

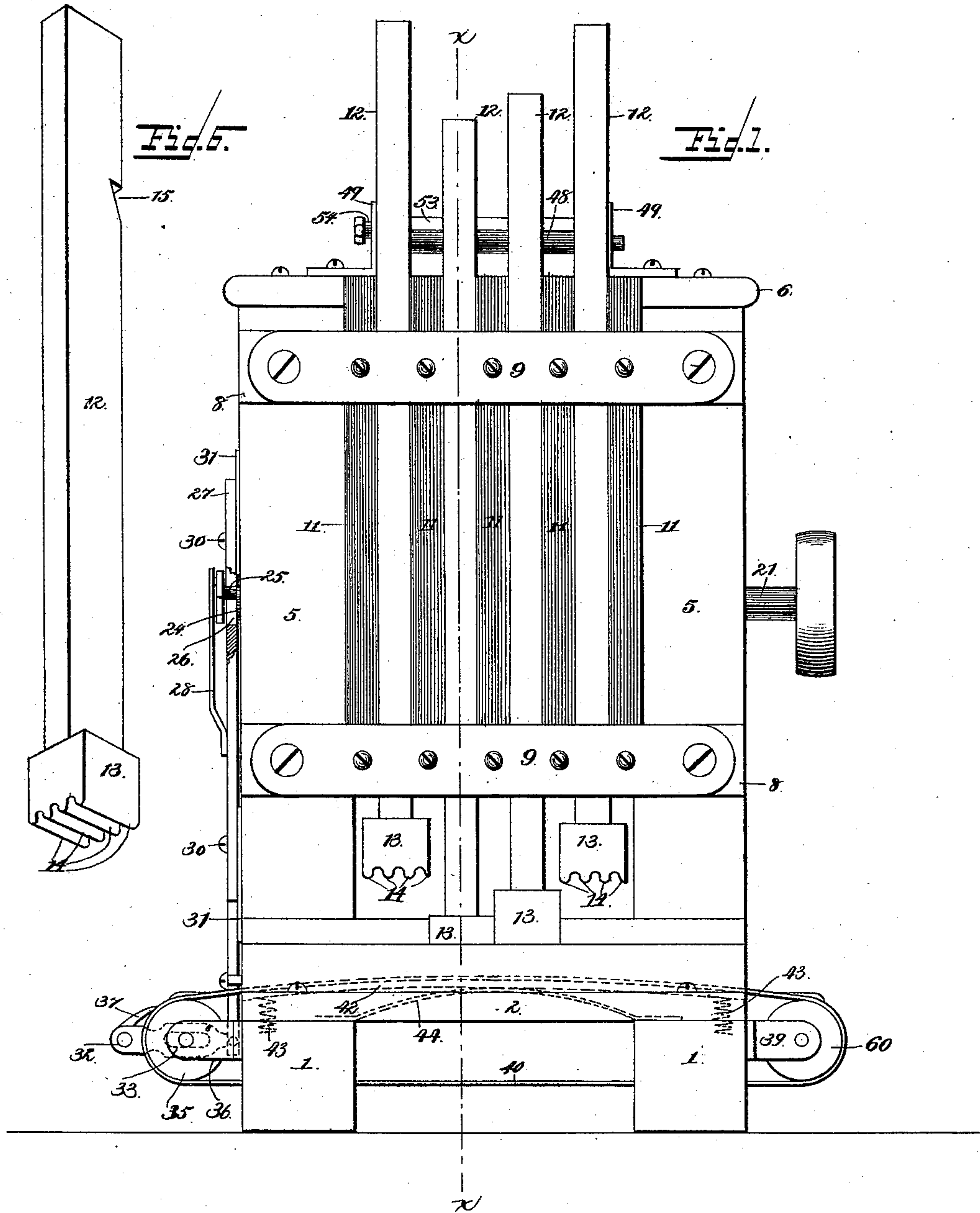
(No Model.)

