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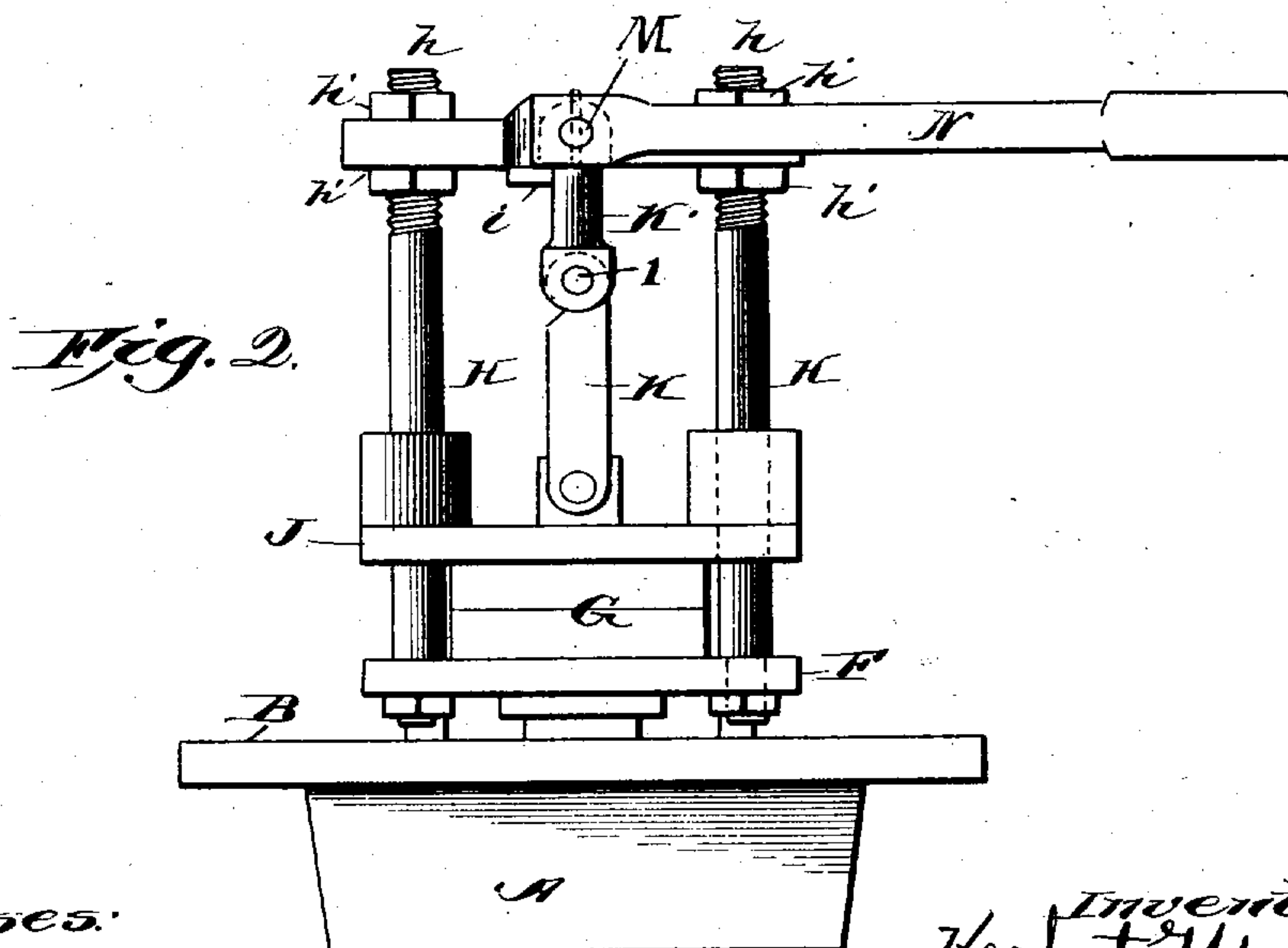
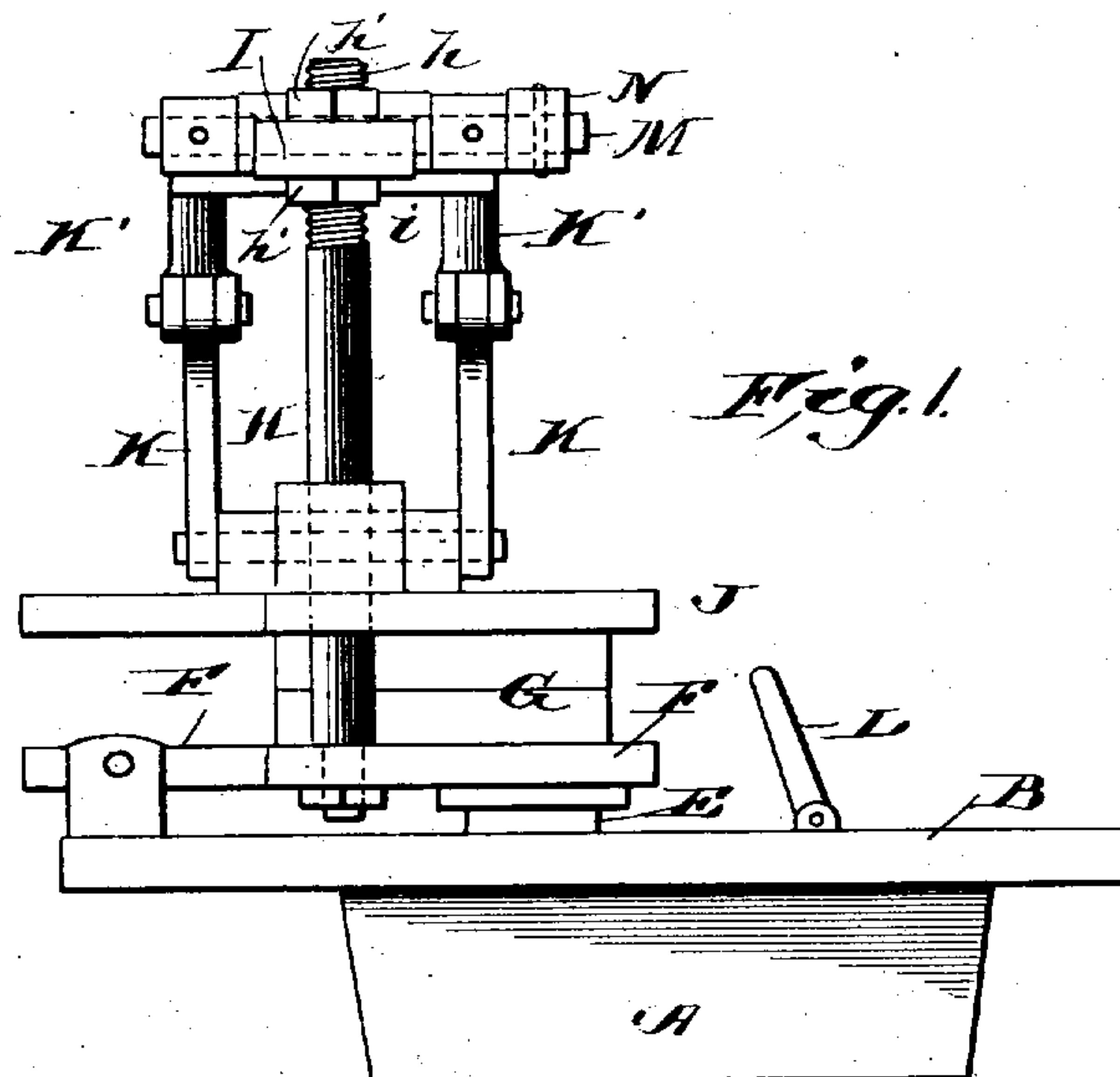
Patented Dec. 9, 1902.

