

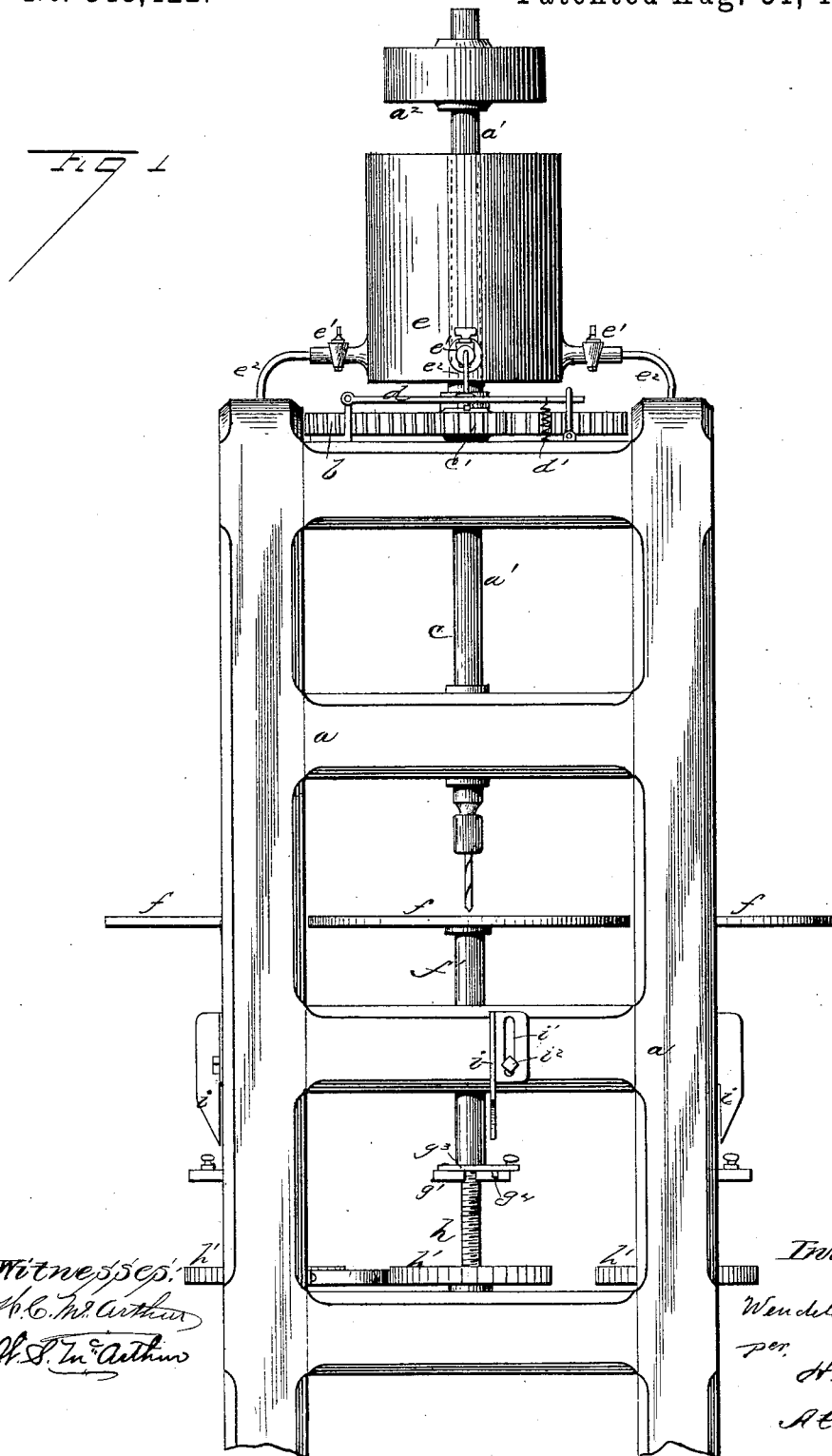
(No Model.)

