

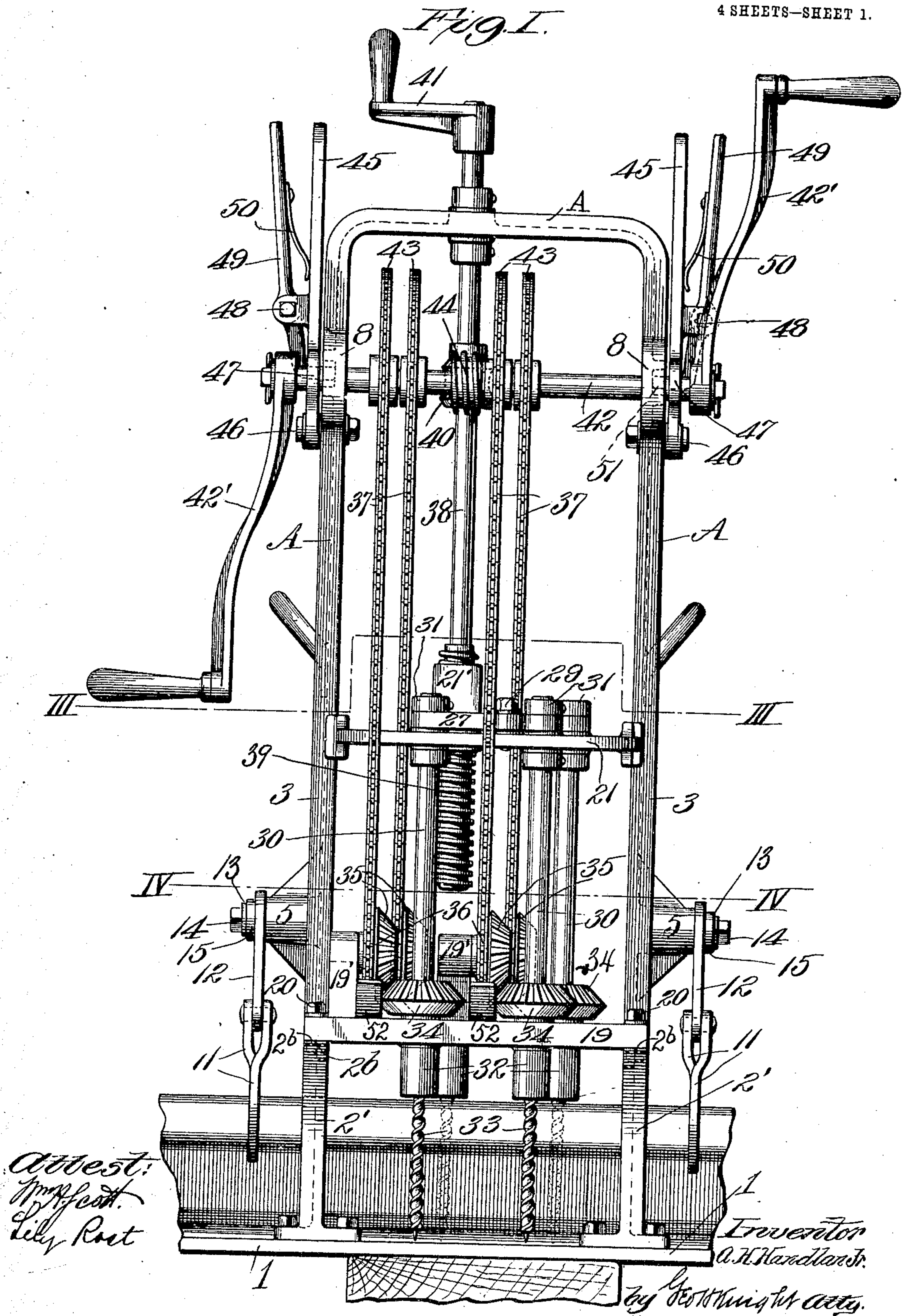
No. 871,402.

PATENTED NOV. 19, 1907.

A. H. HANDLAN, JR.
MACHINE FOR BORING RAILWAY TIES.

APPLICATION FILED APR. 1, 1907.

