

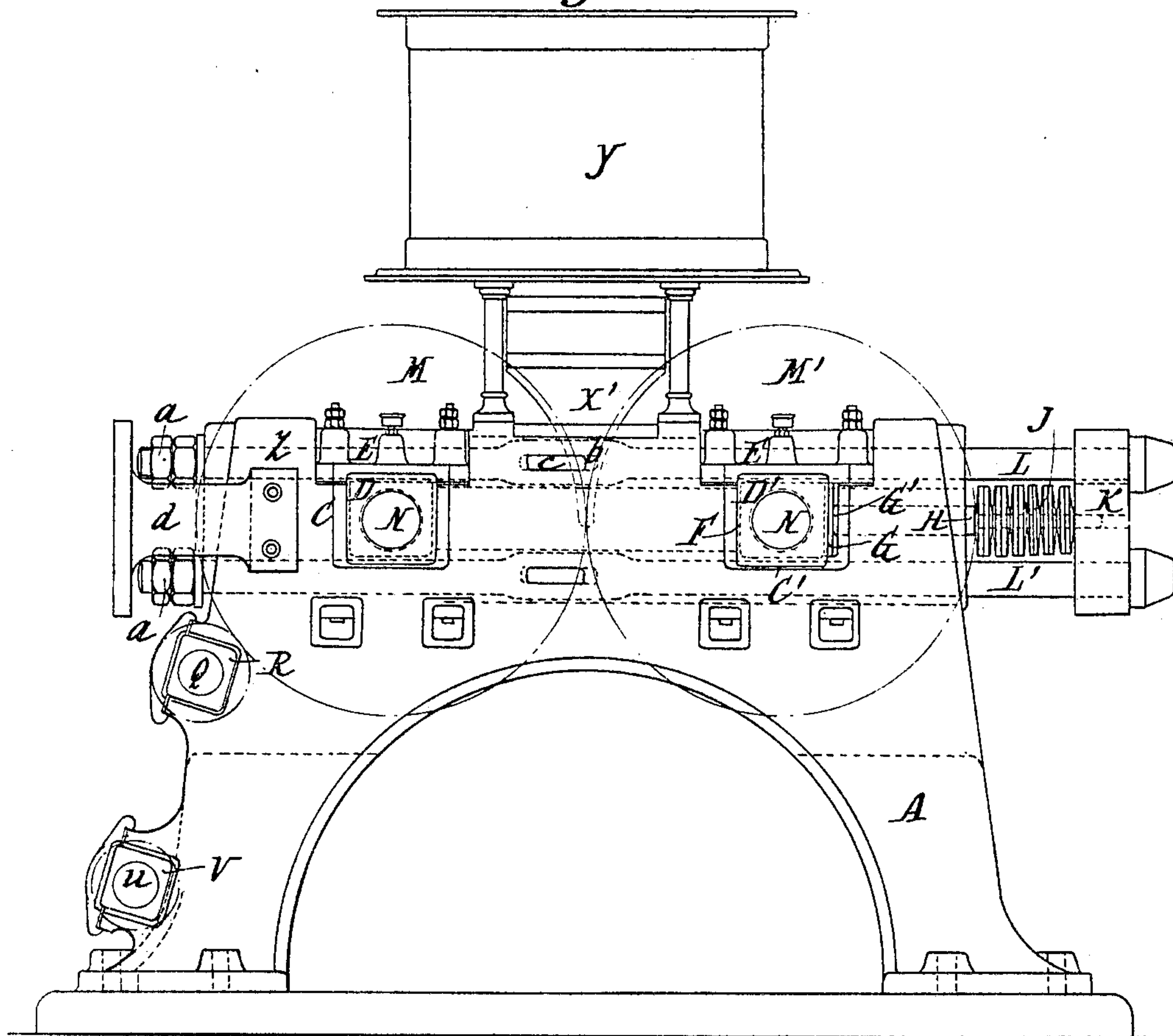
H. J. DEBAUCHE.

PRESS FOR THE MANUFACTURE OF FUEL BALLS, BRIQUETS, &c.

