

No. 721,121.

PATENTED FEB. 17, 1903.

H. A. W. WOOD.
STEREOTYPE PLATE CASTING APPARATUS.

APPLICATION FILED MAR. 4, 1898.

NO MODEL.

3 SHEETS—SHEET 1.

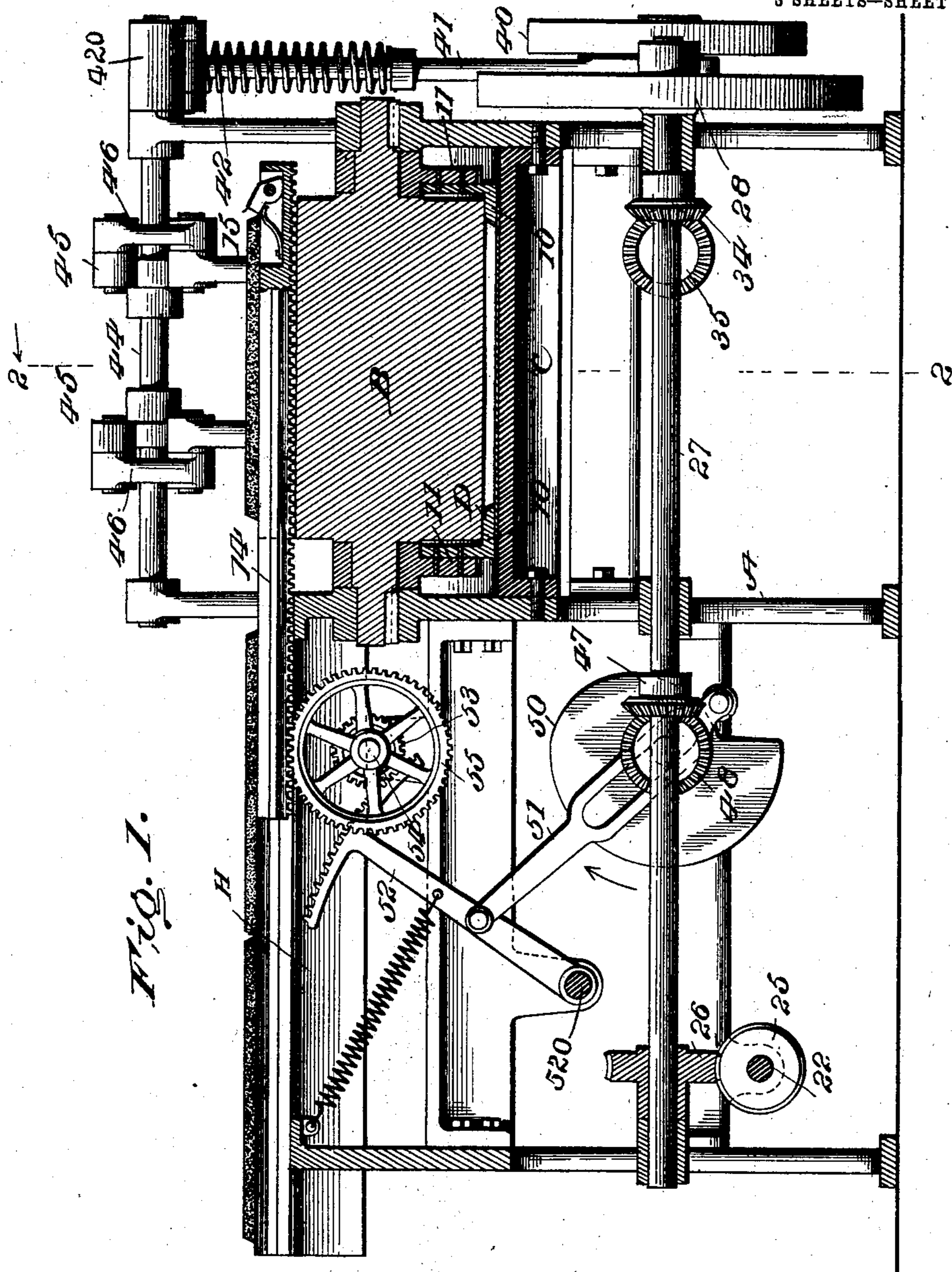


Fig. 1.

Witnesses.