4 SHEETS—SHEET 1.



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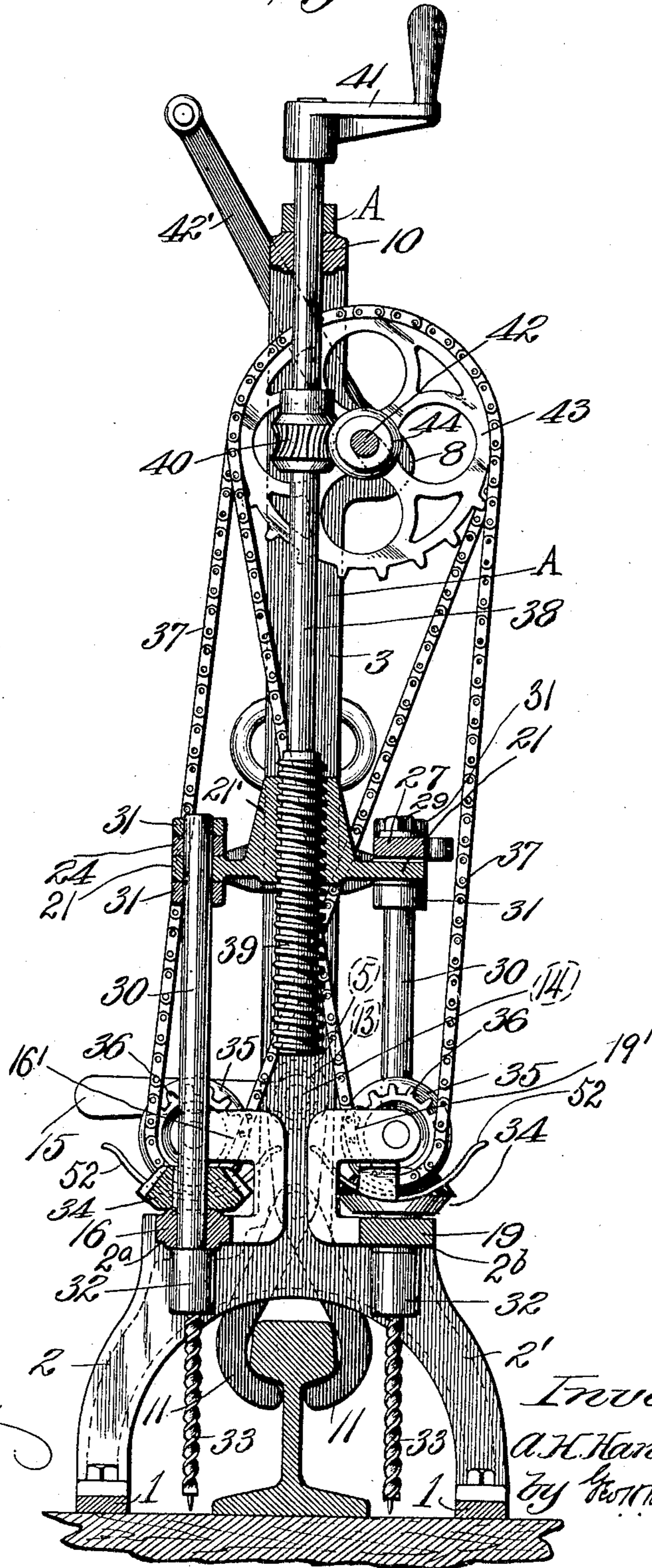
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Fig. II.



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By *Wm. H. Scott*
Atty.

