

908,128.

C. N. PETESCH.  
HORSE POWER RECORDER.  
APPLICATION FILED JULY 18, 1908.

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

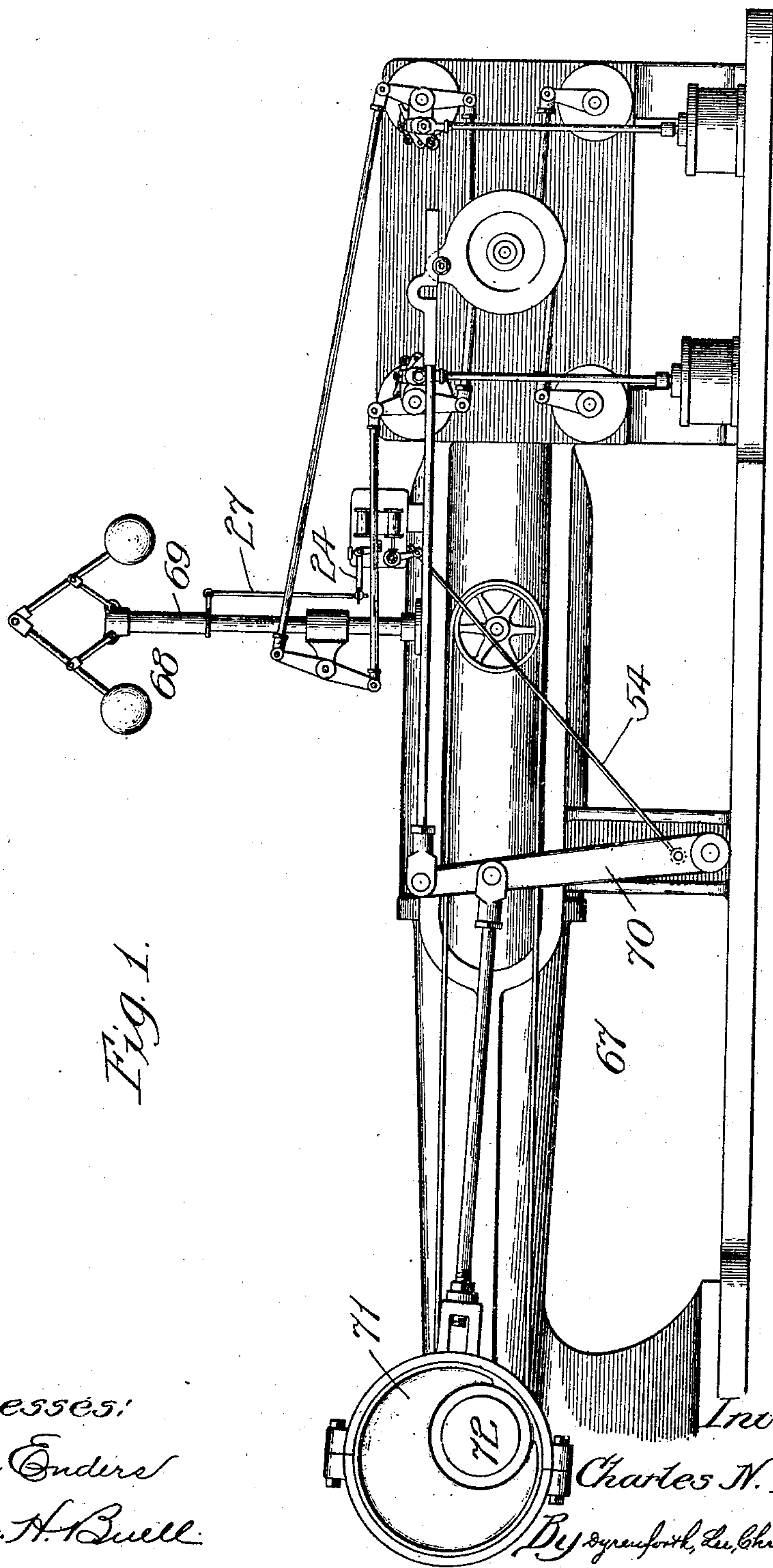


Fig. 1.

