No. 713,914. Patented Nov. 18, 1902.

G. A. OHL.

POWER PRESS.

(Application filed Feb. 20, 1902.)

(No Model.) 3 Sheets—Sheet 1.

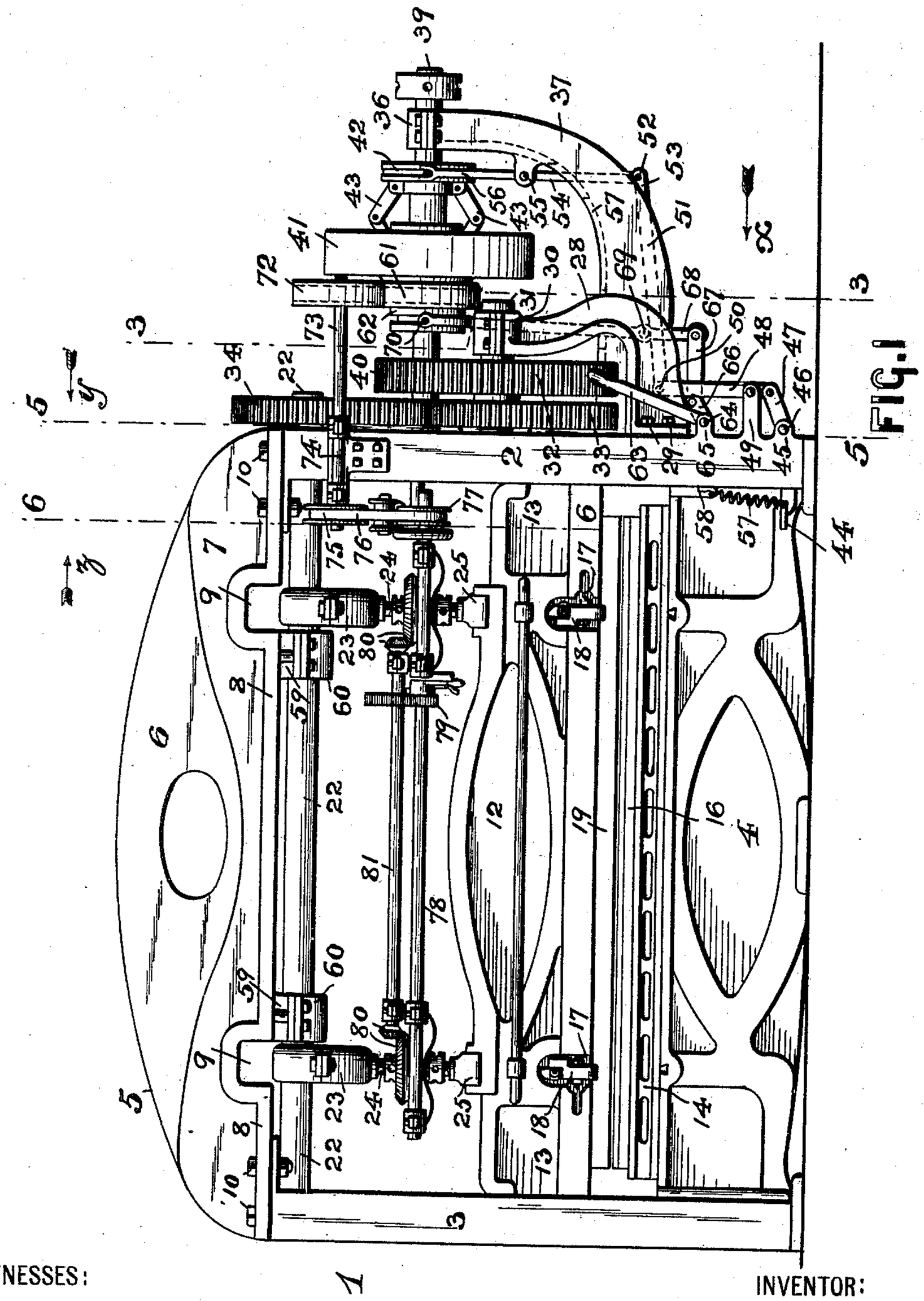

FIG. 1

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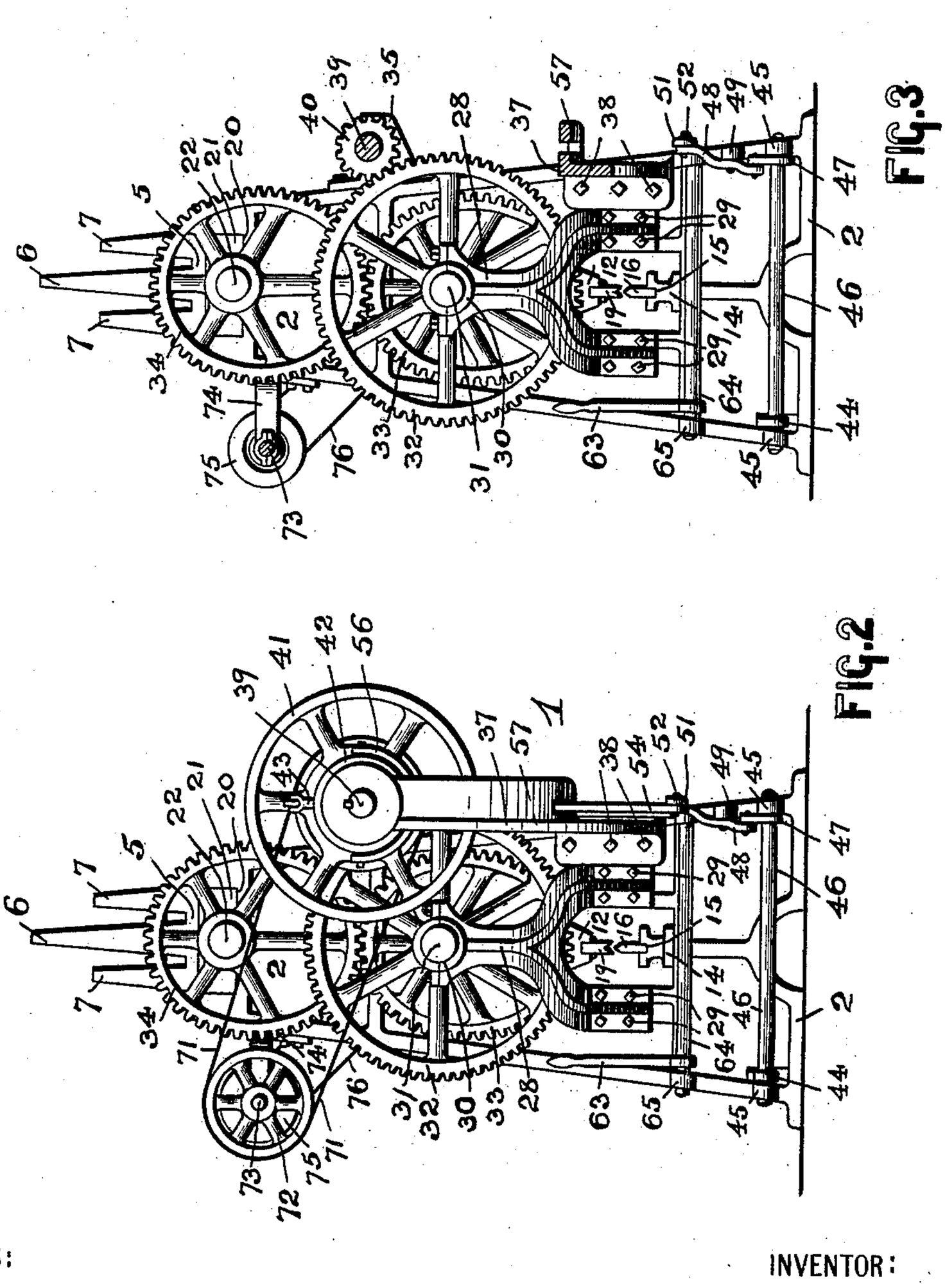