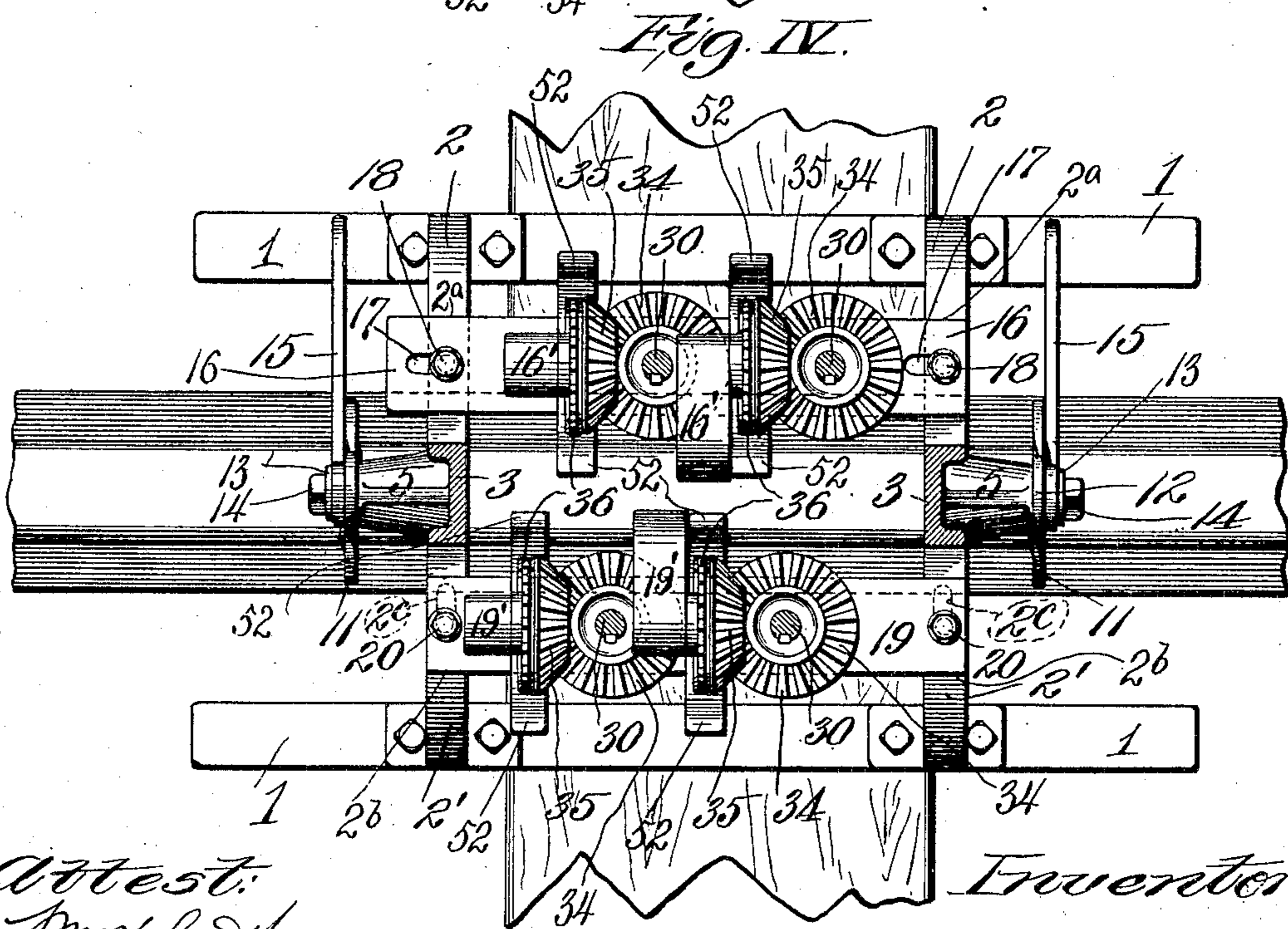
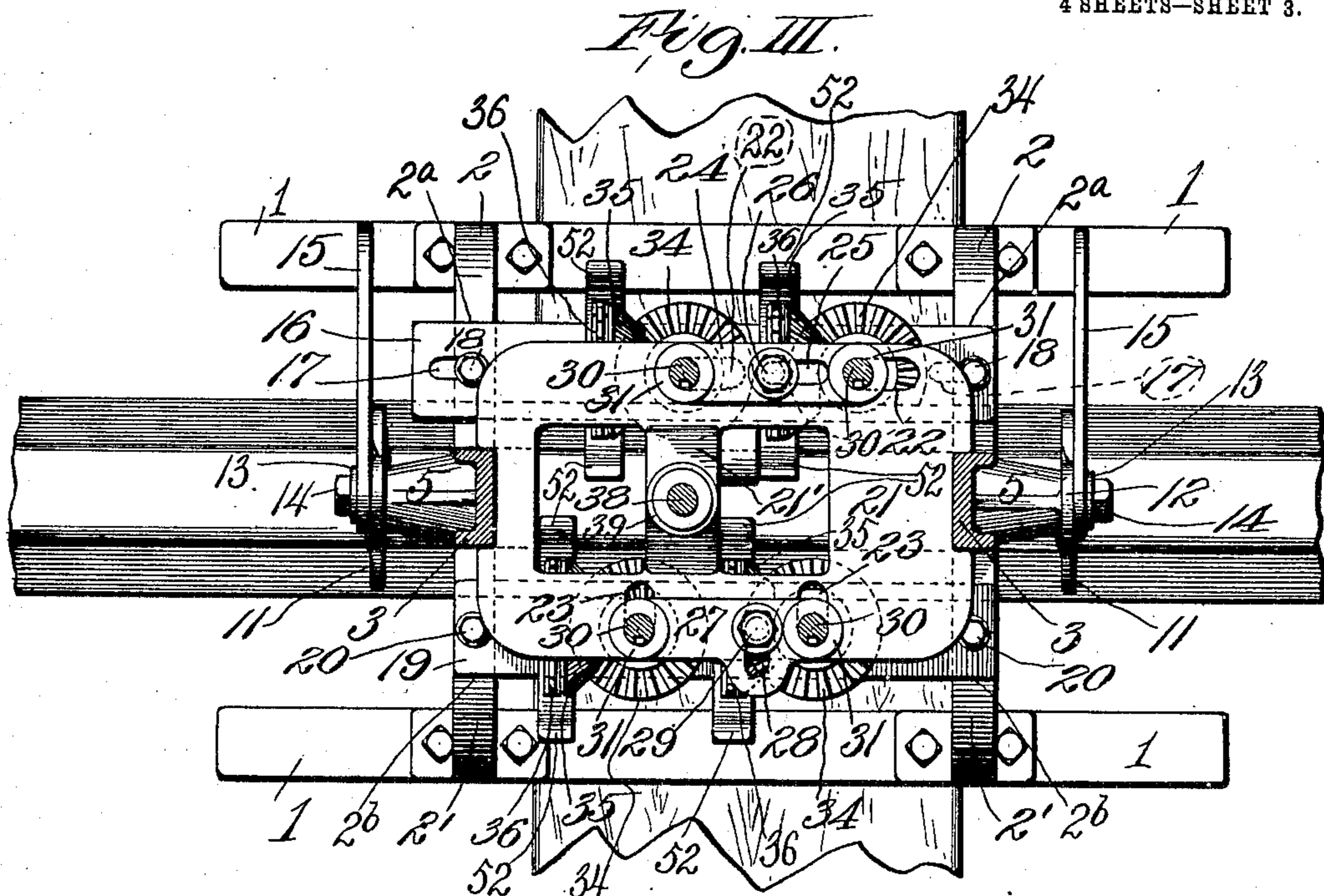
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att'y.