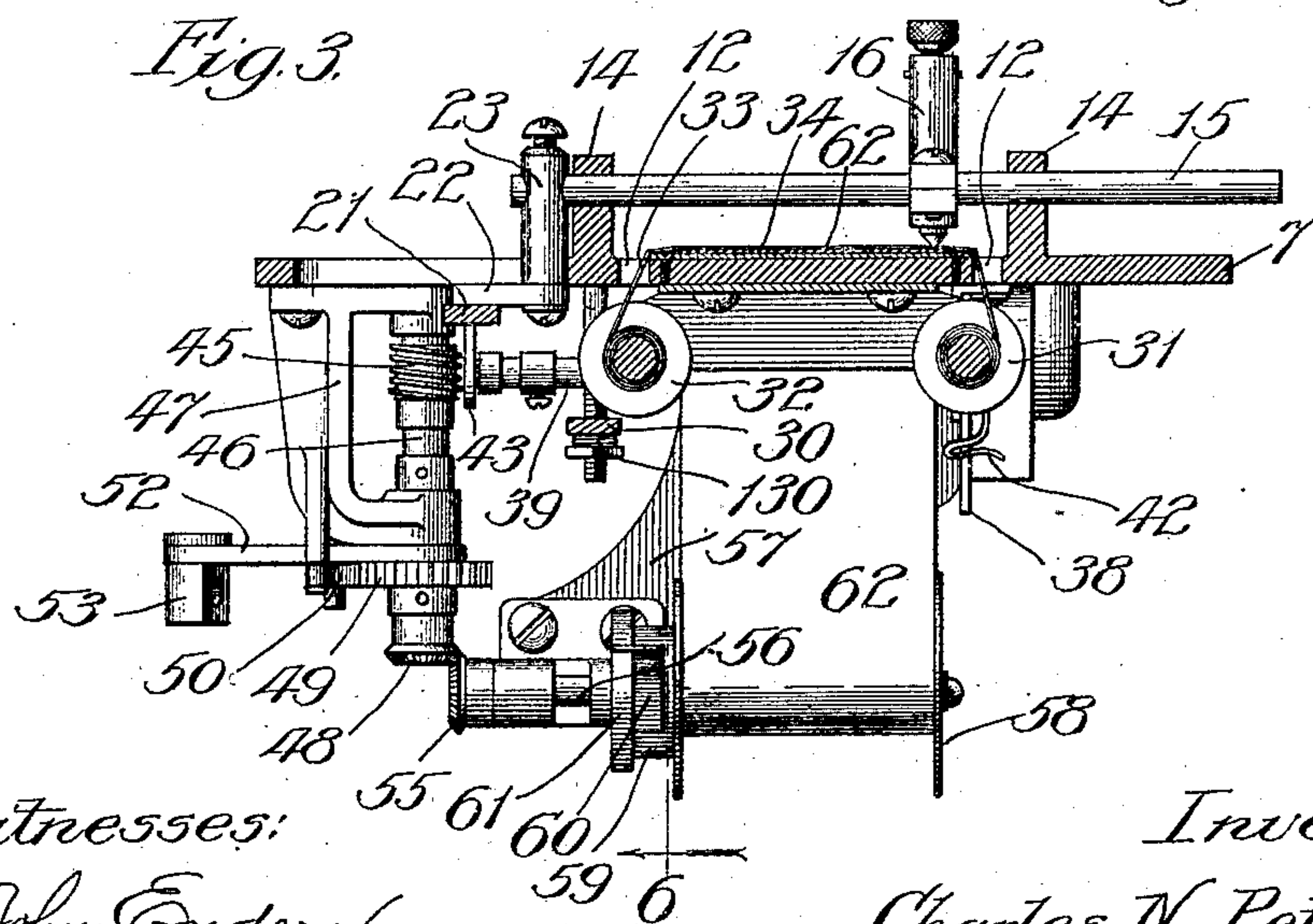
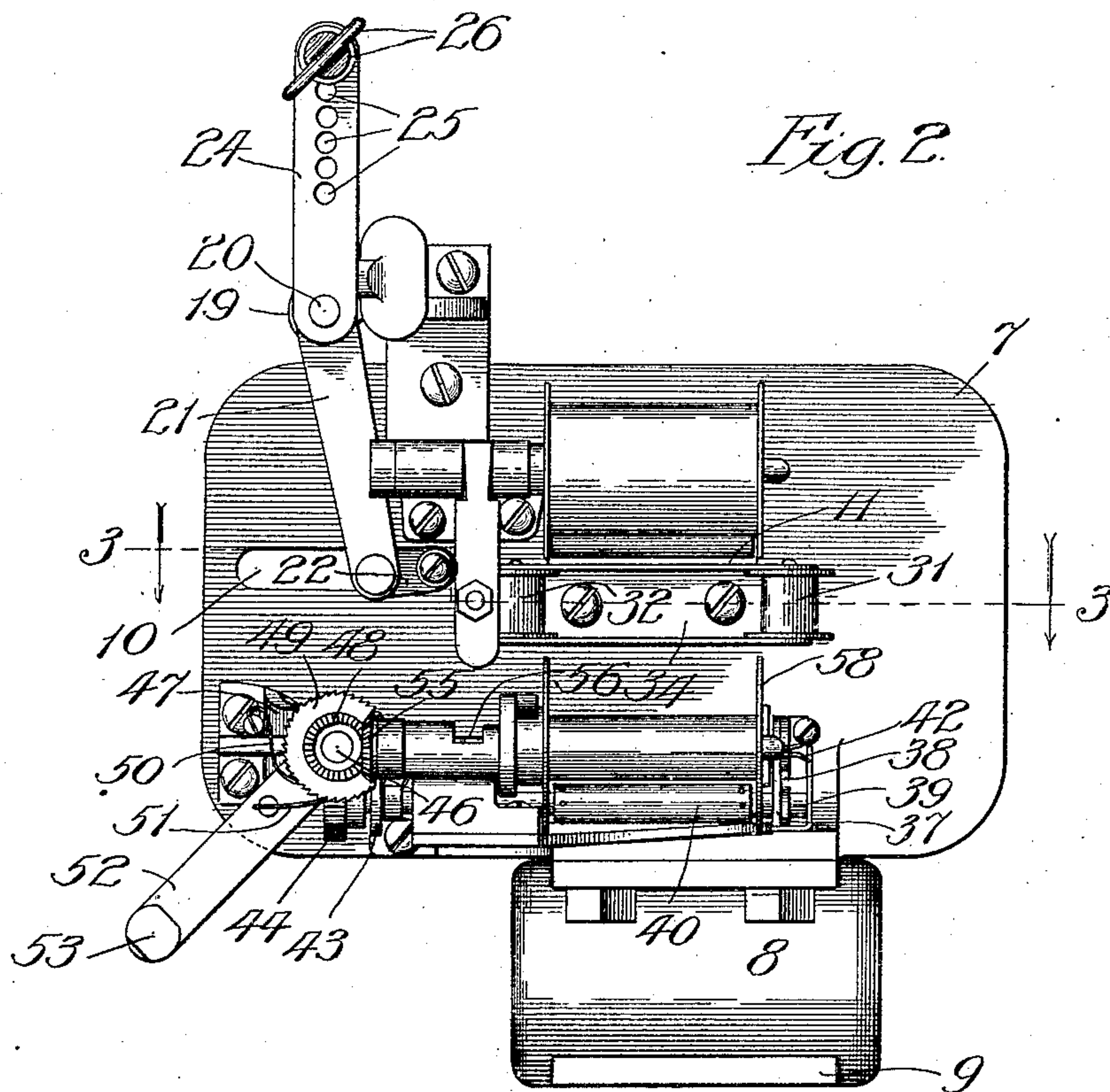
Witnesses:  
John Enders  
Chas. H. Buell

