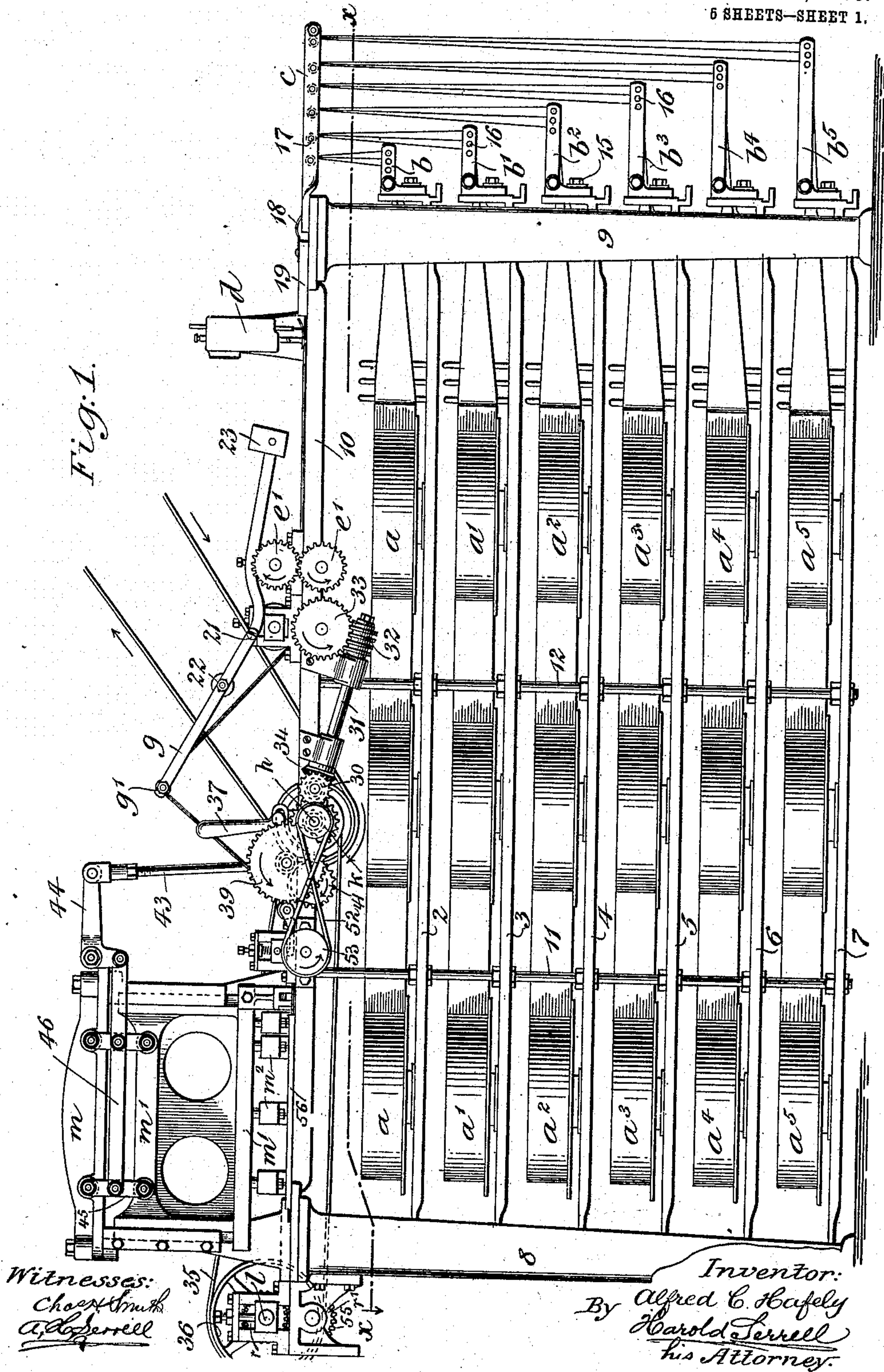


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A. C. HAFELY.
APPARATUS FOR MAKING STUBS.
APPLICATION FILED AUG. 1, 1908.

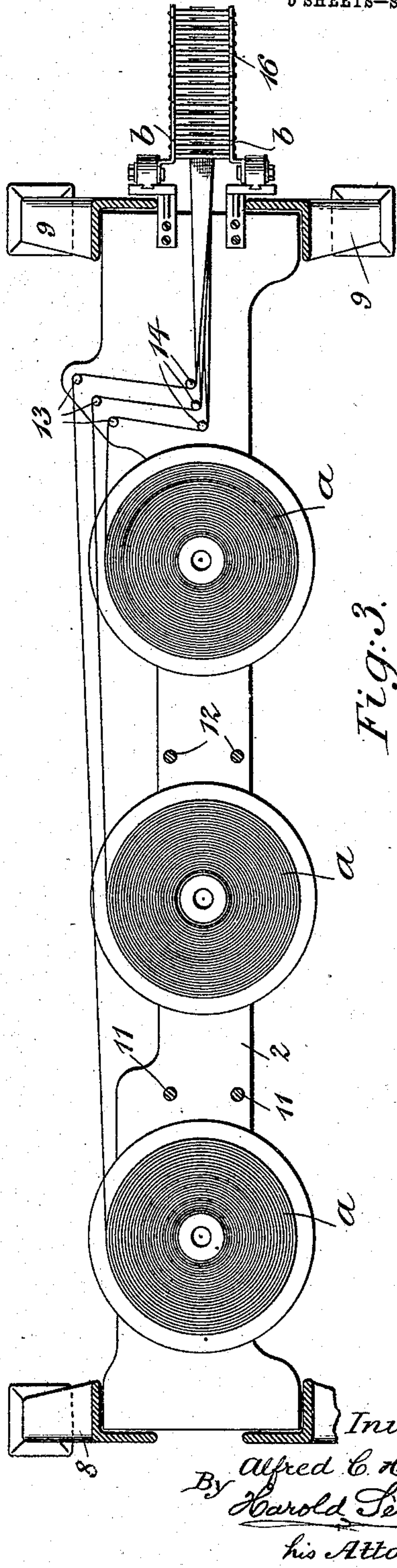
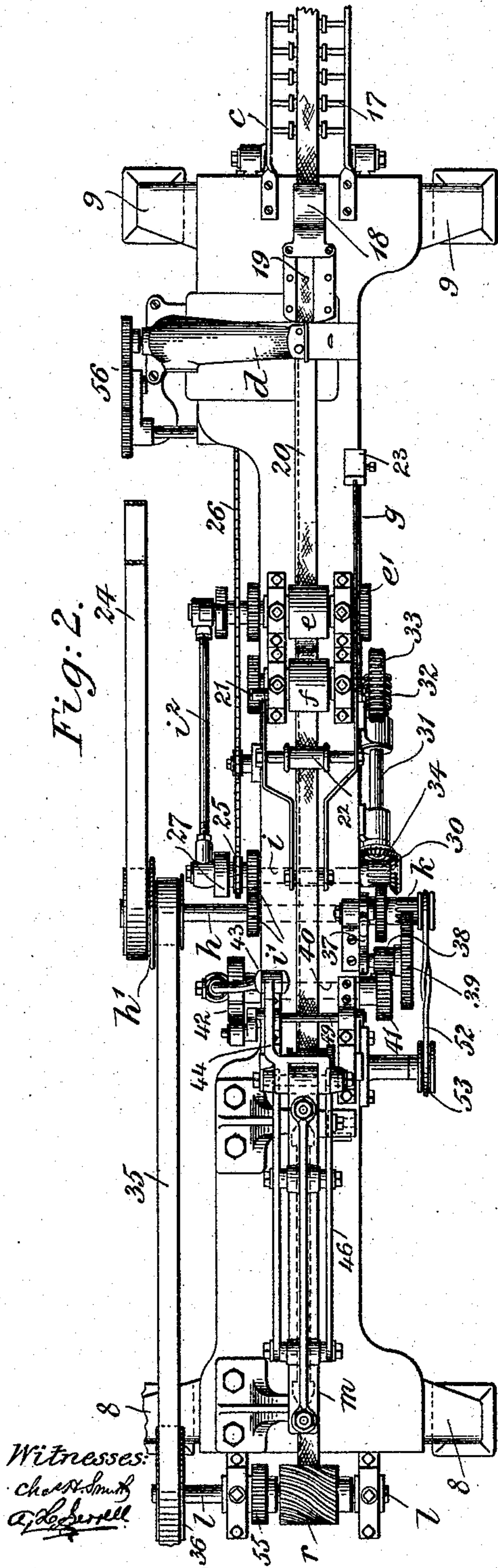
Patented Dec. 29, 1908.
6 SHEETS—SHEET 1.



