D. MOIR & H. BUCHANAN.

MEANS OR APPARATUS RELATING TO THE MANUFACTURE, CENTRIFUGALLY, OF HOLLOW ARTICLES.

APPLICATION FILED JAN. 26, 1917.

1,286,056.

Patented Nov. 26, 1918.

3 SHEETS—SHEET 1.

Fig. 2.

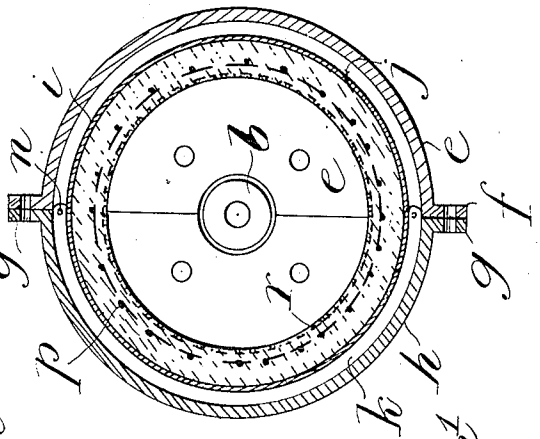
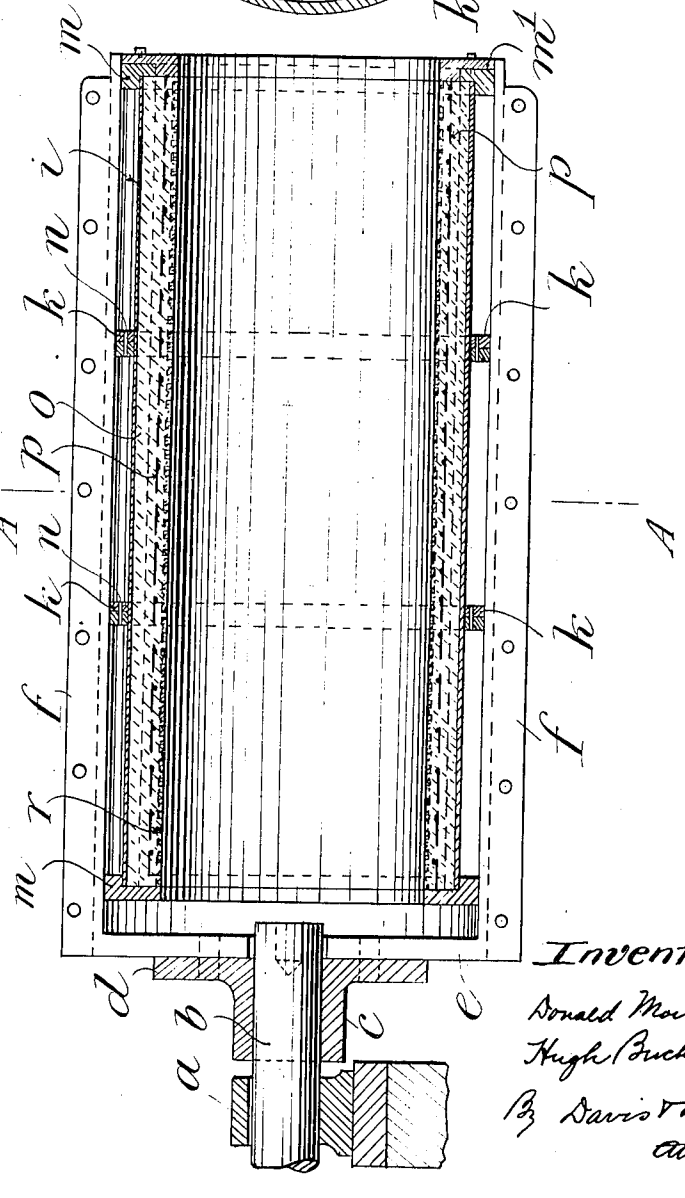


Fig. 1.



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3 SHEETS—SHEET 2.

Fig. 4.