3 Sheets—Sheet 1.

D. P. BURDON.  
MACHINE FOR EXTRACTING FIBERS.

No. 365,430.

Patented June 28, 1887.



Witnesses  
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By his Attorneys  
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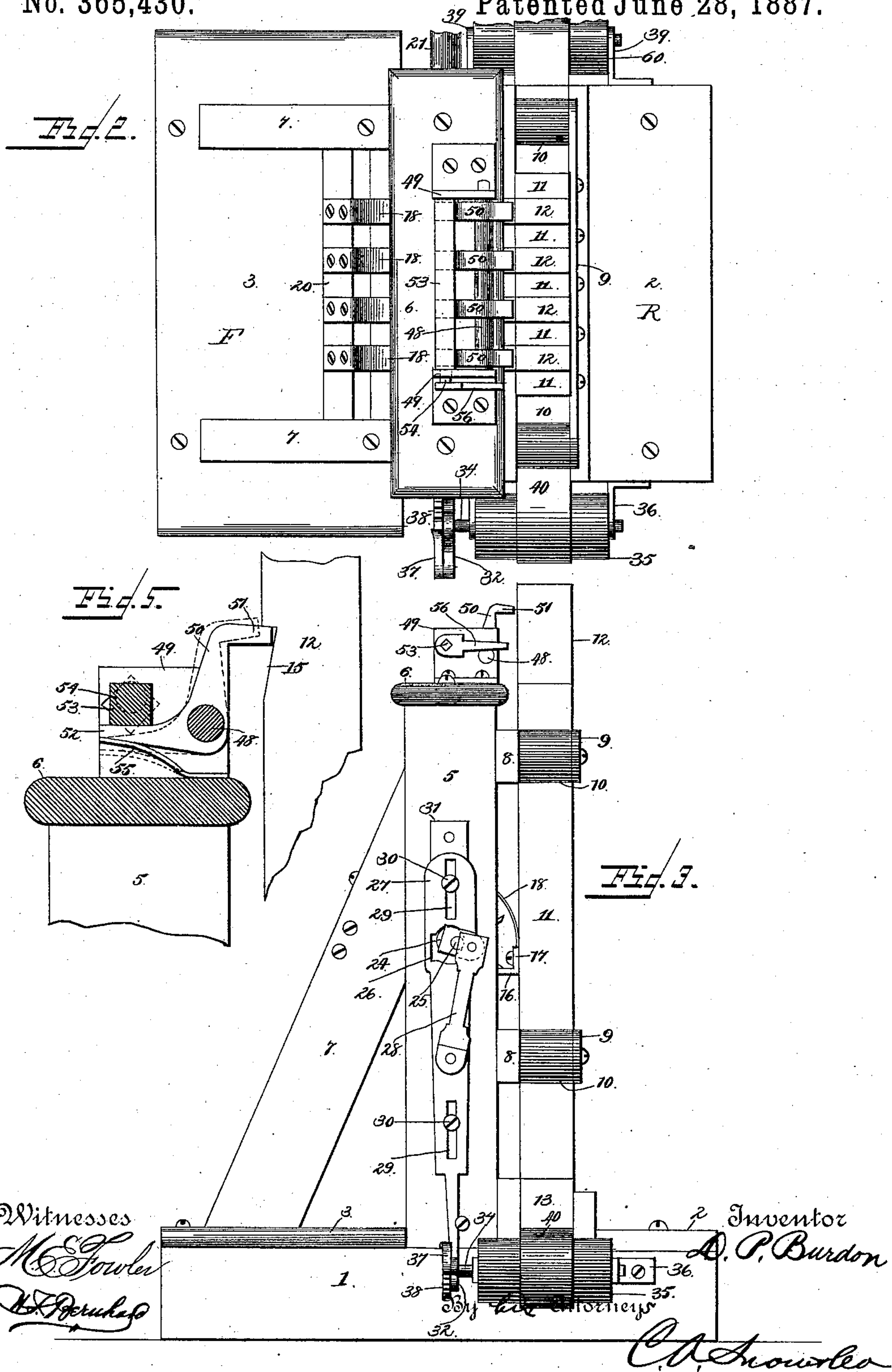
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