

No. 844,330.

PATENTED FEB. 19, 1907.

H. W. N. COLE.
MOLDING MACHINE.

APPLICATION FILED JULY 16, 1904. RENEWED APR. 10, 1905.

3 SHEETS—SHEET 1.

Fig. 1.

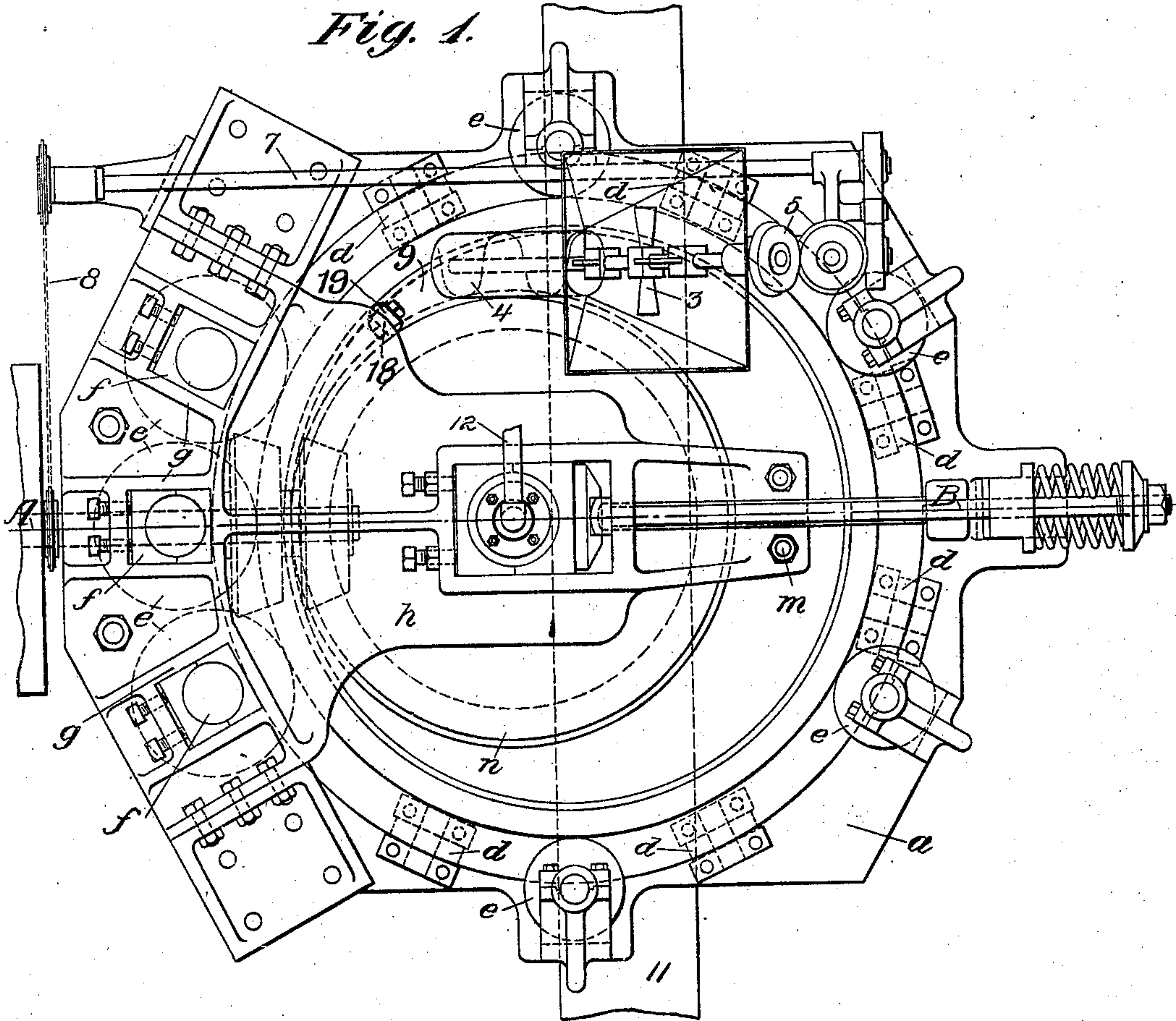
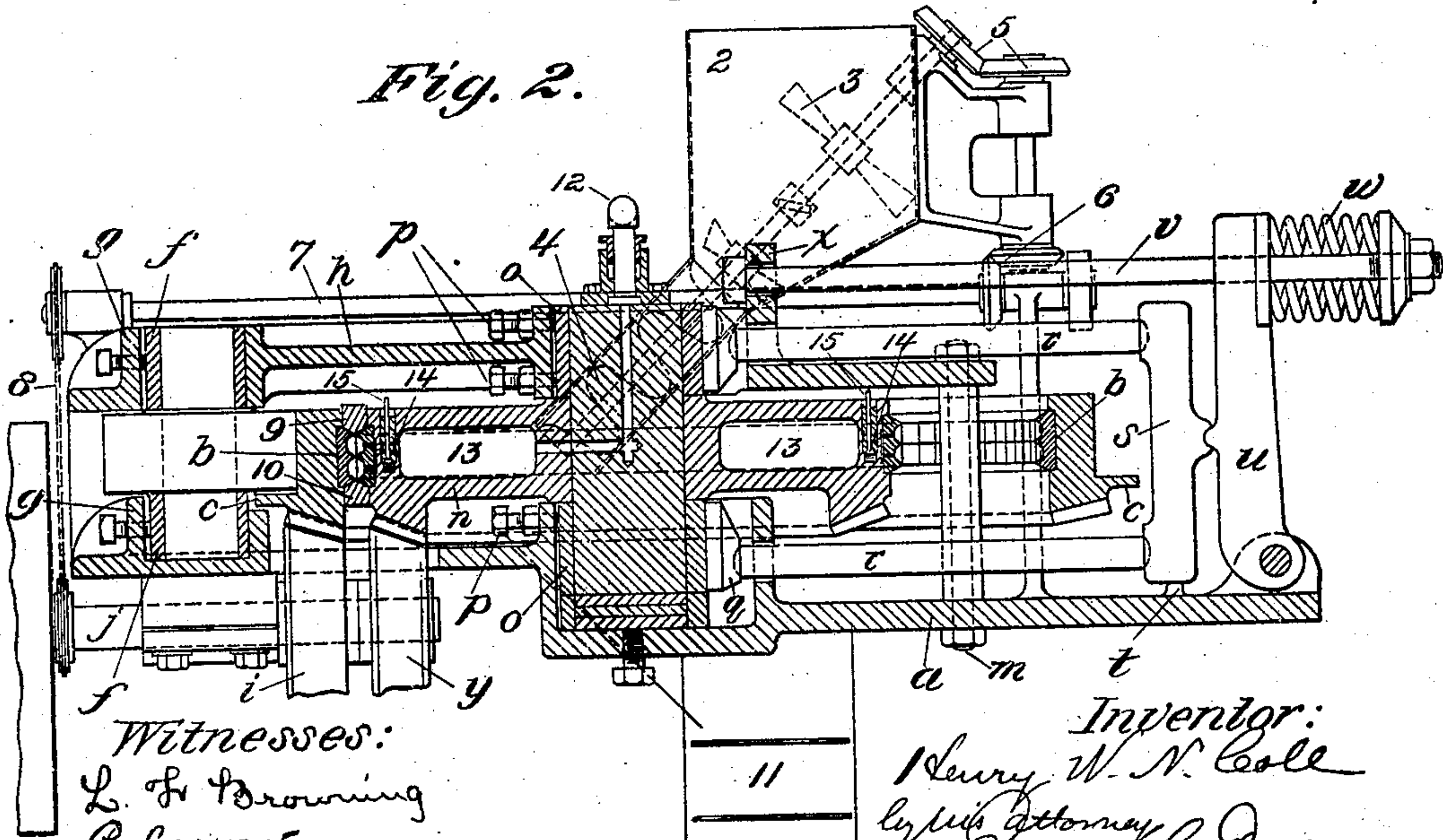


