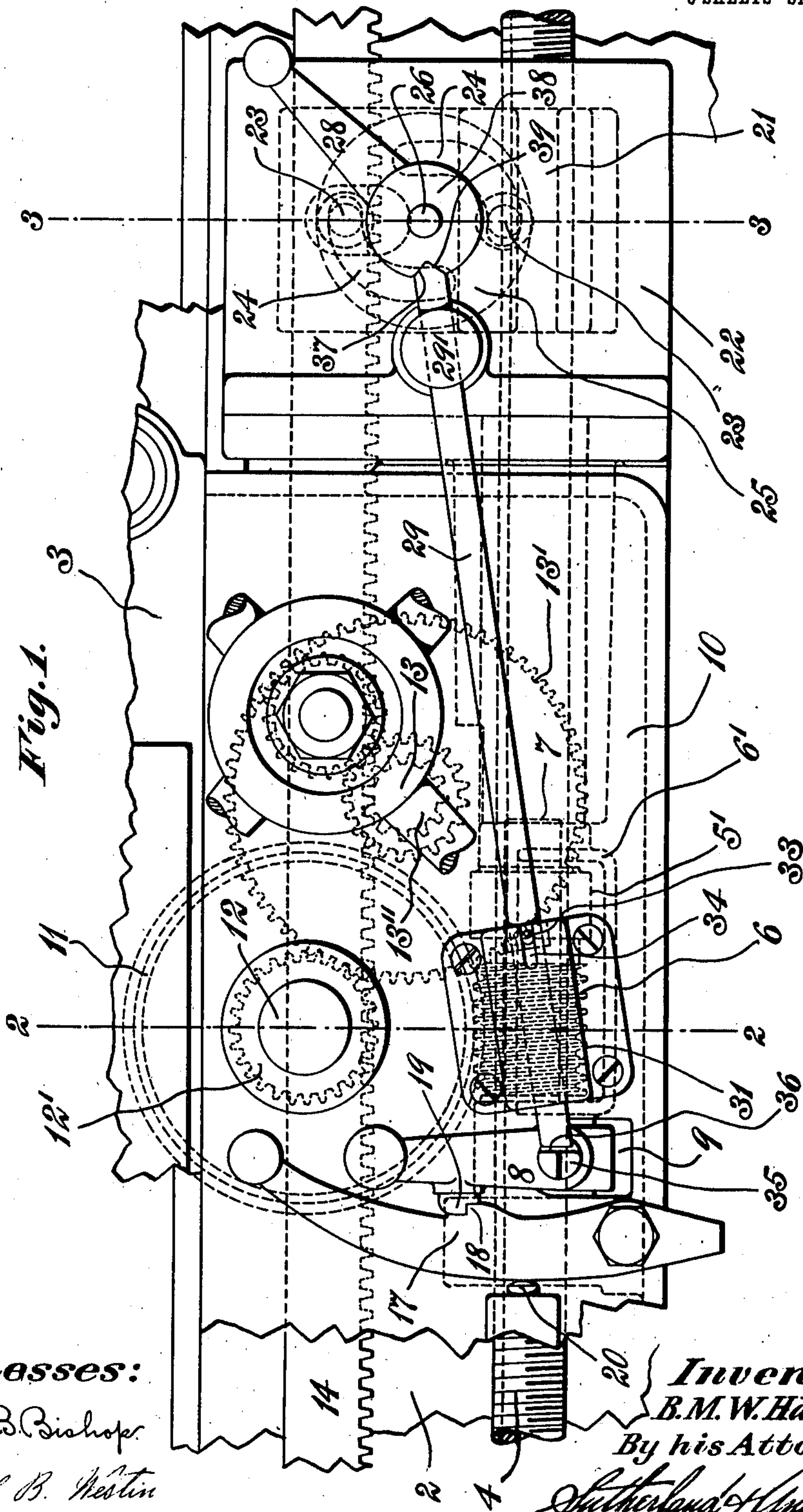


B. M. W. HANSON.
METAL WORKING MACHINE.
APPLICATION FILED JUNE 28, 1909.

945,387.

