(No Model.) 3 Sheets—Sheet 1.

W. S. HUSON.

MECHANICAL MOVEMENT.

No. 475,771. Patented May 31, 1892.

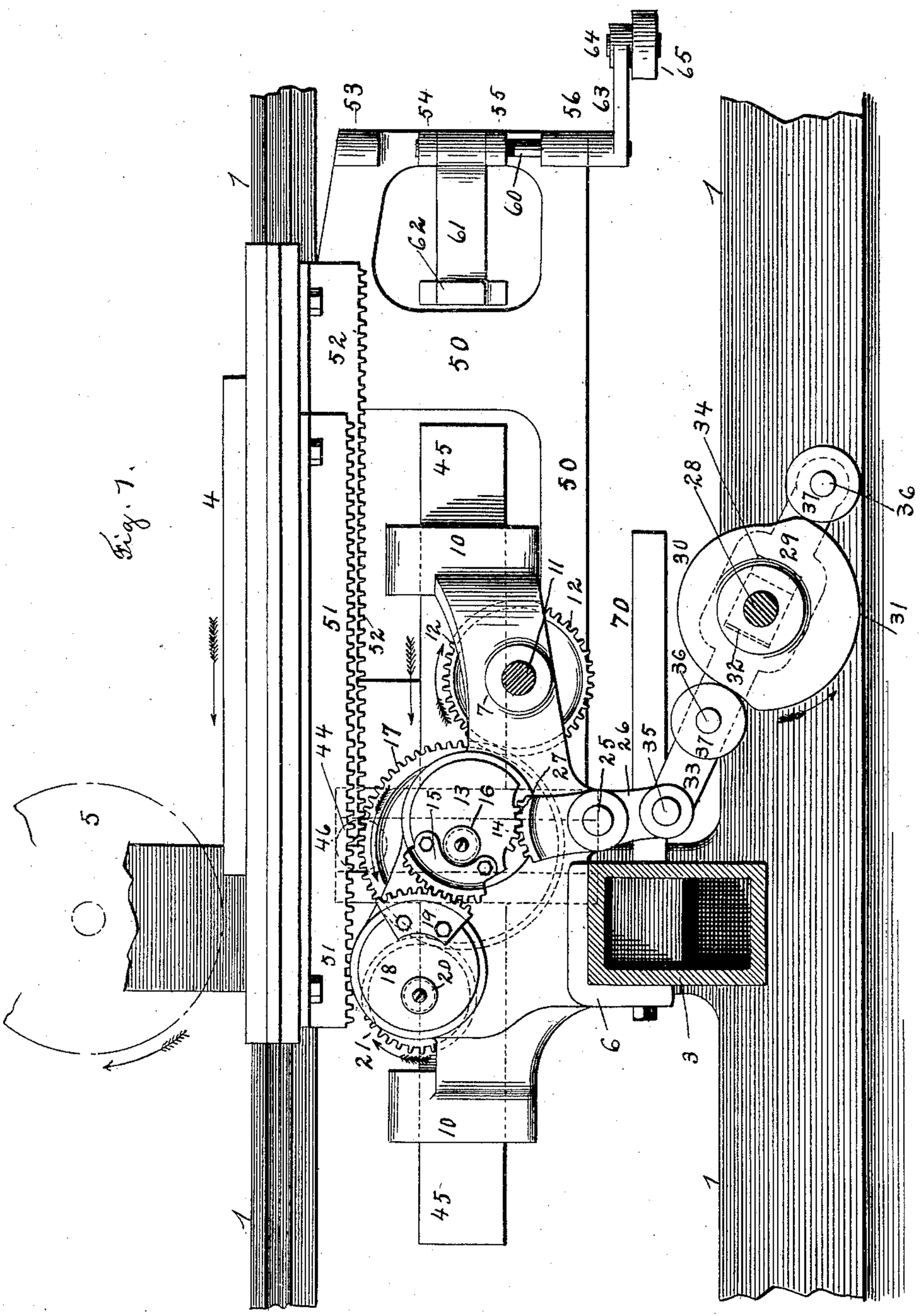

Fig. 1.

Witnesses
Chas. F. Stanley
James J. Rafferty.