H. G. UNDERWOOD.  
CASTING APPARATUS.

(Application filed June 17, 1897. Renewed Jan. 11, 1900.)

(No Model.)

3 Sheets—Sheet 1.



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Inventor:  
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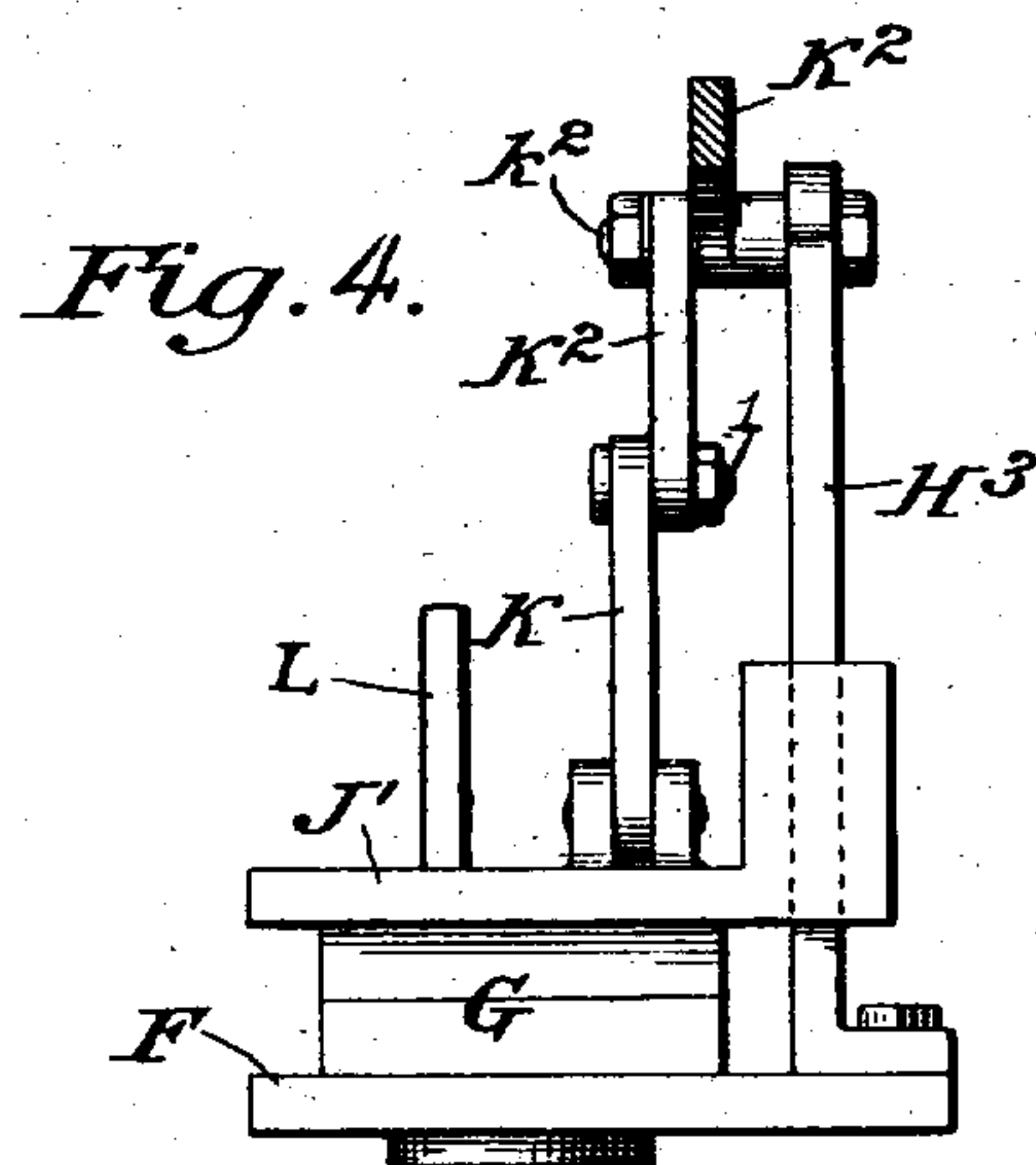
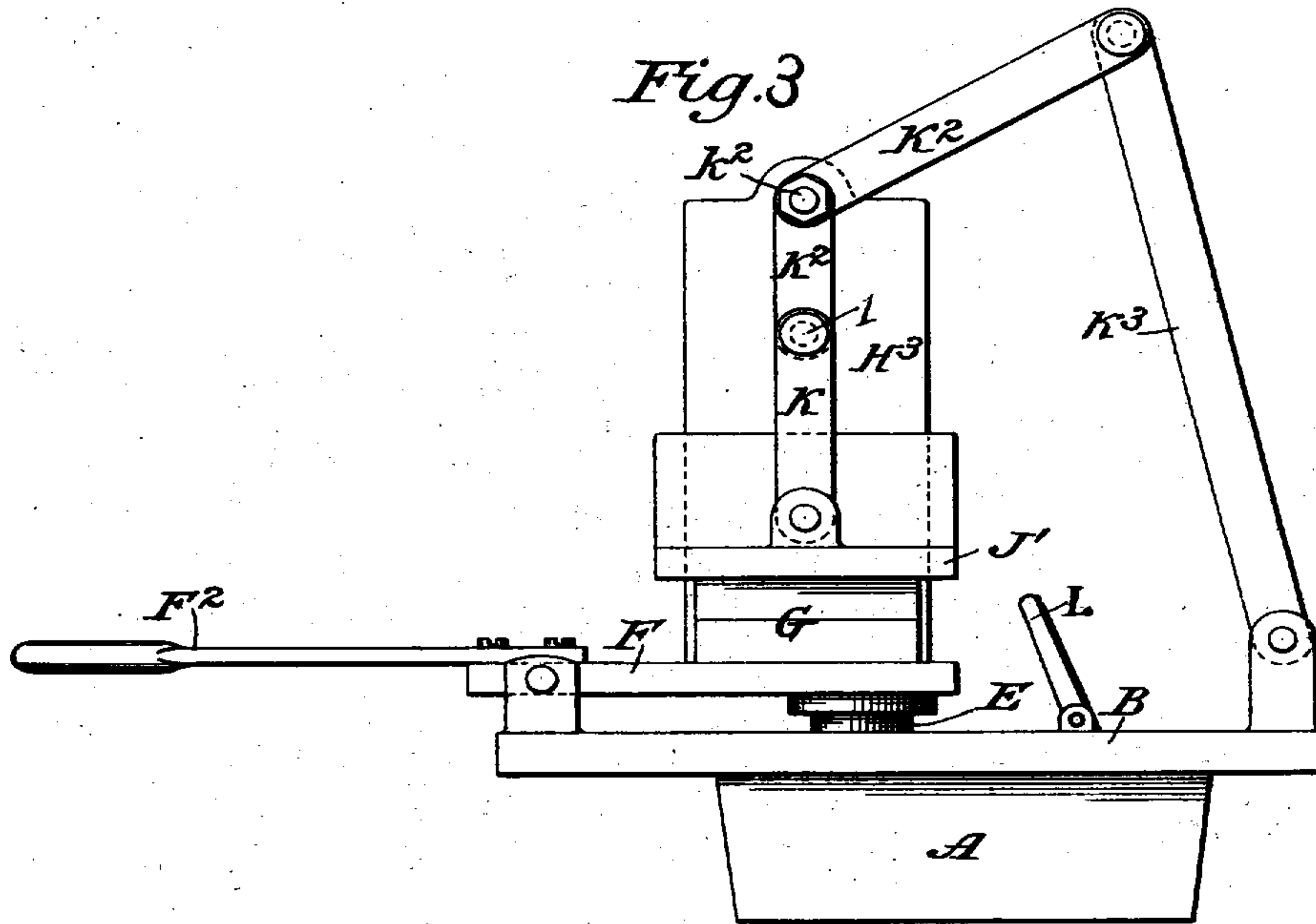
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3 Sheets—Sheet 2.