Patented Jan. 4, 1910.

3 SHEETS—SHEET 1.



Witnesses:

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Daniel B. Martin

Inventor:

B. M. W. Hanson

By his Attorneys,

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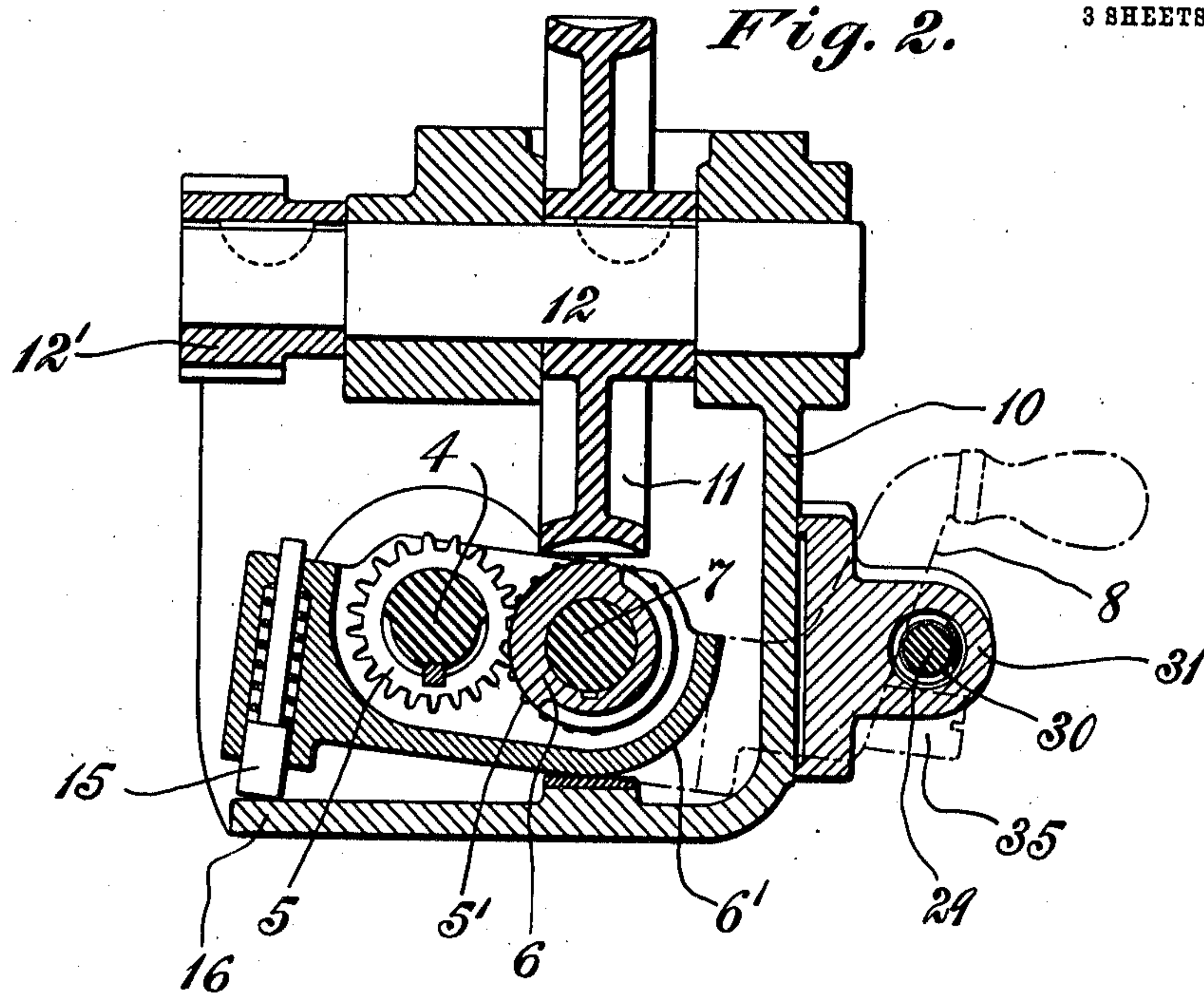
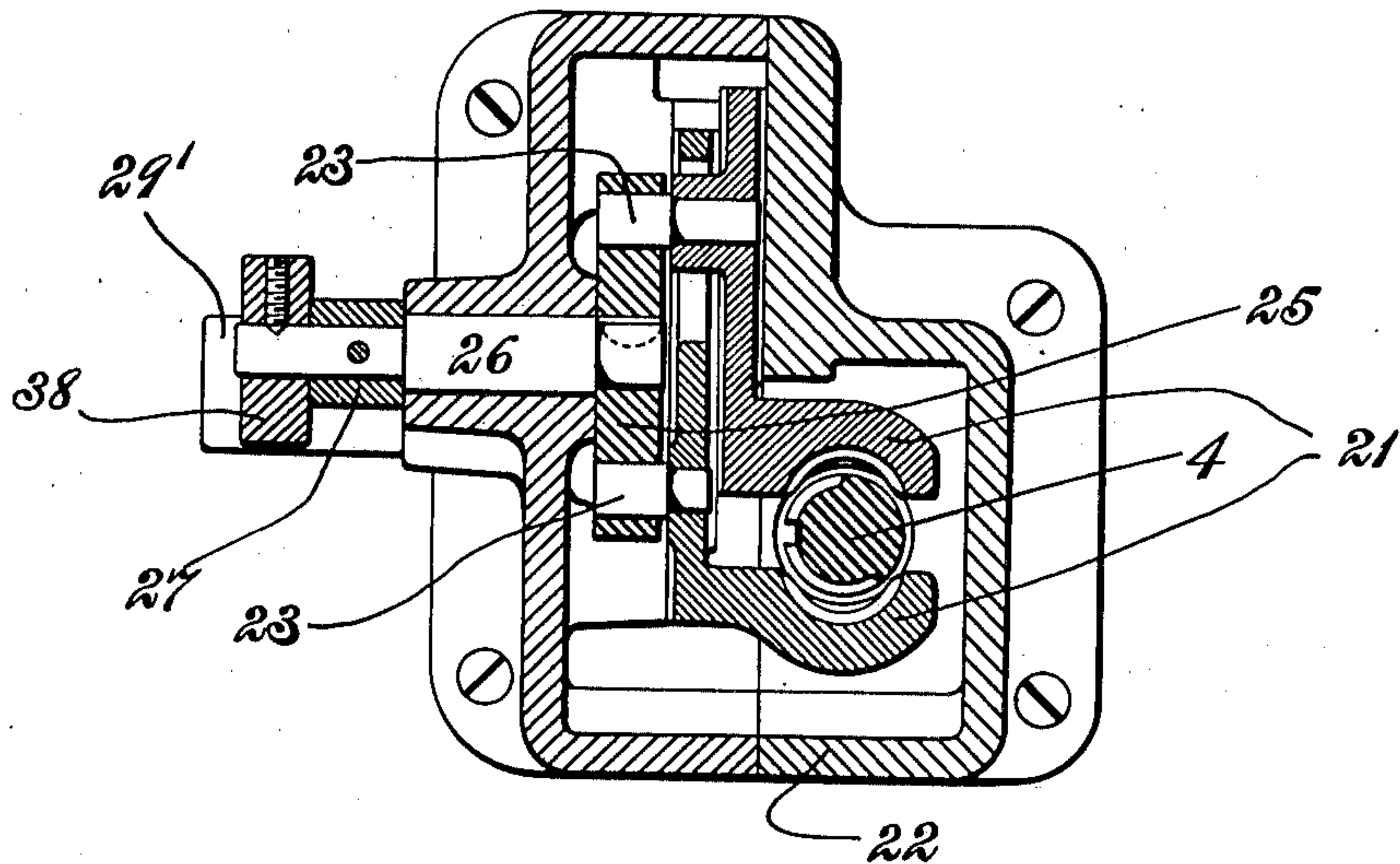


Fig. 3



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3 SHEETS—SHEET 3.