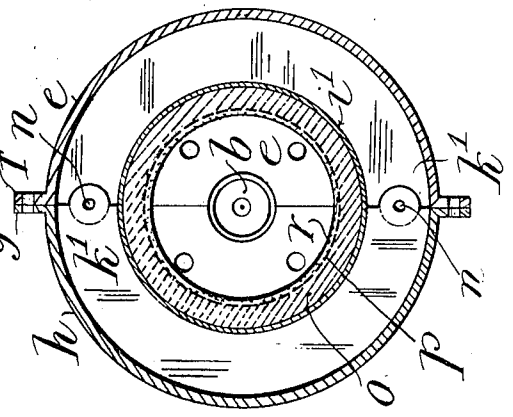
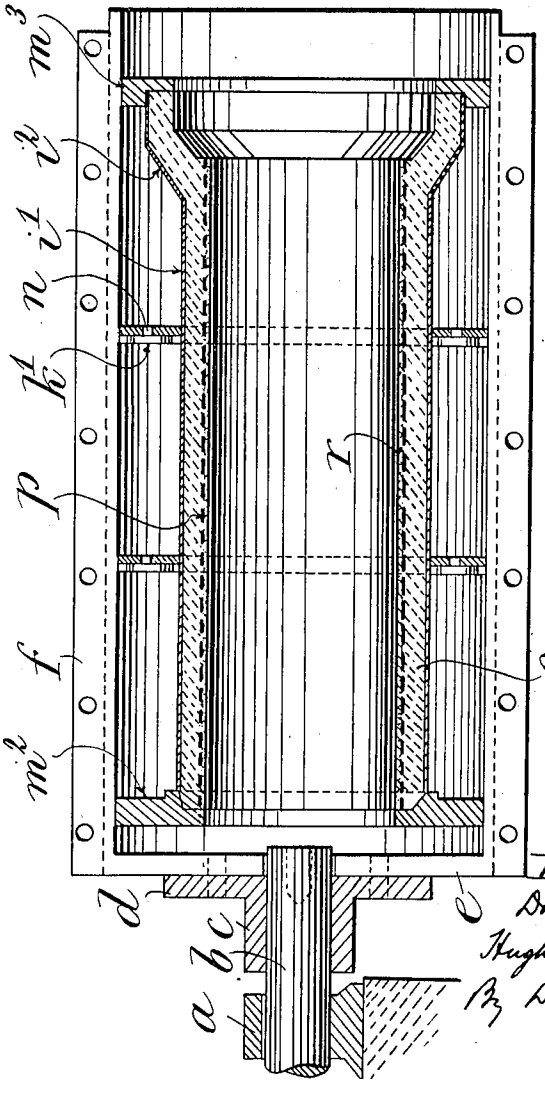


Fig 3



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3 SHEETS—SHEET 3.

Fig. 8.

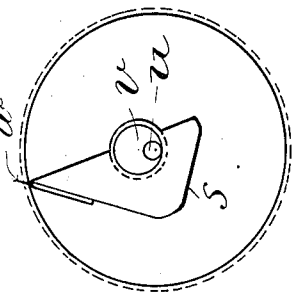


Fig. 4.

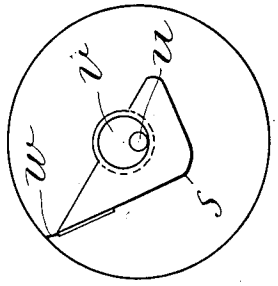


Fig. 6.

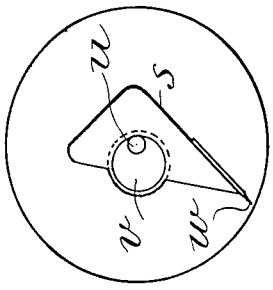


Fig. 5.