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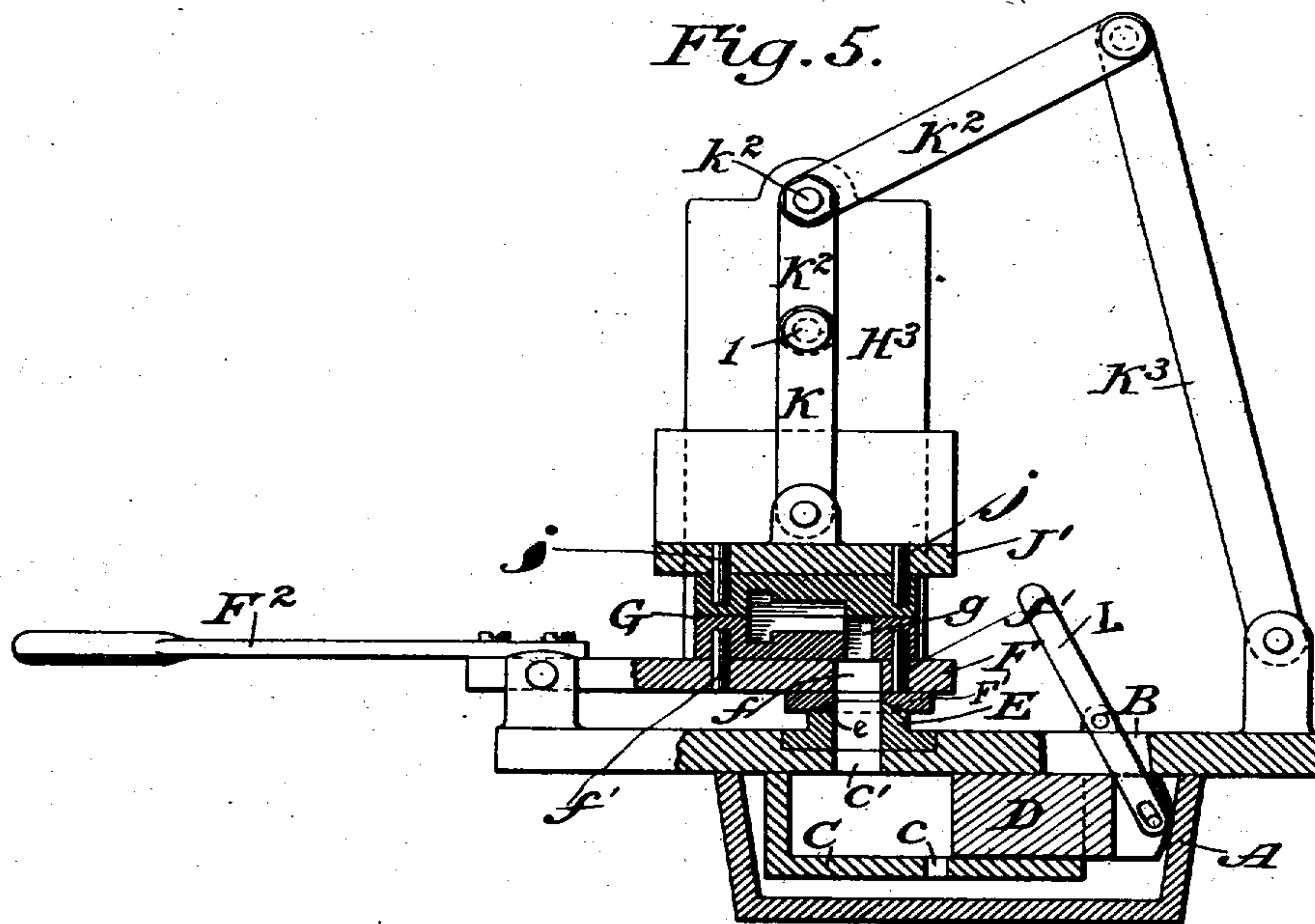
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3 Sheets—Sheet 3.