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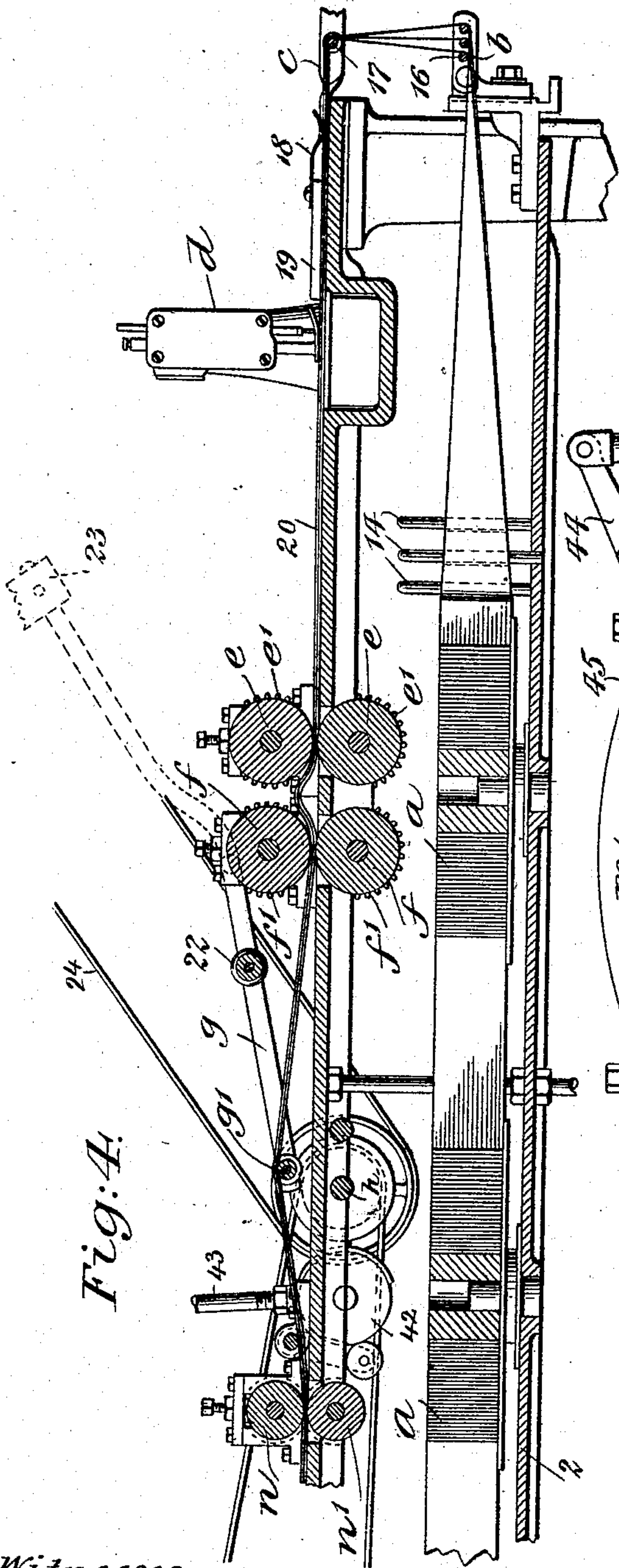


Fig. 4.