Inventor
W. S. Huson
By his Attorney
Louis W. Southgate

(No Model.) 3 Sheets—Sheet 2.

W. S. HUSON.

MECHANICAL MOVEMENT.

No. 475,771. Patented May 31, 1892.

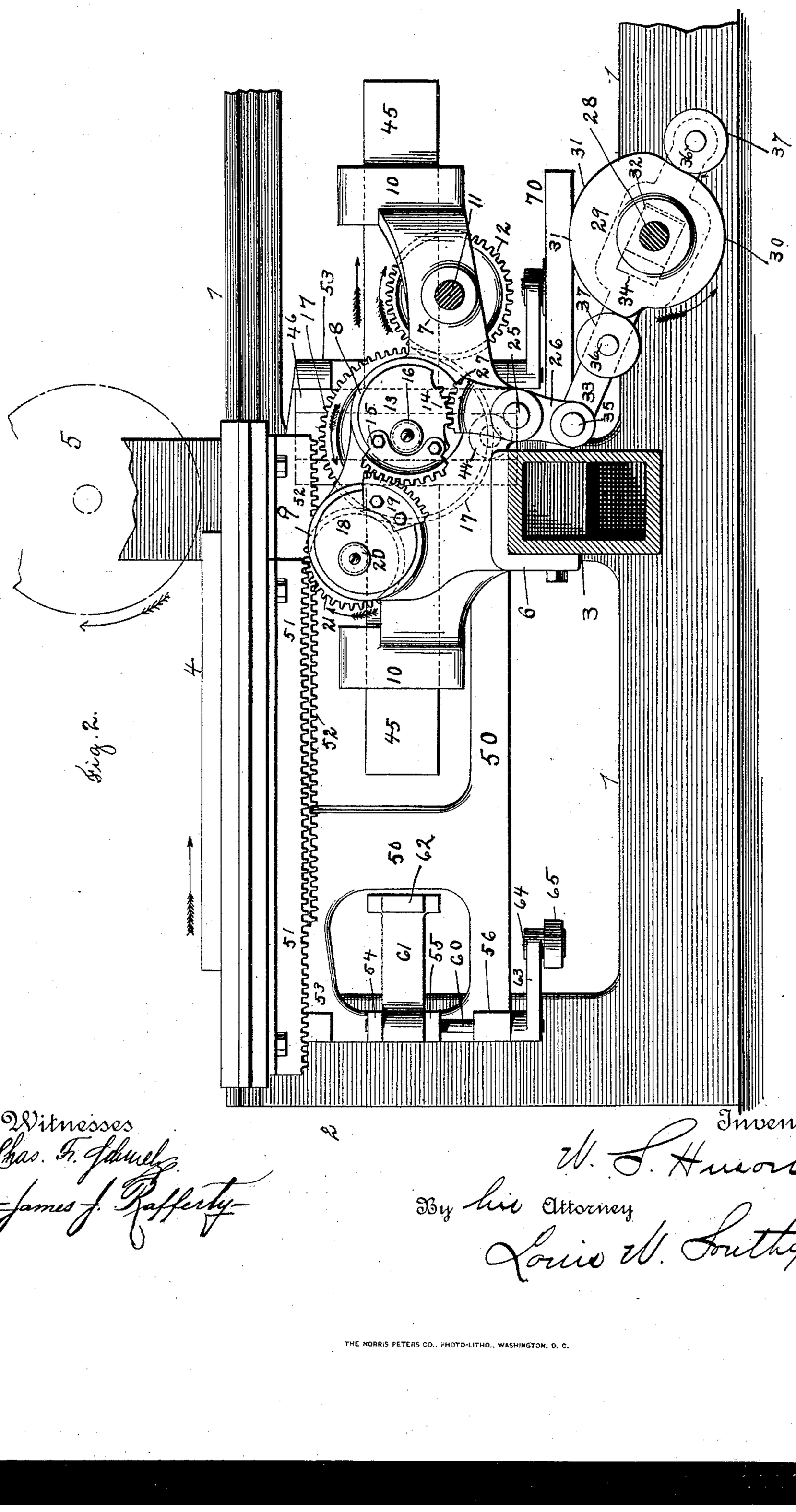

Fig. 2.