Fig. 2.



Witnesses:
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P. Carow

Inventor:
Henry W. N. Cole
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Edward C. Davidson

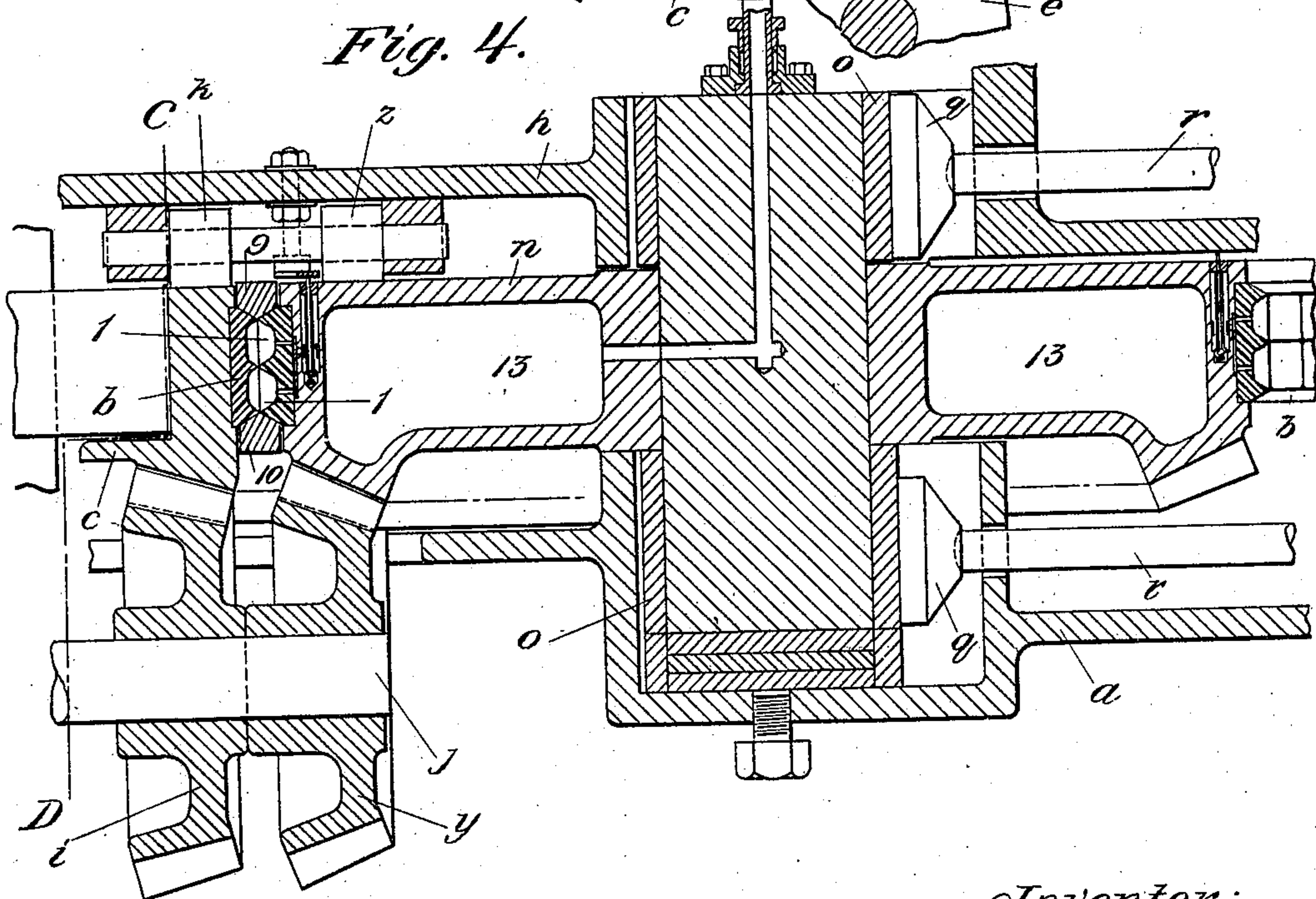
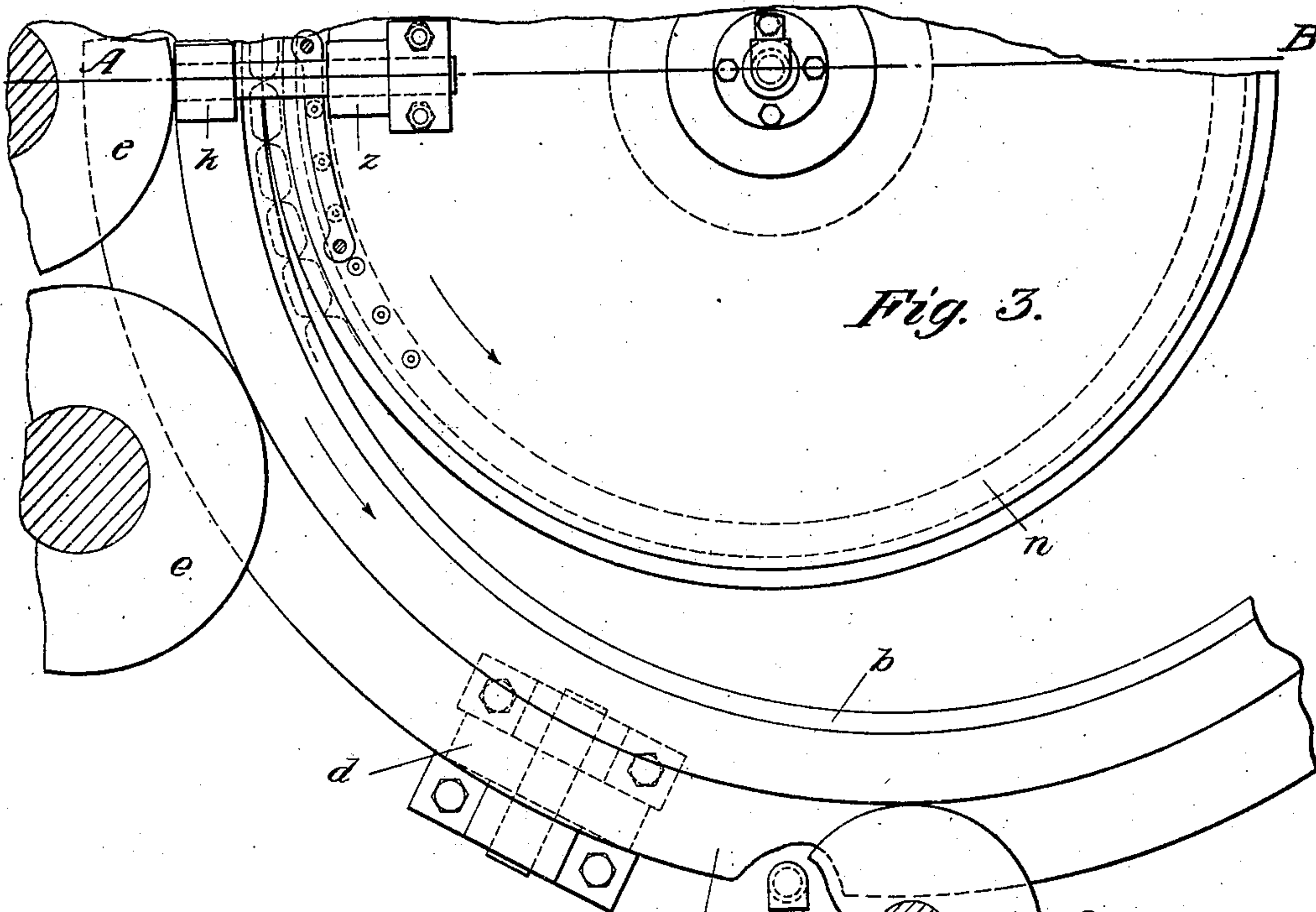
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3 SHEETS—SHEET 2.