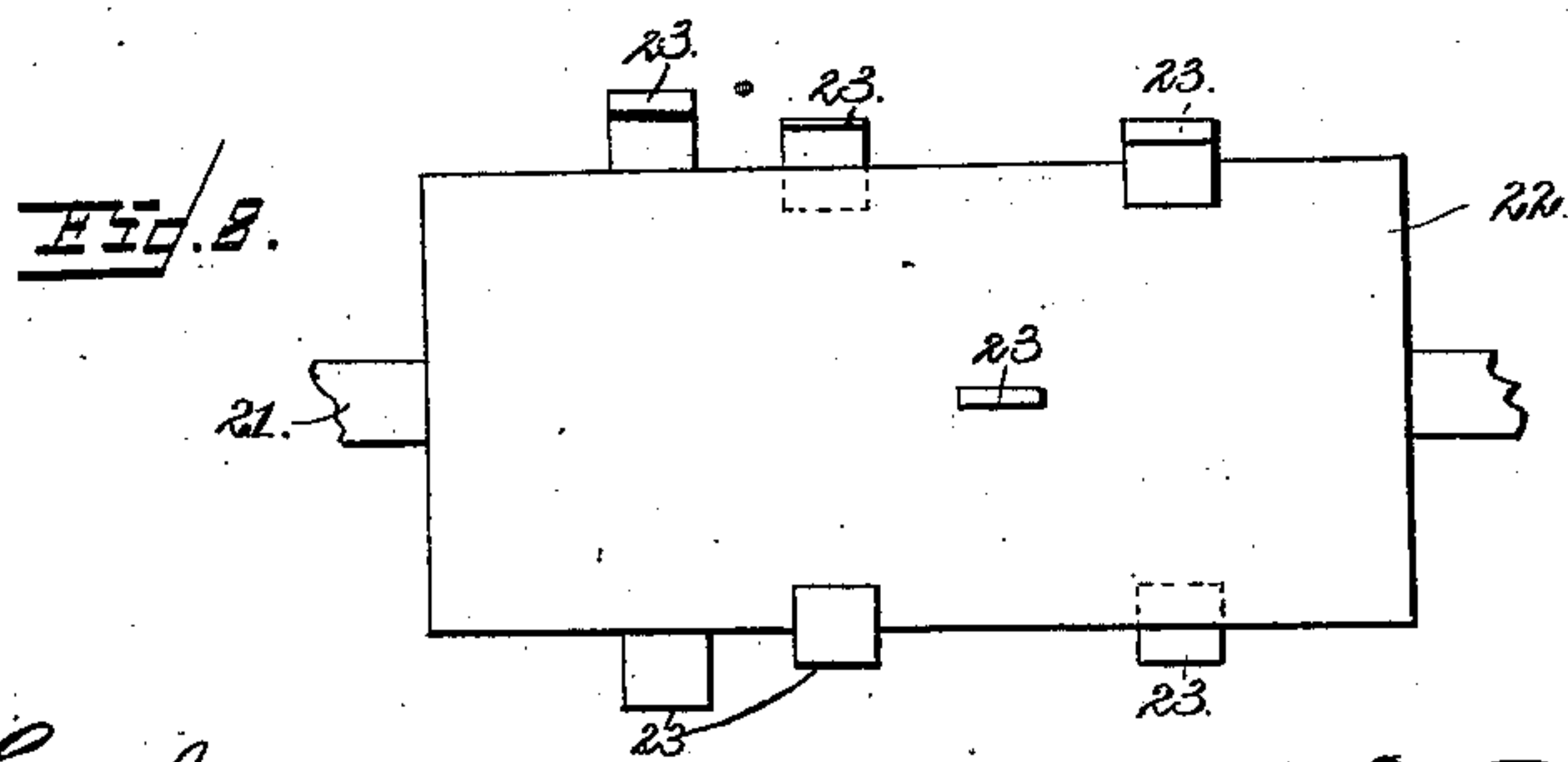
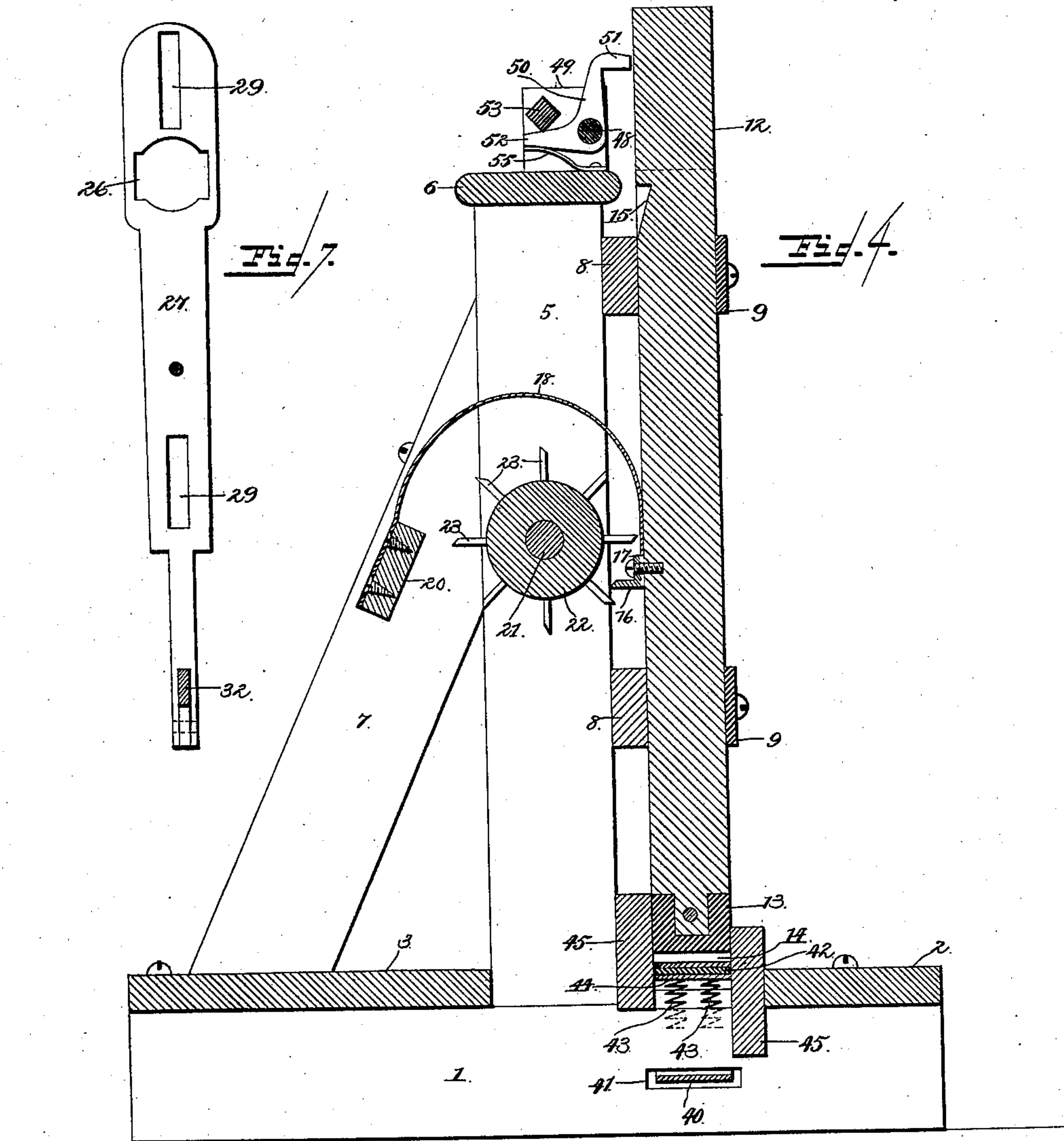
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# UNITED STATES PATENT OFFICE.