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# UNITED STATES PATENT OFFICE.

HERBERT G. UNDERWOOD, OF NEW YORK, N. Y., ASSIGNOR TO HERBERT H. FRANKLIN, OF SYRACUSE, NEW YORK.

## CASTING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 715,713, dated December 9, 1902.

Application filed June 17, 1897. Renewed January 11, 1900. Serial No. 1,145. (No model.)

*To all whom it may concern:*

Be it known that I, HERBERT G. UNDERWOOD, a citizen of the United States, residing in the city, county, and State of New York, have invented a certain new and useful Casting Apparatus, of which the following is a specification, reference being had to the accompanying drawings, forming a part hereof.

This invention is especially designed for use in connection with apparatus in which the molten metal or other material is forced or flows from the melting-pot or other source of supply through a suitable exit port or nozzle; and it has for its object the production of mechanical means which are simple and practical in construction, durable and strong in use, present the mold with great rapidity to receive the material to be cast, hold the mold and its component sections or parts firmly in position, and permit the ready removal of the cast article.

The invention consists in the matters hereinafter described, and referred to in the appended claims.

25 The accompanying drawings illustrate a casting apparatus which I have designed and chosen for explanation of my invention, and in the drawings—

30 Figure 1 is a side elevation of the apparatus. Fig. 2 is a front elevation of the same. Fig. 3 is a view similar to Fig. 1 of a slightly-modified form of apparatus. Fig. 4 is a front elevation of the means shown in Fig. 3; and Fig. 5 is a detail view, partly in section, of 35 the apparatus seen in Figs. 3 and 4.

The melting-pot or other source of supply A of the molten metal or other material is shown as having a top or cover B, which supports a cylinder or chamber C, Fig. 5, within 40 the part A and the molten material therein. Said cylinder or chamber C is illustrated as relatively fixed to the melting-pot or source of supply A and as provided with ports *c c'* and with a plunger D, operated by means 45 here shown as a lever L. The outlet-port *c'* of the cylinder or chamber C communicates with an exit port or nozzle E, which is preferably arranged substantially upright and provided with a tapering end face *e*, Fig. 5.

50 The parts thus far described comprise the means for supplying the material to be cast

and are each of any suitable or desirable form, size, and construction.

The remaining parts of my apparatus form the mold supporting and manipulating means 55 and may be constructed in many different ways. In the illustrated embodiment of my invention, F is a supporting member, and G is a mold. As shown, the member F is pivoted to the top or cover B and is provided 60 with a port or orifice *f* for registering with the exit port or nozzle E, and with means, as the handle *F<sup>2</sup>*, for rocking said member F on its pivot relatively to the exit-port E and alternately presenting the port or orifice *f* to 65 the exit port or nozzle E and removing the same from said part E. The handle *F<sup>2</sup>* may, however, be dispensed with and any other part fixed to the supporting member F, as the upper end of the standard rising from 70 said supporting member may be used as a handle. The face of the supporting member F opposed to the exit port or nozzle E is generally provided with a tapering surface *F'* for engaging the end face *e* of the exit port or 75 nozzle E, and the opposite face of the member F is provided with suitable engaging means, as dowel-pins *f'*.

The mold G is composed of any desirable number of sections or parts, here illustrated 80 as two, is mounted directly on the supporting member F, and its section or part adjacent to the supporting member F is shown as detachably engaged with the means *f'*. Said mold G is preferably provided with an ingate 85 *g*, opening from its face opposed to the supporting member F and normally registered with the port or orifice *f*, and during the entrance of the material is firmly pressed rectilinearly or in a right line toward the oppos- 90 ing face of the member F and the exit-port E by suitable means, which is here illustrated as supported by the standard rising from the member F and a second supporting member secured to said standard and as consisting of 95 a clamping member and toggle-levers between the second supporting member and the clamping member.

