No. 876,144. PATENTED JAN. 7, 1908.

W. BURKE.

SPOOL MOLDING MACHINE.

APPLICATION FILED FEB. 28, 1907.

2 SHEETS—SHEET 1.

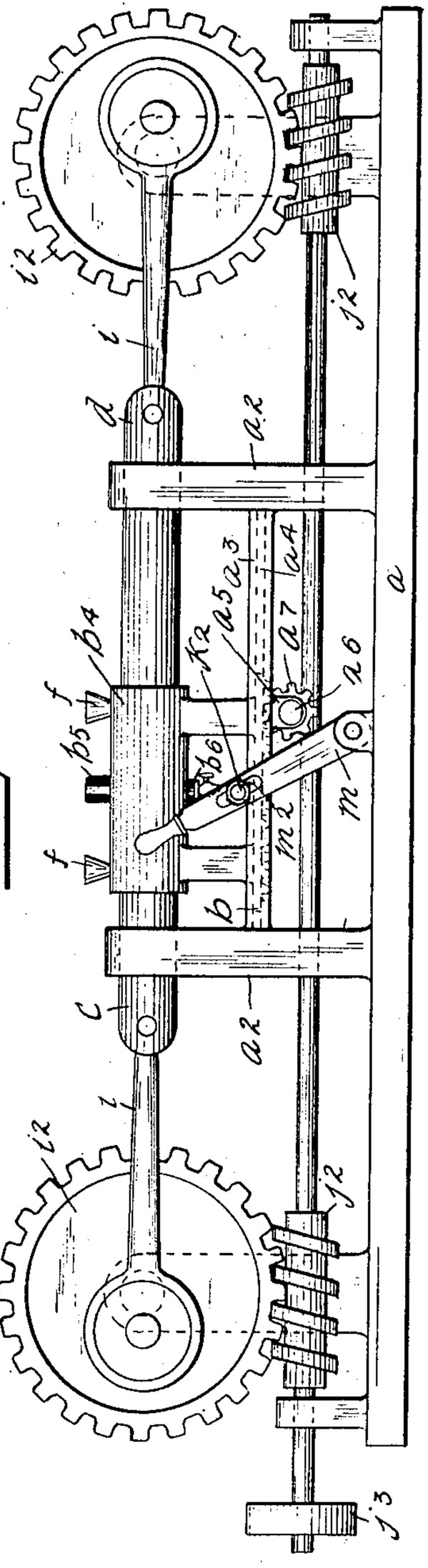

FIG. 1.

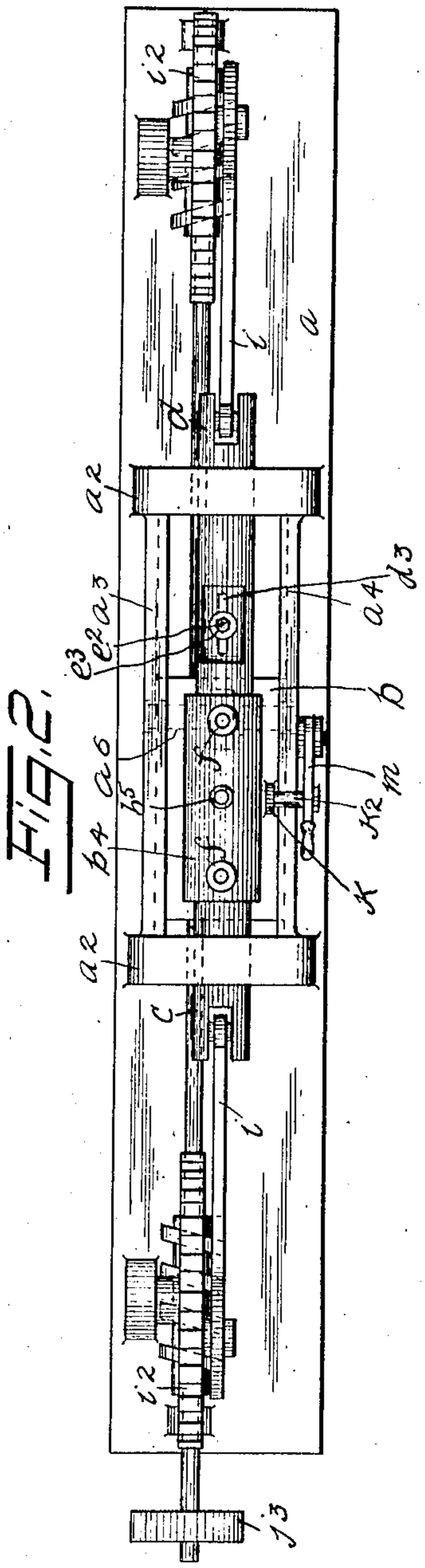

FIG. 2.