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3 SHEETS—SHEET 3.

Fig. 5.

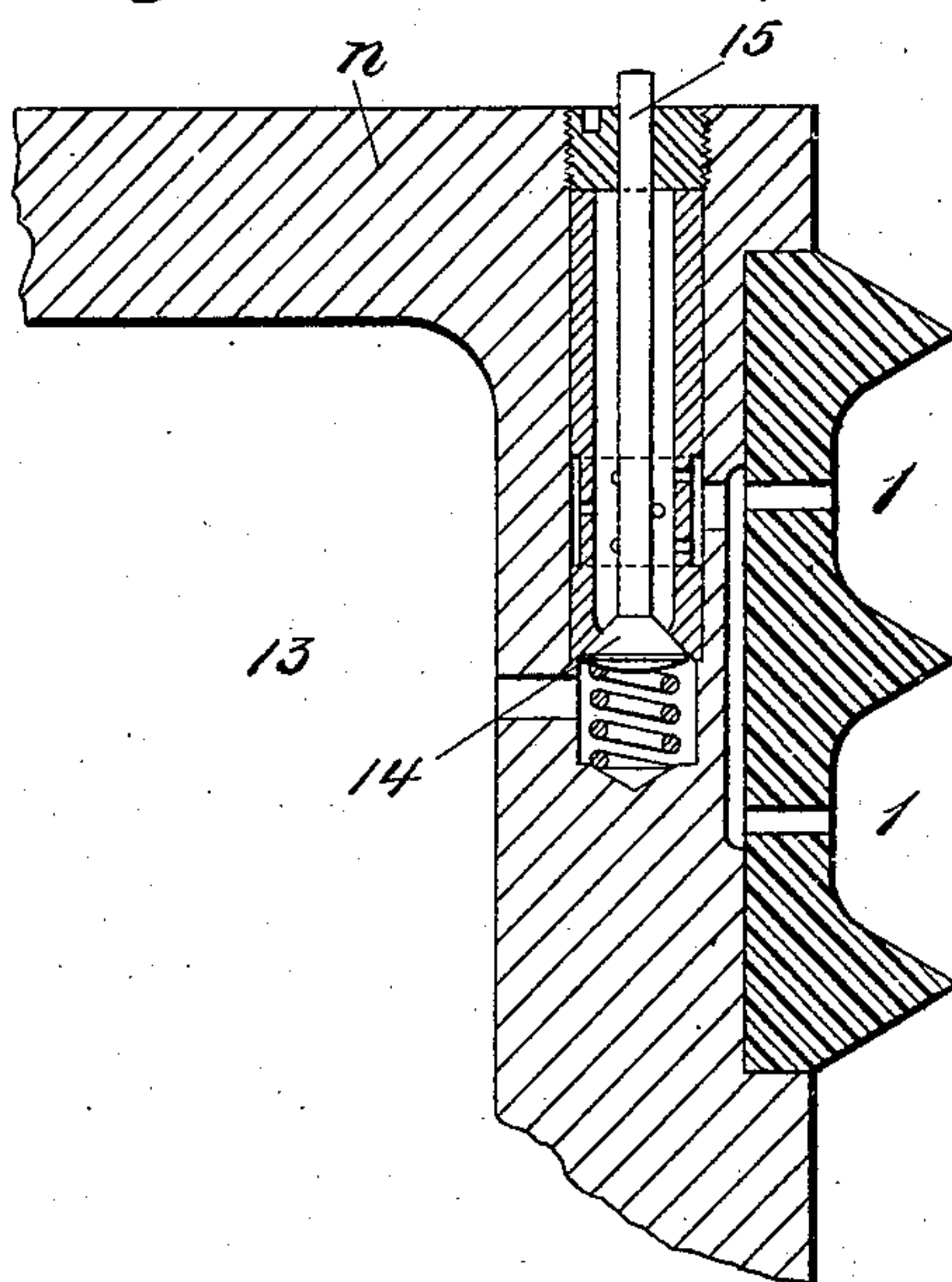
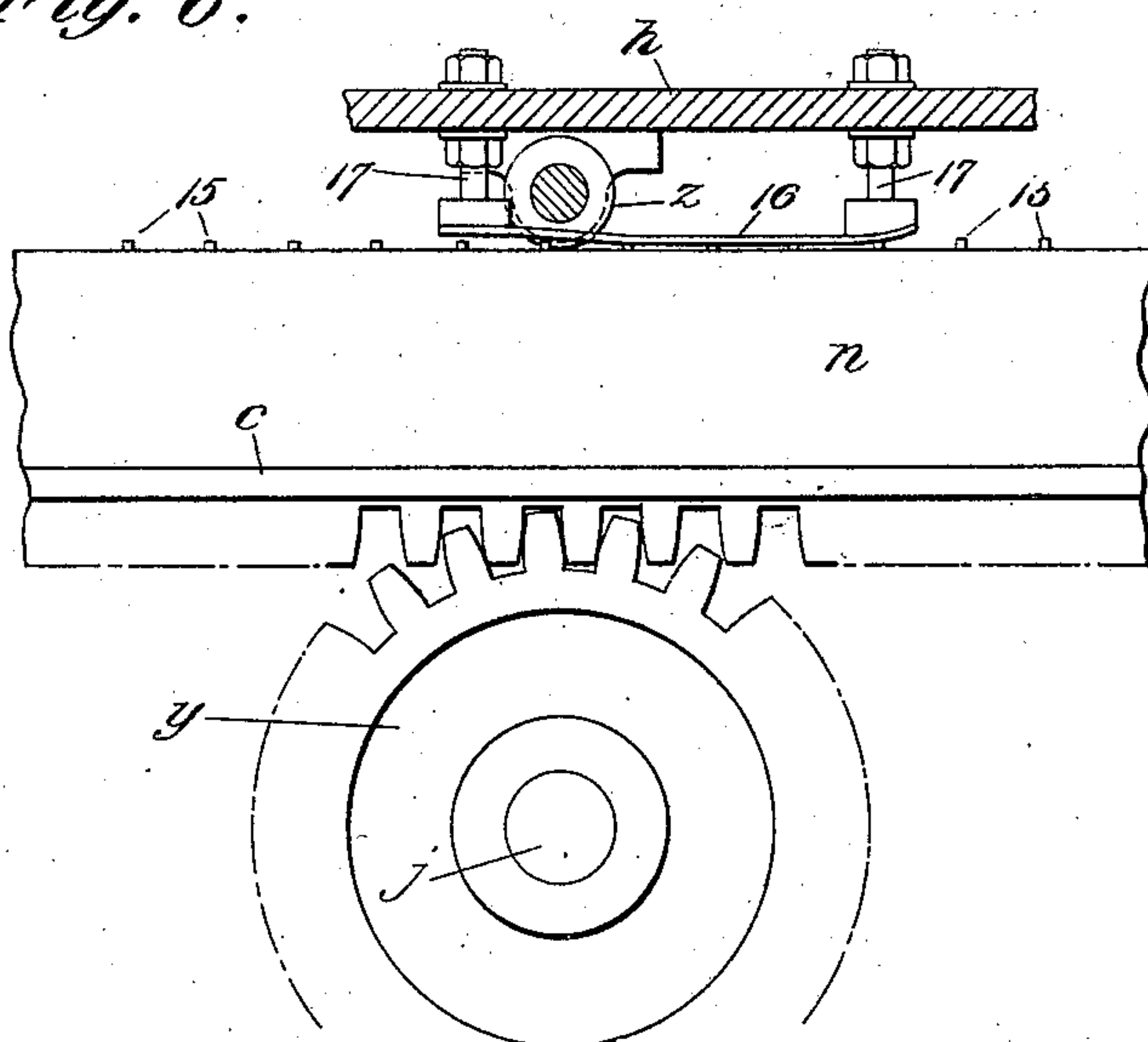