FIG. 3

FIG. 2

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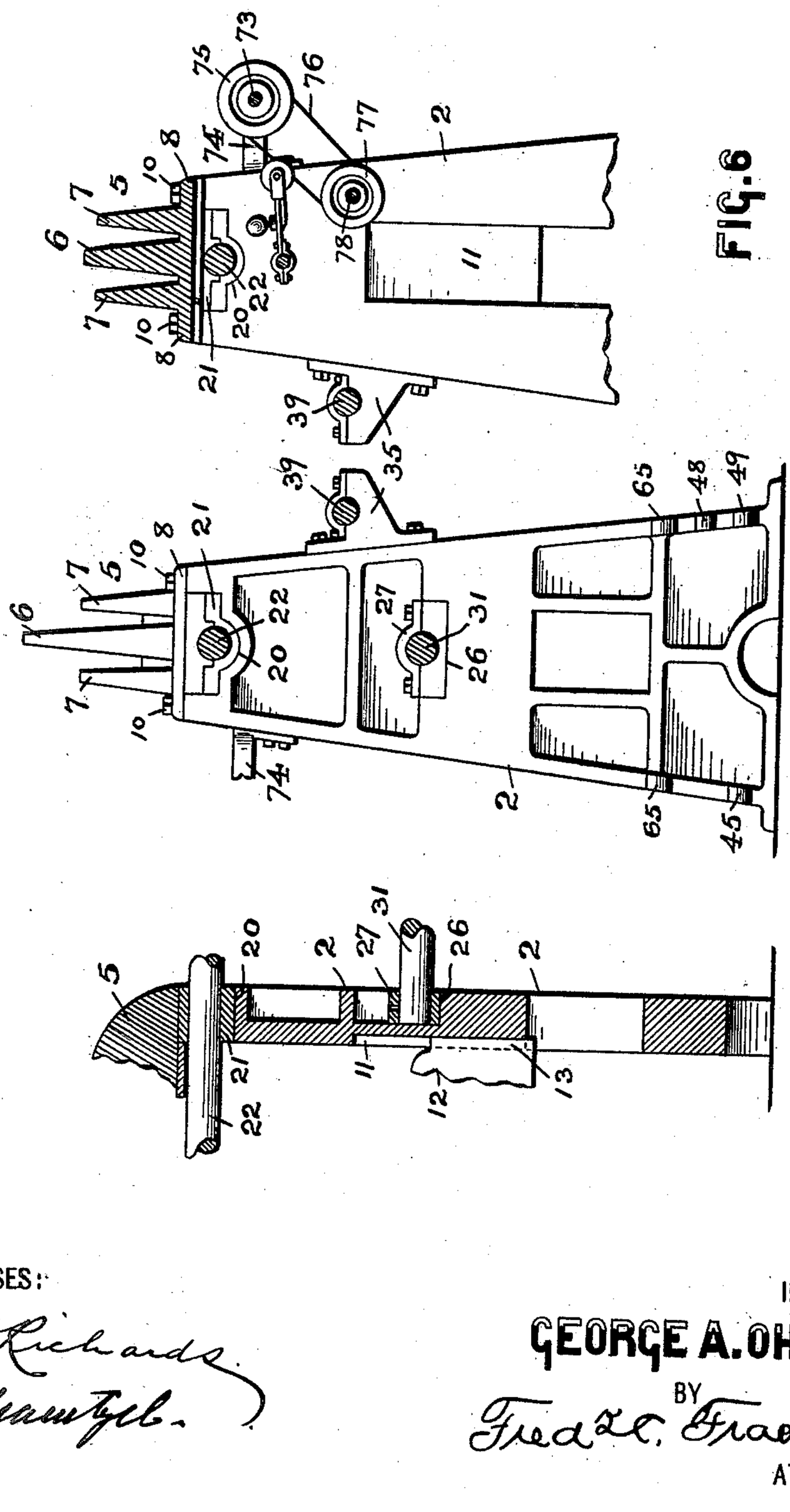

FIG. 6

FIG. 5

FIG. 4

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UNITED STATES PATENT OFFICE.

GEORGE A. OHL, OF NEWARK, NEW JERSEY.

POWER-PRESS.

SPECIFICATION forming part of Letters Patent No. 713,914, dated November 18, 1902.