DAVID PATTEN BURDON, OF SANFORD, ASSIGNOR TO THE BURDON PATENTS ASSOCIATION, OF PALATKA, FLORIDA.

## MACHINE FOR EXTRACTING FIBERS.

SPECIFICATION forming part of Letters Patent No. 365,430, dated June 28, 1887.

Application filed July 10, 1886. Serial No. 207,727. (No model.)

*To all whom it may concern:*

Be it known that I, DAVID PATTEN BURDON, a citizen of the United States, residing at Sanford, in the county of Orange and State of Florida, have invented new and useful Improvements in Machines for Extracting Fibers, of which the following is a specification.

My invention relates to improvements in machines for extracting fibers; and it consists of the peculiar combination and novel construction and arrangement of the various parts for service, substantially as hereinafter fully set forth, and particularly pointed out in the claims.

The object of my invention is to provide a machine for extracting fibers from grasses, mosses, and all classes of fibrous plants, which shall be very reliable and efficient in operation, and simple, strong, and durable in construction; to provide improved beaters which shall be alternately forced against the material to be operated upon with considerable pressure or power, to effect the separation of the fibers with great rapidity and increase the efficiency of the machine; to provide a resilient bed which shall cushion the force of the blows delivered by the beaters on the work, and thereby prevent injury or damage to the beaters; to provide an improved carrier for feeding the work along beneath the beaters and present different portions of the material to the beaters to be acted on thereby, the movement of the carrier being effected automatically and simultaneously with the elevation of the last of the series of beaters, so that a new surface of work is presented for the beaters upon the downstroke thereof; and to provide means whereby the strokes of the beaters can be arrested and the beaters can be elevated above the material and out of contact therewith, so that it can be taken from the carrier or examined or replaced by other material, all as hereinafter fully set forth.

In the accompanying drawings, which illustrate a fiber-extracting machine embodying my invention, Figure 1 is a front elevation of the same. Fig. 2 is a top plan view. Fig. 3 is a side elevation. Fig. 4 is a vertical sectional view on the line *x-x* of Fig. 1. Fig. 5 is a detail view of the means for retaining the beaters in an elevated position. Fig. 6 is a

like view of one of the beaters. Fig. 7 is a detail view of plate 27. Fig. 8 is a detached elevation of the rotary cylinder for elevating the reciprocating beaters.

Referring to the drawings, in which like reference numerals denote corresponding parts in all the figures, 1 designates the longitudinal base-sills of the frame of my improved fiber-extracting machine, which sills are arranged parallel with each other and connected by horizontal platforms 2 and 3, arranged at the front and rear of the machine, respectively. To the sills 1, nearly in the middle thereof, are affixed uprights or standards 5, which are connected at their upper ends by a horizontal support, 6, that is suitably secured thereto—as, for instance, by bolts or otherwise—and these standards or uprights are braced and strengthened by inclined braces 7, that are secured at their extremities to the said standards and the rear platform, 3, as shown. This frame is of sufficient strength and stability to resist the strain and shock that is brought thereon when the machine is in operation; but I would have it understood that I do not intend to confine myself to the exact construction herein shown and described, as changes therein can be made without departing from the principle of my invention.