3 Sheets—Sheet 1.

W. SENG.
DRILLING MACHINE.

No. 348,422.

Patented Aug. 31, 1886.



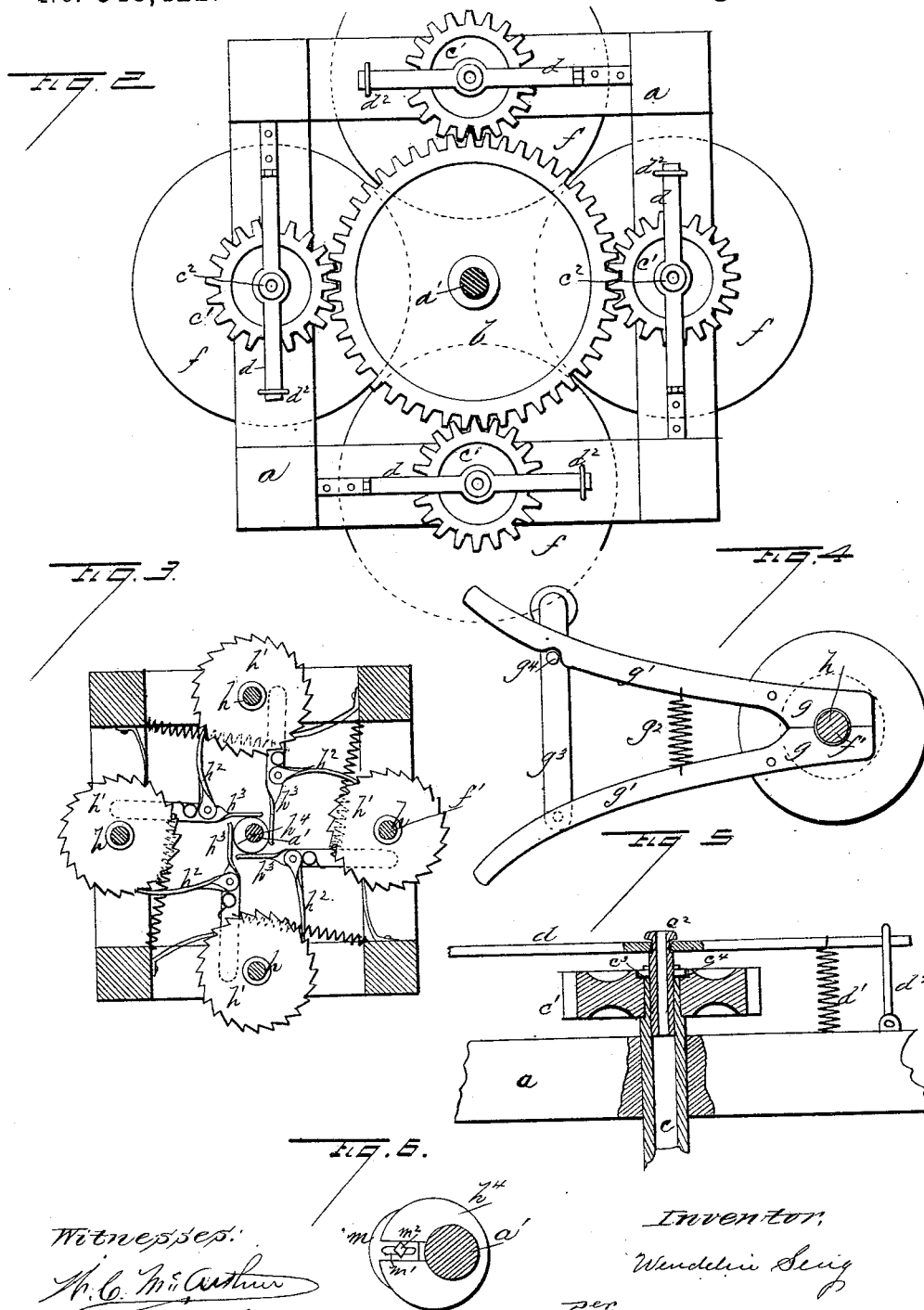
Witnesses:
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H. S. M. Arthur

