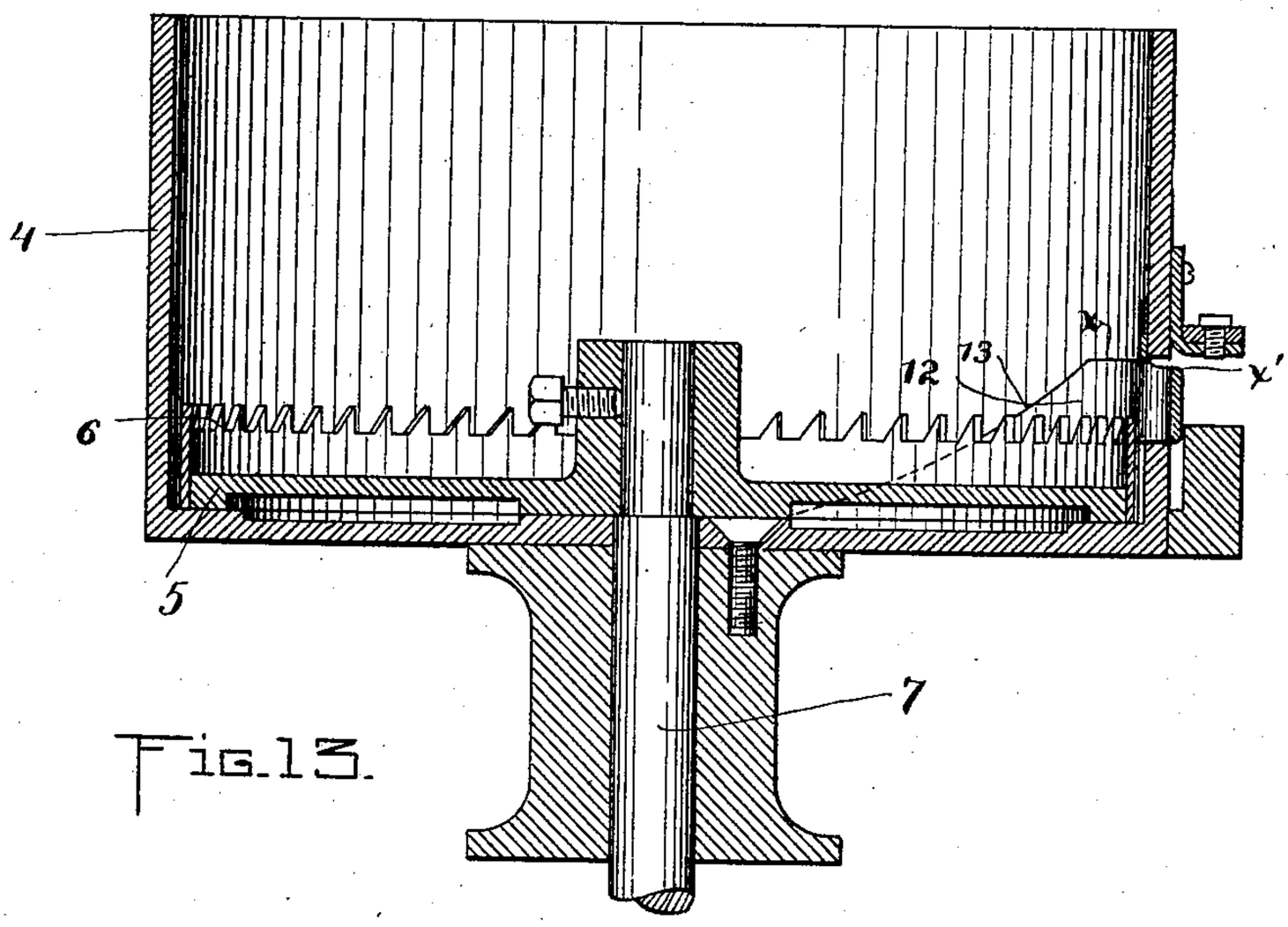

Fig. 13.