To the uprights or standards 5 are secured horizontal bars or beams 8, which are arranged near the ends of the said standards, and with these beams 8 are connected the ends of transverse plates or bars 9 by means of short studs or arms 10, which lie between the ends of the beams and the plates or bars, vertical guide-bars 11 for the beaters being arranged between the beams and the plates and secured thereto by screws or otherwise, so that they are not liable to become easily displaced. These guides 11 are arranged parallel with and at equal distances from each other, so as to provide intervening spaces in which the beaters are arranged. The beaters 12 slide or reciprocate freely between the guides and are prevented from lateral play thereby, while they are free to move vertically, and at their lower ends the beaters have enlarged heads 13, which may be formed integral with them, if they are of metal, or which may be secured to them, as shown herein. The side edges of



the enlarged heads 13 of the beaters extend or project laterally beyond the beater-shafts, so that when they are elevated by the mechanism which I will describe presently the said extended edges of the heads are brought into contact with the lowermost beams, 8, and the corresponding plate, 9, so that the upward play or stroke of the beater is limited and displacement thereof prevented. The lower or working surface of the head of each of the beaters is provided with a series of grooves, which form projecting ribs 14, that extend beyond the lower edges of the head proper and act upon the material which is placed beneath the beaters. These ribs or projections are arranged parallel with each other and in straight lines across the working-faces of the said heads, as shown in Fig. 6; but the form and arrangement of the ribs can be varied, it only being necessary that the lower working-surfaces of the heads of the beaters shall be roughened or corrugated. The upper ends of the beaters are extended above the frame of the machine, and are notched at 15, for a purpose to be hereinafter described, and the beaters are further provided with lifter-arms 16, (shown in Figs. 3 and 4,) which are secured thereto on their rear faces and near their middle points. These lifter-arms 16 are provided with right-angled arms 17, by means of which and screws or nails the said arms 16 are secured to the beaters, and on the upper edge of the arm 17 of each of the lifter-arms bears a spring, 18, which is preferably curved longitudinally and secured at its opposite end to a transverse or horizontal beam or bar, 20, that is rigidly and securely affixed to the inclined braces or struts of the frame, as clearly shown, the said spring serving to assist in depressing the beater after the teeth on a revolving cylinder are drawn away from the lifter arm of the beater, as presently described. A rotary shaft, 21, is journaled in suitable bearings on the vertical standards or uprights 5, which is to be rotated or driven by power from any suitable motor or source, and this shaft carries a cylinder, 22, which is rigidly affixed to the shaft and rotates therewith. The cylinder is arranged or located between the uprights 5, and on its periphery has a series of projecting teeth or fingers, 23, which act upon the lifter-arms or fingers of the beaters to elevate the latter, the said lifter arms being arranged in the path of the fingers of the cylinder. The fingers on the cylinder are arranged thereon out of line with each other, so that they act upon the lifter-arms of the beaters at different periods of time; whereby the beaters are operated independently and alternately of each other, no two beaters acting upon the material at the same time. I preferably employ four of the beaters, although the number thereof can be varied without departing from the spirit of my invention, and the cylinder carries eight teeth or fingers, two of which are provided for each of the beaters and which act upon it suc-

cessively, so that each beater makes or is given two strokes at each revolution of the toothed cylinder. The ends of the shaft 21, that carries the rotating cylinder for actuating the beaters, are extended beyond the uprights 5, one end of said shaft having a crank or other device connected therewith for the purpose of driving it from a suitable motor, and the other end carrying an eccentric, 24, which has a pin, 25, near or at its periphery, said pin having a rotary block secured or affixed rigidly thereto. The eccentric 24 of the shaft works or rotates in a slot or opening, 26, of a vertically-movable bar, 27, that bears against one of the standards or uprights 5 of the main frame; and to the rotary block of the eccentric-pin is pivotally connected the upper end of a link or pitman, 28, which has its opposite end connected in like manner with the vertically-movable bar 27, so that, by means of the eccentric working in the slot of the bar and the pitman connected thereto, the bar is caused to reciprocate simultaneously with the revolutions of the shaft and the cylinder. The vertically-movable or reciprocating bar 27 is slotted at its upper and lower ends longitudinally, as at 29, and through these slots are passed headed guide-pins 30, which are affixed to wear-plates 31, that are secured to one of the standards 5, to decrease or lessen the friction between the standard and the bar 27, as is obvious. The bar 27 is held in proper place on the standard 5 by the headed pins, while at the same time it can reciprocate freely, and the lower end of this bar is pivoted to a horizontal arm 32, which has a longitudinal slot, 33, through which is passed one of the trunnions 34 of the roller or drum 35. The roller or drum is arranged in a horizontal position on one side of the frame, and its shaft, or the trunnions thereof, are journaled in suitable bearings, 36, that are affixed to the base-sills 1 of the main frame. The horizontally-disposed arm is supported by the said trunnion or shaft of the roller or drum, and it is also free to move or oscillate under the motion or stroke of the reciprocating bar 27, and to the outer free end of this arm 32 is pivoted one end of a pawl, 37, that takes into the teeth of a ratchet-wheel, 38, that is secured on and rotates with the shaft of the drum or roller 35, so that the said roller will be driven by motion from the shaft 21, which, for the sake of convenience, I will hereinafter term the "driving-shaft," which is transmitted through the reciprocating-bar 27, as is obvious.