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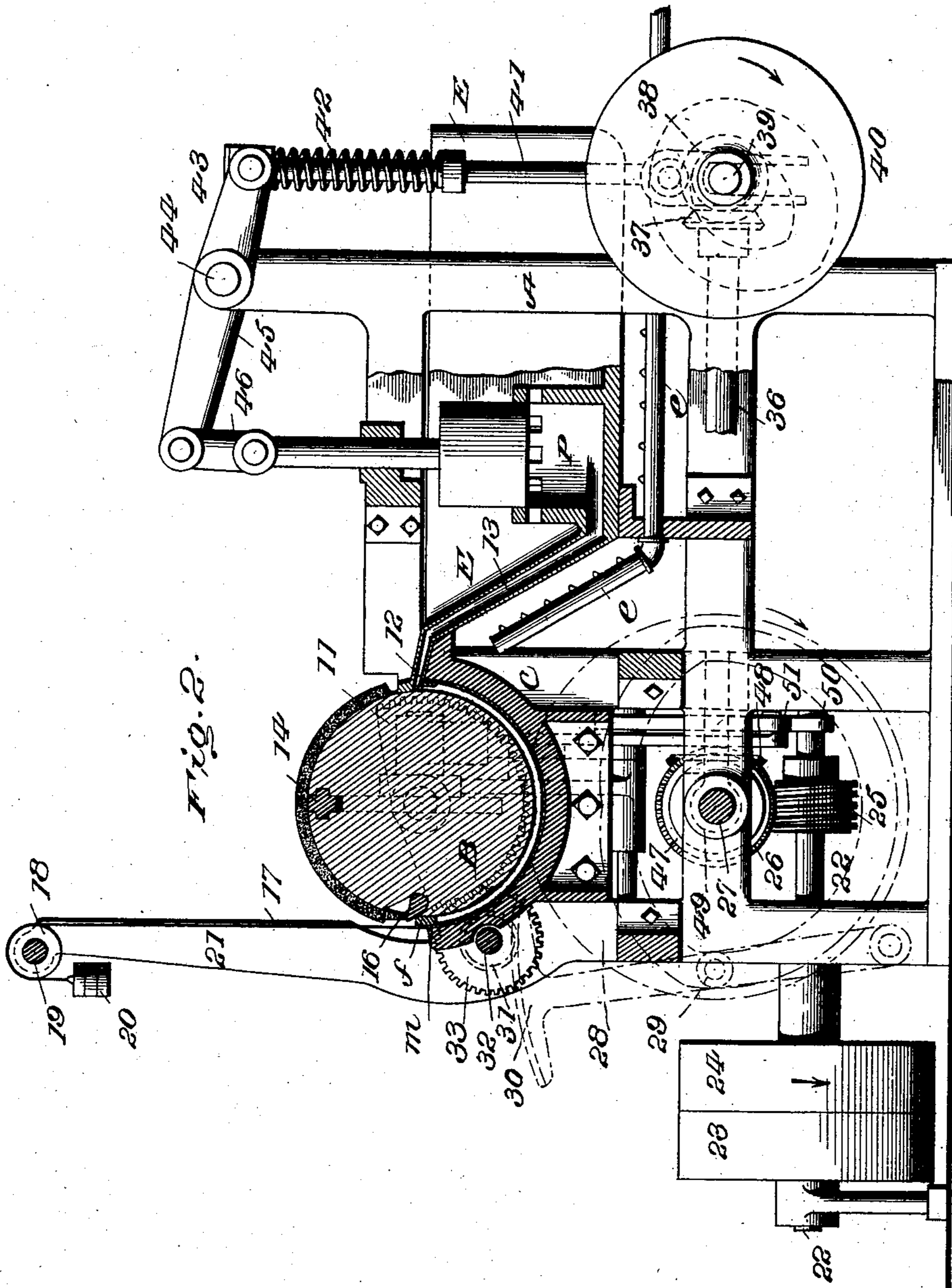
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