Witnesses:
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A. J. Berrell

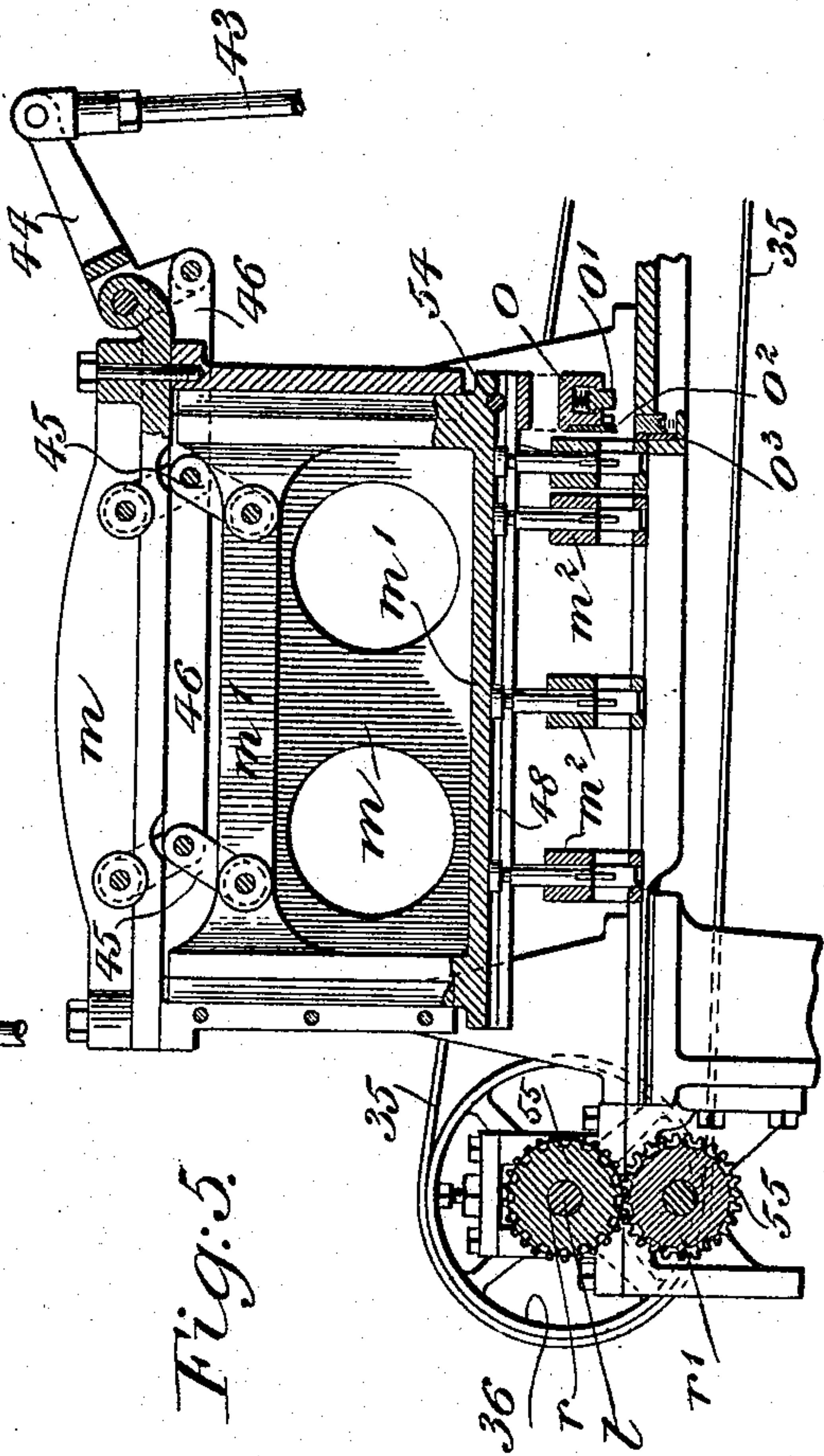


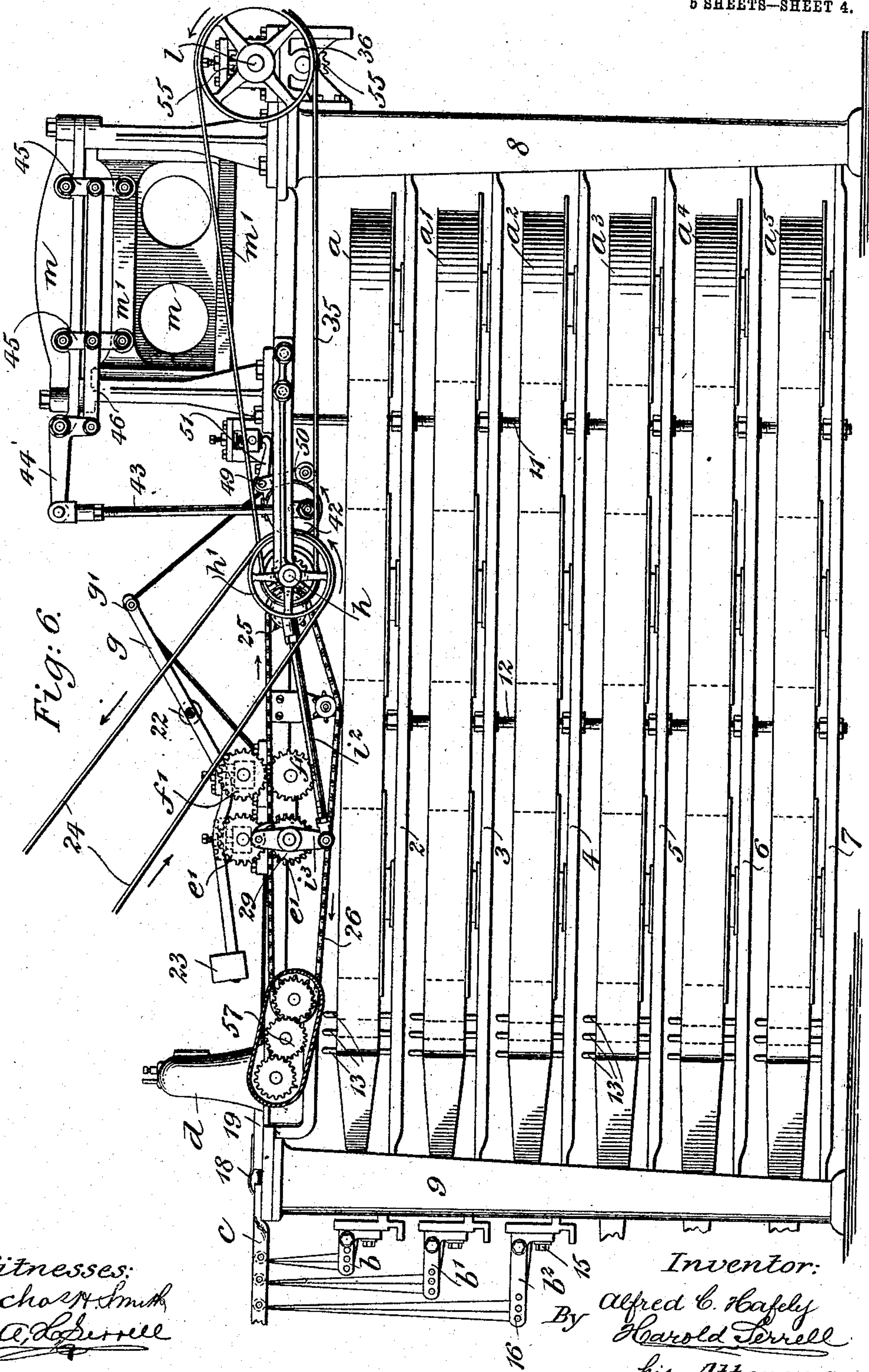
Fig. 5.