In Figs. 1 and 2, the standard rising from the supporting member F is shown as a pair 100 of separated substantially parallel arms H H, having threaded ends *h*, and the sec-



ond supporting member is shown as a cross-head I, provided with a fixed stop *i* and having its opposite ends adjustable lengthwise of the arms H H and engaged by suitable means, as nuts *h'*, provided on the threaded ends of the arms H H for securing the supporting member or cross-head I in its adjusted position relatively to the supporting member F. As illustrated in said Figs. 1 and 2, the clamping member, which is represented by J, is movable rectilinearly or in a right line toward and away from the opposing faces of the supporting members F I and relatively to the handle F<sup>2</sup>, and the standard rising from the supporting member F is guided at its ends on the arms H H and is provided with means, as dowel-pins *j*, for detachably engaging the contiguous section of the mold G and moving the same as a whole toward and away from the remaining portion of the mold in order to permit the ready removal of the cast articles from the mold. The toggle-levers K K', Figs. 1 and 2, are of any desirable form, size, and construction, are operated by any suitable means, as a hand-lever N, fixed to one of said levers, are interposed between the second supporting member I and the clamping member J, and when in their operative position the pivots 1, connecting the ends of the toggle-levers pivoted together, are alined with the pivots for connecting the other ends of the toggle-levers to said supporting and clamping members I J in order that the clamping member J may be positively locked in its position assumed during the entrance of the material to be cast. As the toggle-levers K K' are operated, the pivots 1 move into and out of their locking position, and as said toggle-levers assume their operative position the movement thereof is limited by the stop *i*, which encounters the contiguous toggle-levers.

In the use of the apparatus shown in Figs. 1 and 2 the two sections or parts of the mold G are detachably engaged, respectively, with the supporting and clamping members F J. The hand-lever N operates the levers K K' and the clamping member J to move the section of the mold engaged with the member J rectilinearly toward the opposing section of the mold. The supporting member F is swung on its pivot for presenting the port *f* to the exit port or nozzle E to permit the entrance to the mold of the material to be cast, and during the entrance of said material the clamping member J firmly presses the mold as a whole toward the contiguous face of the supporting member F and the exit port or nozzle E, and the pivots 1 lock said clamping member J in its operative position. If the desired operation of the clamping member J and the levers K K' does not take place, the second supporting member I may be adjusted vertically. After the formation of the cast article in the mold the supporting member F and the hand-lever N are respectively operated to withdraw the port *f* from the exit

port or nozzle E and to separate the sections of the mold to permit the removal of said cast article. These several operations can obviously be completed with minimum ease and maximum rapidity.

The construction of my apparatus seen in Figs. 3, 4, and 5 is substantially identical with that seen in Figs. 1 and 2, with the exception of the standard provided on the supporting member for the mold, the clamping member, one of the toggle-levers, and the means for supporting and actuating said toggle-lever. In Figs. 3 to 5, inclusive, the standard H<sup>3</sup> consists of a single upright or bracket. The clamping member J' is guided on said standard at one end only. The toggle-lever K<sup>2</sup>, which operates the toggle-lever connected to the clamping member J', is mounted on a supporting member *k*<sup>2</sup>, projecting laterally from the standard H<sup>3</sup>, and is provided with a rigid arm connected to a link K<sup>3</sup>, which is pivoted to the top or cover for the melting-pot and serves to move the clamping member J' to and from its operative position when the supporting member from the mold is moved to and from its position assumed during the entrance within the mold of the material to be cast.

The construction and operation of my casting apparatus will now be readily understood upon reference to the foregoing description and the accompanying drawings, and it will be obvious that more or less change may be made in the construction and arrangement of the parts thereof without departing from the spirit of my invention.

I claim—

1. In a casting apparatus, a source of supply for the material to be cast, an exit-port for communicating with the source of supply, a movable supporting member, a mold mounted on a face of the supporting member and having an ingate-opening from its face opposed to said face of the supporting member for communicating with the exit-port, a means for moving the supporting member and the mold mounted thereon into and out of their position assumed during the entrance of the material to the mold, means for forcing the material from the exit-port through the ingate into the mold, and means movable relatively to the supporting member and to said means for moving said member, for pressing the mold as a whole rectilinearly toward said face of the supporting member.

2. In a casting apparatus, a source of supply for the material to be cast, an exit-port for communicating with the source of supply, a movable supporting member formed with a port for communicating with the exit-port, a mold mounted on a face of the supporting member and having an ingate-opening from its face opposed to said face of the supporting member for communicating with the port of the supporting member, means for moving the supporting member and the mold mounted thereon into and out of their position as-



sumed during the entrance of the material to the mold, means for forcing the material from the exit-port through the port of the supporting member and the ingate into the mold, and means for pressing the mold as a whole rectilinearly toward said face of the supporting member.

3. In a casting apparatus, a source of supply for the material to be cast, an exit-port for communicating with the source of supply, a supporting member movable relatively to the exit-port, a sectional mold mounted on a face of the supporting member and having an ingate-opening from its face opposed to said face of the supporting member for communicating with the exit-port, a means for moving the supporting member and the mold mounted thereon into and out of their position assumed during the entrance of the material to the mold, means for forcing the material from the exit-port through the ingate into the mold, and means movable relatively to the supporting member and to said means for moving said member, for forcing one of the sections of the mold as a whole rectilinearly toward and away from the contiguous portion of the mold and for pressing the mold as a whole rectilinearly toward said face of the supporting member, substantially as described.