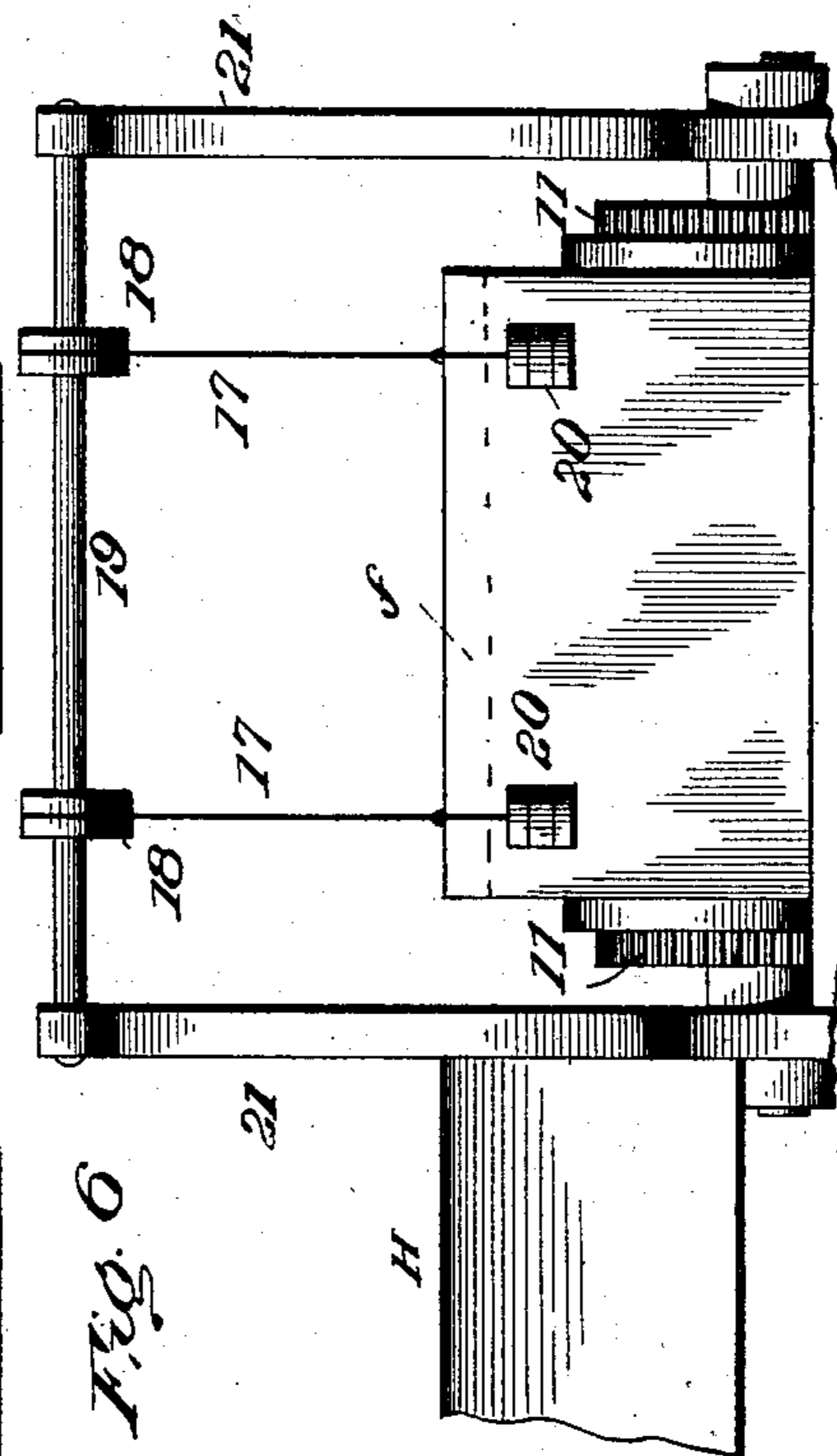
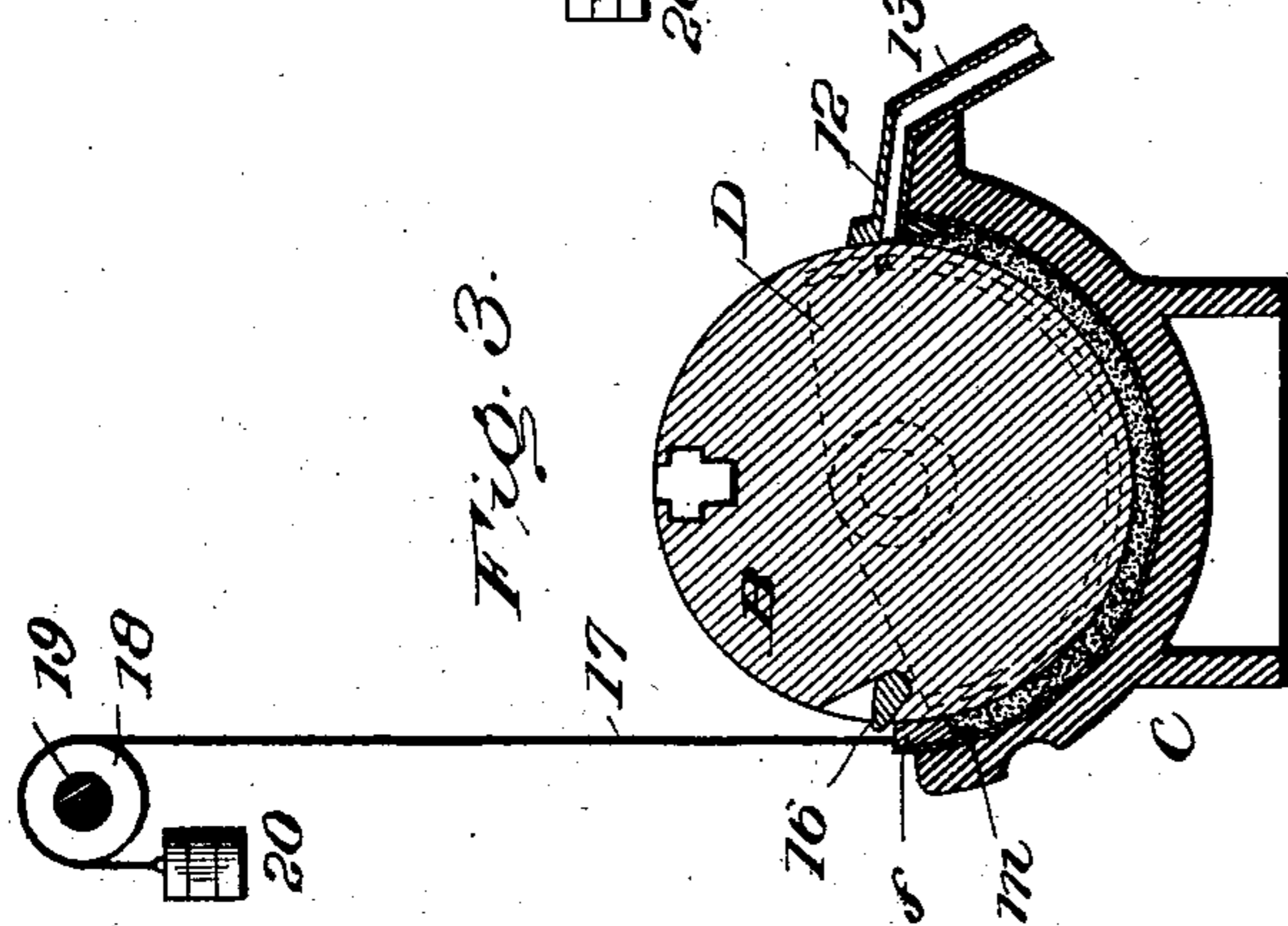
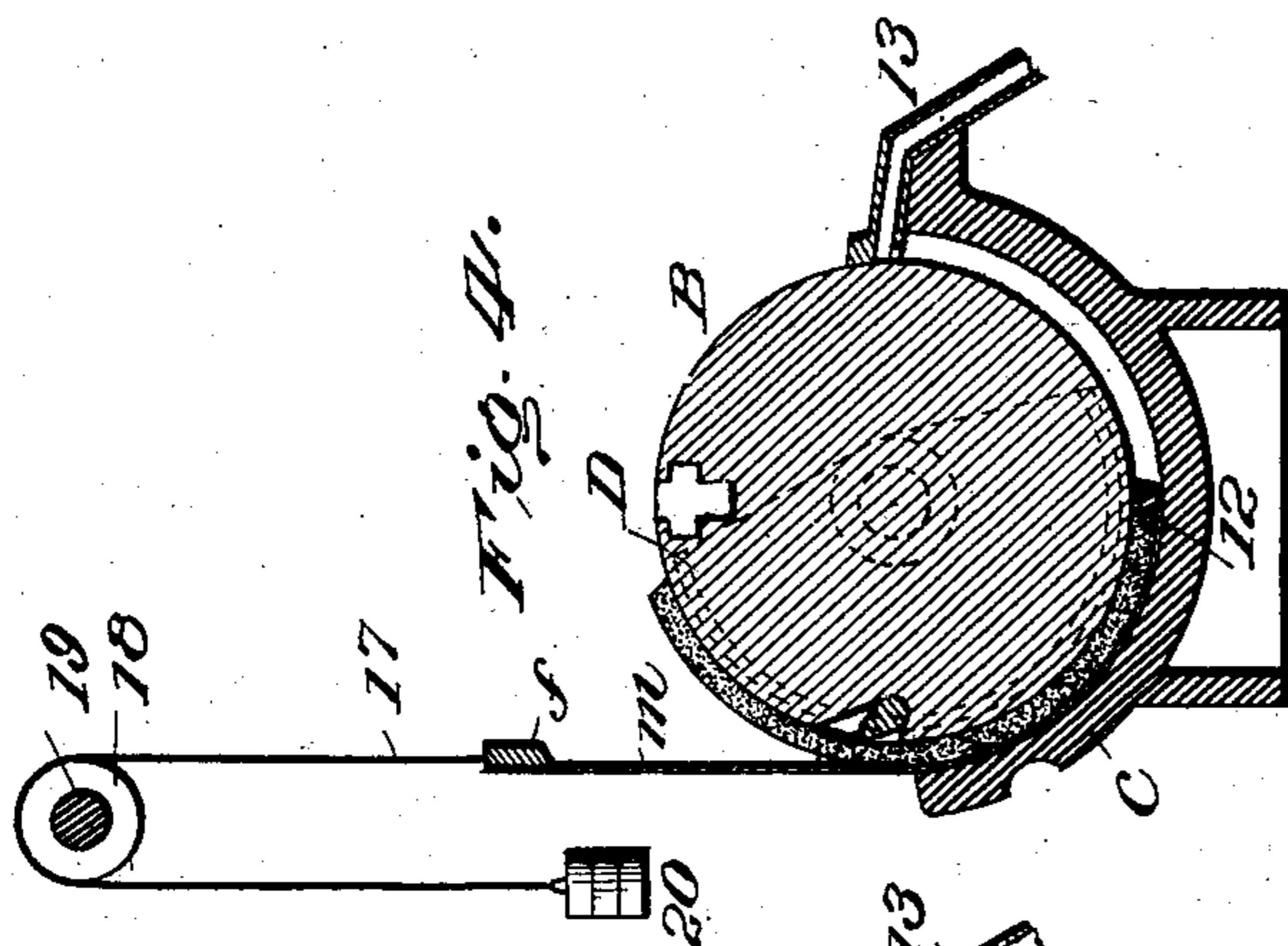