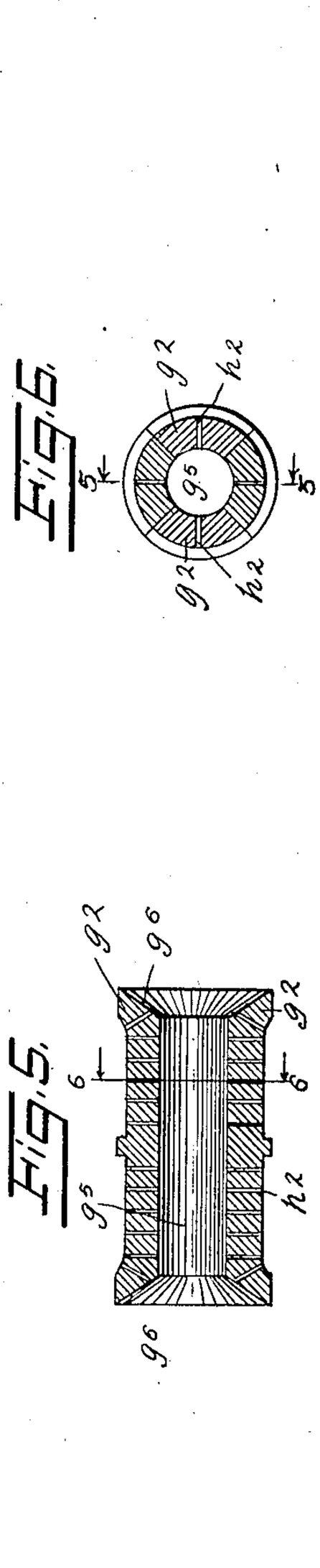

FIG. 4.

FIG. 5.

WITNESSES

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2 SHEETS—SHEET 2.

Fig. 3.