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 5 SHEETS—SHEET 4.



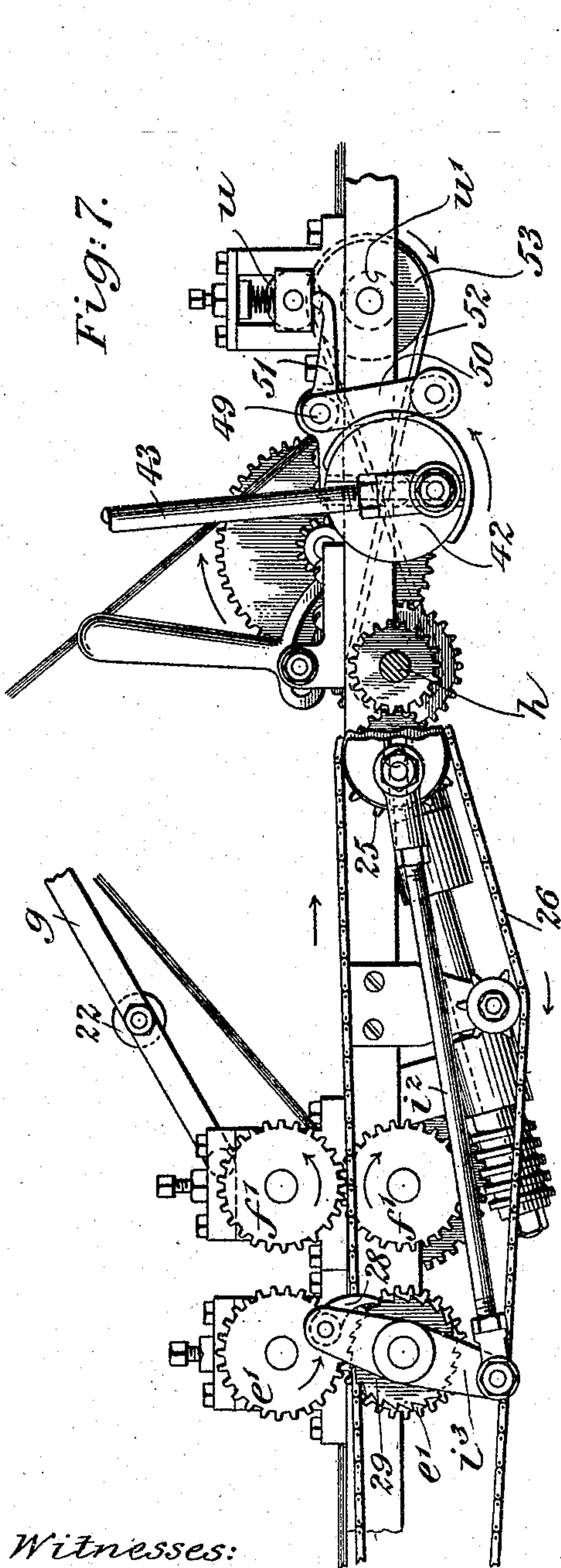
Witnesses:
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Inventor:
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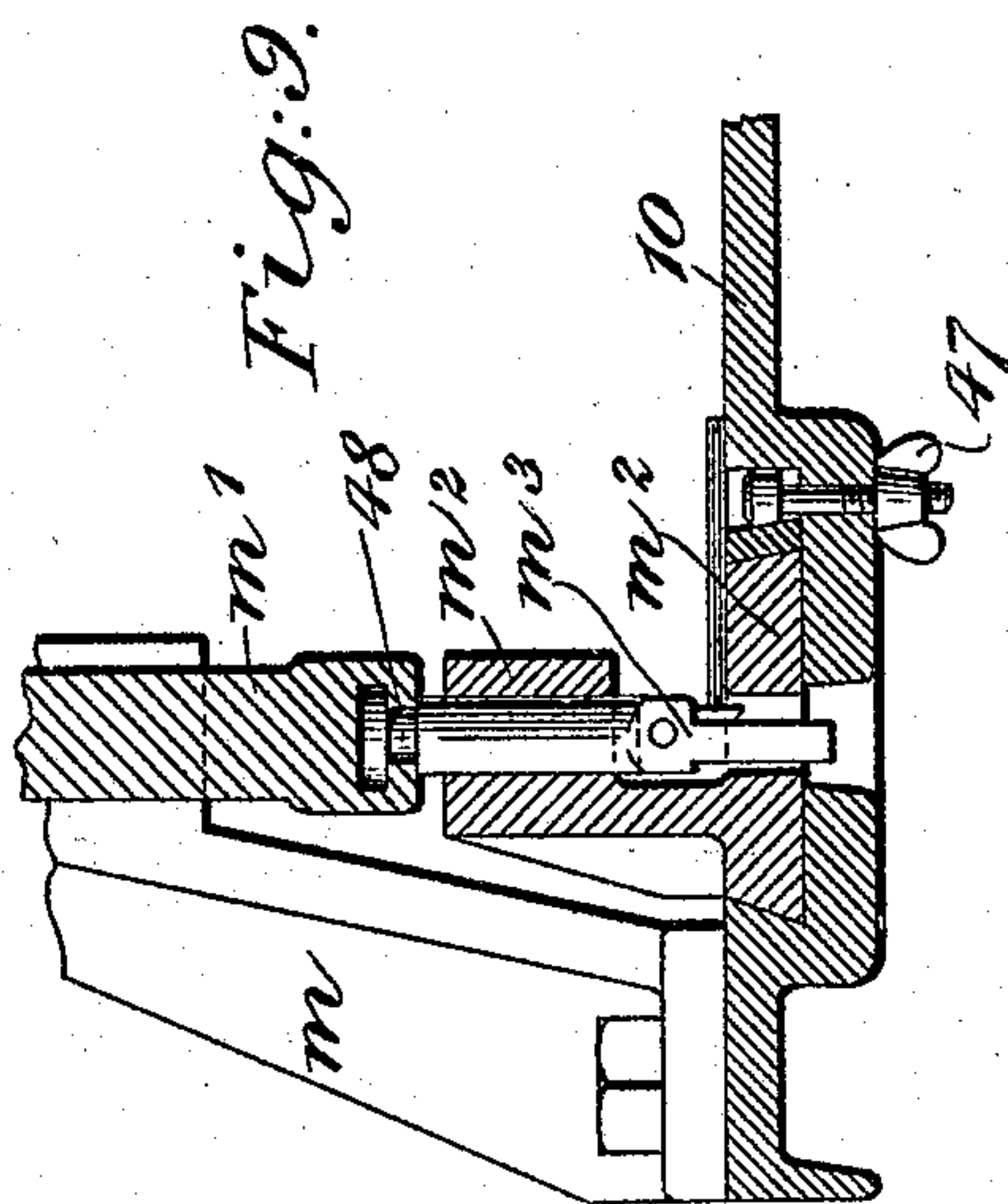
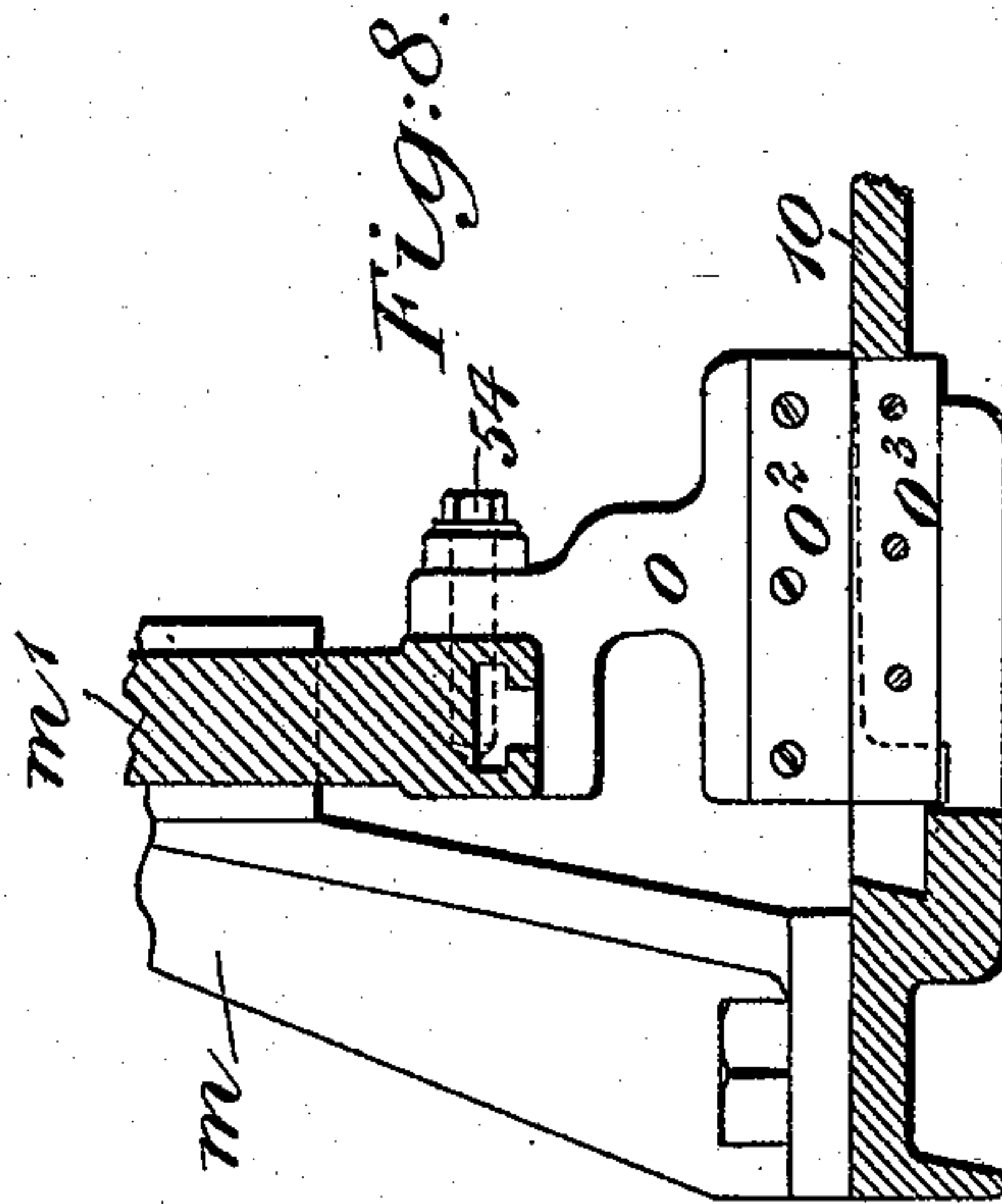
907,995.