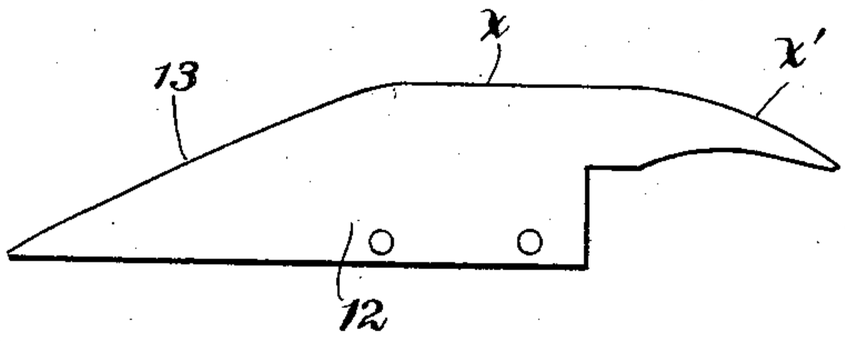

Fig. 14.

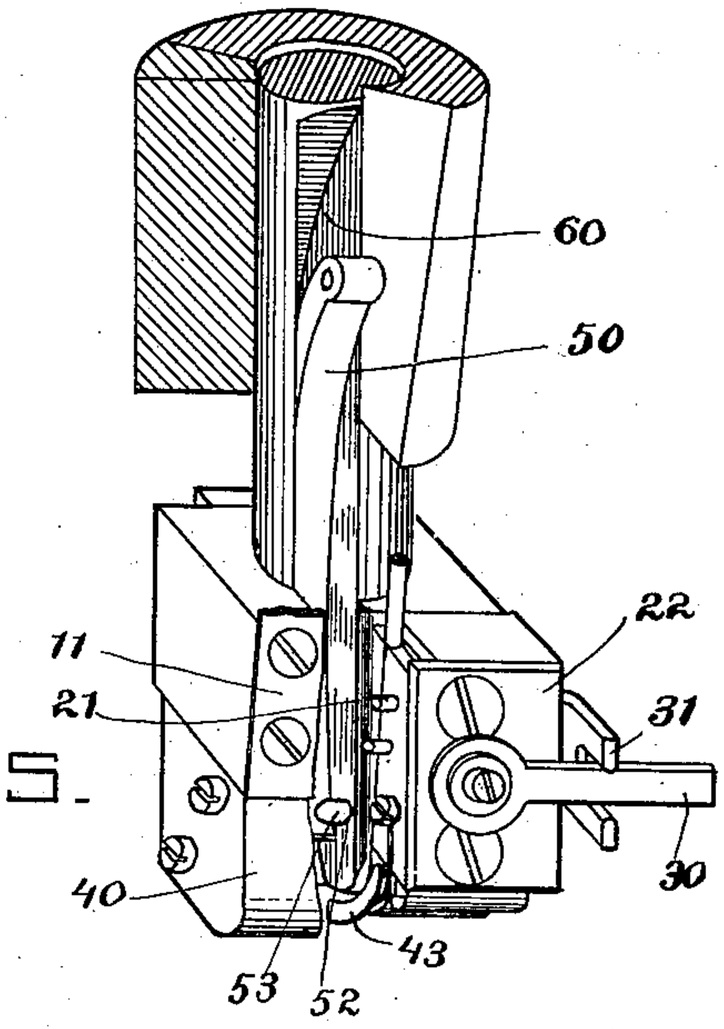

Fig. 15.

WITNESSES:
Walter P. Abell.
P. H. Pezzetti

INVENTOR
Ira F. Peck
by Wright, Brown & Quinby
Attys.

No. 739,105. Patented September 15, 1903.

UNITED STATES PATENT OFFICE.

IRA F. PECK, OF AUBURN, RHODE ISLAND, ASSIGNOR, BY MESNE ASSIGNMENTS, TO GEORGE OTIS DRAPER, OF HOPEDALE, MASSACHUSETTS.

MACHINE FOR SETTING LACING-STUDS.

SPECIFICATION forming part of Letters Patent No. 739,105, dated September 15, 1903.

Application filed June 4, 1900. Serial No. 18,950. (No model.)

To all whom it may concern:

Be it known that I, IRA F. PECK, of Auburn, in the county of Providence and State of Rhode Island, have invented certain new and useful Improvements in Machines for Setting Lacing-Studs, of which the following is a specification.

This invention relates to an improved machine for setting lacing-hooks and other fastening devices.