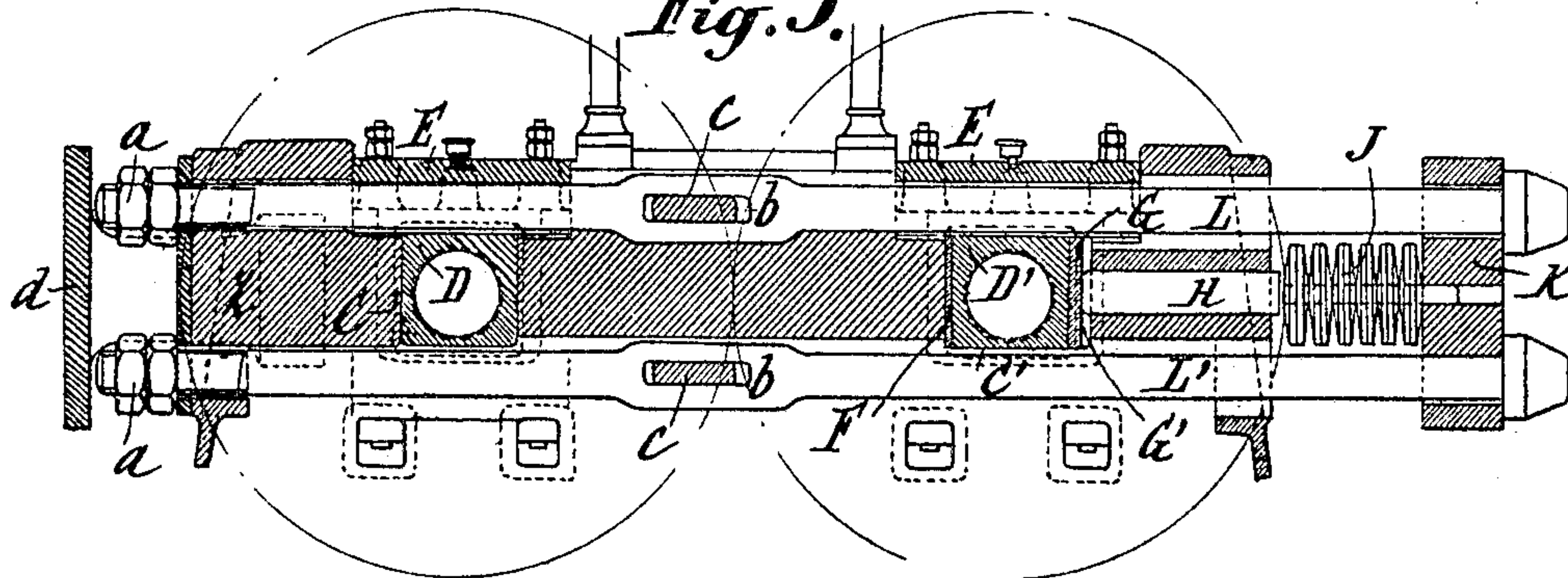
APPLICATION FILED MAY 2, 1904.

2 SHEETS—SHEET 1.

*Fig. 1.*



*Fig. 3.*



Witnesses  
*A. J. Hadden*  
*O. Pickering.*

Inventor  
*Hubert Joseph Debauche*  
 by his Attorney *R. H. Hadden*

No. 799,149.

PATENTED SEPT. 12, 1905.