Inventor.
Wendelin Seng
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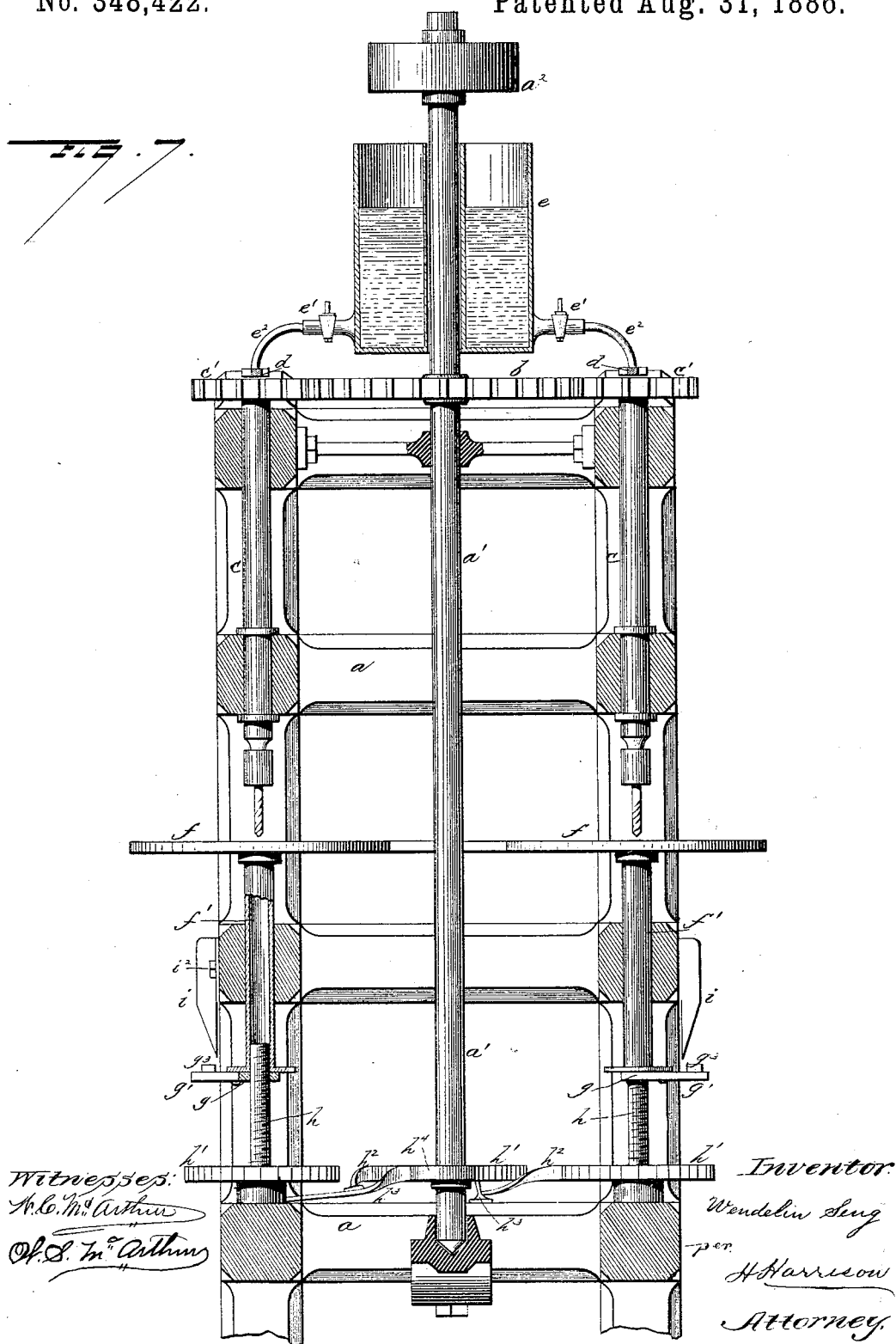
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3 Sheets—Sheet 3.