Figure 1 represents a side elevation of a machine constructed in accordance with my invention. Fig. 2 represents a front view of the machine. Fig. 3 represents a vertical sectional view on the line 3 3 of Fig. 1, showing the plunger in its raised position with a hook in place ready to be forced through the material against the setting-die to have its flange upset against the material. Fig. 4 represents a view similar to Fig. 3, showing the plunger in its depressed position, with the flange of the hook in engagement with and upset by the stationary die. Fig. 5 represents a side elevation of the separator and its operating-levers, the view being taken on line 5 5 of Fig. 1, looking to the left in that figure. Fig. 6 represents a detail view of the lower end of the plunger as viewed from the right-hand side. (See Fig. 2.) Fig. 7 represents a sectional view of the end of the plunger on the line 7 7 of Fig. 5, showing the arrangement and method of mounting the separating-pins. Fig. 8 represents a sectional view on the line 8 8 of Fig. 7, showing in part the guides for the separating-pins and the cam and its engagement with the lugs on the separating-pins through the medium of which the pins are operated. Fig. 9 represents a sectional view on the line 9 9 of either Fig. 7 or Fig. 8, showing the cam and its engagement with the lug of the separator-pin, and also showing the guide of the separator-pin and the path in which it moves, the latter being shown in dotted lines. Fig. 10 represents a side elevation of the lower end of the plunger looking toward the left in Fig. 2, some of the parts being broken away in order to show the push-finger and detent, the spring-finger being shown in dotted lines above the detent and back of the finger. Fig. 11 represents a front elevation of the operating-face of the cam, showing the grooves in which the lugs of the separator-fingers are arranged. Fig. 12 represents a front elevation of the detent. Fig. 13 represents a sectional view of the hopper, showing the movable bottom with its serrated flange, together with the incline or stationary track for receiving the hooks from the serrated flange and delivering them to the raceway. Fig. 14 represents a detail view of the incline or stationary track. Fig. 15 represents a detail perspective view of the plunger-head, the parts being broken away to show the arrangement of the push-finger and detent.

The same reference-figures represent the same parts in all of the figures.

1 represents a framework; 2, the driving-wheel of a machine for setting lacing-hooks or other fastening devices. The framework and driving-wheel may be of any preferred or desired construction.

3 represents a lever pivoted near one end to a lug at the front of the framework.

4 represents a stationary hopper on the framework. This hopper has a movable bottom 5, formed with a serrated flange 6. The serrations resemble the teeth of a crosscut-saw arranged to have their vertical faces move toward an incline hereinafter described. An inclined shaft 7 is connected at its upper end to the movable bottom 5 of the hopper and is provided at its lower end with the gear 8, arranged to mesh with and be driven by a gear 9 on the driving-shaft. (Not shown; see Fig. 2.) A pitman 10 connects one end of the lever 3 with the crank or cam (not shown) on the driving-shaft. This pitman connection is a common one in this class of machines and does not require further description, because it is well known in the art.

11 represents a raceway slidingly connected at its upper end to the hopper 4 (see Figs. 1 and 2) and at its lower end secured to the plunger-head hereinafter described (see Figs. 1 and 2) in order to conduct the hooks or fasteners from the hopper 4 to the setting devices hereinafter described.

12 represents a stationary track or incline, arranged on the hopper 4 outside of, beside, and substantially concentric with the serrated flange 6. This track is formed at one end

with an incline 13, the lower end of which is below the base of the serrations of the flange 6 and its upper end above the apexes of said serrations. This track, with its incline, serves to lift the hooks from the serrated flange as the latter is rotated toward said incline, the hooks being pushed along up said incline, along the flat place x thereon to the inclined delivery end x', where they are pushed to and transferred on the raceway 11, after which the hooks or fastenings descend by gravity to the separator, which I will now proceed to describe.

Prior to my invention separators have been employed in this class of machines which consisted of movable but relatively rigid projections arranged to be inserted between successive hooks or fastening devices in order to prevent more than one at a time being delivered from the raceway to the setting device. These relatively rigid projections have given rise to many difficulties, among which may be mentioned the jamming of the hooks or fastening devices in the raceway, occasioned by the projection engaging the hook, and instead of slipping to one side or the other of the hooks forcing the latter against the raceway. By my invention these difficulties are overcome, the projections of the separator being yielding instead of relatively rigid, so that in case they engage the hook, as stated, the separator yields, and thus prevents the jamming of the hook in the fastening device.