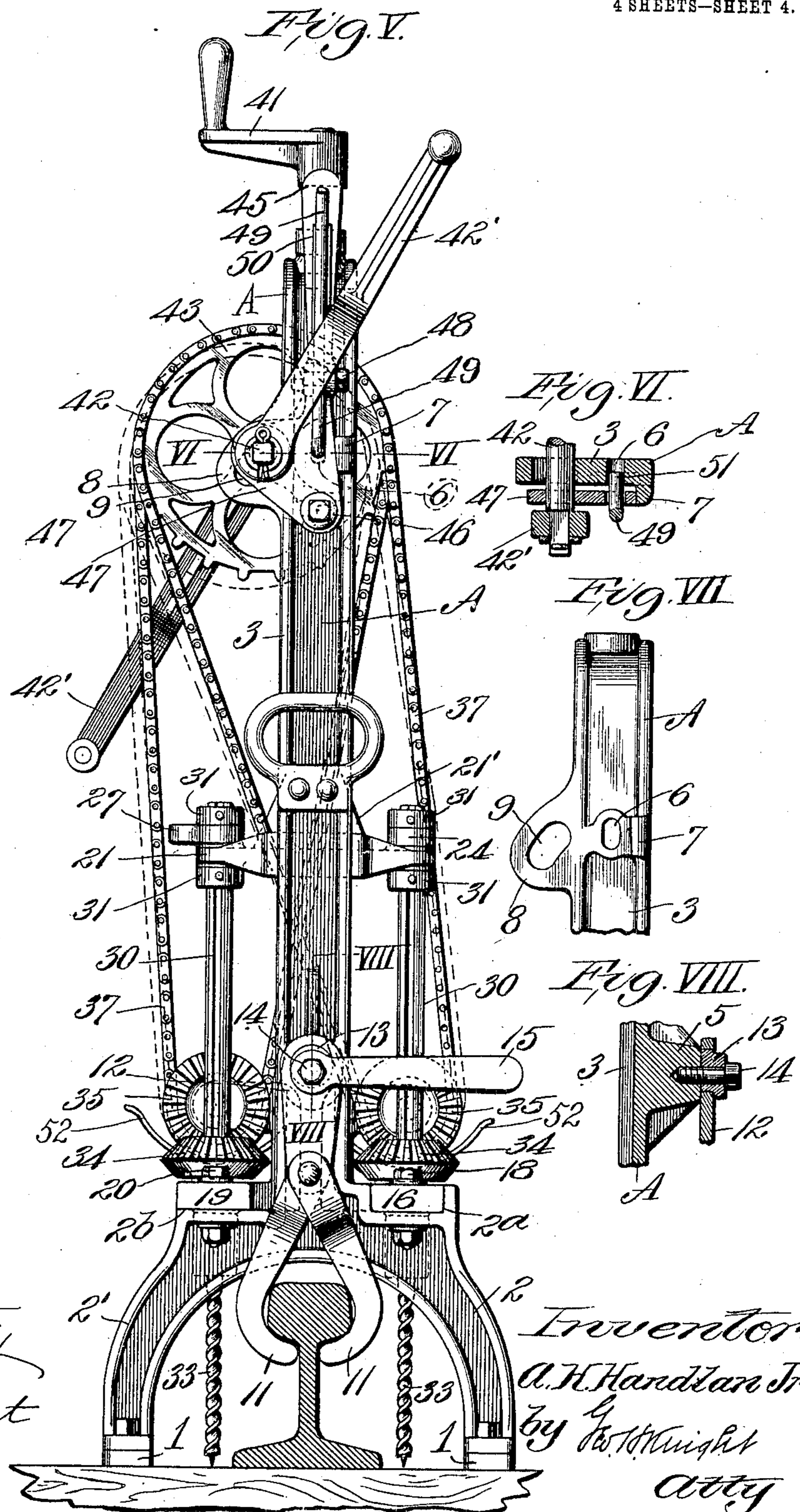
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4 SHEETS—SHEET 4.