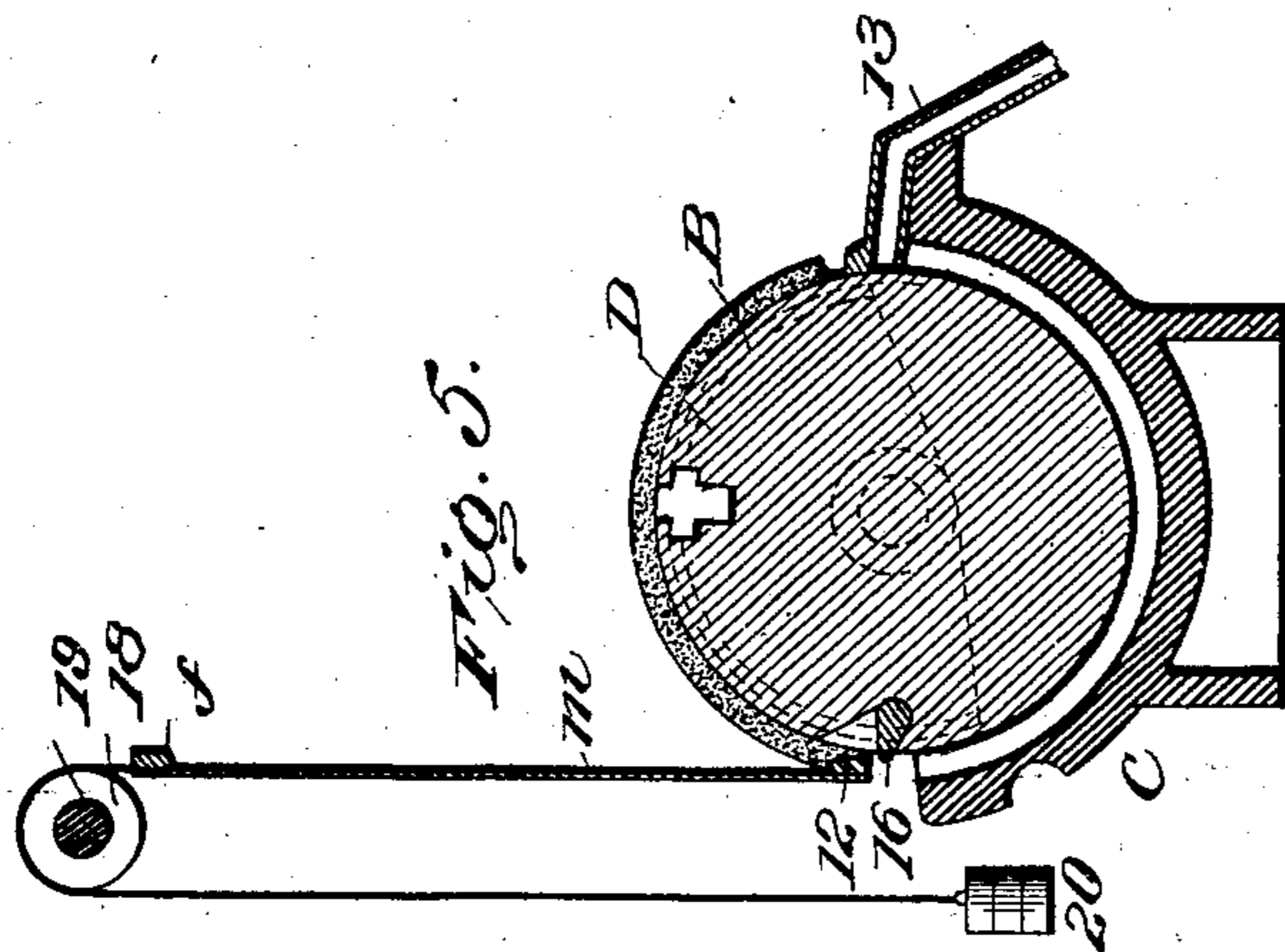
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3 SHEETS—SHEET 3.