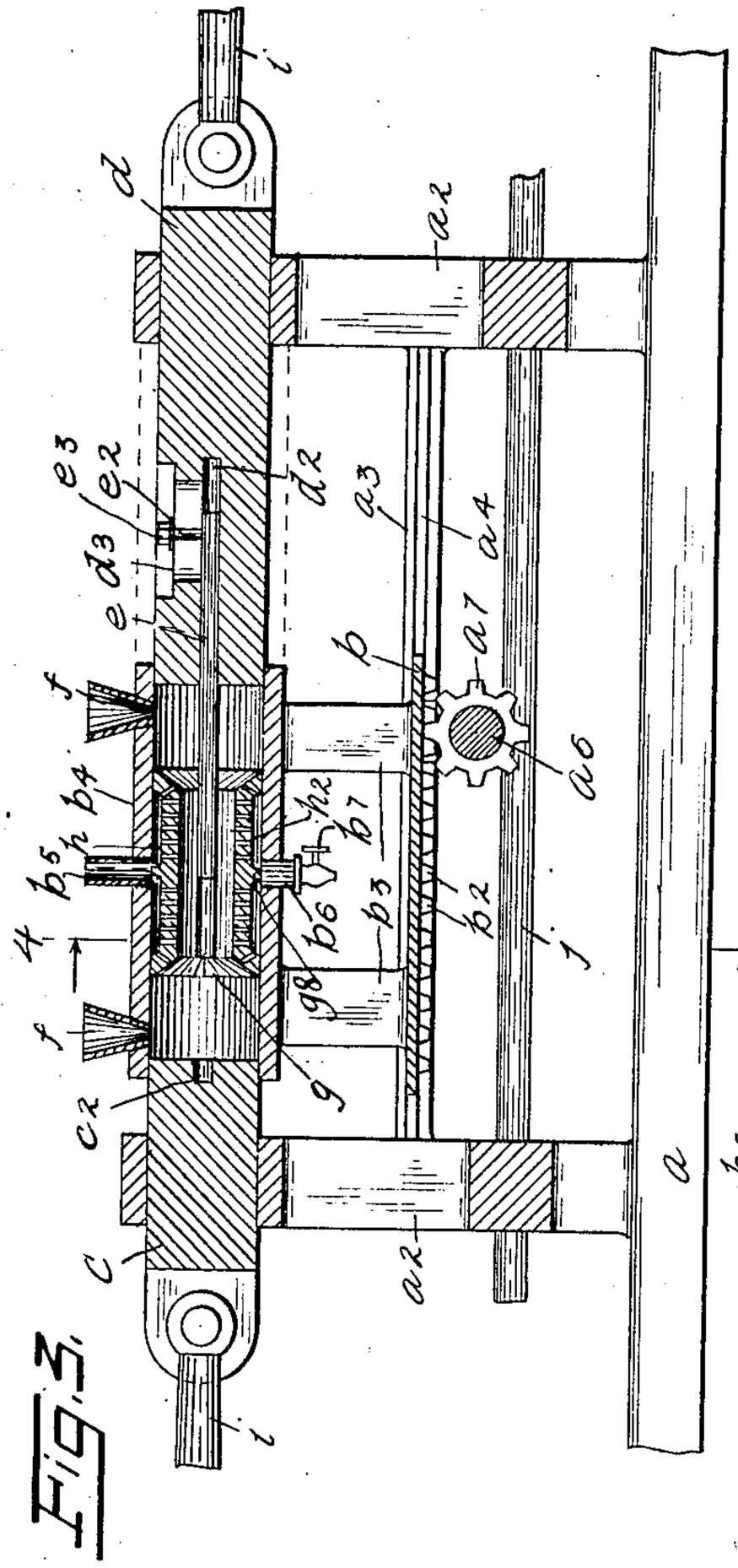

Fig. 4.

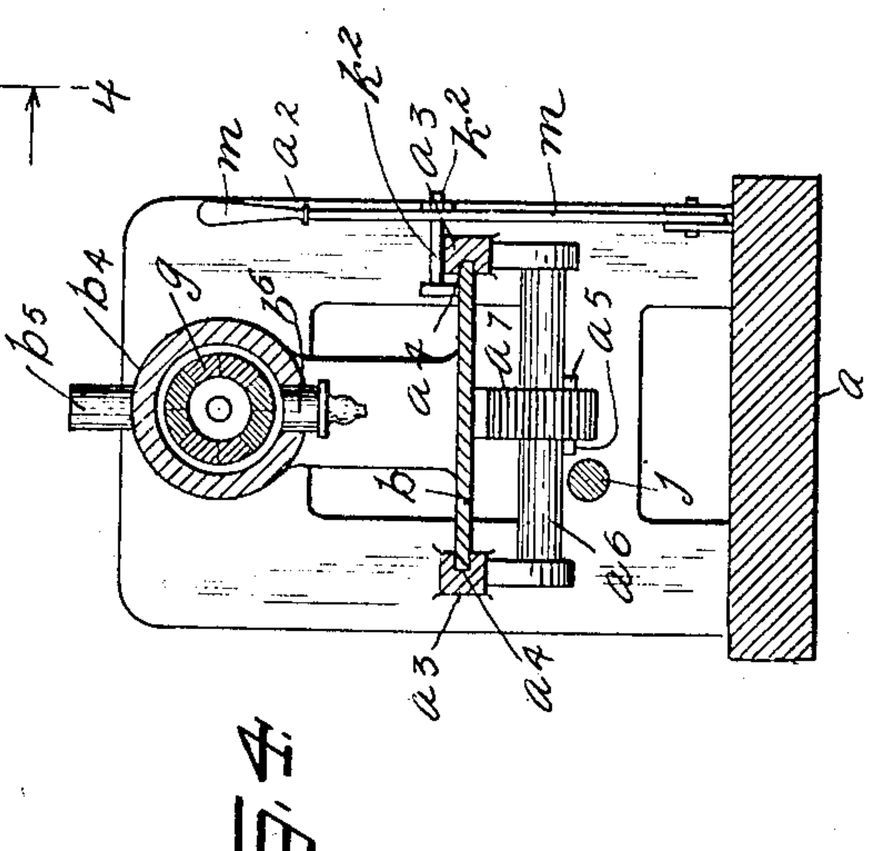

Fig. 5.

Fig. 6.