Witnesses
Chas. F. Schmeltz.
James J. Rafferty

Inventor
W. S. Huson
By his Attorney
Louis W. Southgate

(No Model.) 3 Sheets—Sheet 3.

W. S. HUSON.

MECHANICAL MOVEMENT.

No. 475,771. Patented May 31, 1892.

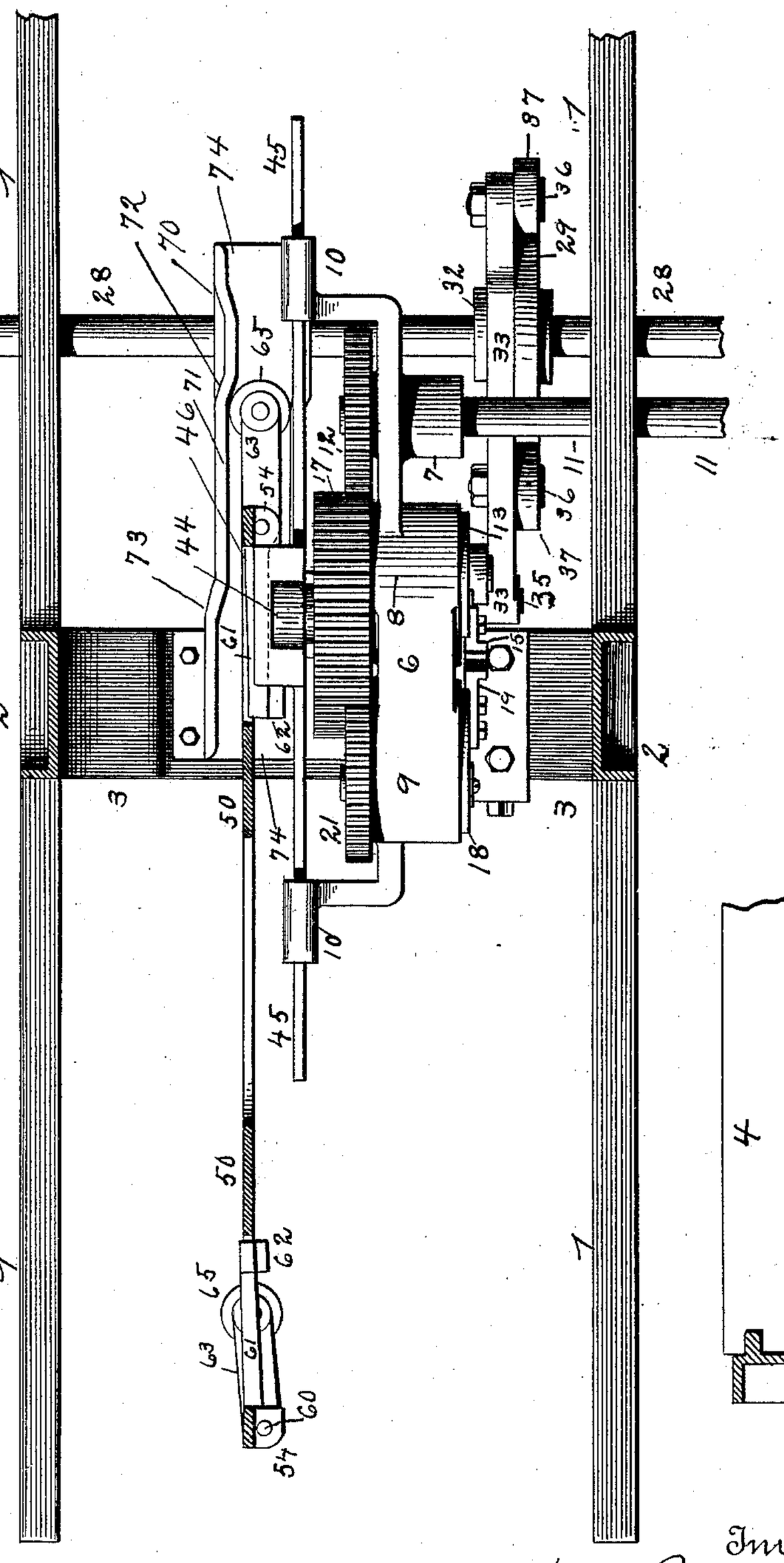

Fig. 3.