UNITED STATES PATENT OFFICE.

ALEXANDER H. HANDLAN, JR., OF ST. LOUIS, MISSOURI.

MACHINE FOR BORING RAILWAY-TIES.

No. 871,402.

Specification of Letters Patent.

Patented Nov. 19, 1907.

Application filed April 1, 1907. Serial No. 365,823.

To all whom it may concern:

Be it known that I, ALEXANDER H. HANDLAN, Jr., a citizen of the United States of America, residing at the city of St. Louis, in the State of Missouri, have invented certain new and useful Improvements in Machines for Boring Railway-Ties, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification.

My invention relates to a machine for use in boring holes in railway ties for the reception of spikes, such as those having screw-threaded shanks, and by which the railway rails are secured to the ties.

The object of the invention is to so construct a machine of this character that it will serve to operate a series of boring bits in gang, whereby a plurality of holes are simultaneously bored in a railway tie properly spaced apart from each other for the reception of spikes at both sides of the railway rail and spaced transversely of the tie.

Figure I is a rear side elevation of my machine. Fig. II is a vertical section through the machine. Fig. III is a horizontal section taken on line III—III, Fig. I. Fig. IV is a horizontal section taken on line IV—IV, Fig. I. Fig. V is an end elevation of the machine. Fig. VI is a horizontal cross section taken on line VI—VI, Fig. V. Fig. VII is an elevation in detail of the upper portion of the frame of the machine. Fig. VIII is a vertical section taken on line VIII—VIII, Fig. V.