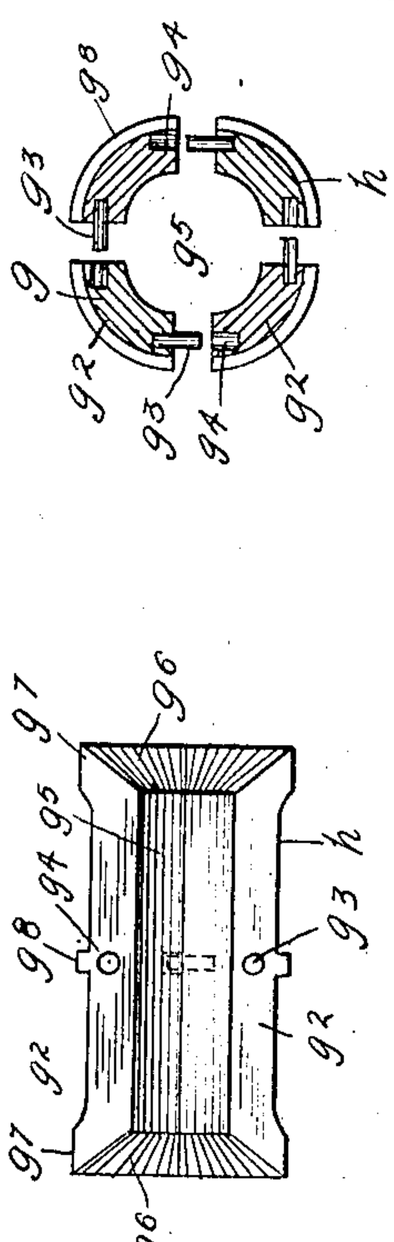

Fig. 7.

Fig. 8.

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WILLIAM BURKE, OF MILLBURN, NEW JERSEY.

SPOOL-MOLDING MACHINE.

No. 876,144. Specification of Letters Patent. Patented Jan. 7, 1908.

Application filed February 28, 1907. Serial No. 359,733.

To all whom it may concern:

Be it known that I, WILLIAM BURKE, a citizen of the United States, and residing at Millburn, in the county of Essex and State of New Jersey, have invented certain new and useful Improvements in Spool-Molding Machines, of which the following is a specification, such as will enable those skilled in the art to which it appertains to make and use the same.

This invention relates to molding machines, and particularly to machines for molding spools from fibrous material in the form of a plastic pulp, and the object thereof is to provide a machine of this class which is simple in construction and operation and by means of which the material is thoroughly packed and compressed and all moisture or water expelled therefrom, and by means of which spools or similar articles may be conveniently and rapidly made at a minimum of cost.

The invention is fully disclosed in the following specification, of which the accompanying drawing forms a part, in which the separate parts of my improvement are designated by suitable reference characters in each of the views, and in which;

Figure 1 is a side view of my improved spool molding machine; Fig. 2 a plan view thereof; Fig. 3 a partial, central, vertical longitudinal section; Fig. 4 a transverse section on the line 4—4 of Fig. 3; Fig. 5 a longitudinal section of the mold proper taken on the line 5—5 of Fig. 6; Fig. 6 a cross section of the mold proper taken on the line 6—6 of Fig. 5; Fig. 7 an inside view of one part of the mold proper; and, Fig. 8 a cross section thereof showing all the parts of the mold proper and the method of connecting the same.

In the practice of my invention, I provide a substantial main frame comprising a base plate or member a having suitably spaced upright members a^2 connected centrally by parallel bars a^3 provided in their inner faces with grooves a^4, and the bars a^3 are provided centrally with depending bearings a^5 in which is mounted a shaft a^6 provided with a pinion a^7.

The bars a^3 form guides and supports for a horizontally movable plate b provided centrally of its lower side with a rack bar or rack teeth b^2 in connection with which the pinion a^7 operates, and the plate b is provided with uprights b^3 with which is connected a horizontal mold cylinder b^4 provided in the top and bottom thereof, in the form of construction shown, with tubular inlets b^5 and b^6, the latter which is at the bottom of the mold cylinder being provided with a valve b^7.

Mounted in the top portion of the left hand upright a^2 of the main frame is a horizontally movable plunger c, and mounted in the top portion of the right hand upright a^2 of the main frame is a horizontally movable plunger d and the inner ends of these plungers are adapted to enter and move in the opposite end portions of the mold cylinder b^4, and said mold cylinder b^4 is also adapted to slide on said plungers or on the right hand plunger d, which, as will be seen, is much longer than the left hand plunger c.