Witnesses.

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UNITED STATES PATENT OFFICE.

HENRY A. WISE WOOD, OF NEW YORK, N. Y., ASSIGNOR TO THE CAMPBELL PRINTING PRESS & MANUFACTURING COMPANY, OF NEW YORK, N. Y., A CORPORATION OF NEW YORK.

STEREOTYPE-PLATE-CASTING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 721,121, dated February 17, 1903.

Application filed March 4, 1898. Serial No. 672,553. (No model.)

To all whom it may concern:

Be it known that I, HENRY A. WISE WOOD, a citizen of the United States, residing at New York, in the county of New York and State of New York, have invented a new and useful Stereotype-Plate-Casting Apparatus, of which the following is a specification.

My invention relates to an apparatus for casting stereotype printing-plates from a flexible matrix; and the object of my invention is to provide a strong, simple, and efficient plate-casting apparatus which can be operated very rapidly.

To these ends my invention consists of the parts and combinations of parts, as hereinafter described, and more particularly pointed out in the claims at the end of this specification.

In the accompanying three sheets of drawings, Figure 1 is a longitudinal sectional view of a plate-casting machine constructed according to my invention. Fig. 2 is a transverse sectional view taken on the line 2 2 of Fig. 1. Figs. 3, 4, and 5 are diagrammatic views illustrating the operation of the plate-removing and matrix-stripping devices, and Fig. 6 is a detail view of the matrix-supporting devices.