Patented Dec. 29, 1908.
 5 SHEETS—SHEET 5.



Witnesses:

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UNITED STATES PATENT OFFICE.

ALFRED C. HAFELY, OF NEW YORK, N. Y.

APPARATUS FOR MAKING STUBS.

No. 907,995.

Specification of Letters Patent.

Patented Dec. 29, 1908.

Application filed August 1, 1908. Serial No. 446,392.

To all whom it may concern:

Be it known that I, ALFRED C. HAFELY, a citizen of the United States, residing in the borough of Brooklyn, county of Kings, city and State of New York, have invented an Improvement in Apparatus for Making Stubs.

My invention relates to the method of and apparatus for collating, superposing and sewing strips of paper for forming stubs for letter, invoice and other files, and the object of my invention is the production of such stubs quickly and economically, and of any desired number of superposed strips of paper and of any desired or useful length, and simultaneously to prevent the same curling and provide the notches in the back edges required for the back cords of the file in binding.

In the carrying out of my invention, I collate the strips of paper from suitable rolls arranged in series,—the strips of each predetermined series coming together and the strips of all the series being superposed in advance of the sewing needle. These strips are pulled along as a continuous stub, by a movement intermittent with the sewing of the strips together and thereafter the continuous strip is steadily advanced by rollers having a continuous movement. The continuous strip is thereafter given a rapid feed which takes up the intermediate slack and an alternate rest, during which latter period the cutting and notching are performed; afterwards with the advance of the stub, the cut length or lengths are rapidly removed and simultaneously corrugated to keep the same from curling. Suitable mechanical devices hereinafter described, are employed for performing these movements and effecting the speeds required in the travel of the sewed strips forming the continuous stub.