Inventor:  
Charles N. Petesch.  
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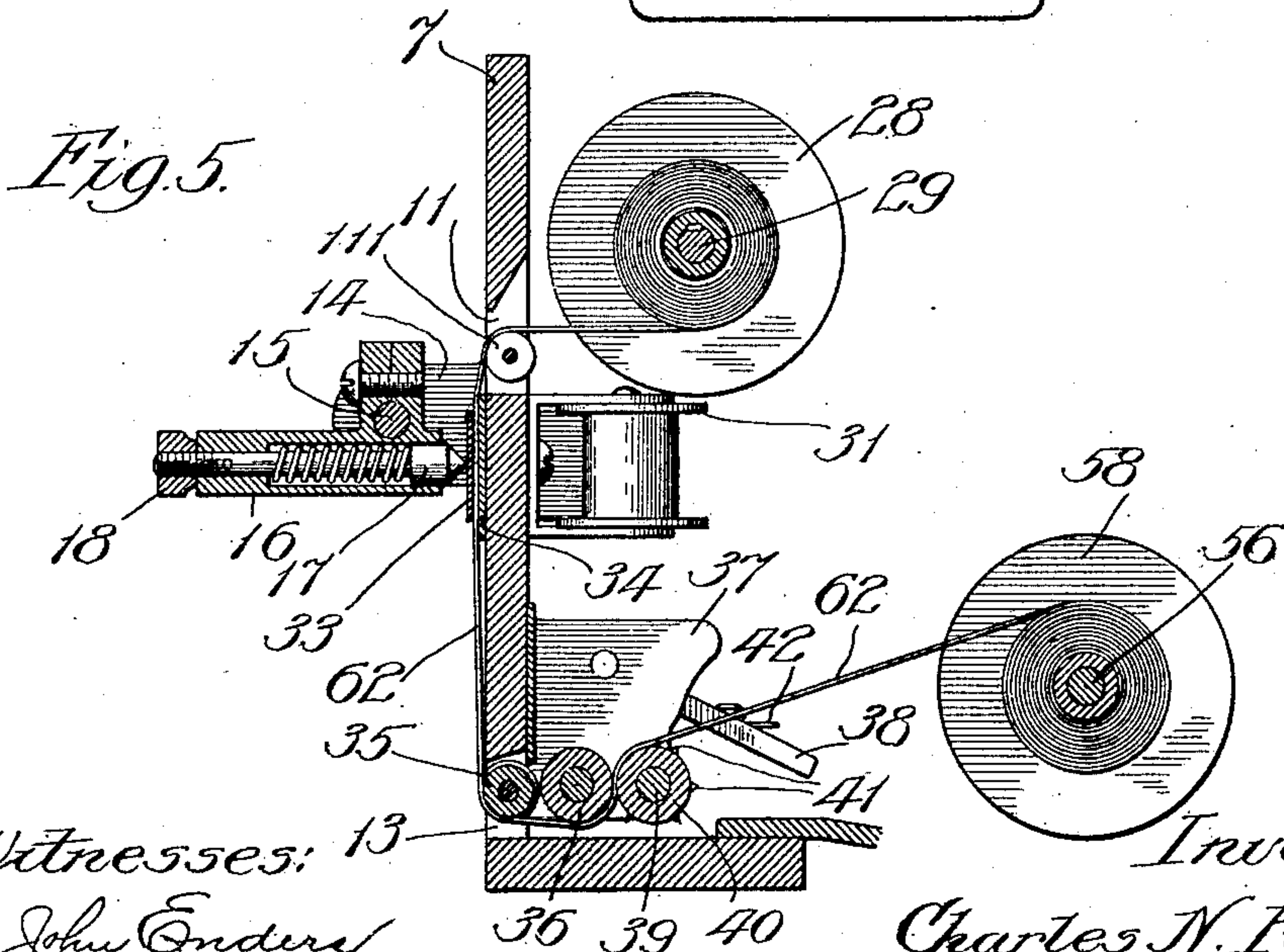