A roller or drum, 60, is located on the opposite side of the main frame to and in line with the roller or drum 35, and has its shaft or trunnions journaled in suitable bearings, 39, that are secured to the frame, or to the base-sills thereof. A traveling carrier, 40, of any pliable material—as, for instance, leather or canvas—passes over these rollers or drums 35 and 60, and the carrier is moved or caused to travel in one direction continuously by the



motion from the drum 35, ratchet-wheel, pawl, and reciprocating bar 27. The drum 35 is driven or rotated by positive motion, and for this reason I will term it the "driving-pulley" or "drum," and the fellow drum 60 turns or rotates loosely in its bearings, which latter roller I will hereinafter term the "idler drum or roller." The traveling belt or carrier is supported by these rollers or drums, and it passes through slots 41, that are formed in the base-sills 1, said carrier being arranged immediately beneath the enlarged corrugated heads of the beaters.

The work or material to be acted upon by the beaters is placed upon the traveling carrier and fed thereby beneath the beaters, and beneath the carrier is arranged a resilient bed, which consists, essentially, of a plate, 42, and cushion-springs 43. These springs are supported on or connected in any suitable manner to the base-sills of the machine, and beneath the central part of the carrier is arranged a longitudinally-curved spring or spring-bar, 44, (shown clearly in dotted lines in Fig. 1,) which is secured at its ends to the sills 1; and the plate 42 rests on all the springs and is supported thereby, the beaters acting upon the traveling carrier and the plate to depress the springs, which yield and obviate the danger of injuring the beaters. The traveling carrier works between the vertical strips 45, which are arranged on opposite sides of the same to form a channel for the passage of the material, so that it cannot be displaced from the carrier.

I will now describe my preferred mechanism for retaining one or all of the reciprocating beaters in an elevated position to permit the material upon which they operate to be inspected or changed. A rock-shaft, 48, is journaled at or near its ends in suitable bearings, 49, which are affixed to the longitudinal support connecting the standards 5 at their upper ends. This rock-shaft carries a series of arms, 50, which project or extend upward from the rock-shaft and have their free ends provided with angular lips 51, which are adapted to take or fit beneath notches or shoulders at the upper ends of the beaters, so that the latter are prevented from falling or descending when the lips fit beneath the shoulders thereon. The arms 50 of the rock-shaft are further provided with rearward-extending fingers 52, that lie or fit beneath a shaft, 53, which is also journaled in the bearings 49, said shaft being arranged above and in rear of the rock-shaft 48 and made square or rectangular in cross-section. The ends of the shaft 53 have trunnions 54, and when the shaft assumes the position shown in Fig. 5 of the drawings in dotted lines the rearwardly-extending fingers of the arms 50 are depressed, so that the lips of the arms are withdrawn from the notches or shoulders of the beaters. When the said shaft assumes the reverse position, the rearwardly-extended fingers 52 of the arms are elevated by means of the springs

55, so that the lips of the arms will project or extend into the notches to prevent the descent of the beaters. The arms are actuated simultaneously and controlled by the rock-shaft 48, and the shaft 53 can be conveniently operated by the hand of the attendant by means of the crank or lever 56, that is affixed to the shaft, as shown.