My improved separator consists of two pins 21, (see Figs. 1, 7, and 9,) arranged in the path of the setting ends of the hooks at the lower end of the raceway 11 and spaced far enough apart to receive one hook at a time between them. The separator is designed to permit one or in the gang-machine one set of hooks to be delivered to the setting device or devices at each upward or reverse movement of the plunger-head or at each feeding operation of the material.

The mechanism of the separator (see Figs. 1, 2, 3, 4, 5, 6, 7, 8, 9, and 15) is housed in the casting 22, carried by and secured to the lower end of the plunger-head in any desired way. The pins 21 are mounted in this casting at a right angle to the path of movement of the hooks. Each pin 21 is provided with a collar 23. A coiled spring 24 is arranged upon each pin between the rear face of the collar 23 and the rear face of the casting. This spring normally tends to force the front end of the pins outward across the path of the fasteners as they travel from the raceway 11 to the plunger-head, hereinafter described. Each collar 23 has a pin 25, arranged to slide in a recess 26, formed in the casting 22 and serves as a guide for the pin 21. Each collar 23 is further provided with a lug 27, whose end is arranged in a slot 28 in a cam 29, suitably mounted in the casting 22. Instead of separate structures for the pin 25 and the lug 27 I may employ one pin, as shown in Fig. 8, but this is not essential, as the collar may be formed with lugs or provided with pins or any suitable construction to accomplish the desired purpose. 30 represents a lever, one end of which is secured to the said cam, while the opposite end is arranged in a fork 31 of a lever 32, pivoted to the casting. The front end of the lever 32 is operatively connected to a stationary plate 33, preferably by having the end of the lever 32 pass through a slot in the plate 33. In lieu of this construction any well-known expedient may be adopted for connecting the stationary plate 33 to a part, as the end of the lever 32, designed to have a motion relative to the plate 33. The lugs 27, as shown, can have considerable play in the slot 28. By this construction should the pin impinge upon a hook, instead of passing to one side or the other of the hook the pin can and will yield, owing to its spring 24 and the loose connection of its lug 27 in the slot 28, thereby preventing the jamming of the hook in the raceway, and the consequent clogging of the raceway, an occurrence that would necessitate the stopping of the machine and an occurrence of frequent repetition in machines prior to my invention.

The operation of the separator is as follows: As the plunger rises and descends the cam 29 is rocked, thereby alternately drawing back against the tension of the spring 24 first one pin 21 and then the other. As the plunger rises the cam 29 is rocked to force the upper pin 21 above the lower hook in the raceway 11, (see Fig. 1,) that rests upon the lower pin 21 and below the second hook. At the same time the lower pin is withdrawn, permitting the hook held by it to drop in the raceway 40 of the plunger-head, that forms a continuation of the raceway 11 and at the same time forms one member of the setting device. (See Figs. 1, 3, 4, 6, and 10.) The hook when released by the lower pin, as above described, passes from the raceway 11 to the position in the raceway 40 occupied by the upper hook, in Figs. 3, 4, and 6, in position to be engaged by the push-finger, hereinafter described, when the plunger makes its next upstroke. As the plunger descends to set or attach the lacing-hook or fastening device the cam 29 is rocked in the opposite direction to advance the lower pin across the path of the raceway 11 and withdraw the upper pin, thereby permitting a hook to occupy the space between two pins. (See Fig. 1.) The pins, yieldingly mounted, cannot, as heretofore stated, jam the hooks and effect an accurate continuous predetermined delivery of a hook or set of hooks to the raceway 40 in the plunger at each upstroke of the latter or at each feeding motion of the material.

Referring to Figs. 3, 4, 6, and 10, the plunger-head is shown as provided with a curved raceway 40, forming a continuation of the raceway 11. The raceway 40 not only serves, as stated, to receive the hooks from the raceway 11, but also serves to hold the hook or fastening devices while they are being set to

fasten the material through the coöperation of the stationary die 42. (See Fig. 4.) A spring 43 (see Fig. 6) serves to yieldingly retain the hook in the raceway 40, the hook being withdrawn by pulling the latter against the spring 43 to the right in Fig. 4. The stationary die 42 is adjustable on the framework and is secured to any desired adjustment by a lock-nut 44. The adjustment shown is effected by means of screw-threads; but any well-known means for accomplishing this end may be employed.