Fig. 4.

Witnesses
Chas. F. Schmelz
James J. Rafferty

Inventor
W. S. Huson
By his Attorney
Louis W. Southgate

UNITED STATES PATENT OFFICE.

WINFIELD S. HUSON, OF TAUNTON, MASSACHUSETTS, ASSIGNOR TO THE CAMPBELL PRINTING PRESS AND MANUFACTURING COMPANY, OF NEW YORK, N. Y.

MECHANICAL MOVEMENT.

SPECIFICATION forming part of Letters Patent No. 475,771, dated May 31, 1892.

Application filed April 6, 1892. Serial No. 428,016. (No model.)

To all whom it may concern:

Be it known that I, WINFIELD S. HUSON, a citizen of the United States, residing at Taunton, in the county of Bristol and State of Massachusetts, have invented a new and useful Improvement in Mechanical Movements, of which the following is a specification.

The aim of this invention is to produce a new and improved mechanical movement for converting rotary motion into rectilineally-reciprocating motion; and the invention is especially designed for use in connection with the reciprocating beds of printing-presses, though of course, as the invention, strictly speaking, is a mechanical movement, the same may be applied and used in any location where it may be desired to apply the same.

The improvement described and claimed in this case is a further carrying out of the invention described in my companion application, Serial No. 427,151, filed March 31, 1892.

The invention consists of the device described and claimed in this specification and illustrated in the accompanying three sheets of drawings, in which—

Figure 1 is a sectional elevation illustrating the position of the parts with the bed or moving member moving in one direction. Fig. 2 is a similar view illustrating the position of the parts when the bed or moving member is moving in the opposite direction. Fig. 3 is a sectional plan view of the driving mechanism, and Fig. 4 is an end view of part of the bed.

Referring to the drawings and in detail, 1 represents the framing, 2 two vertical braces of the same, and 3 a horizontal tie beam or brace. The bed or reciprocating member is represented by the numeral 4, and 5 indicates the impression-cylinder of the press.

Bolted on top of the horizontal tie-beam 3 is the frame or bracket 6, which has three bearings 7, 8, and 9 and extending arms 10, which have rectangular holes for a purpose hereinafter noted. Mounted in the bearing 7 is the power-shaft 11, which is continuously driven in one direction, and on the end of said shaft is fastened the driving-pinion 12. Journaled in bearing 8 is the eccentric bushing 13, which has the teeth 14 and a segment 15 fastened to the same. Journaled in the bushing 13 is a shaft 16, and fastened on the end of the shaft is the gear 17, which meshes with the pinion 12. Journaled in the bearing 9 is the eccentric bushing 18, which has fastened thereto the segment 19, which meshes into the segment 15, each segment having gear-teeth for this purpose, as shown.

Mounted in the eccentric bushing 18 is the shaft 20, and on the end of this shaft is secured the gear 21, which is in mesh with gear 17, but which has less than one-half the width of gear 17, as shown in Fig. 3. It is evident that as the pinion 12 revolves the same will drive the gears 17 and 21 and that the latter will revolve in opposite directions relatively to each other.

Fastened to bracket 6 is the stud 25, on which is hung the lever 26, which has the teeth 27 formed on the end thereof, and which teeth mesh with the teeth 14 on the eccentric bushing 13.

28 represents another driven shaft, and the same, if so desired, may be connected to shaft 11 by means of any suitable gearing not necessary here to show.

Shafts 28 and 11 are preferably arranged to turn in opposite directions, as indicated by arrows.

Mounted on shaft 28 is the cam 29, which has the two surfaces 30 and 31, which are parts of circles about the center of the shaft 28, and which surfaces are connected by easy inclines, as shown. Each surface extends about one hundred and eighty degrees, as shown. Mounted on shaft 28 is the block 32, upon which the slotted portion 34 of link 33 is fitted, and link 33 is connected to lever 26 by pin 35, and fitted into the link are studs 36, upon which are mounted rollers 37, that bear on opposite sides of the cam 29, as shown. The cam is connected so as to make one complete revolution for each forward-and-return movement of the bed, and thus the lever 26 will be vibrated forward and then back, as is readily seen. This will oscillate the bushings 13 and 18, and thus will raise and lower the gears 17 and 21, one gear rising as the other falls, and vice versa.