A designates the inverted U-shaped frame of the machine which is of the following construction.

1 are foot bars that are adapted to rest upon a railway tie adjacent to and at opposite sides respectively of a rail placed thereon, as seen in the drawings. These foot bars are surmounted by and attached to the front legs 2 and rear legs 2' of the transverse arched base of the sides 3 of the frame A. The front legs 2 are provided with sockets 2^a at the top thereof and at the tops of the rear legs 2' are ledges 2^b that contain slots 2^c, transverse of the frame as seen in dotted lines Fig. IV. 5 are frame-bosses projecting from the side pieces 3 at the ends of the frame. Near the upper ends of said side pieces are vertical slots 6 and front stops 7 located adjacent to said slots, see Figs. VI and VII. 8 are pro-

tuberances that project from the rear edges of the side pieces 3 and contain inclined slots 9. In the top or cross piece of the frame A is a vertical aperture 10, see Fig. II.

11 designates a pair of claws that are suspended from the frame-bosses 5 at each end of the frame A and are adapted to grip the rail that is resting upon the tie in which the holes are to be bored by my machine. These claws are pivoted to suspension bars 12 that are loosely fitted at their upper ends to eccentrics 13 rotatably mounted upon pivot pins 14 seated in the frame bosses 5, the said eccentrics being provided with hand levers 15, whereby they may be rocked upon the pivot pins for the purpose of lifting the suspension bars 12 and claws in order that when the eccentrics are moved to dead centers while the claws are in engagement with the ball of the rail, the foot bars of the machine frame will be forced firmly into contact with the tie on which they rest to hold the frame of the machine from movement.

16 designates a front guide plate that is seated in the sockets 2^a of the frame legs 2. This guide plate is provided with slots 17 extending longitudinally thereof and which receive clamping bolts 18 that seat in the legs 2. The front guide plate 16 is, by the construction stated, rendered susceptible of being shifted longitudinally upon the frame legs 2 for a purpose to be hereinafter stated. 19 is a rear guide plate that is mounted upon the ledges 2^c of the legs 2' and 20 are clamping bolts that extend through this plate and through the transverse slots 2^c in said ledges. The transverse slots just referred to are provided for the purpose of permitting transverse adjustment of the rear guide plate 19 upon the ledges of the rear legs 2' for a purpose to be hereinafter mentioned.

21 designates a carrier that is slidably fitted to the side pieces 3 of the frame A to operate vertically within said frame, the said carrier being provided at its front side with a pair of longitudinal slots 22 extending length-wise of the machine and located above the front guide plate 16. The carrier is also provided at its rear side which is located above the rear guide plate 19 with a pair of transverse slots 23 that extend transversely of the machine. 24 is a front set plate that is provided with a longitudinal

slot 25 and is secured to the carrier at the location of the longitudinal slots 22 therein by a clamping bolt 26, whereby adjustment of said set plate is permitted in a direction
 5 longitudinal of the machine. 27 is a rear set plate on the carrier 21 that is provided with a transverse slot 28 and is adjustably held to the carrier for transverse movement thereon above the transverse slots 23 in the
 10 carrier by a clamping bolt 29.

30 designates a plurality of bit carrying rods, preferably four in number, that are journaled in the guide plates 16 and 19 and in the set plates 24 and 27 to operate freely
 15 in these members, each rod having applied to its upper end above and below the carrier 21 collars 31 that serve to restrain the rod from vertical movement independent of the carrier and each rod has applied to its lower
 20 end a bit socket or clutch 32 adapted to receive a boring bit 33. Each of the bit carrying rods is grooved longitudinally and has feathered to it a bevel gear wheel 34 that rests upon either the front guide plate 16 or
 25 the rear guide plate 19, according to the location of the rod, and through which the rod is adapted to move vertically while it is caused to partake of any rotative movement imparted to the bevel gear wheel.

30 35 are vertically disposed bevel gear wheels which are journaled in U-shaped arms 16' and 19' supported respectively by the guide plates 16 and 19 and are arranged in mesh with the bevel gear wheels 34. Each bevel
 35 gear wheel 35 has rigidly associated with it a sprocket wheel 36 that receives a drive chain 37 corresponding thereto and which is operated by means to be presently explained.