This being the construction of my improved machine, the operation thereof is as follows: The work is first placed on the carrier and power communicated to the driving-shaft to rotate the same and the toothed cylinder. The teeth or fingers of the cylinder then act upon the lifter-arms that lie in their path on the vertically-movable beaters, and the latter are elevated successively and independently of each other. When the teeth or fingers of the rotary drum are drawn away from the lifter-arms of the beaters, the springs force the beaters down upon the material, and the corrugated working-faces of the heads thereof act upon it on the carrier to separate the fibers thereof by stamping or pressing them out. Simultaneously with the vertical movement of the beaters the reciprocating bar 27 is actuated by the eccentric on the driving-shaft and the link, thus oscillating the horizontal arm to cause the pawl to rotate or drive the ratchet-wheel and the driving roller or drum to move the traveling carrier forward for a certain predetermined distance, so that a new area or surface of work is presented for the action of the beaters. The above-described operation is continued so long as the material is fed to the carrier, and the strokes of the beaters are cushioned or deadened by the resilient bed.

My improved machine is simple and strong in construction, effects the separation of the fibers from grasses, mosses, and fibrous plants of any character without injury or damage to the fibers, and requires but a small amount of power for its successful operation.

Various changes in the form and proportion of parts and details of construction can be made without departing from the spirit of my invention.

Having thus fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a fiber-extracting machine, the combination, with the longitudinally and vertically reciprocating beaters, of the carrier arranged beneath the same, the driving and idler drums over which the carrier passes and is actuated, and a resilient bed arranged beneath the carrier to cushion the strokes or blows of the beaters thereon, substantially as described, for the purpose set forth.

2. In a fiber-extracting machine, the combination, with the reciprocating beaters and the rotary cylinder for elevating the latter, of the carrier arranged beneath the beaters, the driving and idler drums over which the carrier works, and mechanism between the rotary cylinder and the driving-drum for rotating the



latter, substantially as described, for the purpose set forth.

3. A fiber-extracting machine comprising the beaters, the rotary cylinder for elevating the latter, the resilient bed beneath the beaters, the traveling carrier working over the bed, the drums or rollers for supporting the carrier, and ratchet mechanism intermediate of the rotary cylinder and one of the rollers or drums for rotating the latter, substantially as described.

4. A fiber extracting machine comprising the beaters, a rotary cylinder for elevating the beaters, a resilient bed comprising the plate and the cushion-springs supporting the plate, and an intermittently-traveling carrier arranged to work over the bed, substantially as described, for the purpose set forth.

5. A fiber-extracting machine comprising the beaters, the rotary cylinder for actuating the beaters, the eccentric carried by the cylinder-shaft, the vertically-movable bar actuated by the eccentric and having the guide-pins passing through slots therein, an oscillating arm connected with and actuated by the vertically-movable bar and carrying a pawl, the driving-pulley carrying a ratchet with which the pawl engages, the idler pulley or

drum, and the traveling carrier connecting the idler and driving pulleys, substantially as described.

6. The combination of the beaters, a rock-shaft carrying a series of arms adapted to engage the beaters and retain them in an elevated position, and means for oscillating the rock-shaft, substantially as described, for the purpose set forth.

7. The combination of the beaters having the shoulders, the arms having the lips to engage the shoulders, the shaft for controlling the arms, and the springs bearing against the arms, substantially as described.

8. The combination of the beaters having the shoulders, the rock-shaft carrying the arms provided with the lips, the springs bearing against the arms, and the shaft having the eccentric-bearings for actuating the arms, substantially as described.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in presence of two witnesses.

DAVID PATTEN BURDON.

Witnesses:

L. M. MOON,  
J. N. BISHOP.