Connected to the gear 17 is a slider mech-

anism similar to that shown, described, and claimed in my companion application before referred to. This mechanism consists of a wrist-pin fastened to the face of the gear 17 so that the center of the same will come in the pitch circle of the gear, and mounted on this wrist-pin is the block or roller 44, which works in the slot 47 of the vibrating yoke or slider 46, which has the extending arms 45, which are mounted in the holes in the arms 10 of the bracket 6, before referred to. Evidently now as the gear 17 revolves the slider 46 will be reciprocated back and forth parallel to the bed a distance equal to a pitch diameter of the gear 17 for each revolution of said gear 17.

Fastened to the under side of the moving member or bed 4 is the frame 50, and secured to the bed is the double rack 51 52. The portion 51 of the rack is placed so as to mesh with the gear 21 when the latter is in its raised position, and the portion 52 of the rack is placed so as to mesh with the gear 17 beyond gear 21 when the gear 17 is in its raised position. The rack 51 projects to the left beyond the rack 52, and the rack 52 projects to the right beyond rack 51 a distance substantially equal to the distance between the centers of gears 17 and 21; also, it will be noted that the rack 51 is below rack 52, so that the gears 17 and 21 may properly engage the racks.

On the ends of frame 50 are formed the lugs 53, 54, 55, and 56, against which the slider 46 is adapted to abut. Journaled in lugs 54, 55, and 56 are the vertical shafts 60, which have mounted thereon the swinging arms 61, which have the latches or catches 62, which are adapted to engage the yoke 46. On the ends of the shafts are secured the operating-arms 63, which have studs mounted in the outside ends thereof, and on the studs are secured the friction-rollers 65.

Fastened to the tie-beam 3 is the face-cam 70, which has the groove 71, and the two parallel inclines 72 and 73, which have the wide mouth 74. It will be noticed that the arms 62 and 63 are arranged oppositely on opposite sides of the frame 50—that is, on the left-hand end of the frame they are arranged on the same side of the shaft 60 and that on the right-hand end they are placed relatively oppositely on the vertical shaft 60. The left-hand roller 65 is adapted to engage incline 73 of the cam and the right-hand roller is adapted to engage incline 72 of the cam 70.

This slider and latch mechanism is the same as specifically described and claimed in my companion application before referred to, and the object of the same is to gradually slow, stop, and gradually reverse the movement of the reciprocating member, the same as if the same were crank-actuated at the limits of its movements.

The operation is as follows: In Fig. 1 the bed is shown as just commencing its movement to the left and gear 17 being raised and in mesh with its rack 52. The racks are made, preferably, of a length equal to one or more circumferences of the gear 17, so that the direct forward-and-backward movement will be a distance equal to one or more pitch circumferences of said gear. When the bed has completed its direct movement to the left, and while the same is being reversed by the mechanism hereinafter described, the cam 29 will push the link 33 to the left. This through the mechanism previously described will oscillate the bushings 13 and 18 in opposite directions and will raise gear 21, so that the same will mesh with its rack 51, and will drop the gear 17 out of mesh with rack 52. Now as gear 21 is revolving in an opposite direction from the gear 17 (see Fig. 2) the bed will be moved back to the right or to its original position. Thus this means provides a simple and effective mechanism for converting rotary motion into reciprocating, and of course one rack could be used and each gear 17 and 21 arranged to alternately engage with the same; but I prefer to arrange the racks as shown and to apply to the bed a stopping and reversing mechanism, so that the moving member will be easily stopped and reversed without jar. The mechanism shown and described for this purpose is the same as that of my companion application before referred to, and a brief statement of the operation of the same is as follows: When the bed has moved to the left as far as the same can be moved by gear 17, the right-hand lugs 53, 54, 55, and 56 will be engaged by the yoke 46, and as the right-hand roller 65 engages incline 72 the right-hand catch 62 will engage the yoke 46. Now during the next quarter-revolution of gear 17 the bed will be moved to the left a distance equal to a pitch radius of gear 17 at a speed gradually decreasing until the bed comes to a full stop. Now during the next quarter-revolution of gear 17 the bed will be moved back to the right at a speed gradually increasing from zero to the full speed a distance equal to that which it was previously moved to the left by the slider or a pitch radius. Now the latch will release the slider as the roller runs back through the incline 72, and the gear 21 will engage rack 51 and the bed be moved directly to the right by the gearing. At the other end of the movement the bed is easily reversed in a similar manner by the same mechanism and it is not thought necessary to describe the same at length. The rising and falling of gears 17 and 21 take place during the reversing movement, and thus when the reversing movement brings one of the racks up to the gear the bed is moving at full speed and the gear 17 or 21, as the case may be, will easily engage its respective rack. The slider simply idly moves forward and back as the bed is making its direct movement. Thus the movement of the bed is equal to one or more pitch circumferences of the gear 17 plus a pitch diameter. Thus I provide a mechanism admirably adapted to move the heavy reciprocating beds of printing-presses