40 The carrier 21 is provided with a central screw-boxing 21'. 38 is a feed rod that is loosely fitted in the top or cross piece of the frame A and is provided with a feed screw
 45 39 that is fitted in the boxing 21' of the carrier and is adapted to impart vertical movement to said carrier when the feed rod is rotated. The feed rod has fixed to it a worm wheel 40. Located upon the rod at
 50 its upper end exterior of the frame is a hand crank 41.

42 designates a drive shaft and 43 are sprocket wheels feathered to said shaft in order that they may be shifted longitudinally thereon. These sprocket wheels serve
 55 as driving members for the drive chains 37 for the purpose of transmitting motion from the drive shaft to the sprocket wheels 36 of the vertically disposed bevel gear wheels 35 and therefrom to the bevel gear wheels 34
 60 so as to impart rotative movement to the bit carrying rods 30. The drive shaft 42 is equipped with hand cranks 42' mounted upon its ends and its also has fixed to it within the frame of the machine a worm 44

that, by meshing with the worm wheel 40, 65 transmits motion from the drive shaft to the feed rod 38 for the purpose of rotating said feed rod to either lower or raise the carrier 21, according to the direction in which the drive shaft and feed rod are rotated. 70

With the object in view of separating the drive shaft 42 from the feed rod 38 in order that said feed rod may be operated independently of the bit operating mechanism of the machine to quickly lower and raise 75 the carrier 21 and the bit carrying rods, I mount the drive shaft in supporting members movably attached to the frame A and by which the drive shaft may be moved to and from the feed rod. 80

45 are drive shaft supporting levers that are pivoted to the sides of the frame A at 46 and are provided with projecting arms 47 in which the drive shaft 42 is journaled, the said arms extending in the positions alongside of 85 the protuberances 8 of the sides of the frame in the slots 9 of which the drive shaft is adapted to move when the supporting levers are moved to carry said drive shaft in a direction away from the feed rod 38 and in a 90 direction toward said feed rod. Each drive shaft supporting lever is provided with ears 48 in which is pivotally mounted a latch 49 bearing a spring 50 that tends to force the upper or handle end of the latch away from 95 the corresponding lever and also with a finger 51, seen most clearly in Fig. VI, which extends through an aperture in the supporting lever and is adapted to enter into the slot 6 in the adjacent side of the frame A for 100 the purpose of holding the supporting lever in an upright position while the drive shaft is in its inner position and the worm thereon is in engagement with the worm wheel of the feed rod 38 for coöperation therewith. 105

It will be seen that when the latches 49 are moved to retract their fingers from engagement in the slots 6 in the sides of the frame A, the drive shaft supporting levers are freed and they move in a direction away 110 from the stops 7 of the frame to carry the drive shaft away from the feed rod. When, however, the latches are in engagement with the frame and the drive shaft is held to cause coöperation of its worm with the worm 115 wheel of the feed rod, the parts are in condition for coöperation and in such operation, the bit carrying rods 30 are rotated, due to the gearing leading to them from the drive shaft and the rods are constantly carried 120 downwardly, due to the actuation of the feed rod and its coöperation with the carrier 21. For the purpose of preventing the separation of the drive chains 37 from the sprocket wheels of the bevel wheels 35 when 125 said chains are slackened, due to the movement of the drive shaft away from the feed rod, I provide guard fingers 52 that are at-

tached to the guide plates 16 and 19 and extend upwardly adjacent to said sprocket wheels.

Whenever it is desired to adjust the bit carrying rods 30 length-wise of the machine to vary the positions of the rods at one side of the machine from those at the other side, the clamping bolts 18, that secure the front guide plate 16 to the front legs 2 of the frame of the machine, are loosened and the clamping bolt 26 that secures the front set plate 24 to the carrier 21 is loosened, thereby permitting adjustment of the parts 16 and 24 to carry the bit carrying bars lengthwise of the machine in these parts in which they are journaled and the loosened bolts are then again tightened to hold the parts as before. Whenever it is desired to shift the bit carrying rods that are journaled in the rear guide plate 19 and the rear set plate 27 transversely of the machine, the clamping bolts 20 and 29 that respectively hold said plates are loosened and the plates may then be shifted to carry the rods journaled therein in either a direction toward the bit carrying rods at the other side of the machine or in a direction away from said last named rods.