As illustrated in the drawings, a plate-casting machine constructed according to my present invention comprises a core or cylinder, which is preferably stationary, and a stationary back. The matrix is secured at one edge to a matrix-carrying frame, which is pivoted concentrically with the stationary core. The casting-chamber is formed by the annular space between the stationary core and the stationary back. Molten metal is forced into the casting-chamber by means of suitable pumps. After the plate has solidified the matrix-carrying frame is then turned about its pivots to slide the cast plate out of the casting-chamber, and during this operation the matrix is automatically stripped from the surface of the cast plate by means of suitable cords and weights, which are secured to the opposite edge thereof. A detent or pawl is arranged to engage the edge of the plate to retain the same in place when the matrix-carrying frame is oscillated back to its origi-

nal position, drawing the matrix into the casting-chamber in position for the next casting operation. Suitable plate moving or conveying devices are also preferably provided for removing the plate from the top of the stationary core and for sliding the same onto a suitable receiving table or horse.

Referring to the drawings and in detail, A designates a suitable framework for supporting the movable parts of the machine.

B designates a stationary core or cylinder which is rigidly supported in the framework A.

Mounted in the framework A and cooperating with the core B to form the annular casting-chamber is a stationary back or piece C, which is bolted to the framework, as shown.

Mounted in the framework A at the rear of the machine is a melting-pot E, which may be heated by any suitable means, as by the gas-burners e.

Arranged in the melting-pot E is a pump P, which connects to the casting-chamber by means of a channel or spout 13.

Journalled concentrically with the stationary core or cylinder B is an oscillating matrix-carrying frame D.

As illustrated, the matrix-carrying frame D comprises end sections 10, which may be cut off or beveled to form finished ends upon the plate, a strip 12, which connects the sections 10 and which is adapted to have one edge of a flexible matrix secured thereto, and sectors 11, which are rigidly secured to the end sections 10. The sectors 11 are provided with gear-teeth meshing with driving-gears for oscillating the matrix-carrying frame.

Pivoted near the front of the stationary core B is a gravity pawl or catch 16, which is arranged to engage behind the end of the plate and prevent said plate from being carried back into the casting-chamber when the matrix-carrying frame is moved back into position for the next casting operation.

A sliding conveyer 14 is mounted in the stationary core B and is provided with a catch or pawl 15 for engaging the end of the cast plates and for conveying the same onto a suitable receiving table or horse H.

A flexible matrix m is riveted or secured

in any desired manner at one edge to the strip 12. At its opposite edge the matrix *m* is provided with a finishing-strip *f* and is supported by cords 17, which pass over pulleys 18, journaled on a shaft 19, carried by frame 21, which shaft 19 is arranged at a height above the core sufficient to keep the matrix in a vertical position when entirely stripped from the plate, as shown in Fig. 5. The cords 17 are connected at their ends to suitable counterweights, as 20.

The sections 10 of the frame D bear on the edges of the matrix, as shown, and thereby hold it in proper position in the casting-chamber and prevent it from buckling or pressing on the core B under the tension of the counterweights.

In a machine as thus constructed the force-pumps operate to force the molten metal into the casting-chamber, the parts assuming substantially the position illustrated in Fig. 3. After the plate has solidified the matrix-carrying frame D then turns to slide the cast plate out of the casting-chamber and around the stationary core or cylinder B. During this operation the counterweights 20 will strip or unwind the matrix *m* from the surface of the cast plate, as illustrated in Fig. 4, as the matrix will diverge from the cast plate as they together move out of the casting-chamber. When the plate has been slid completely out of this casting-chamber and onto the top of the stationary core or cylinder B, the catch or pawl 16 will engage behind the end of the plate and will retain the same in place when the matrix-carrying frame is moved back in position for the next casting operation, as illustrated in Fig. 5.

Any desired form of gearing may be used for driving the operative parts of the machine.

As illustrated, 22 designates a driving-shaft, to which power may be applied by means of a loose pulley 23 and a tight pulley 24. Mounted on this driving-shaft 22 is a worm 25, which meshes with and drives a worm-wheel 26, fastened upon a longitudinal shaft 27. At its outer end the longitudinal shaft 27 is provided with a box-cam 28. As illustrated in dotted lines in Fig. 2, the box-cam 28 engages with and actuates a roller 29, journaled upon a sector 30. The sector 30 meshes with and drives a gear 31, fastened upon the shaft 32, which carries the driving-gears 33 for oscillating the matrix-carrying frame. Fastened on the longitudinal shaft 27 is a bevel-gear 34, which meshes with and drives a bevel-gear 35, fastened upon a transverse shaft 36. On the shaft 36 is a bevel-gear 37, which meshes with and drives a bevel-gear 38 upon the pump-operating shaft 39. Fastened upon the pump-operating shaft 39 is a box-cam 40, which engages with and actuates a roller journaled on a yoke 41. The end of the yoke 41 passes through a block 420, secured on the end of a rock-arm 43 on the end of the shaft 44. A spring 42 is arranged between said block 420 and a collar