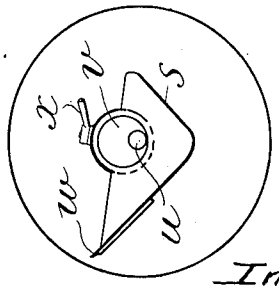
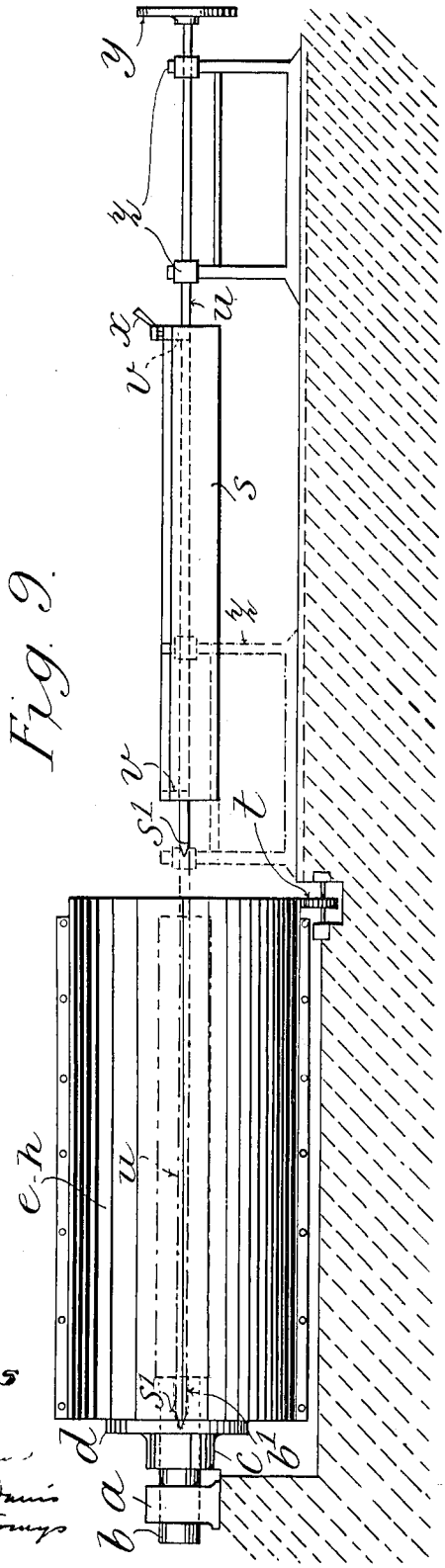


Fig. 9.



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DONALD MOIR AND HUGH BUCHANAN, OF ROSARIO DE SANTA FÉ, ARGENTINA.

MEANS OR APPARATUS RELATING TO THE MANUFACTURE, CENTRIFUGALLY, OF HOLLOW ARTICLES.

1,286,056. Specification of Letters Patent Patented Nov. 26, 1918.

Original application filed February 12, 1916, Serial No. 77,972. Divided and this application filed January 26, 1917. Serial No. 144,662.

To all whom it may concern:

Be it known that we, DONALD MOIR and HUGH BUCHANAN, subjects of the King of Great Britain and Ireland, residing, respectively, at Rosario de Santa Fé, Argentine Republic, have invented Improved Means or Apparatus Relating to the Manufacture, Centrifugally, of Hollow Articles, of which the following is a specification.

This invention relates to means or apparatus for the manufacture of articles, centrifugally such for example as concrete pipes and other hollow ware having smooth internal surfaces.

In such manufacture, arrangements have been proposed according to which material, such for example as cement or lime concrete or other suitable agglomerate intended to be subjected to centrifugal action, is to be received by a configuring member confined within outer inclosing means designed to resist the bursting stresses to which the inner configuring member is to be subject, such configuring member being designed to be removed as soon as the material has been sufficiently acted upon by centrifugal force.

The present invention which is a division of our application for patent dated 12th February, 1916, Serial No. 77,972, is applicable, whether the smooth internal surfaces are to be the final stage or articles made throughout by a centrifugal method of production, or the linings, produced centrifugally, of articles made in any other way, consists in an arrangement whereby inner configuring members having a variety of forms differing widely it may be from the outer supporting means, can be accommodated by the supporting means, within the range of its capacity, and be easily removed therefrom.

Another feature of the invention is an improvement in means for smoothing the internal surface of the article produced and consists in a device for adjustably removing superfluous surface material simultaneously throughout the length of the article and delivering it into a collector.

It will be understood that the inner mold will be shaped to suit the required exterior formation of the pipe, column or the like and also that the invention can be usefully adapted to the lining of articles such as pipes with material for purposes such as the strengthening, water-proofing or finishing of the same.

In the accompanying drawings, Figure 1 is a longitudinal and Fig. 2 a transverse section on the line A A of Fig. 1, showing one form of centrifugal mold arrangement as used for the manufacture of a reinforced pipe, cylindrical throughout, both externally and internally. Figs. 3 and 4 are similar views of a modified arrangement for use in the manufacture of a spigot and faucet pipe. Figs. 5 to 8 are diagrammatic views of means for adjustably removing surface material simultaneously throughout the length of the article and collecting it, and Fig. 9 is a view of the general arrangement of plant according to the invention.