4. In a casting apparatus, a source of supply for the material to be cast, a substantially upright exit-port for communicating with the source of supply, a mold arranged above the exit-port and having an ingate-opening from its face opposed to the exit-port for communicating with the exit-port, a supporting member for the mold, a means for moving the supporting member relatively to the exit-port and thereby moving the mold into and out of its position assumed during the entrance of the material to the mold, means for forcing the material through the exit-port and the ingate into the mold, and means movable relatively to the supporting member and to said means for moving said member, for pressing the mold as a whole rectilinearly toward the exit-port.

5. In a casting apparatus, a source of supply for the material to be cast, a substantially upright exit-port for communicating with the source of supply, a sectional mold arranged above the exit-port and having an ingate-opening from its face opposed to the exit-port for communicating with the exit-port, a supporting member for the mold, a means for moving the supporting member relatively to the exit-port and thereby moving the mold into and out of its position assumed during the entrance of the material to the mold, means for forcing the material through the exit-port and the ingate into the mold, and means movable relatively to the supporting member and to said means for moving said member, for forcing one of the sections of the mold as a whole rectilinearly toward and away from the contiguous portion of the mold

and for pressing the mold as a whole rectilinearly toward the exit-port.

6. In a casting apparatus, a source of supply for the material to be cast, a substantially upright exit-port for communicating with the source of supply, a supporting member movable relatively to the exit-port and formed with a substantially upright port for communicating with the exit-port, a mold mounted on an upper face of the supporting member and having an ingate-opening from its face opposed to said upper face of the supporting member for communicating with the port of the supporting member, means for moving the supporting member and the mold mounted thereon into and out of their position assumed during the entrance of the material to the mold, means for forcing the material from the exit-port through the port of the supporting member and the ingate into the mold, and means for pressing the mold as a whole rectilinearly toward said upper face of the supporting member.

7. In a casting apparatus, a source of supply for the material to be cast, an exit-port for communicating with the source of supply, a movable supporting member, a mold mounted on a face of the supporting member and having an ingate-opening from its face opposed to said face of the supporting member for communicating with the exit-port, a manually-operated means for moving the supporting member and the mold mounted thereon into and out of their position assumed during the entrance of the material to the mold, means for forcing the material from the exit-port through the ingate into the mold, and additional manually-operated means movable relatively to the former manually-operated means for pressing the mold as a whole rectilinearly toward said face of the supporting member.

8. In a casting apparatus, a source of supply for the material to be cast, an exit-port for communicating with the source of supply, a movable supporting member, a mold mounted on a face of the supporting member and having an ingate-opening from its face opposed to said face of the supporting member for communicating with the exit-port, means for moving the supporting member and the mold mounted thereon into and out of their position assumed during the entrance of the material to the mold, means for forcing the material from the exit-port through the ingate into the mold, and means provided on the supporting member for pressing the mold as a whole rectilinearly toward said face of the supporting member.

9. In a casting apparatus, a source of supply for the material to be cast, an exit-port for communicating with the source of supply, a movable supporting member, a mold mounted on a face of the supporting member and having an ingate-opening from its face opposed to said face of the supporting member for communicating with the exit-port, a means



for moving the supporting member and the mold mounted thereon into and out of their position assumed during the entrance of the material to the mold, means for forcing the material from the exit-port through the ingate into the mold, and means movable relatively to the supporting member and to said means for moving said supporting member for pressing the mold as a whole rectilinearly toward said face of the supporting member, said latter means having a locking part movable into and out of its operative position by the movement of said latter means for preventing movement of said latter means and holding the mold in position during the entrance of the material.

10. In a casting apparatus, a source of supply for the material to be cast, a substantially upright exit-port for communicating with the source of supply, a mold arranged above the exit-port and having an ingate-opening from its face opposed to the exit-port for communicating with the exit-port, a supporting member for the mold, a means for moving the supporting member relatively to the exit-port and thereby moving the mold into and out of its position assumed during the entrance of the material to the mold, means for forcing the material through the exit-port and the ingate into the mold, and means movable relatively to the supporting member and to said means for moving said supporting member, for pressing the mold as a whole rectilinearly toward the exit-port, said latter means having a locking part movable into and out of its operative position by the movement of said latter means for preventing movement of said latter means and holding the mold in position during the entrance of the material.

11. In a casting apparatus, a source of supply for the material to be cast, an exit-port for communicating with the source of supply, a movable supporting member, a mold mounted on a face of the supporting member and having an ingate-opening from its face opposed to said face of the supporting member for communicating with the exit-port, means for moving the supporting member and the mold mounted thereon into and out of their position assumed during the entrance of the material to the mold, means for forcing the material from the exit-port through the ingate into the mold, movable mechanical means for pressing the mold as a whole rectilinearly toward said face of the supporting member, and a stop independent of the mold for limiting the movement of said means for pressing the mold.