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UNITED STATES PATENT OFFICE.

WENDELIN SENG, OF CHICAGO, ILLINOIS.

DRILLING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 348,422, dated August 31, 1886.

Application filed April 15, 1886. Serial No. 198,885. (No model.)

To all whom it may concern:

Be it known that I, WENDELIN SENG, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Automatic Drill-Presses, of which the following is a specification, to wit:

This invention relates to automatic drill-presses; and it consists in certain peculiarities of the construction and arrangement of the same, as will be hereinafter more fully set forth and claimed.

In order to enable others skilled in the art to which my invention pertains to make and use the same, I will now proceed to describe its construction and operation, referring to the accompanying drawings, in which—

Figure 1 is a side elevation of my invention; Fig. 2, a horizontal section through the main shaft just below the lubricating-reservoir; Fig. 3, a similar view taken just above the ratchet-feeding devices. Fig. 4 is a bottom view of the screw-feeding jaws; and Fig. 5 is a vertical section in detail of one of the hollow drill-shafts and the means for clutching and releasing its driving-pinion. Fig. 6 is a detail view of the eccentric and its movable shoe; and Fig. 7 is a central vertical section of the machine.

a represents the main frame of my device, which is of any suitable form and material, and through the center of which runs the main driving-shaft *a'*, on which is a suitable driving-pulley, *a''*, for connection with any suitable power. Upon this shaft, in the upper part of the main frame, is secured a large gear, *b*, which serves to drive the drill-shafts, as will be presently seen.

In the main frame are journaled four upright shafts, *c*, to the lower ends of which the drill-points are secured in the ordinary and well-known manner. Upon the upper ends of these shafts are placed loosely small pinions *c'*, which mesh with and receive motion from the large driving-gear on the main shaft. Each of the drill-shafts is hollow, and in their upper ends are placed small tubular extensions *c''*, which are arranged to slide freely in and out a short distance, and are each provided with one or more projections, *c'''*, projecting from the side through an open-ended slot in the end of the main hollow shaft and into corresponding sockets, *c''''*, in the loose pinion, as in Fig. 5.

To a suitable bracket or support on the main frame are hinged levers *d*, which engage the sliding extensions *c''* to lift and lower them for engagement with the drill-shafts and pinions, and the outer ends of these levers are held down to place by springs *d'*. Loops *d''* are hinged on the frame, and serve the double purpose of passing over the ends of the levers, as in the drawings, to lock them down, or are turned up beneath these levers when they are lifted to hold them up and cut out of operation any particular drill that may be desired. A can or reservoir for water or lubricating material *e* is fixed in place around the main shaft and provided with a series of stop-cocks, *e'*, which are connected by small tubes *e''* with the several hollow shafts and serve to conduct the fluid through the shafts directly to the drill-points without waste, as will be at once understood.

In the main frame beneath each drill-shaft is a work-table, *f*, supported on a vertically-sliding tubular standard, *f'*, to the lower end of which are pivoted a pair of lever-jaws, *g*, as fully seen in Fig. 4. These lever-jaws are on their heads formed with semicircular depressions on their adjacent faces, which are screw-threaded, and these depressions, when the jaws are closed, form a screw-nut, which engages the elevating-screw, as hereinafter described. In rear of their pivotal points the lever-jaws are extended, as at *g'*, and connected by a spring, *g''*, which acts to open them, as will be seen. One of the extension-arms *g'* is provided with a hinged arm, *g'''*, which is near its opposite end formed or provided with a shoulder or pin, *g''''*, and by reference to Fig. 4 it will be understood that when this arm is thrown across, as in the drawings, the pin or shoulder forces the two levers apart, thereby causing their screw-threaded heads to clasp the operating-screw, and when the hinged arm is drawn back the spring at once opens the jaws to release the screw.