Referring first to Figs. 1 and 2, *a* is the bearing of a horizontal driving shaft *b* provided with a boss or head *c* that is furnished with a collar or flange *d*. To this collar *d* is bolted one half *e* of a cylindrical casing that has flanges *f* enabling it to be securely bolted to the flanges *g* of a companion casing part *h*. The inner mold comprises a sheet *i* of metal bent into cylindrical form having scarfed overlapping edges at *j*. This mold is supported within and from the casing parts *e*, *h* by rings *k* intermediate of its length and by ring formers *m* at the ends. The rings *k*, as can be clearly seen in Fig. 2, are each made in halves interengaging and connected together by pins *n*. The end formers *m* are made in separable parts in the same way as the rings *k*. *o* represents a layer of suitable agglomerate which is first acted upon centrifugally, *p* represents a metal reinforcement which is next added and *r* represents the subsequent layer of agglomerate centrifugally treated. The left hand end former *m* is of a radial depth sufficient to produce an end wall accommodating both layers of agglomerate but in order to permit of the entry of the reinforcement *p* into the mold the right hand end former *m* is radially of lesser depth, having combined therewith supplemental ring m^1 which is fixed to the former *m* after the reinforcement *p* has been introduced and before the inner lawer *r* of agglemorate is formed.

In Figs. 3 and 4 the cylindrical mold *i* of Figs. 1 and 2 is replaced by a mold i^1 which is shouldered at i^2 to form a socket, the rings k^1 and end formers m^2, m^3 being altered in

dimensions to those employed in Figs. 1 and 2. In other respects the apparatus is the same.

Fig. 9 shows means according to Figs. 1 and 2 or to Figs. 3 and 4 mounted in relation to a distributing trough *s* the casing *e*, *h* being supported at one end by a roller *t*. The trough *s* is carried upon a shaft *u* by eccentrics *v* (Figs. 5 to 8) and is provided with a scraping edge *w*, a handled bolt *x* being shown as provided to engage one of the eccentrics *v* whereby the trough can be clamped in different angular positions relatively to the shaft *u*. This shaft *u* is fitted with a handle *y* and is revoluble in a sliding bearing *z*, the arrangement being such that the shaft and trough can be advanced longitudinally into the positions indicated in dot and dash lines where the end s^1 of the shafts *s* enters a housing b^1 in the end of the shaft *b*. Normally the trough *s* is clamped to the shaft *u* so that it can be freely moved longitudinally into the inner mold, as exemplified in Fig. 5, after which it can be turned by the handle *y* into a position (see Fig. 6) to enable its contents to be discharged. Afterward the angular position of the trough *s* in relation to the shaft *u* can be altered, as exemplified in Figs. 7 and 8, to vary the distance of the dressing edge *w* from the center of rotation which distance is a maximum in Fig. 8.

What we claim is:—

1. Means for manufacturing hollow articles centrifugally comprising in combination an inner removable centrifugal configuring member, an outer casing adapted to resist the centrifugal stresses to which said inner member is subjected and means for dressing the interior surface of the article produced simultaneously throughout its length and collecting the removed material.

2. Means for manufacturing hollow articles centrifugally, comprising, in combination, a light sheet metal mold, a substantial outer rotary mold, positioning devices through which the inner mold is supported against bursting stresses by the outer mold and a bucket feeding device having a dressing blade edge adjustably mounted within the sheet metal mold.

3. Means for manufacturing hollow articles centrifugally, comprising, in combination, a light sheet metal mold, a substantial outer rotary mold, positioning devices through which the inner mold is supported against the bursting stresses by the outer mold, a bucket feeding device having a dressing blade edge extending within the sheet metal mold and means for moving the bucket feeding device eccentrically in relation to the said mold.

4. In means for manufacturing hollow articles centrifugally, the combination with a light inner mold, an outer heavy mold and positioning rings whereby the inner mold is supported against bursting stresses by the outer mold, of an end former of compound character comprising parts enabling it to be built up as the manufacture of the hollow articles proceeds.

Signed at Rosario, Argentina, this second day of January 1917.

DONALD MOIR.
HUGH BUCHANAN.