In the drawing, Figure 1 is an elevation representing the mechanical devices,—or in other words, a mechanism suitable for carrying out the method of my invention. Fig. 2 is a top plan view. Fig. 3 is a cross section and plan at the dotted line x, x , of Fig. 1. Figs. 4 and 5 are vertical central sections upon a larger scale than the elevation Fig. 1, Fig. 4 being towards the right hand of Fig. 1 and Fig. 5 towards the left hand of Fig. 1. Fig. 6 is an elevation from the rear of the machine, showing parts of the mechanism in

plan in Fig. 1. Fig. 7 is an elevation in larger size than Fig. 6 and partial section of the mechanical devices at the center of the elevation Fig. 6. Figs. 8 and 9 are vertical transverse sections,—Fig. 8 being through the mechanism for gripping and cutting the continuous strip, and Fig. 9 through the mechanism for forming the notches in the back of the strip for the binding cords.

Referring particularly to Figs. 1, 3 and 6, a, a', a^2, a^3, a^4 , and a^5 each represent series of rolls of paper strips, and 2, 3, 4, 5, 6 and 7 platforms supported between the standards 8, 9, and upon which these series of rolls of paper strips are mounted. The said standards 8, 9, are secured to a floor or other support at their lower ends and 10 represents a frame top or platform extending between and secured to the upper ends of said standards 8 and 9 and upon which platform are mounted the series of mechanical devices hereinafter described.

The spacing tie rods 11, 12, extend vertically through the series of platforms 2 to 7 inclusive and are provided with clamping nuts, said spacing tie rods 11, 12, also passing through or into and secured to the platform 10. Upon each of the platforms 2-7 inclusive, are mounted pins 13 and 14 in series, the number of each series of which corresponds to the number of rolls of paper strips. This will appear particularly in Fig. 3, in which are shown three rolls a of paper strips, from which the paper strip passes to and around the guide pins 13, extending therefrom to and around the opposite sides of the guide pins 14. From these guide pins 14, the paper strips are led away in the direction of the bracket b upon one end of the machine, or in other words, secured to the outer or end face of the standard 9. I employ a number of these brackets, the same being represented at b, b', b^2, b^3, b^4 and b^5 , there being as many of these brackets as there are series of rolls of paper strips. These bracket devices are of progressively increasing length and are preferably adjustable in height. As shown, there are three rolls of paper strips in each series and the three strips from the three rolls pass first around the guide pins 13 and then around the guide pins 14, then in the direction of the said bracket devices, being given a quarter turn as they approach the same. Each of these bracket devices is

provided at the ends with three pins 16 and the paper strips pass between and over said pins and rise vertically, converging as they rise and passing over the rollers 17 of the frame *c*, which frame is secured to and extends out from the machine directly over the series of bracket devices. These paper strips pass to the left of the machine, Fig. 1, in a superposed relation, passing under the spring presser foot 18 and through the guide 19 to the sewing machine *d*, 20 representing the superposed strips or stub strip. Spaced apart from this sewing machine device are feed rollers *e e* mounted in suitable bearings upon the frame top 10 and connected by meshing gears *e' e'*, the stub or sewed strips passes between these feed rollers *e e*, an intermittent motion being imparted thereto; that is to say—the rollers are moved each time the needle lifts out of the strip and the motion is stopped as the needle enters the paper and passing down and up through the superposed strips so that there is no motion during the sewing and a feed motion between each stitch, consequently there is no tendency to bend or break the sewing needle.

f f represent feed rollers placed in suitable bearings quite close to the feed roller *e* and these rollers are connected by meshing gears *f' f'*. A continuous motion is imparted to the feed rollers *f f*, the progressive motion of which is slightly less than the feed motion of the rollers *e e*, consequently between the rollers *e e* and *f f*, the stub of superposed sewed strips is in a slightly bowed condition.

Mounted on the bearing frame of the rollers *f f* is a take-up frame *g* having an end roller *g'*, pivots 21 to the said frame, a roller 22 and an end adjustable weight 23, the stub strip 20 passing beneath the roller 22 and over the roller *g* after passing between the rollers *f f*.

h represents the power shaft of the machine in suitable bearings secured to the top 10. On one end of this shaft I place a double pulley *h'*, a belt 24 passing around a part of this pulley, supplies the power and rotation. I provide a parallel and adjacent shaft *i* and on the power shaft and shaft *i* are meshing gears *i' i'*. On the shaft *i* is a sprocket 25, from which passes a chain 26 to the sewing machine devices for their operation. On this shaft *i* is a disk 27, to the face of which is mounted a connecting rod *i²*. On one end of the shaft of the lower of the feed rollers *e* is a rocker *i³*, to one end of which this connecting rod *i²* is secured; on the other end of this rocker is a pawl 28. The rocker is loosely mounted on this shaft but the ratchet 29 is keyed thereto, consequently with the rotation of the disk 27 and the reciprocation of the rod *i²* the rocker *i³* is swung and the pawl 28 caused to turn the ratchet 29 one tooth, or to move back to take the next tooth, the feed of a tooth at a

time being equal on the periphery of the rollers *e e* to a stitch made by the sewing machine devices; consequently the stub is pulled along for each stitch while the needle is up and the pawl moves back to take another tooth while the needle is passing through the paper.

On one end of the power shaft *h* is a member *k*, comprising a gear, a pinion and a pulley, and on one end of the shaft *i* is a member 30, comprising a pinion and a bevel gear, the gear of *k* and the pinion of 30 being in mesh.

In suitable bearings I mount a shaft 31. On one end of this shaft is a worm 32 and on the other end a bevel gear 34, the bevel gear being in mesh with the bevel gear part of the member 30 and the worm in mesh with the worm wheel 33. The worm wheel is mounted on one end of the shaft of the lower of the feed rollers *f f*, and through these devices just described, the feed rollers *f f* are given a slow continuous movement so as to continuously and slowly feed along the stub strip 20. A belt 35 passes from one part of the double pulley towards the opposite or left hand end of the machine, around the pulley 36 mounted upon a shaft *l*, hereinafter more fully described.

A sector member and handle 37 is connected to the power shaft *h*. It is of any desired construction and mounted thereon or connected thereto is a pinion 38 and gear 39. The gear 39 is in mesh with the pinion portion of the member *k* and the arbor on which the pinion 38 and gear 39 are mounted, moves with the sector concentrically with the power shaft.