Beneath the hollow table-standard is journaled vertically in the main frame a series of elevating-screws, *h*, each of which has secured upon it near its lower end a ratchet-wheel, *h'*, which latter are operated by a series of pawls, *h''*, carried upon the arms *h'''*, which are hinged at one end on the main frame and have their other ends resting against and operated by an

eccentric, h^4 , fixed upon the main driving-shaft, as in Figs. 3 and 7. These arms are provided with springs h^5 , to retain them in proper contact with the eccentric.

5 On the main frame, in proper relation to each work-table and its sliding standard, are arranged the inclined stops i , which engage and operate the hinged arms g' , to release the screw-jaws, and each of these inclined plates
10 is provided with a slot, i' , and an adjusting-screw, i'' , in order that they may be set up or down to correspond with the work under operation and the consequent distance the tables are to travel.

15 This machine is designed for the rapid and automatic drilling of holes in metal castings, and as no attention is required after the work is once placed in position, it is evident that it may be provided with any desired number of
20 drill-shafts and the corresponding tables and other mechanism, and the whole fed and attended by but one operative.

In operation the main driving-shaft is driven by any desired power, and imparts a constant
25 motion to all of the elevating-screws and to all of the drill-shafts that are clutched. The work is placed on the table and the hinged arm g^3 swung across to force apart the levers, the jaws of which at once engage the
30 screw, and as they are secured to the hollow standard it and the table are by action of the screw lifted steadily toward the drill-point. When the work is fully drilled through or to the desired depth, the inclined stop engages
35 and trips the hinged arm g^3 and releases the screw-jaws, which are at once opened by the spring and the table drops freely back to its lowest point, the work is removed and another piece substituted, and the operation is repeated.
40 It will thus be seen that the work requires no attention after being placed in position and the feeding-screw started, and one operator is thus enabled to attend to all the drills in the machine, any one of which may
45 be disengaged and stopped at any time found desirable.

As will be seen clearly in Fig. 6, I form the eccentric with a radial groove in one face, and provide a shoe, m , having an arm formed with
50 a slot, m' , which arm lies in the grooved eccentric, and it and the shoe are adjusted in or out, as required, and secured by a set-screw, m^2 , passed through the slot. By setting this shoe to or from the shaft I easily regulate the
55 stroke of the pawls, and through them the extent of feed given the ratchet-wheels, elevating-screws, and work-tables.

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

60 1. In an automatic drill-press, a main driving-shaft, a series of drill-shafts driven therefrom, and a series of work-tables sliding to and from the drills, in combination with a series of work-feeding screws connected to and operated
65 by the main shaft, and a pair of screw-threaded jaws upon each of the work-tables engaging with the screws, substantially as and for the purpose set forth.

2. In a drill-press, the combination, with
70 the main driving-shaft provided with a large driving-gear, of a series of drill-shafts each provided with a loose pinion meshing with the large gear, a sliding extension on each shaft provided with projections engaging recesses
75 in the shaft and in its loose pinion, a shifting spring-actuated lever connected with said extension, and a loop or bail for securing this lever in both positions, substantially as and for the purpose set forth. 80

3. In a drill-press, the combination, with a main driving-shaft and a series of drill-shafts geared thereto, and a series of work-tables sliding to and from the drills, of a series of operating-screws for said tables, each provided
85 with a ratchet-wheel, a series of feeding-pawls carried upon pivoted spring-actuated arms, and an eccentric on the main shaft for actuating said arms, substantially as and for the purpose set forth. 90

4. In a drill-press, the combination, with a vertically-sliding work-table supported on a hollow standard, and a pair of spring-actuated screw-threaded jaws pivoted on said standard, and provided with a locking-arm, of an elevating-screw for engagement with said jaws,
95 and an adjustable stop or trip on the main frame to disengage said jaws at the proper point, substantially as and for the purpose set forth. 100

5. In a drill-press, the combination, with a work-table and a screw for advancing it toward the drill, of a feeding-pawl, and an actuating-eccentric provided with an adjustable shoe for regulating the throw of the pawl, substantially as and for the purpose set forth. 105

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

WENDELIN SENG.

Witnesses:

W. C. McARTHUR,
W. S. McARTHUR.