The right hand plunger d, in the form of construction shown, is provided with a central longitudinal bore d^2 which opens through the inner end thereof and in which is placed a longitudinally movable and adjustable rod e provided at its outer end with a pin e^2 which passes up through a longitudinal slot d^3 in the plunger d and by means of which the position of the rod e may be adjusted, and said pin e^2 is provided with a nut e^3 for this purpose.

The mold cylinder b^4 is provided in the top thereof and in the opposite end portions thereof with hoppers or other suitable devices f through which the pulp from which the spools are made may be discharged into the opposite end portions of the mold cylinder b^4, and placed in the mold cylinder b^4 is the mold proper as shown at g, the mold proper is shown in section in Fig. 3 and in detail in Figs. 5, 6, 7 and 8 and said mold is cylindrical in cross section and oblong in form and the dimensions thereof will depend on the dimensions of the spool or spools which it is desired to form. The said mold is cylindrical in cross section and composed of separate longitudinal parts g^2 as clearly shown in Figs. 6, 7 and 8, and each of said parts is provided with a dowel-pin g^3 and a corresponding recess g^4, and the dowel-pin or pins g^3 of one part enter the recess or recesses g^4 of another part and hold the separate parts of the mold together. The mold is also provided with a longitudinal bore g^5, the end portions of which are beveled as shown at g^6, and the central bore g^5 and beveled portions g^6 at the ends thereof form the spool in the operation of the device as hereinafter described. The mold g is also enlarged at the

ends to form annular shoulders g^7 which snugly fit the interior of the mold cylinder b^4, and the separate parts thereof are also provided with a central annular bead or rib g^8, and between the annular shoulders g^7 and the rib g^8 the body portion of the mold is smaller than the interior diameter of the mold cylinder b^4 whereby an annular chamber h is formed around the body portion of the mold. The body portion of the mold or the separate parts thereof are also provided with fine radial perforations h^2 which communicate with the annular chamber h, and if the annular bead g^8 is employed, the said annular chamber will be divided into two parts as will be readily understood, and the said annular bead, when employed, is made sufficiently narrow to not interfere with the passage of liquids into and through the discharge pipe connections b^5 and b^6. The annular rib g^8 is only intended, however, to strengthen the body portion of the mold, and the mold may be made of sufficient strength to render said bead unnecessary.

Connected with the outer ends of the plungers c and d are crank rods i eccentrically connected with worm gears i^2 which are mounted in the same vertical plane longitudinally of the main frame, and in the central bottom portion of the main frame is a longitudinal shaft j provided at its opposite ends with worms j^2, and by turning the shaft j the plungers c and d may be moved inwardly or outwardly according to the direction in which said shaft j is turned. The shaft j, in the form of construction shown, is provided with a belt wheel j^3 by which it may be operated if desired, or said shaft may be turned by means of a crank or in any other manner.

The plate b which constitutes the base plate of the mold cylinder b^4 is provided at one side with an upright member k with which is connected a pin k^2, and pivoted to the base plate or member a of the main frame is a lever m provided with a longitudinal slot m^2 through which the pin k^2 passes and by means of this construction the mold cylinder may, as will be understood, be moved longitudinally of the main frame, in either direction.

The normal position of the parts of the apparatus or machine is that shown in Figs. 1, 2 and 3, and whenever it is desired to mold a spool, the paper or other fibrous pulp in a plastic or liquid condition is poured into the mold cylinder b^4 through the hoppers, funnels or other devices f. The shaft j is then turned so as to force the plungers c and d inwardly and the fibrous pulp in the opposite ends of the mold cylinder b^4 is forced into the mold g. It will be understood, of course, that the movement of the plungers c and d is a reciprocating movement, and this operation may be repeated until the mold g is compactly filled with pulp. In this operation the liquid or moisture in the pulp is forced out through the perforations h^2 in the mold g into the chamber around said mold and passes out through the discharge pipe connections b^5 and b^6. It is sometimes advantageous to close the pipe b^6 at the bottom of the cylinder so as to prevent the water or moisture from the pulp from passing out therethrough and retain a quantity thereof in the cylinder b^4 until the spool is completely formed in the mold after which the valve b^7 may be open and the chamber h drained.