A shaft 40 passes across the platform 10 in suitable bearings and on one end of this shaft is a gear 41, removable and interchangeable with larger or smaller gears and the function of this gear is to control the lengths into which the stub is cut up. This gear 41 meshes with the pinion 38, and should the gear 41 be removed and a larger or smaller one be put on in place thereof, the same will still mesh with the pinion 38, because of the possibility of the shifting of the pinion 38 and the gear 39 by means of the sector and handle 37. On the opposite end of the shaft 40 is a cam disk 42 and pivotally mounted upon this cam disk in an adjustable relation, is a connecting rod 43. The upper end of this connecting rod is pivoted to the long end of a bell-crank lever 44 and this bell-crank lever is mounted on a frame *m*,—see particularly Figs. 1, 2, 5 and 6. This frame has suitable foot pieces bolted to the platform 10, and it is made with opposite vertically disposed slide-ways receiving the vertically movable head *m'*.

Toggles 45 are pivotally and respectively connected to the frame *m* at their upper ends and the movable head *m'* at their lower

ends and centrally to a toggle bar 46 at one end pivotally connected to the short arm of the bell-crank lever 44, consequently an up and down movement of the connecting rod 5 43 actuates the toggle bar and toggles to raise and lower the vertically movable head m' . The platform 10 beneath the frame m is recessed and undercut to receive the slide beds and guide members m^2 ; these in turn 10 being clamped, when placed as desired, to the platform by clamping bolts 47,—see Fig. 9. The lower edge of the movable head m' is longitudinally channeled or provided with a grooved way 48 to receive the reduced 15 heads of punches m^3 , consequently while the parts m^2 remain in position, the punches m^3 with the movable head m' rise and fall as actuated by the devices hereinbefore described.

I provide a shaft 49 extending over the 20 platform 10 in suitable bearings. To one end of this shaft I secure the crank arm 50, on the free end of which is a roller or wheel contacting with the surface of the cam disk 42. Adjacent to this crank arm, on one end 25 of the shaft 49, and also on the opposite end of the shaft 49, are levers 51, the ends of which come beneath the bearing boxes of a roller n , with the object of lifting the same. Beneath the roller n is another roller n' , 30 which latter roller is rotated by the belt 52 from the pulley of the member k and a belt wheel 53 on the shaft of this roller n' . The sheets of paper forming the strips as sewed, are passed between these rollers n n' and by 35 they are fed along.

Referring particularly to Figs. 5 and 8, o represents a presser head secured by a bolt 54 to the lower right hand or forward end of the movable head m' . This presser head 40 contains a spring actuated presser bar o' and a cutter bar o^2 is secured to one end of the presser head and the same has a shearing function with a complementary cutter blade o^3 secured to the platform 10 of the machine. 45 On the shaft l , at the left hand end of Figs. 1 and 2, is mounted a crimping roller r and a gear 55, and in suitable bearings below the roller r is a corresponding crimping roller r' and its shaft is connected by another gear 55 50 to the first gear 55 for the simultaneous operation of the crimping rollers.

In the operation of the machine as generally hereinbefore described, the paper strips are drawn from their rolls in the series over 55 the guide pins 13, 14, are given a quarter turn and passed through the bracket devices and over the series of pins 16, then up over the series of rollers 17 of the frame, and beneath the spring presser foot 18 and through 60 the guide 19 to and past the sewing machine d ; between the rollers e , e , which draw the superposed paper strips with an intermittent motion as sewed, the strips so formed then passing through the rollers f f , which as here- 65 inbefore stated, is a continuous regular

movement and the operation of which at times gives a bend to the strip, as shown in Fig. 4.

The continuous length or strip passes from the rollers f f over the roller g' of the take-up 70 frame g and to and between the rollers n n' when the roller n is lifted as hereinbefore described; the continuous strip is free between these rollers and the parts are so timed that at this moment the continuous strip is held 75 by the presser bar o' against the platform 10 while the strip is being cut by the cutters o^2 o^3 and simultaneously notched by the punches m^3 ; the feed of the continuous strip while this is being accomplished, causes considerable slack, which is taken up as shown 80 in Fig. 1, by the gravity lever g or take up frame, borne down by its weight 23 lifting the continuous strip. As soon however as the cutting and punching of the strip has 85 been performed, the roller of the crank arm 50 runs off the cam surface of the disk 42, permitting the roller n with its bearing to drop by gravity, to nip the continuous strip and rapidly feed the same forward. This 90 takes up the slack of the strip shown in Figs. 1 and 7 and pulls the frame down into the position shown in Fig. 4, in which the weight end of the frame g is in an elevated position, this rapid forward movement of the super- 95 posed paper strips forming the stub which are sewed together, causes the cut length of the strip to be advanced to and into the bite of the crimping rollers r r' . These crimping rollers are rotated very rapidly and the mo- 100 ment they take hold of the stub length, the same, with an accelerated movement is run through the said rollers so rapidly as to entirely get away from the cut strip or length of continuous strip before cut coming through 105 the machine.

The rollers r r' , because of their ribbed character; form permanent indentations across the stub length, straightens the same out if bent at all and at the same time giving 110 a permanent set to the stub which prevents further curling.

From the foregoing it will be readily understood that the size of the gear 41 and the quicker or slower movements of the parts ac- 115 tuated by the shaft 40 and controlled thereby, determine the lengths into which the strip shall be cut up, because the smaller the gear 41 and the quicker its rotation, the shorter will be the length, and the larger the 120 gear and the slower the rotation, the longer will be the strip. It will be further apparent that the punching devices m^3 and the parts which form sides and beds therefor, may be moved along adjustably in relation 125 to the face or base of the movable head m' so as to determine the places where the backs of the strips outside the sewed line shall be notched to receive the threads in binding the strips into covers. The head m' is made 130

long enough for the longest strip and the punches may be adjusted and the adjusted parts so timed as to cut strips of any desired length.

5 I prefer, as shown in Fig. 1, to employ guides 56 forming ways for the severed strips as they are progressed by the movement of the continuous strip forward of the cutter, said guides directing the cut strips into the
10 bite of the crimping rollers $r r'$.

I have shown in Figs. 2 and 6, series of gears 57 between the chain 26 and sewing machine proper, by means of which and by the graded sizes of which the timing of the
15 rollers $e e$ with the sewing machine is effected, but I do not limit myself to this mechanism.

The continuous and superposed strips of paper hereinbefore referred to may, if de-
20 sired, be initially surfaced on one or both sides with adhesive material, which only requires to be moistened in use in connecting bills, invoices etc. thereto for filing.