Application filed February 20, 1902. Serial No. 94,884. (No model.)

To all whom it may concern:

Be it known that I, GEORGE A. OHL, a citizen of the United States, residing at Newark, in the county of Essex and State of New Jersey, have invented certain new and useful Improvements in Power-Presses; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to numerals of reference marked thereon, which form a part of this specification.

This invention relates particularly to that class of large power-presses or similarly-acting machines for the purposes of bending metal, and more especially for punching and shearing or corrugating, crimping, or squeezing together of sheet metal or for the working of other materials where a machine is necessary, having a reciprocating slide or hammer and an actuating mechanism for operating the said slide or hammer, and where it is desirable to produce a slow downward motion of the said slide or hammer with an increase of power and a quick upward or return movement of the said slide or hammer with a decrease of power.

The present invention therefore has for its primary object to provide a power-press or other suitable machine for the bending of metal or for working metal in general, embodying the features above stated, with a view of providing a construction and arrangement of the various devices and their parts to greatly reduce the strains on the various parts of the machine, and in general to simplify the construction and greatly reduce the cost of the manufacture of machines of this character.

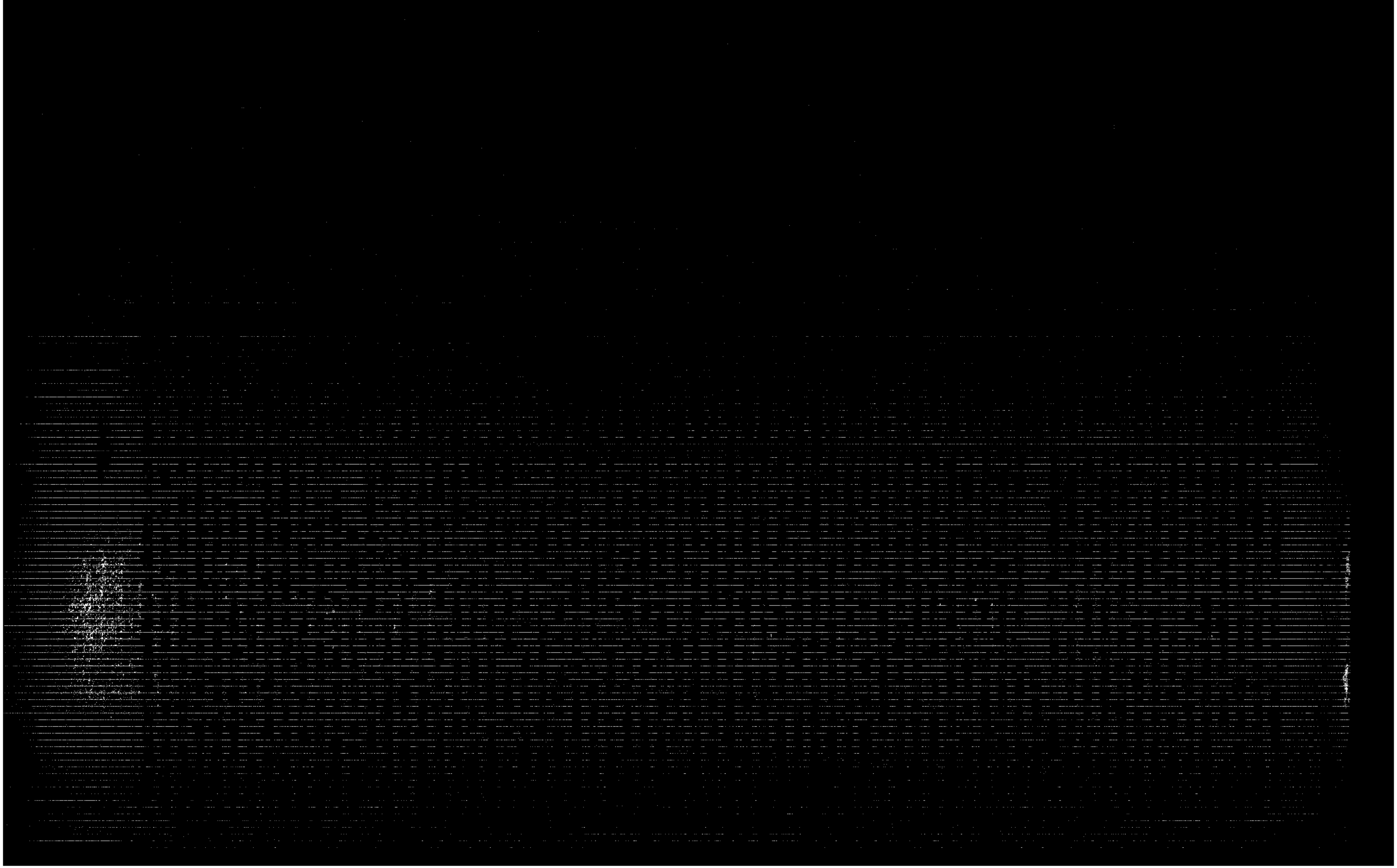
This invention therefore consists in the various novel arrangements and combinations of devices, as well as in the details of the construction of the parts of the same, all of which will be fully set forth in the following description of my invention and then finally embodied in the clauses of the claim.