When the operation of forming a spool is fully completed the plungers c and d are withdrawn into the position shown in Fig. 3, the lever m is operated so as to throw the mold cylinder b^4 into the position shown in dotted lines in Fig. 3, and in this operation the mold g with the spool therein is discharged at the opposite end of the mold cylinder b^4. The plunger c is provided at its inner end with a recess c^2 adapted to receive one end of the rod e, and the object of the rod e is to form the usual central longitudinal bore in the spool and it will be understood that this rod may be adjusted to any desired position in the operation of the apparatus as hereinbefore described. After the mold with the spool therein has been discharged from the mold cylinder as above described, the separate parts of the mold may be disconnected and the spool removed therefrom as will be readily understood.

The movement of the plate b which carries the cylinder b^4 as above described may be effected by the lever m or by turning the shaft a^6, the gear a^7 of which operates in connection with the rack b^2 on the bottom of the plate b but the said cylinder may be moved longitudinally, or into the different necessary positions thereof, by any suitable means. If the shaft a^6 is employed for this purpose, however, an ordinary crank may be connected therewith.

My invention is not limited to the exact construction, combination and arrangement of the various parts of my improved machine as herein shown and described, and various changes therein and modifications thereof may be made without departing from the scope of my invention as set out in the appended claims.

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

1. In a spool molding machine, a frame, a mold cylinder movable longitudinally thereof, horizontal plungers mounted in the frame and adapted to operate in the cylinder, means for feeding material into the opposite ends of the mold cylinder, and a spool mold mounted in the mold cylinder and movable longitudinally thereof.

2. In a spool molding machine, a frame, a mold cylinder movable longitudinally thereof, horizontal plungers mounted in the frame and adapted to operate in the cylinder, means for feeding material into the opposite ends of the mold cylinder, and a spool mold mounted in the mold cylinder and movable longitudinally thereof, one of said plungers being also provided with a rod which passes centrally through the spool mold.

3. In a spool molding machine, a frame, a mold cylinder movable longitudinally thereof, horizontal plungers mounted in the frame and adapted to operate in the cylinder, means for feeding material into the opposite ends of the mold cylinder, and a spool mold mounted in the mold cylinder and movable longitudinally thereof, one of said plungers being also provided with a rod which passes centrally through the spool mold, said spool mold and said mold cylinder being provided with means for discharging liquid therefrom when the pistons are moved inwardly.

4. In a spool molding machine, a frame, a mold cylinder movable longitudinally thereof, horizontal plungers mounted in the frame and adapted to operate in the cylinder, means for feeding material into the opposite ends of the mold cylinder, and a spool mold mounted in the mold cylinder and movable longitudinally thereof, one of said plungers being also provided with a rod which passes centrally through the spool mold, said spool mold and said mold cylinder being provided with means for discharging liquid therefrom when the pistons are moved inwardly, and said spool mold being composed of separate longitudinal parts detachably connected.

5. In a machine for molding spools from fibrous pulp, a frame, a mold cylinder movable longitudinally of the frame, plungers mounted in the opposite end portions of the frame and adapted to operate in the mold cylinder, means for operating said plungers, means for moving the mold cylinder longitudinally of the frame, a spool mold placed in the mold cylinder, and a rod connected with one of said plungers and adapted to pass through the spool mold in the mold cylinder.

6. In a machine for molding spools from fibrous pulp, a frame, a mold cylinder movable longitudinally of the frame, plungers mounted in the opposite end portions of the frame and adapted to operate in the mold cylinder, means for operating said plungers, means for moving the mold cylinder longitudinally of the frame, a spool mold placed in the mold cylinder, and a rod connected with one of said plungers and adapted to pass through the spool mold in the mold cylinder, said mold cylinder being also provided with means for feeding material into the opposite end portions thereof.

7. In a machine for molding spools from fibrous pulp,—a frame, a mold cylinder movable longitudinally of the frame, plungers mounted in the opposite end portions of the frame and adapted to operate in the mold cylinder, means for operating said plungers, means for moving the mold cylinder longitudinally of the frame, a spool mold placed in the mold cylinder, and a rod connected with one of said plungers and adapted to pass through the spool mold in the mold cylinder, said mold cylinder being also provided with means for feeding material into the opposite end portions thereof, and said spool mold and mold cylinder being provided with means for discharging liquid therefrom.

In testimony that I claim the foregoing as my invention I have signed my name in presence of the subscribing witnesses this 26th day of February 1907.

WILLIAM BURKE.

Witnesses:
C. E. MULREANY,
A. WORDEN GIBBS.