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UNITED STATES PATENT OFFICE.

BENGT M. W. HANSON, OF HARTFORD, CONNECTICUT, ASSIGNOR TO PRATT & WHITNEY COMPANY, OF HARTFORD, CONNECTICUT, A CORPORATION OF NEW JERSEY.

METAL-WORKING MACHINE.

945,387.

Specification of Letters Patent.

Patented Jan. 4, 1910.

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To all whom it may concern:

Be it known that I, BENGT M. W. HANSON, a citizen of the United States, residing at Hartford, in the county of Hartford and State of Connecticut, have invented certain new and useful Improvements in Metal-Working Machines, of which the following is a specification.

This invention relates to metal working machines, the primary object of the invention being to provide simple and effective means for preventing in a positive and certain manner, the throwing into operative relation simultaneously of two different devices which are normally or under proper working conditions, alternately utilized to give to a carrier or similar device, different characters or degrees of movement.

In the drawings accompanying and forming part of the present specification I illustrate in detail one advantageous form of embodiment of the invention which to enable those skilled in the art to practice the invention, will be fully set forth in the following description while the novelty of the invention will be included in the claims succeeding said description. In said drawings the invention is shown as incorporated in a turret lathe.

Referring to the drawings, Figure 1 is a side elevation of the carriage of a turret lathe with throw-in devices, driving members and certain adjunctive elements. Figs. 2 and 3 are cross sections on the line 2—2 and 3—3, respectively, of Fig. 1, and Fig. 4 is a detail view of the two throw-in devices, the coöperating locking element and certain adjacent parts.

Like characters refer to like parts throughout the several figures.

In turret lathes it is the custom to provide two independent and distinct operating members for advancing the carriage or carrier which sustains the tool-carrying turret these members imparting to said carriage different degrees of movement, throw-in devices being provided to alternately put said operating devices into action. It is imperative that the said throw-in devices, which are manually-operable, should not be set at the same time into their operative positions for if they were the machine would be damaged or possibly some parts thereof might be broken. I provide a means whereby it is not possible

to move the throw-in devices at the same time into their working relations.

In Fig. 1 of the drawings I have shown certain of the parts of a turret lathe of known construction, which I shall briefly describe that the nature of my invention may be better understood.

The numeral 2 denotes the bed and 3 the carriage which supports the turret (not shown), said carriage having as is usual a longitudinal movement of the bed upon suitable ways on the latter.

I have alluded to two operating members for imparting to the carriage different degrees of movement and in the present instance both of these members receive their motion from a common source such as the lead-screw 4 which as is well known is immovable longitudinally but which is rotative and to obtain the latter function any of the usual means may be provided.

There is shown as splined to the lead screw 4 a spur-gear 5 which as will be clear is continuously rotative or which turns at all times during the normal operation of the machine. Said worm-gear is shown as meshing with a like gear 5' which together with the worm 6 is carried by the stud shaft 7 supported in what is known as a "drop-box" or swinging arm which oscillates upon the lead-screw 4, said drop-box or swinging arm having an outwardly projecting handle-portion 8 which projects through a vertically-elongated slot 9 in the pendent apron 10 of the turret-carrier or carriage 3. The worm 6 is coöperative with a worm-gear as 11 keyed or otherwise suitably fastened to the shaft 12 which extends crosswise of and is supported by said carrier or carriage. Another shaft 13 is similarly supported and provided with a gear 13' and a pinion 13'' the former being in mesh with the pinion 12' fastened at the inner end of said shaft 12 and the latter in mesh with the customary stationary rack 14 disposed longitudinally of the machine. The drop-box or arm 6' as will be understood travels with the carriage 3 and it presents a suitable device for throwing the worm 6 into and out of action. Said drop-box 6' is shown as being in its inoperative position in Fig. 2 the worm 6 being out of mesh with the worm gear—the consequence being that when this relation is present the carriage