The invention is clearly illustrated in the accompanying drawings, in which—

Figure 1 is a front elevation of a power-press made according to the principles of this invention. Fig. 2 is an end view of the press, and Fig 3 is a vertical section taken on line 33 in Fig. 1 looking in the direction of the arrow *x*. Fig. 4 is a central vertical cross-section of one of the end standards or supports of the machine, illustrating the arrangement of a bearing for one of the ends of a gear-shaft and also a bearing for one of the ends of an eccentric or other shaft from which the slide or hammer is suspended and operated, said view also representing a guide portion or recess in the inner surface of the standard in which the one end of the slide or hammer reciprocates. Fig. 5 is a vertical cross-section taken on line 5 5 in Fig. 1 of the drawing, looking in the direction of the arrow *y* in said figure, the said view representing the end standard and the said bearings in side elevation, and the said view also illustrating in end elevation the construction of a top piece employed with the machine; and Fig. 6 is a detail sectional representation taken on line 6 6 in said Fig. 1 looking in the direction of the arrow *z*, the slide or hammer being omitted from this view to clearly illustrate the guide portion or recess in the inner surface of the standard in which the one end of the said slide or hammer is adapted to reciprocate.

Similar characters of reference are employed in all of the said above-described views to indicate corresponding parts.

In the said drawings the reference character 1 indicates the complete machine or press, the same comprising a pair of standards or end frames 2 and 3, which are commonly termed "housings." These standards are suitably tied together by means of a bed or supporting-table 4 and a top piece 5. To give stability and strength, as well as to reduce the weight of the casting, the said casting or top piece 5 is made longitudinal of its length with a central rib 6 and two other ribs 7 at the sides of the rib 6, the said rib 6 being made with a convex marginal configuration, so as to have its highest point at the middle, while the other ribs 7 are made with a concave marginal configuration, substantially as illustrated in Fig. 1 of the drawings. By this arrangement and construction of the several parts comprising the said top piece 5 great strength and stability, with the weight



pressed and the shaft 39 begins to revolve the auxiliary shaft 31 is set in motion, and the elliptical gear 33 operates the elliptic gear 34, and in consequence thereof the shaft 22. Owing to the arrangement of the gears 33 and 34 a slow and positive movement of the slide or hammer 12 is produced, great power being exerted for properly bending the piece of work which has been placed beneath the said slide or hammer, but causing a quick return of the said slide or hammer during its upward movement, and that with an expenditure of power reduced to a minimum, as will be clearly understood.

To remove any unnecessary strain from the shaft 22 and prevent it from being forced out of alinement when the dies are being operated, the cross-piece 5 may be provided with integrally-formed and downwardly-extending bearing portions 59, to which are secured bearing-caps 60 to provide complete bearings in which portions of the shaft 22 are rotatably arranged, as shown in Fig. 1 of the drawings.

The arrangement of the various parts for rapidly adjusting the slide or hammer 12 is similar to the arrangement of the said parts for this purpose set forth in the previously-mentioned patent, No. 679,031.