Fig. 6.



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UNITED STATES PATENT OFFICE.

HENRY W. N. COLE, OF NEW YORK, N. Y.

MOLDING-MACHINE.

No. 844,330.

Specification of Letters Patent.

Patented Feb. 19, 1907.

Application filed July 16, 1904. Renewed April 10, 1905. Serial No. 254,724.

To all whom it may concern:

Be it known that I, HENRY W. N. COLE, a citizen of the United States, residing in the borough of Brooklyn, city and State of New York, have invented certain new and useful Improvements in Molding-Machines, of which the following is a specification.

The machine herein described, while applicable to molding plastic compositions of various kinds, is primarily intended for the manufacture of fuel briquets.

The invention is characterized by the employment of two rotary circular surfaces in which the halves or opposite parts of the several molds are formed, one contained within the other and both revolving in the same plane and direction upon different centers. Material to be molded is subjected to gradual compression between the converging surfaces, which come together at the molding-point, and all strains being radial are sustained at the bearings. With surfaces of relatively small circumference a highly-efficient operation is afforded, and, the material being properly fed, briquets may be continuously formed and discharged. Any appropriate means for discharging the briquets from the molds may be employed. I have illustrated the use of compressed air or other fluid under pressure.

This invention so far as is now known to me may best be realized by employing a ring, preferably supported and revolving upon rollers, in the inner face of which are formed parts of the respective molds, and a wheel mounted within and eccentric to the ring and in the periphery of which are formed the corresponding parts of the molds. Both the ring and wheel are driven, preferably positively, in the same direction.

In the accompanying drawings, illustrating such an embodiment of this invention, Figure 1 is a plan; Fig. 2, a vertical section; Fig. 3, a view, on an enlarged scale, partly in plan and horizontal section, showing the molding-point—i. e., where the converging surfaces come together; Fig. 4, a vertical longitudinal section on the line A B of Figs. 1 and 3; Fig. 5, an enlarged view of the extreme right-hand side of Fig. 4, the compressed-air passages and valves; and Fig. 6, a detail view on the line C D of Fig. 4.