12. In a casting apparatus, a source of supply for the material to be cast, a substantially upright exit-port for communicating with the source of supply, a mold arranged above the exit-port and having an ingate-opening from its face opposed to the exit-port for communicating with the exit-port, a supporting member movable relatively to the exit-port for moving the mold into and out of its position

assumed during the entrance of the material to the mold, means for forcing the material through the exit-port and the ingate into the mold, movable mechanical means for pressing the mold as a whole rectilinearly toward the exit-port, and a stop independent of the mold for limiting the movement of said means for pressing the mold.

13. In a casting apparatus, a source of supply for the material to be cast, an exit-port for communicating with the source of supply, a supporting member movable relatively to the exit-port, a second supporting member, means for securing the second supporting member relatively to the first supporting member, a mold mounted on the first supporting member between opposing faces of the supporting members and having an ingate-opening from its face opposed to the first supporting member, means for forcing the material through the exit-port and the ingate into the mold, and movable means between the second supporting member and the mold for pressing the mold as a whole rectilinearly toward the contiguous face of the first supporting member during the entrance of the material.

14. In a casting apparatus, a source of supply for the material to be cast, a substantially upright exit-port for communicating with the source of supply, a supporting member movable relatively to the exit-port, a second supporting member, means for securing the second supporting member relatively to the first supporting member, a mold arranged above the exit-port and movable relatively thereto by the first supporting member, said mold having an ingate-opening from its face opposed to the exit-port, means for forcing the material through the exit-port and the ingate into the mold, and movable means between the second supporting member and the mold for pressing the mold toward the exit-port during the entrance of the material.

15. In a casting apparatus, a source of supply for the material to be cast, an exit-port for communicating with the source of supply, a supporting member movable relatively to the exit-port, a second supporting member adjustable toward and away from the first supporting member, means for securing the second supporting member in its adjusted position relatively to the first supporting member, a mold having an ingate for communicating with the exit-port, means for forcing the material through the exit-port and the ingate into the mold, and movable means between the second supporting member and the mold for pressing the mold toward the exit-port during the entrance of the material.

16. In a casting apparatus, a source of supply for the material to be cast, an exit-port for communicating with the source of supply, a supporting member movable relatively to the exit-port, a second supporting member, means for securing the second supporting member relatively to the first supporting member, a sectional mold having an ingate for commu-



nicating with the exit-port, said mold being movable relatively to the exit-port by the first supporting member, means for forcing the material through the exit-port and the ingate  
 5 into the mold, a clamping member movable relatively to the second supporting member and connected to the contiguous section of the mold, and movable means between the second supporting member and the clamping mem-  
 10 ber for actuating said clamping member.

17. In a casting apparatus, a source of supply for the material to be cast, an exit-port for communicating with the source of supply, a supporting member movable relatively to the  
 15 exit-port, a second supporting member adjustable toward and away from the first supporting member, means for securing the second supporting member in its adjusted position relatively to the first supporting member, a  
 20 sectional mold having an ingate for communicating with the exit-port, said mold being movable relatively to the exit-port by the first supporting member, means for forcing the material through the exit-port and the ingate  
 25 into the mold, a clamping member movable

relatively to the second supporting member and connected to the contiguous section of the mold, and movable means between the second supporting member and the clamping member for actuating said clamping member. 30

18. In a casting apparatus, a source of supply for the material to be cast, an exit-port for communicating with the source of supply, a supporting member movable relatively to the exit-port, a standard consisting of a pair of  
 35 arms having corresponding ends fixed to the movable supporting member, a second supporting member adjustable lengthwise of the arms, means for securing the second supporting member relatively to the arms, a mold  
 40 having an ingate for communicating with the exit-port, and movable means between the second supporting member and the mold.

This specification signed and witnessed this 4th day of June, A. D. 1897.

H. G. UNDERWOOD.

In presence of—

ANTHONY N. JESBERA,  
 W. B. GREELEY.

Corrections in Letters Patent No. 715,713.

It is hereby certified that in Letters Patent No. 715,713, granted December 9, 1902, upon the application of Herbert G. Underwood, of New York, N. Y., for an improvement in "Casting Apparatus," errors appear in the printed specification requiring correction, as follows: In lines 110 and 129, page 2; lines 14, 35, 53, 78, 96, 115, and 132, page 3; and lines 21, 45, 63, 85, and 104, page 4, the hyphens between the words "ingate" and "opening" should be stricken out; and that the said Letters Patent should be read with these corrections therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 17th day of February, A. D., 1903.

[SEAL.]

F. I. ALLEN,  
*Commissioner of Patents.*



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[SEAL.]

F. I. ALLEN,  
*Commissioner of Patents.*