cannot be advanced through the rack 14 and the interposed gearing. When, however, the drop-box 6 is elevated sufficiently to put the said worm 6 into mesh with said worm gear the carriage will be operated by said rack and pinion means through the agency of the gearing and lead-screw described. The drop-box 6' is shown as provided at its inner end with a spring-plunger 15 which bears against the base portion 16 of the apron 10 and exerts a constant tendency to move said drop-box into its inoperative position. In the present case I provide a latch for holding the drop-box 6 in its operative position and the latch 17 answers this purpose said latch being represented as pivoted near its lower end to the apron 10 and as having a catch-portion 18 to engage under a projection 19 on the extended or handle portion 8 of said drop-box, said latch being shown as occupying its effective position in Fig. 1 where it is maintained by the usual spring plunger 20. To release the drop-box 6' it is only necessary to swing the latch to the left in Fig. 1 at which time said drop box will drop to its ineffective position. The drop-box 6' therefore presents a convenient device for throwing into action a driving-member such as the worm 6, or for putting said worm into driving relation with the carriage 3.

The second operating member for the said carriage is shown as consisting of a split or divided nut 21 the sections of which are in the present case supported for vertical sliding movement within the box or housing 22 connected with or forming part of the apron 10 and therefore movable with the carriage. The nut therefore when engaged with the lead-screw 4 causes the carriage 3 to travel directly from said lead screw. As is well known in threading fine work it is the custom to cause the carriage to advance from the lead screw and nut as thereby greater precision in results are secured than when said carriage is operated through the gearing hereinbefore described or its equivalent. The sections of the split nut 21 are shown as furnished with outwardly projecting pins or studs 23 extending into cam-slots 24 in a disk 25 suitably fastened to the inner end of the shaft 26 supported for rotation by the forward wall of the box 22. Near the forward end of said shaft 26 is fastened the hub 27 of the hand-lever 28 constituting a suitable throw-in device for the split nut 21. In Fig. 3 the sections of the nut 21 are shown as being out of engagement with the lead screw 4 the hand lever 28 at this time being in its upper position. To put the sections of said nut into engagement with said lead-screw the hand lever 28 is swung down to the position shown in Fig. 4 which is in its operative position the drop-box 6' at this time being

in its inoperative position. As said hand-lever is swung down the sections of the split nut are caused through the cam-disk 25 and cooperating parts to embrace the lead screw 4.

Between the drop-box 6' and the hand-lever 28 I dispose a sliding rod as 29 which presents a convenient means for alternately locking or positively fastening the said drop-box and hand lever in their ineffective or inoperative relations. Said rod in the present case is moved to its lever locking position by the power of a spring as 30 and to its drop-box locking position by the lever 28. The spring 30 is shown as inclosed by the casing 31 fastened to the exterior of the apron 10, and as bearing at one end against said casing and at the other against a collar 32 fastened to said rod or bolt 29. Said collar is shown as equipped with a pin or stud 33 which travels in the longitudinal slot 34 of said casing to prevent turning of the rod or bolt 29.

The drop-box 6' is shown as having a stud 35 constituting a suitable stop and which may consist of a screw. One side of this stud is cut-away to produce a flattened stop-face 36 as shown in Figs. 1 and 4. In the latter position the rod or bolt 29 is shown as positioned to hold the drop-box 6' in its inoperative relation one end of said rod (the left end) being above and in the path of the stud or stop 35 whereby at this time it will be impossible to elevate said drop-box to put the worm 6 into mesh with the worm-gear 11. By moving the rod or bolt to the right a distance to carry the left end of said rod out of the path of the stop or stud 35 said drop-box may be freely lifted to put the carriage 3 into working relation with the lead-screw 4 through the intervention of the described gears.