on the yoke. The shaft 44 is provided with arms 45, which connect with and actuate the pistons of the pumps by means of links 46. The conveyer 14 may be actuated by means of a bevel-gear 47 on the longitudinal shaft 27, which meshes with and drives a bevel-gear 48, journaled upon a stud 49. Fastened upon and turning with the bevel-gear 48 is a cam 50, which engages with and actuates a roller journaled on a yoke 51, which connects to a spring-pulled sector 52, pivoted on stud 520. The sector 52 meshes with and drives a pinion 53, fastened upon the shaft 54, which carries a driving-gear 55, meshing with and engaging a rack on the lower side of the conveyer 14.

After a plate has been cast and delivered by my improved plate-casting machine it may be trimmed and finished in any of the ordinary ways, not necessary to describe herein at length.

While the apparatus herein shown is an organized machine operated by power, it is obvious that my improvements can be employed in an apparatus or mechanism which is not driven by power without departing from my claims.

I am aware that many changes may be made in my plate-casting machine and that certain parts may be used in different combinations and in different locations without departing from the scope of my invention as expressed in the claims. I do not wish, therefore, to be limited to the construction which I have shown and described; but

What I do claim, and desire to secure by Letters Patent of the United States, is—

1. The combination in an apparatus for casting stereotype printing-plates from a flexible matrix, of a core and a back, the space between the two forming a casting-chamber, means for moving the cast plate out of the casting-chamber, and connections for simultaneously stripping the flexible matrix from the surface of the cast plate.

2. The combination in an apparatus for casting stereotype printing-plates from a flexible matrix, of a core and a back, the space between the two forming a casting-chamber, a frame constructed and arranged to hold one edge of the matrix, means for moving said frame to force the plate from the casting-chamber, and connections for stripping the matrix from the surface of the cast plate.

3. The combination in an apparatus for casting stereotype printing-plates from a flexible matrix, of a core and a back, the space between the two forming a casting-chamber, a frame for moving the cast plate out of the casting-chamber, and connections for stripping the flexible matrix from the surface of the cast plate.

4. The combination in an apparatus for casting stereotype printing-plates from a flexible matrix, of a core and a back, the space between the two forming a casting-chamber, means for moving the cast plate out of the

casting-chamber, connections for stripping the matrix from the surface of the cast plate, and means for then bringing the matrix back in position in the casting-chamber for the next casting operation.

5. The combination in an apparatus for casting stereotype printing-plates from a flexible matrix, of a core and a back, the space between the two forming a casting-chamber, means for moving the cast plate and matrix out of the casting-chamber, connections for simultaneously stripping the flexible matrix from the surface of the cast plate, and means for then bringing the matrix back in position in the casting-chamber for the next casting operation.

6. The combination in an apparatus for casting stereotype printing-plates from a flexible matrix, of a core and a back, the space between the two forming a casting-chamber, a frame constructed and arranged to hold one edge of the matrix, means for moving said frame to force the plate from the casting-chamber, connections for stripping the matrix from the surface of the cast plate, and means for then returning the frame to its normal position to bring the matrix back into the casting-chamber in position for the next casting operation.

7. The combination in an apparatus for casting stereotype printing-plates from a flexible matrix, of a core and a back, the space between the two forming a casting-chamber, a frame for sliding the cast plate out of the casting-chamber, connections for stripping the flexible matrix from the surface of the cast plate, and means for oscillating said frame, whereby the matrix will be brought back into the casting-chamber in position for the next casting operation.

8. The combination in an apparatus for casting stereotype printing-plates from a flexible matrix, of a core and a back, the space between the two forming a casting-chamber, a pivoted frame to which one edge of the matrix is connected, means for moving said frame to move the cast plate out of the casting-chamber, and connections for unwinding the matrix from the surface of the cast plate.

9. The combination in an apparatus for casting stereotype printing-plates from a flexible matrix, of a core and a back, the space between the two forming a casting-chamber, means for moving the cast plate out of said casting-chamber around the core, and connections for stripping the matrix from the surface of the cast plate.

10. The combination in an apparatus for casting stereotype printing-plates from a flexible matrix, of a core and a back, the space between the two forming a casting-chamber, means for moving the cast plate out of said casting-chamber around said core, and a detent for retaining the plate on top of the core.

11. The combination in an apparatus for casting stereotype printing-plates from a flexible matrix, of a core and a back, the space

between the two forming a casting-chamber, means for moving the cast plate out of said casting-chamber around said stationary core, and a plate-conveying device for removing the plate from the top of the stationary core.

12. The combination in an apparatus for casting stereotype printing-plates from a flexible matrix, of a core and a back, the space between the two forming a casting-chamber, means for moving the cast plate out of said casting-chamber around said stationary core, a detent for retaining said plate on the top of the core, and a plate-conveying device for removing the plate from the top of the stationary core.