I desire to call attention to the fact that by the use of a pair of gripping claws at each end of the frame of my machine, I furnish means whereby firm resistance is obtained against the upward movement of the machine in drilling operation in railway ties, inasmuch as resistance against lateral movement of the machine on the tie is constantly afforded.

While I have shown and described the gripping claws as arranged for engagement with a rail it is obvious that the claws may be so lengthened that they may be caused to engage the tie on which the machine rests instead of engaging the rail.

I claim:

1. In a drilling machine of the character described, the combination of a frame, having bosses provided with pivot pins, eccentrics having handles and mounted upon the pivot pins, suspension bars supported by the eccentrics, a pair of gripping claws pivoted to the suspension bars, a plurality of bit carrying rods supported by said frame, means for rotating said rods, and means for feeding said rods longitudinally while being rotated, substantially as set forth.

2. In a drilling machine of the character described, the combination of a frame, a plurality of bit carrying rods supported by said frame, means for feeding said rods, a drive shaft, mechanism operated by said drive shaft for rotating said bit carrying rods, and means, in which the ends of the drive shaft are mounted, movably connected to said frame and by which said shaft is held either in coöperation or out of coöperation

with said feeding means, substantially as set forth.

3. In a drilling machine of the character described, the combination of a frame, a plurality of bit carrying rods supported by said frame, means for feeding said rods, a drive shaft for coöperation with said feeding means, a pair of supporting arms pivoted to said frame and in which said drive shaft is journaled, so as to be movable to and from said feeding means, latches carried by said arms and arranged for engagement with said frame, and means coöperating with said drive shaft for rotating said bit carrying rods, substantially as set forth.

4. In a drilling machine of the character described, the combination of a frame, a plurality of bit carrying rods movably supported by said frame, a carrier to which said rods are fitted, a feed rod operable in said carrier, a drive shaft for coöperation with said feed rod, means for supporting said drive shaft, and by which it is supported in engagement with and out of engagement with said feed rod, and means coöperating with said drive shaft for rotating said bit carrying rods, substantially as set forth.

5. In a drilling machine of the character described, the combination of a frame, a carrier mounted in the frame, means for reciprocating the carrier, set plates supported by the carrier and adjustable thereon, bit carrying rods suspended from the carrier and loosely fitted in the set plates, guide plates supported by said frame beneath the carrier and through which the bit carrying rods extend and correspondingly adjustable to the set plates and means for rotating said bit carrying rods; substantially as set forth.

6. In a drilling machine of the character described, the combination of a frame, guide plates adjustably supported by said frame for adjustment both transverse and cross-wise of the machine, bit carrying rods mounted in said guide plates, a carrier, set plates in which said bit carrying rods are loosely fitted and which are adjustable transversely and cross-wise of said carrier, and means for rotating said bit carrying rods, substantially as set forth.

7. In a drilling machine of the character described, the combination of a frame, a plurality of bit carrying rods supported by said frame, means for feeding said rods, sprocket wheels geared to said rods for imparting rotation thereto, drive chains coöperating with said sprocket wheels, a drive shaft shiftable into and out of coöperation with said feeding means, sprocket wheels carried by said drive shaft, and drive chains coöperating with the first and last named sprocket wheels, substantially as set forth.

8. In a drilling machine, of the character described, the combination of a frame, a

plurality of bit carrying rods supported by
said frame, means for feeding said rods,
sprocket wheels geared to said rods for im-
parting rotation thereto, drive chains co-
5 operating with said sprocket wheels, a drive
shaft shiftable into and out of coöperation
with said feeding means, sprocket wheels
carried by said drive shaft, drive chains
coöperating with the first and last named
10 sprocket wheels, and guards supported by

said frame for maintaining said drive chains
in engagement with said first named sprocket
wheels when said drive shaft is out of co-
operation with said feeding means, substan-
tially as set forth.

ALEXANDER H. HANDLAN, JR.,

In presence of—

BLANCHE HOGAN,
LILY POST.