The right end of the rod 29 is shown as beveled as denoted by 37 and this beveled portion 37 coöperates with a disk 38 secured to the outer end of shaft 26 said disk having a peripheral notch or rod-freeing portion 38. This disk constitutes as will be obvious a stop. In Fig. 4 the rod 29 as stated is occupying its drop-box locking position and it follows therefore that said rod is in its lever-releasing position at which time said lever can be freely moved up and down so long as the beveled notch 39 is not brought opposite the beveled portion 37. It will be assumed that the lever 28 is moved upward its extreme extent so as to disengage the nut 21 from the lead-screw 4. When said lever reaches its extreme upper position the beveled portion 37 of said rod 29 is projected into the notch 37 thereby locking said lever 28, such projection being caused by the push spring 30. When the rod is thus moved to the right it releases the drop-box 6' so that if necessary the same may be elevated and

as said drop-box is elevated the stop-face 36 is moved into the path of the rod 29 as shown in Fig. 1 at which time it will not be possible to swing the lever 28 downward.

5 Before said lever can be swung down it will be necessary to disengage the latch 17 from said drop-box when the latter can fall to carry the stop-face 36 out of the path of the rod. When this occurs the lever 28 is
10 freed and can be swung down and as it thus moves one wall of the beveled notch 38 acting as a cam thrusts said rod 29 to the left or to carry its left end over the stop 35 as illustrated in Fig. 4. At this time the
15 beveled or pointed end 37 of the rod 29 will be against the periphery of the hub 27 so that said rod cannot be moved to the right in said Fig. 4 nor can it be until the notch 27 is brought opposite said beveled
20 portion 37. There is therefore provided a very simple means for preventing absolutely the two throw-in devices occupying at the same time their operative relations or such relations as would cause the carriage to be
25 advanced by the independent operating devices.

I may provide on the apron 10 a guide stud 29' through which the rod 29 extends and which prevents flexure or binding of
30 the rod as the same is moved back and forth.

What I claim is:

1. The combination of a rising and falling throw-in device provided with a flattened face, an oscillatory throw-in device
35 provided with a circular portion concentric with the axis of motion thereof and having a notch, and a rod one end of which is adapted to enter said notch and the other end of which is adjacent to said flattened
40 face to thereby lock said second-mentioned throw-in device and at the same time permit free rising and falling movement of the first-mentioned throw-in device and said rod being movable into the path of said first-
45 mentioned throw-in device on the retractive movement thereof to thereby carry said rod out of said notch and release said second

mentioned throw-in device and at the same time prevent advancing movement of said first-mentioned throw-in device.

50

2. The combination of a rising and falling drop-box provided with a stud having a flattened face, an oscillatory lever provided with a circular hub having a notch, and a rod one end of which is adapted to
55 enter said notch and the other end of which is adjacent to said flattened face to thereby prevent said lever from turning and at the same time permit free up and down movement of said drop box and said rod being
60 movable out of said notch when the drop-box is lowered and over said stud to thereby release said lever and at the same time prevent rising movement of said drop-box.

3. The combination of a rising and fall-
65 ing throw-in device provided with a flattened face, an oscillatory throw-in device provided with a circular portion concentric with the axis of motion thereof and having a peripheral notch, a rod one end of which
70 is adapted to enter said notch and the other end of which is adapted to said flattened face to thereby lock said second mentioned throw-in device and at the same time permit free rising and falling movement of said
75 first-mentioned throw-in device and said rod being movable into the path of said first-mentioned throw-in device on the retractive movement thereof to thereby carry said rod
80 out of said notch and release said second-mentioned throw-in device and at the same time prevent advancing movement of said first-mentioned throw-in device, a spring for forcibly moving the rod in one direction, and a latch for holding the said first-men-
85 tioned throw-in device in its elevated position said latch being manually-operable to release said first-mentioned throw-in device.

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

BENGT M. W. HANSON.

Witnesses:

HEATH SUTHERLAND,
JOSEPH P. KENNEDY.