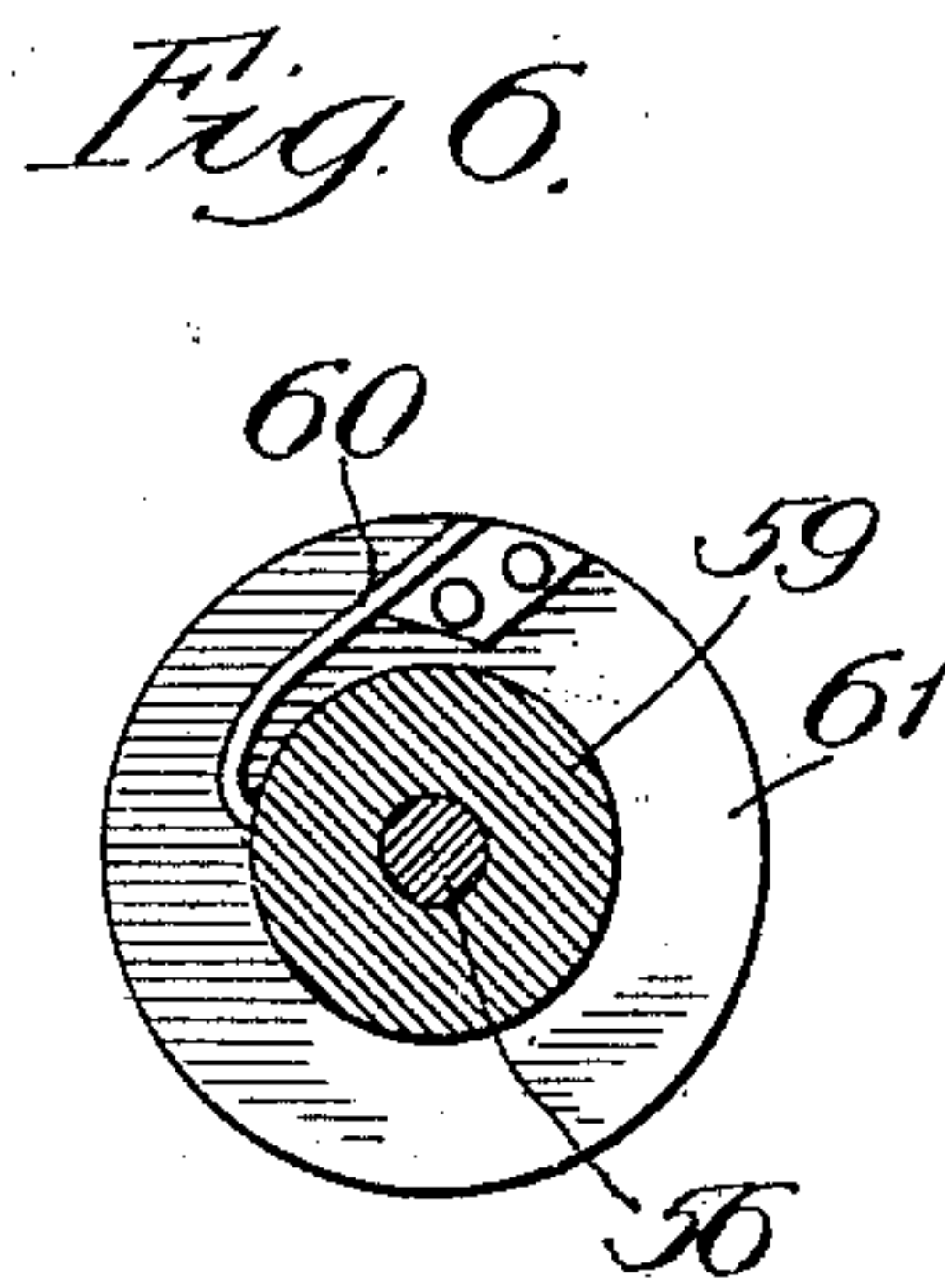
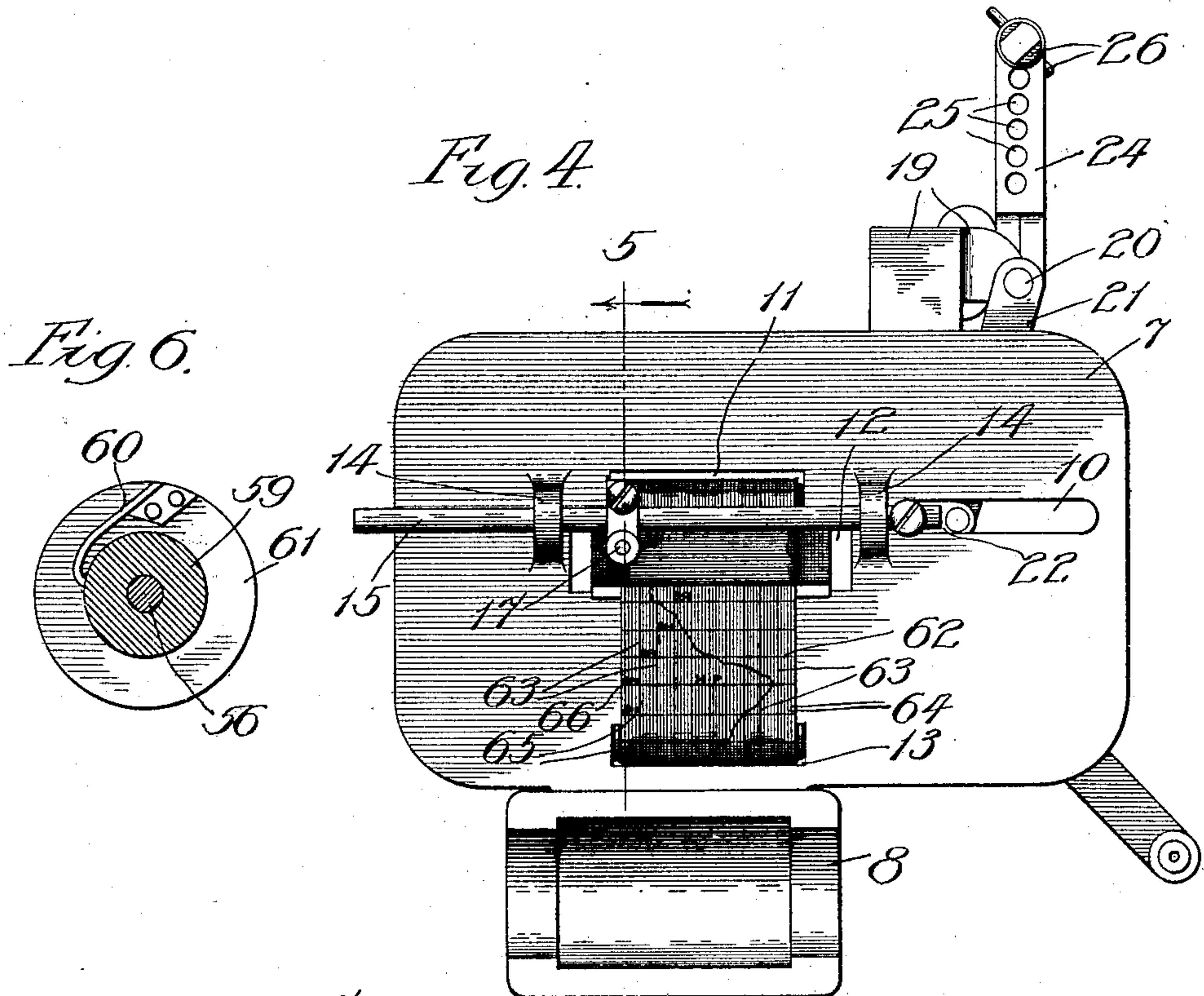
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3 SHEETS—SHEET 3.