Upon a base or bed plate *a* is mounted a mold-ring *b*, the annular flange *c* of which turns upon a series of rollers *d* and against the periphery of which bear rollers *e*. At

the molding-point the three rolls *e* are larger. One is opposite the center of the molding-point and one on each side thereof, and each of them has bearing-boxes *f*, seated in housings *g* on the base and in a bridge frame or piece *h*, bolted to the base, radially adjustable relatively to the ring *b* by means of screw-bolts, as shown. On the bottom of the ring is formed a beveled rack engaged by a bevel-gear *i* on a power-driven shaft *j*, and on the upper face of the ring opposite the gear is a pressure-roll *k*, mounted in bearings on the under face of the bridge-frame. The opposite or inner end of the bridge-frame is supported in horizontal position by vertical sleeves containing bolts *m*, passing through the bridge-frame and base and located between the ring *b* and mold-wheel *n*. Bearing-boxes for this wheel are contained in housings in the base and bridge-frame and are susceptible of adjustment by means of bolts *p*, located on the side adjacent the molding-point. On the opposite side of the boxes bear recessed blocks *q*, in the recesses of which are seated the ends of bars *r*, the opposite ends of which are seated in recesses in a vertical equalizing-lever *s*, rocking on the point or bearing *t* and at its center bearing against a vertical lever-arm *u*, pivoted at the bottom and through the upper end of which passes loosely a rod *v*, around which are disposed heavy coiled springs *w*, held between the lever and a collar, back of which is an adjustable nut on the end of the rod. The opposite beaded end of the rod engages an upwardly-extending projection *x* on the bridge-frame. The mold-wheel *n* is driven by a gear *y*, engaging teeth formed on its under side, and opposite the gear a pressure-roll *z* bears upon the upper face of the wheel.

The outer surface of the mold-wheel and inner surface of the mold-ring have corresponding molding-cavities *1*, which are preferably formed in separate segmental steel plates or blocks applied to the surfaces, and preferably the molds or cavities in the ring are made of less depth than those in the wheel to facilitate discharge of the briquets or other articles, as explained below.

2 is the hopper, the base and outlet of which are inclined and within which is disposed a shaft carrying agitating-paddles 3 and a worm conveyer 4. The shaft may be driven by bevel-gears 5, actuated by bevel-gears 6, and a shaft 7, driven by sprocket-chain 8 from the main power-shaft, as

shown. Any appropriate feed and means of driving it may be employed. Between the hopper and molding-point the space between the converging surfaces is closed at top and
 5 bottom by plates or blocks 9 10, thereby forming a pressure chamber gradually decreasing in cross-section from the hopper-outlet to the molding-point, within which the material to be molded is gradually sub-
 10 jected to an increasing pressure that compacts it in the molds.

Since the mold-cavities in the wheel are deeper than those in the ring, the briquets will naturally leave the ring and cling to the
 15 wheel, from which they may be discharged at a suitable point upon a carrier 11. This arrangement is adopted in lieu of using special ejector devices for the ring-molds. Any appropriate discharging devices may be used.
 20 In the construction shown a fluid, as air under pressure, is admitted through pipe 12, Fig. 4, to a passage in shaft of wheel *n* and thence to an annular chamber 13 in the wheel, which communicates, Fig. 5, by means of
 25 normally closed valves 14, with the several mold-cavities. Each valve is normally closed by its spring, which urges it upwardly, and its spindle projects beyond the upper face of the wheel. As the ring and wheel move to-
 30 gether beyond the molding-point the ends of the stems 15 of the valves come under and against the face of a plate 16, supported from the under side of the bridge-frame *h* by bolts 17. Compressed air is admitted to the bot-
 35 toms of the mold-cavities, breaking the vacuum therein, should such exist, and expelling the briquets, which fall upon the carrier 11 or are otherwise disposed of. This general mode of discharging the briquets or molded
 40 articles is a feature of this invention and is believed to be new.

In a machine of this character all strains are radial and in the same plane, and the shafts, bearings, and supports of the various
 45 parts may be made of such dimensions and strength as is desirable. Excessive strain between the molding-surfaces will be relieved by yielding of springs *w*, which may be set at desired tension. The machine has been
 50 shown with the axes of the ring and wheel vertical, as that is thought to be the most satisfactory arrangement.

The outer member *b* is shown as a ring peripherally supported, as this is deemed to be
 55 preferable to providing it with a central support, which would convert it into a wheel of which the ring would be a flange or peripheral portion.

The plates 9 and 10, forming the top and
 60 bottom of the compression-chamber, should be held against endwise movement. This may be done in any appropriate way. They may abut against projections from the bridge-frame and base, respectively. Thus
 5 in Fig. 1, 18 indicates a projection on the un-

der side of the bridge-frame, against which a projection 19, extending up from the plate 9, abuts. These two projections may be se-
 cured together by a bolt, as shown.