13. The combination in an apparatus for casting stereotype printing-plates from a flexible matrix, of a core and a back, the space between the two forming a casting-chamber, means for moving the matrix and cast plate together out of said chamber, and connections for removing the flexible matrix from the surface of the cast plate.

14. The combination in an apparatus for casting stereotype printing-plates from a flexible matrix, of a core and a back, the space between the two forming a casting-chamber, means for moving the matrix and cast plate out of said chamber, and connections arranged so that as the cast plate and matrix move, the matrix will diverge from, and be stripped off of the surface of the cast plate.

15. The combination in an apparatus for casting stereotype printing-plates from a flexible matrix, of a core and a back, the space between the two forming a casting-chamber, sections forming the ends of the casting-chamber, a strip carried by said sections to which one edge of the matrix is secured, connections to the other edge of the matrix, and means for turning the sections.

16. The combination in an apparatus for casting stereotype printing-plates from a flexible matrix, of a core and a back, the space between the two forming a casting-chamber, a strip to which one edge of the matrix is secured, a finishing-strip at the other edge of the matrix, connections to said strip, and means for oscillating the strip around the core.

17. The combination in an apparatus for casting stereotype printing-plates from a flexible matrix, of a core and a back, the space between the two forming a casting-chamber, a strip to which the matrix is attached, end sections bearing on the edges of the matrix to which said strip is attached, and means for turning said end sections.

18. The combination in an apparatus for casting stereotype printing-plates from a flexible matrix, of a core and a back, the space between the two forming a casting-chamber, sections forming the ends of said chamber, a strip connecting said sections, one edge of the matrix being secured to said strip, a finishing-strip to which the other edge of the matrix is secured, flexible connections attached

to said strip and trained over suitable pulleys, weights connected to the other ends of the flexible connections, and means for oscillating the strip around the center of the core.

19. The combination in an apparatus for casting stereotype printing-plates from a flexible matrix, of a core and a back, the space between the two forming a casting-chamber, sectors pivoted on the trunnions of the core, end sections carried by said sectors, a strip connecting said end sections to which one edge of the flexible matrix is secured, a finishing-strip to which the other edge of the matrix is secured, connections from said finishing-strip to control the matrix, and gearing for oscillating said sectors.

20. The combination in an apparatus for casting stereotype printing-plates from a flexible matrix, of a core and a back, the space between the two forming a casting-chamber, a strip to which one edge of the matrix is connected, means for oscillating said strip, and connections to the other edge of said matrix trained over pulleys at such height above the casting-chamber that as the strip moves to deliver the cast plate, the matrix will assume a vertical position.

21. The combination in an apparatus for casting stereotype printing-plates from a flexible matrix, of a core and a back, the space between the two forming a casting-chamber, means for moving the matrix and the cast plate from the casting-chamber, connections for causing the matrix to diverge from the surface of the cast plate as the same passes out of the casting-chamber, and means for removing the cast plate.

22. An organized automatic machine for casting stereotype printing-plates from a flexible matrix comprising a back and core, means for moving the cast plate and the matrix out of the casting-chamber, and simultaneously stripping the matrix from the surface of the cast plate, a mechanism for forcing molten metal into the casting-chamber, and gearing for actuating these parts.

23. An organized automatic machine for casting stereotype printing-plates from a flexible matrix comprising a core and a back, a strip to which one edge of the matrix is secured, means for oscillating said strip through the casting-chamber to force the cast plate therefrom, connections to the other edge of

the matrix to cause the same to diverge from the surface of the cast plate, a mechanism for forcing metal into the casting-chamber, a delivery mechanism for the cast plates, and gearing for operating these parts.

24. An organized automatic machine for casting stereotype printing-plates from a flexible matrix comprising a casting-chamber formed by a stationary core and back, means for moving the cast plate and the matrix together from the casting-chamber, connections to strip the matrix from the surface of the cast plate, a pumping mechanism, and gearing for automatically operating the parts.

25. The combination in a stereotype-printing-plate-casting apparatus for casting stereotype printing-plates from a flexible matrix, of a stationary core and stationary back, the annular space between the two forming a casting-chamber, means for moving the cast plate and matrix together from the casting-chamber, and connections to the matrix for stripping the same from the surface of the cast plate.

26. The combination in a stereotype-printing-plate-casting apparatus for casting stereotype printing-plates from a flexible matrix, of a stationary core and stationary back, the annular space between the two forming a casting-chamber, means for turning the plate around the core, and connections to the matrix for simultaneously causing the same to move in a straight line and to unwind from the surface of the cast plate.

27. The combination in a stereotype-printing-plate-casting apparatus for casting stereotype printing-plates from a flexible matrix, of a stationary core and stationary back, the annular space between the two forming a casting-chamber, a strip, means for moving the same around through the casting-chamber to move the cast plate therefrom, and connections to the matrix for causing the same to diverge from the surface of the cast plate as the same emerges from the casting-chamber.

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

H. A. WISE WOOD.

Witnesses:

H. W. COZZENS, Jr.,
LOUIS W. SOUTHGATE.