In the present arrangement a friction-pulley 61 is loosely arranged upon the shaft 39, the pulley 61 being capable of being forced in operative engagement with the pulley 41 by means of a slide-collar 62. The operative engagement between the usual cone-surfaces of these parts is caused by means of a hand-lever 63, which is secured to a rod 64, arranged to oscillate in bearings 65 at the sides of the standard or housing 2. Connected with this rod 64 are a pair of pivotally-connected links 66 and 67, the link 67 being pivotally attached to the lower end of an operating arm or lever 68. This latter arm or lever is pivotally arranged upon a stud or pin 69 at the side of the bracket 37, and its upper and yoke-shaped end portion 70 is operatively connected with the said slide-collar 62. As soon as the pulley 61 has been set in operation its motion is communicated by means of a belt 71 to a pulley 72, which is secured upon a shaft or spindle 73. This spindle is rotatably arranged in a suitable bearing 74, secured to the said standard 2, substantially as shown, and is provided with a wheel 75, over which passes a belt 76 for driving a second wheel 77, arranged upon a shaft 78. Upon this shaft 78 is arranged a suitably-constructed frog-gearing 79, preferably of the construction and arrangement of the parts represented in said Patent No. 679,031. This mechanism is employed for producing the reverse movements of the pitmen 24, connected with the eccentrics 23 and the slide or hammer 12 by means of the gear mechanism 80 and a connecting shaft or rod 81, arranged and constructed and operating in the manner of the gear mechanism described in the said previously-mentioned patent, No. 679,031.

To all the parts hereinabove referred to as being described in said Letters Patent No. 679,031 I do not lay any claim; and it will be clearly understood that various other mechanism may be substituted in lieu of such parts and devices, my present invention consisting generally in the arrangement of a reciprocating slide or hammer, combined with a novel means for operating the same from a main driving-shaft, the novel means for setting said operating means in action, and in the general and novel construction of the machine-frame, combined with the variously arranged and operating parts and devices hereinabove described.

I am fully aware that some changes may be made in the various arrangements and combinations of the devices and parts and in the details of the construction of the same without departing from the scope of this invention. Hence I do not limit my invention to the exact arrangements and combinations of the variously-described mechanism and the devices as set forth in the previous specification and illustrated in the accompanying drawings, nor do I confine myself to the exact details of the construction of the said parts.

Having thus described my invention, what I claim is—

1. In a power-press, the combination, with a main driving-shaft, a slide or hammer, an auxiliary shaft, and means between said shaft and the slide or hammer for causing a reciprocatory motion of said slide or hammer, of an intermediately-arranged mechanism between said main driving-shaft and said auxiliary shaft for actuating the latter, but constructed and arranged to cause a slow downward motion of said slide or hammer and a quick upward or return motion of the same, substantially as and for the purposes set forth.

2. In a power-press, the combination, with a main driving-shaft, a slide or hammer, an auxiliary shaft, and means between said shaft and the slide or hammer for causing a reciprocatory motion of said slide or hammer, of a pair of intermediately-arranged elliptical gears, one of said gears being secured on said auxiliary shaft and the other elliptical gear meshing with the gear on said auxiliary shaft, and means on said main driving-shaft for actuating said elliptical gears and thereby causing a slow downward motion of said slide or hammer and a quick upward or return motion of the same, substantially as and for the purposes set forth.

3. In a power-press, the combination, with a main driving-shaft, a slide or hammer, an auxiliary shaft, and means between said shaft and the slide or hammer for causing a reciprocatory motion of said slide or hammer, of an intermediately-arranged shaft 31, a gear 32 on said shaft 31, and a pinion on said main

slide-collar, comprising, a foot-treadle, a cross-rod 45, a link 47, a connecting-rod 48, an arm 51 pivoted to said rod 48, and an upwardly-extending rod 54 connected with said arm 51, having a yoke-shaped end in engagement with said slide-collar, substantially as and for the purposes set forth.

In testimony that I claim the invention set forth above I have hereunto set my hand this 13th day of February, 1902.

GEORGE A. OHL.

Witnesses:
FREDK. C. FRAENTZEL,
GEO. D. RICHARDS.