I claim as my invention—

1. In a molding-machine, the combination
 70 of two members, one within the other, having corresponding mold-cavities in their adjacent surfaces, and both revolving in the same direction upon different axes so that
 75 corresponding edges surrounding the mold-cavities in such surfaces come together at the molding-point, to thereby compress the material in the mold-cavities solely by the pres-
 80 sure of the converging faces of the two members and at the same time separate it into individual briquets, means for positively rotating both members in unison and a com-
 85 pression-chamber, walls of which are formed by such converging surfaces adjacent the molding-point.

2. In a molding-machine, the combination
 of two members, one within the other, hav-
 ing corresponding mold-cavities in their ad-
 90 jacent surfaces, and both revolving in the same direction upon different axes so that such surfaces come together at the molding-
 point to thereby compress the material in the mold-cavities solely by the pressure of the
 95 converging faces of the two members and at the same time separate it into individual briquets, means for positively rotating both
 members in unison, a compression-chamber, walls of which are formed by such converg-
 100 ing surfaces adjacent the molding-point, means for supplying material to the compression-chamber, and means for discharging the molded articles from the mold-cavities.

3. In a molding-machine, the combination
 105 of two members, one within the other, having corresponding mold-cavities in their adjacent surfaces, and both revolving in the same direction upon different axes so that
 110 such surfaces come together at the molding-point to thereby compress the material in the mold-cavities solely by the pressure of the
 converging faces of the two members and at
 115 the same time separate it into individual briquets, means for positively rotating both members in unison, a compression-chamber, walls of which are formed by such converg-
 ing surfaces adjacent the molding-point, and
 120 means for admitting a fluid under pressure to the mold-cavities to discharge molded articles therefrom.

4. In a molding-machine, the combination
 of two members, one within the other, hav-
 ing corresponding mold-cavities in their ad-
 125 jacent surfaces, and both revolving in the same direction upon different axes so that such surfaces come together at the molding-
 point, a compression-chamber, walls of
 130 which are formed by such converging surfaces adjacent the molding-point, and a

spring yieldingly supporting the inner member against molding strains.

5. In a molding-machine, the combination of two members, one within the other, having corresponding mold-cavities in their adjacent surfaces, and both revolving in the same direction upon different axes so that such surfaces come together at the molding-point, a compression-chamber, walls of which are formed by such converging surfaces adjacent the molding-point, a spring yieldingly supporting the inner member against molding strains, and equalizing devices by which such strains are transmitted to the spring.

6. In a molding-machine, the combination of a ring having mold-cavities in its inner face, a wheel contained within the ring and having corresponding mold-cavities in its outer face, both wheel and ring being rotatable in the same plane but upon different centers so that corresponding edges surrounding the mold-cavities in such faces come together at the molding-point to compress the material in the mold-cavities and divide it into individual briquets, means for positively rotating the ring and wheel in unison in the same direction and means for supplying the material to be molded to the spaces between the converging surfaces of the ring and wheel adjacent the molding-point.

7. In a molding-machine, the combination of two coöperating rotating members with series of corresponding mold-cavities in their adjacent molding-surfaces, such mold-cavities having fixed walls and those in one series having apertures in the bottom thereof, passages connecting such apertures with a source of fluid under pressure, a valve in each passage, and means for opening each valve after its corresponding mold-cavity has passed the molding-point.

8. In a molding-machine the combination of two members one within the other, having corresponding molds in their adjacent surfaces and both revolving in the same direction upon different axes so that the corresponding edges of opposite molds in such surfaces come together at the molding-point whereby the material being molded is compressed solely by the pressure of the converging faces of the two members and separated into individual briquets by the edges of the molds, means for positively rotating both members in unison, and a compression-chamber, walls of which are formed by such converging surfaces adjacent the molding-point.

9. In a molding-machine the combination of two members one within the other, having corresponding molds in their adjacent surfaces and both revolving in the same direction upon different axes so that the corresponding edges of opposite molds in such surfaces come together at the molding-point whereby the material being molded is compressed solely by the pressure of the converging faces of the two members and separated into individual briquets by the edges of the molds, means for positively rotating both members in unison, and a compression-chamber, walls of which are formed by such converging surfaces adjacent the molding-point, means for supplying material to the compression-chamber, and means permitting delivery of the molded articles from the mold-cavities.

In testimony whereof I have hereunto subscribed my name.

HENRY W. N. COLE.

Witnesses:

KATHARINE MACMAHON,
L. F. BROWNING.