I claim as my invention:

- 25 1. An apparatus for making stubs for letter, invoice and other files, the same comprising supports for rolls of paper strips arranged in series, devices for drawing along and simultaneously superposing said strips of
30 paper, devices for sewing the same together and forming a stub strip, devices for advancing said stub strip, devices for holding the same and for simultaneously severing the stub strip into predetermined lengths.
- 35 2. An apparatus for making stubs for letter, invoice and other files, the same comprising supports for rolls of paper strips arranged in series, devices for drawing along and simultaneously superposing said strips of paper,
40 devices for sewing the same together and forming a stub strip, devices for advancing said stub strip and other devices for taking up any slack therein, devices for holding the stub strip and for simultaneously severing
45 the same into predetermined lengths and devices acting at the same time for forming notches in one edge.
- 50 3. An apparatus for making stubs for letter, invoice and other files, the same comprising supports for rolls of paper strips arranged in series, devices for drawing along and simultaneously superposing said strips of paper, devices for sewing the same together and forming a stub strip, devices for advancing
55 the said stub strip, other devices for holding the stub strip and for simultaneously severing the same into predetermined lengths, devices for progressively advancing the severed stub lengths, and crimping rollers
60 through which the said lengths are passed to straighten out the same and provide a set to prevent curling.

- 65 4. An apparatus for making stubs for letter, invoice and other files, the same comprising supports for rolls of paper strips arranged

in series, devices for drawing along and simultaneously superposing said strips of paper, devices for sewing the same together and forming a stub strip, devices for advancing the said stub strip, devices for taking up any
70 slack therein, devices for holding the same and simultaneously severing the stub into predetermined lengths, devices acting simultaneously to form notches in one edge, devices for progressively advancing the sev-
75 ered stub lengths and crimping rollers through which the same are passed to straighten out the same and provide a set to prevent curling.

5. An apparatus for making stubs for let-
80 ter, invoice and other files, the same comprising supports for rolls of paper strips arranged in series, devices for guiding the strips of each series together and for simultaneously super-
85 posing all the said strips, and devices for sewing the same together, devices providing an intermittent feed timed with the sewing for drawing along the said superposed paper strips or stub strip, devices for advancing the
90 length of the stub strip with a continuous motion, devices for periodically advancing the same at a further forward point and devices for alternately taking up any slack, de-
95 vices for holding and severing and other devices for simultaneously notching the edges of the same and other forwarding devices.

6. An apparatus for making stubs for let-
ter, invoice and other files, the same comprising supports for rolls of paper strips arranged in series, devices for guiding the strips of
100 each series together and for simultaneously superposing all the said strips, devices for sewing the same together, devices providing an intermittent feed timed with the sewing for drawing along the said superposed paper
105 strips and the stub strip, devices for advancing the length of the stub strip with a continuous motion, devices for periodically advancing the same at a further forward point, de-
110 vices for alternately taking up any slack, devices for holding and severing and other devices for simultaneously notching the edges of the same, devices brought into evidence upon the release of the cutting mechanism
115 for advancing the stubs cut up from the continuous strips by the forward movement of the continuous strip and for rapidly removing and simultaneously crimping and straightening the same.

7. An apparatus for making stubs for let-
120 ter, invoice and other files, comprising supports for series of rolls of paper strips, guides through which said paper strips extend from the rolls, devices for superposing all the strips as collated, devices for sewing the
125 strips together, means for drawing along the superposed strips timed with the sewing devices, so that the strips will be at rest as the needle passes through the paper and will be moved when the needle is out of the paper, 130

devices for advancing said sewed strip with a continuous movement, feeding and cutting devices acting alternately and intermediate devices for taking up the slack of the sewed stub strip.

8. An apparatus for making stubs for letter, invoice and other files, comprising supports for series of rolls of paper strips, guides through which said paper strips extend from the rolls, devices for superposing all the strips as collated, devices for sewing the strips together, means for drawing along the superposed strips timed with the sewing devices, so that the strips will be at rest as the needle passes through the paper and will be moved when the needle is out of the paper, devices for advancing said sewed strip with a continuous movement, intermittently acting rollers for advancing said stub strip, a device engaging and holding and for simultaneously cutting through and severing said stub strip, a gravity frame acting between the latter and forming devices for taking up the slack in the feed of the sewed strip.

9. An apparatus for making stubs for letter, invoice and other files, comprising supports for series of rolls of paper strips, guides through which said paper strips extend from the rolls, devices for superposing all the strips as collated, devices for sewing the strips together, means for drawing along the superposed strips timed with the sewing devices, so that the strips will be at rest as the needle passes through the paper and will be moved when the needle is out of the paper, devices for advancing said sewed strip with a continuous movement, intermittently acting rollers for advancing said stub strip, a device engaging and holding and for simultaneously cutting through and severing said stub strip, a gravity frame acting between the latter and former devices for taking up the slack in the feed of the sewed strip, punching devices for notching the edges of the severed stubs simultaneously with the cutting or severing movement, and means for engaging, advancing and simultaneously crimping the stubs.

10. In an apparatus for making stubs for letter, invoice and other files, the combination with a series of rolls of paper strips and supporting devices therefor, of guide pins over which the same passes in opposite direc-

tions, brackets having pins placed at right angles to the former pins so as to give the said strips a quarter turn, rollers around which said strips pass and by which they are brought into a superposed relation, rollers for engaging said strips as superposed and for drawing the same along with an equal pull, a sewing machine for sewing together the superposed strips, means for continuously running the sewing machine, and means for intermittently actuating the drawing along rollers, whereby the superposed strips are drawn along in the elevated position of the sewing needle and the drawing movement stopped when the needle is passing through the strips.

11. In an apparatus for making stubs for letter, invoice and other files, the combination with devices for collating, superposing and sewing together paper strips, of rollers and devices actuating the same for advancing said stub strip with a continuous motion, other rollers spaced apart having periods of activity and alternate periods of rest for advancing said stub strip with a rapid motion, an intermediate gravity frame device for taking up the slack, and a presser head and cutter bar acting intermediately with the rapidly moving periodical rollers for holding the continuous strip and severing the same.

12. In an apparatus for making stubs for letter, invoice and other files, the combination with devices for collating, superposing and sewing together paper strips, and for advancing and severing the same and taking up any slack, of a frame, a head movable thereon carrying said cutting devices, devices for notching the stub strip for the sewing threads in binding also carried by said movable head, means for actuating the said movable head, a gear interchangeable with other gears, a power shaft and movable intermediate meshing gears, whereby the timing of the movable head is effected for controlling the lengths into which the continuous length stub is cut up.

Signed by me this 24th day of July, 1908.

A. C. HAFELY.

Witnesses:

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BERTHA M. ALLEN.