Referring to Figs. 3, 4, 10, and 15, a push-finger 50 is shown pivoted at its upper end to the casing or walls forming the bearings of the plunger-rod and arranged in a recess 60 in the plunger-rod. The push-finger is slightly curved and is constructed and arranged to have its free end engage the hooks at the point in the raceway 40 where they stop after leaving the raceway 11 (see the upper hook in Figs. 3, 4, and 6) and force the said hook into position for setting. (See also the hook in Figs. 3 and 6 and the hook in Fig. 10.) A spring-pin 51 (see Figs. 3 and 4 and the dotted line, Fig. 10) is mounted in the plunger and arranged to engage the push-finger 50 and cause its free end to engage the hook as the plunger rises. 52 represents a detent mounted in the plunger and arranged at right angles to the pin 51. (See Figs. 3, 4, 10, and 15.) The end of the detent is beveled, as at 53, said bevel being arranged on the side next the free end of the push-finger 50 in the position occupied by the parts in Fig. 4, in order that the bevel may be engaged by the push-finger as the two parts are moved in relation to each other, the push-finger being relatively stationary, while the detent moves with the plunger-head up and down. On the upstroke of the plunger-head the end of the finger 50 engages the bevel 53 and forces the detent 52 back against the tension of the spring 54, the detent snapping behind the end of the finger as soon as the latter has passed the bevel 53. (See Fig. 4.) On the downstroke or setting stroke of the plunger the detent is above the end of the finger 50. (See Fig. 3.) As the plunger, with its detent 52, descends the detent will engage the finger and hold it away from the upper hook in Fig. 3 until the end of the finger has been brought to a position above the upper hook or the position shown in Fig. 4, when the pin 51 will force the end of the finger against the raceway 40 and by the detent 52 into the position shown in Fig. 4, in which position it is ready for the next upstroke of the plunger to feed a hook from the point occupied by the upper hook in Fig. 3 to the point occupied by the lower hook in said figure. The parts are so arranged that the finger pushes the detent back as the plunger rises; but as the plunger descends the detent holds the finger back (see Figs. 4 and 15) until the end of the finger has passed the hook or set of hooks last delivered from the raceway 11 to the raceway 40. The pin 51, together with the curved raceway 40, as the plunger rises serves to keep the ends of the finger 50 in engagement with the hook and the wall of the raceway in order that it may travel from the position shown in Fig. 4 to the position shown in Fig. 3. Instead of the two pins 21 and their operating mechanism I may employ two spring pins or fingers whose operating ends are normally in the path of the hooks and are further arranged to be pushed back or to one side or out of the path of the hooks by the push-finger or some other part of the machine.

Having thus explained the nature of my invention and described a way of constructing and using the same, though without attempting to set forth all of the forms in which it may be made or all of the modes of its use, what I claim, and desire to secure by Letters Patent, is—

1. In a machine for setting lacing-hooks and other fastening devices, a raceway, a supply-hopper, a serrated feeding device in said hopper and movable continuously in the direction of a line connecting the series of serrations and arranged to pick up the fastening devices therein contained, and a stationary transfer-track arranged between the serrated feeding device and the wall of the hopper and adapted to receive the hooks or fastening devices from said feeding device and deliver the same to said raceway.

2. In a machine for setting lacing-hooks or other fastening devices, a raceway, a movable setting device connected therewith, a reciprocating plunger-rod to which said device is connected, said rod being formed with a recess, a push-finger housed in said recess, but pivoted near the upper end of said recess to the stationary wall of the plunger-rod bearing, the free end of said lever being arranged to play in the plane of the lower end of the raceway, means for yieldingly forcing said finger toward the raceway to engage a hook, a detent carried by the plunger-rod and arranged between the push-finger and the raceway, the parts being arranged as and for the purpose described.

In testimony whereof I have affixed my signature in presence of two witnesses.

IRA F. PECK.

Witnesses:
H. L. ROBBINS,
C. F. BROWN.