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# UNITED STATES PATENT OFFICE.

CHARLES N. PETESCH, OF CHICAGO, ILLINOIS.

## HORSE-POWER RECORDER.

No. 908,128.

Specification of Letters Patent.

Patented Dec. 29, 1908.

Application filed July 18, 1908. Serial No. 444,270.

*To all whom it may concern:*

Be it known that I, CHARLES N. PETESCH, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a new and useful Improvement in Horse-Power Recorders, of which the following is a specification.

The object of my invention is to provide, as an attachment for any stationary or marine steam or other engine, a device for recording variations from the theoretical horse-power; and it is my further object to adapt the device to record the revolutions of the fly-wheel of the engine.

In the accompanying drawings, Figure 1 is a view in elevation showing my attachment operatively applied to an engine of the Corliss type; Fig. 2 shows the attachment by a view in rear elevation; Fig. 3 is a section on the irregular line 3—3, Fig. 2; Fig. 4 is a view of the attachment in front elevation; Fig. 5 is a section on line 5, Fig. 4, and Fig. 6 is an enlarged section on line 6, Fig. 3, showing a brake-detail of the take-up device for the record-sheet.

The entire mechanism is supported on a plate 7 extending vertically from a pedestal 8 adapted to be bolted through its base-flange 9 in suitable position on an engine. The plate contains at one side of its vertical center an elongated horizontal slot 10, a similar slot 11 crossing said center, short vertical slots 12 below and beyond the ends of the slot 11, and a lower slot 13, like and in line with the slot 11. At opposite ends of the slot 11 perforated ears 14, 14 project from the face of the plate and form bearings for a longitudinally reciprocating rod 15 carrying a stylus-device 16, or marker. The device 16 shown is a sleeve adjustably clamped upon the rod 15 and containing a spring-pressed stylus 17, or pencil, provided on its rear end with a knob 18, or handle, by means of which to retract it in adjusting the ribbon hereinafter described. In a bearing 19 extending from the upper end of the plate and transversely thereof at its rear side is journaled a rock-shaft 20 carrying dependently on its forward end a crank-arm 21 having a link-connection 22 at its lower end with a stud 23 adjustably mounted on the reciprocating rod 15 to extend transversely thereof through the slot 10 for connection with said link, whereby turning the rock-shaft moves the rod 15 to trace the point of the stylus-device over the face of an inter-