and to reverse the movement of the same without jar.

The particular arrangement of parts and the details of construction herein shown and described may be greatly varied by a skilled mechanic without departing from the scope of my invention as expressed in the claims.

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

1. In a mechanical movement, the combination, with the moving member having gearing on the same, of two gears, means for rotating said gears in opposite directions, and means for moving said gears oppositely up and down to alternately mesh with the gearing on the moving member, whereby the moving member will be reciprocated, substantially as described.

2. In a mechanical movement, the combination, with the moving member having gearing on the same, of the two intermeshed gears, means for raising and lowering said gears oppositely to alternately engage the gearing on the moving member, and means for rotating said gears, whereby the moving member will be reciprocated, substantially as described.

3. In a mechanical movement, the combination of the bed 4, having the racks 51 and 52, the two intermeshed gears, as 21 and 17, means for rotating said gears, and means for alternately raising and lowering each of said gears oppositely to engage its rack, whereby the bed will be reciprocated, substantially as described.

4. In a mechanical movement, the combination, with the bed having the gearing on the same, of the two intermeshed gears, and a reversing mechanism adapted to carry the bed beyond the limits by which the same will be moved by said gears in either direction and to reverse the movement of the bed and present the same again so that the particular gear and gearing on the bed will engage, and means for causing said gears to alternately engage the gearing on the bed, substantially as described.

5. The combination, in a mechanical movement, with the moving member having the gearing on the same, the two intermeshed gears, and means for rotating the same, of a reversing mechanism adapted to reverse the movement of the moving member beyond the point by which the same would be carried in either direction by said gears, and means acting at the same time with the reversing mechanism to change the gear that meshes with the gearing on the bed, substantially as described.

6. The combination, with bed 4, having the gearing on the under side of the same, of the intermeshed gears 17 and 21 and means for rotating the same, the shafts 16 and 20, on which the gears 17 and 21 are mounted, eccentric bushings in which said shafts are mounted, and means for oscillating said bushings so that the gears will be alternately oppositely raised and lowered to engage the gearing on the bed, substantially as described.

7. The combination of bed 4, having racks 51 and 52, the intermeshed gears 17 and 21, the shafts 16 and 20, on which said gears are mounted, the eccentric bushings in which said shafts are mounted, said bushings being geared together, and means for oscillating said bushings, whereby the gears 17 and 21 will be alternately raised and lowered to engage the racks on the bed, substantially as described.

8. The combination, with bed 4, having racks 51 and 52, of shafts 16 and 20, carrying intermeshed gears 17 and 21, said shafts being mounted in eccentric bushings 13 and 18, said bushings being geared together, the cam 29, and connections between said cam and bushings, whereby they will be oscillated and the gears alternately oppositely raised and lowered to engage said racks, substantially as described.

9. The combination of bed 4, having gearing on the under side of the same, the two intermeshed gears 17 and 21, and means for causing the same to alternately engage the gearing on the bed, means for rotating said gears, a wrist-pin attached to the gear 17, and a reversing mechanism actuated from said wrist-pin adapted to reverse the movement of the bed, substantially as described.

10. In the device described, the bracket 6, having the bearings 7, 8, and 9, and the extending arms 10, having holes for the slider, substantially as described.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

WINFIELD S. HUSON.

Witnesses:

LOUIS W. SOUTHGATE,

J. F. HALEY.