mittently-traveling chart, hereinafter described. On the rear end of the rock-shaft is clamped a crank-arm 24 containing a longitudinal series of holes 25 for setting its connection, through the medium of a thimble 26 journaled in any one of the holes 25, with the cut-off of an engine, by a connecting-rod 27.

In the ends of the slot 11 is journaled a guide-roller 111. On the back of the plate adjacent to the slot 11 is journaled a spool 28 against the shaft 29 of which a brake-finger 30 bears to feebly resist turning the spool under the pressure of a spring 130 (Fig. 3). Just below the ends of this spool are journaled in vertical position in suitable bearings near the slots 12 two similar small spools 31 and 32 for carrying a carbon-ribbon 33 which extends between the spools through the slots 12 over a face-plate 34, or wear-plate, on the front side of the plate 7. In the ends of the slot 13 is journaled a guide-roller 35, behind which and to coincide with it is journaled in bearings at opposite ends of that slot a roller 36, one of said bearings being in an ear 37.

In one arm of a spring-pressed bell-crank 38 fulcrumed at its angle on the outer side of the ear 37, is journaled one end of a shaft 39 carrying a feed-roller 40 provided near each end with a circumferential series of spaced teeth 41 and coöperating with the roller 36 under the tension of the spring 42 which bears against the bell-crank, the free arm of which affords a handle by means of which to strain the roller 40 out of engagement with its companion-roller. The opposite end of the shaft 39, near which it is journaled in a bearing 43 on the back of the plate 7, carries a worm-wheel 44 meshing with a worm 45 on a shaft 46 journaled in bearings in a bracket 47 extending at a right-angle to the plate 7 from its back. This shaft 46 carries on its rear end a miter-gear 48 and adjacent thereto a ratchet-wheel 49 engaged by a spring-detent 50 and by a spring-pawl 51 extending from a swinging arm 52 carrying on its free end a rotatable thimble 53, like the thimble 26, for connection by a rod 54 with the eccentric on the fly-wheel shaft of the engine. The gear 48 meshes with a similar miter-gear 55 on one end of a shaft 56 journaled in bearings in an arm 57 extending from the back of the plate 7. The shaft 56 carries loosely upon it a take-up spool 58 having on one end concentric therewith a circular boss



59 against which bears a spring-finger 60 extending from a collar 61 on the shaft (Fig. 6).

An important adjunct of my device is a traveling chart 62 actuated intermittently 5 by each revolution of the engine and adapted to have the stylus 17 record upon it variations in the horse-power exerted by the engine. It consists of a web or band, preferably of paper, wound upon the spool 28, passing thence 10 over the guide-roller 111 through the slot 11 and against the face-plate 34 under the stretch of ribbon 33, to be wound upon the take-up spool 58, to which it passes over the guide-roller 35 and between the rollers 36 15 and 40 for feeding it. This web is marked (Fig. 4) with longitudinal coarse lines 63 forming equal spaces each representing fifty horse-power, each said space being marked off into ten equal sub-spaces by finer lines 64 20 extending parallel with the coarser lines, each sub-space representing ten horse-power; and the band is marked off at equal intervals by transverse lines 65, the space between each two of these lines representing 25 a number (say five hundred) of the revolutions of the engine. To facilitate reading the chart each tenth line 65 may be coarser than the others, as shown at 66; and the spaces between lines 63 have marked upon 30 them the number of the horse-power represented by each, thus "500", "450", "400", and so on, as shown, in steps of fifty.

To illustrate the operation of the device it is shown in Fig. 1, by way of example, as applied to an engine 67 of the Corliss type, being mounted on the frame thereof adjacent to the governor 68, with the vertically reciprocating ball-carrying sleeve 69 of which the rod 27 is connected; and the rod 54 is connected with the vertical rocker-arm 70, preferably near its pivotal point, as shown, and through which the crank-arm 52 is connected with the eccentric 71 on the fly-wheel shaft 72.

The operation is as follows: Each rotation of the shaft 72 swings the arm 52 back and forth causing it, in turning in one direction, to engage the pawl 51 with the ratchet 49 and turn the latter the extent of one tooth and with it the worm-shaft 46. The worm 50 45 thereby actuates the worm-wheel 44 to turn the shaft 39 carrying the feed-roller 40 to effect, by engagement of its teeth with the web 62 and coöperation therewith of the roller 36, movement of the web longitudinally; and the action of the gears 48 and 55 turns the shaft 56 to take up the web on the spool 58 as it is paid out by the feed from the spool 28, but without causing the take-up to drag the web because of the frictional weakness of the spring-finger 60. Of course the feed of web is very slow, the gearing, as it is arbitrarily arranged according to the representation in the drawing, requiring one hundred rotations of the worm-shaft 46 to effect 65 one complete rotation of the shaft 39. Any

variation in the speed of rotation of the shaft 72 raises or lowers the governor-sleeve 69, and the oscillations of the latter move the arm 24 to reciprocate the rod 15 and stylus 16 causing the stylus to trace, through the 70 ribbon 33, the variations, such as are indicated at 73 in Fig. 4, recording on the web 62 variations in the exerted horse-power of the engine. Of course while the horse-power remains constant the line marked by the 75 stylus will be parallel with the straight edges of the web. The number of revolutions of the engine during a run of any given time may be readily calculated by observing the extent of travel in that time of the web and 80 multiplying the extent of movement from any line 65, or point between two successive lines 65 to any other line 65, by five hundred.

What I claim as new and desire to secure by Letters Patent is— 85

1. In a horse-power recorder, the combination of an upright plate forming a support for the mechanism and provided with slots, a paying-out spool for a chart-forming web to extend from said spool through slots in 90 said plate, a longitudinally reciprocable rod extending across the path traversed by said web between the plate-slots through which it passes, a marker carried by said rod to engage the web-surface, means for connecting 95 said rod with the cut-off of an engine to reciprocate the rod and marker, a feed-device for the web having a feed-roller on a shaft carrying a worm-wheel, a rotary shaft carrying a worm engaging said wheel, a ratchet on 100 said rotary shaft, and a crank-arm loosely mounted on said rotary shaft for connection with the eccentric of the engine and carrying a pawl engaging said ratchet, for the purpose set forth. 105

2. In a horse-power recorder, the combination of an upright plate forming a support for the mechanism and provided with slots, a paying-out spool for a chart-forming web to extend from said spool through slots in 110 said plate, a longitudinally reciprocable rod extending across the path traversed by said web between the plate-slots through which it passes, a marker carried by said rod to engage the web-surface, means for connecting 115 said rod with the cut-off of an engine to reciprocate the rod and marker, a pair of co-operating rollers for feeding said web, one of said rollers forming the feed-roller being in spring-pressed engagement with the companion-roller and provided with a shaft, a worm-wheel on said shaft, a rotary shaft carrying a worm engaging said wheel, a ratchet on said rotary shaft, and a crank-arm 120 loosely mounted on said rotary shaft for connection with the eccentric of the engine and carrying a pawl engaging said ratchet, for the purpose set forth. 125

3. In combination, a plate provided with slots and adapted to be supported in upright 130



position on an engine, a carbon-ribbon extending between spools on shafts journaled on said plate and extending on the face thereof, a web-paying out spool and a web  
5 take-up spool journaled in bearings on the back of said plate, a longitudinally reciprocable rod extending along said ribbon, a stylus carried by said rod to engage said ribbon, a stud extending from said rod through  
10 a slot in the plate, a rock-shaft having at one end a crank-arm and link connection with said stud, a crank-arm on the other end of said rock-shaft adapted to be connected with the cut-off of an engine, a pair of coöperat-  
15 ing web-feeding rollers on said plate, one of

said rollers having a shaft carrying a worm-wheel, a rotary shaft carrying a worm engaging said wheel, a ratchet and a miter-gear, a crank-arm loosely mounted on said rotary shaft, adapted to be connected with the eccentric of the engine and carrying a pawl engaging said ratchet, and a miter-gear on the shaft of said take-up spool meshing with the miter-gear on said rock-shaft, for the purpose set forth.

CHARLES N. PETESCH.

In presence of—

A. U. THORIEN,  
R. A. SCHAEFER.