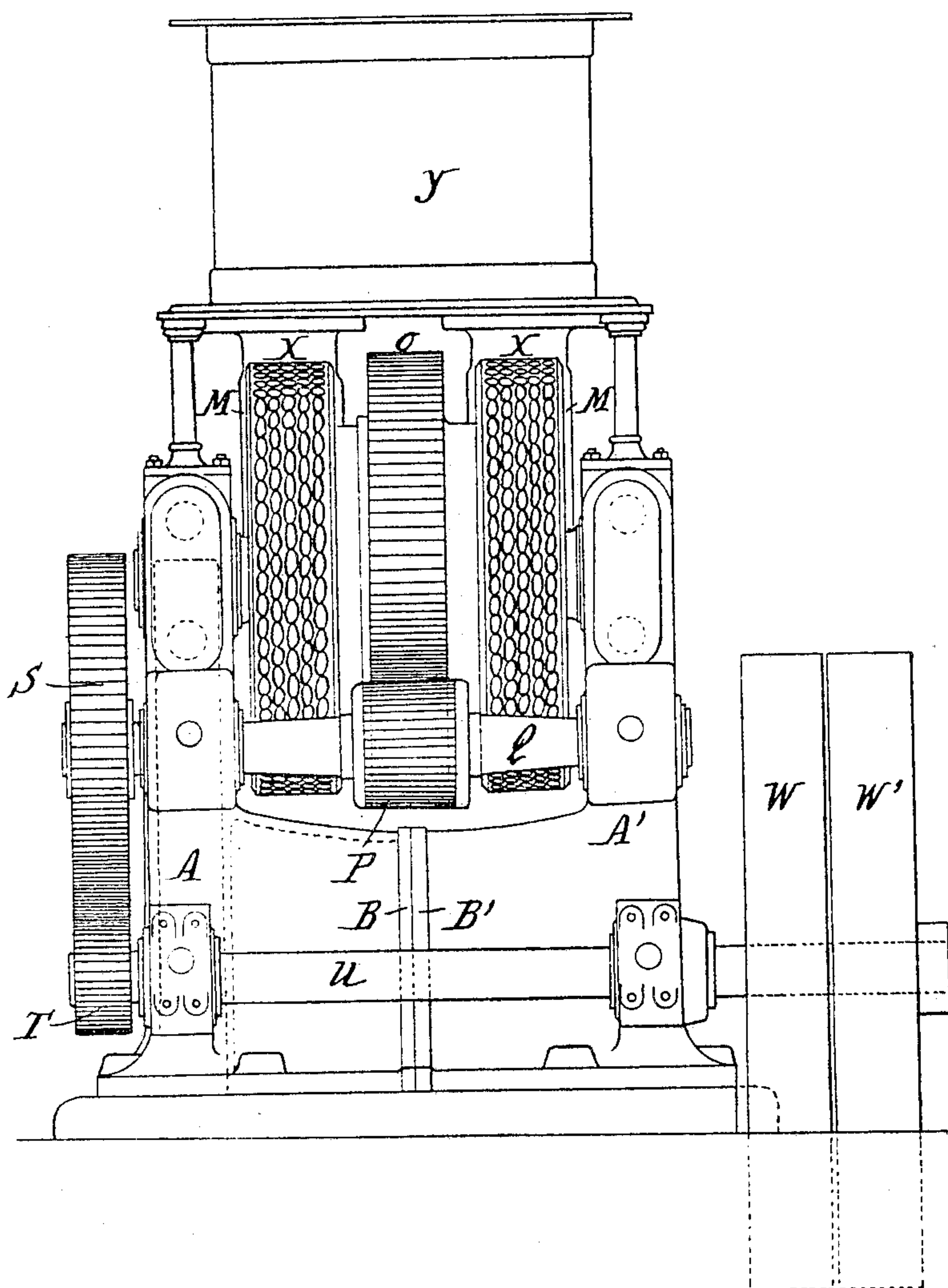
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APPLICATION FILED MAY 2, 1904.

2 SHEETS—SHEET 2.

*Fig. 2.*



Witnesses  
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O. Pickering.

Inventor  
Hubert Joseph Debauche  
by his Attorney *A. J. Haddan*



# UNITED STATES PATENT OFFICE.

HUBERT JOSEPH DEBAUCHE, OF GILLY, BELGIUM.

PRESS FOR THE MANUFACTURE OF FUEL BALLS, BRIQUETS, &c.

No. 799,149.

Specification of Letters Patent.

Patented Sept. 12, 1905.

Application filed May 2, 1904. Serial No. 205,986.

*To all whom it may concern:*

Be it known that I, HUBERT JOSEPH DEBAUCHE, a subject of the King of Belgium, residing at Gilly, Belgium, have invented certain new and useful Improvements in Presses for the Manufacture of Fuel Balls, Briquets, and the Like, of which the following is a specification.

The presses used for compressing coal and the like into balls or briquets of suitable shapes, more particularly into elliptical, spherical, or lenticular briquets, generally comprise cylinders revolving in opposite directions and having on their peripheries molds or the like which impart to the briquets the desired shape. The strain on these cylinders is very considerable, since the mass introduced between them tends to force the cylinders apart. In order to prevent this, it has hitherto been usual to use a frame of great rigidity and strength, in which the bearings for the journals of the cylinders are supported at fixed distances from each other, so as to prevent any separation whatever of the cylinders. This direct connection of the frames with the bearings and the absolute rigidity of the connection throw very great normal strain on the frames and cause the latter to be bent or broken if on occasion an exceptional strain is produced owing either to defective preparation of the coal-paste or to the presence of a foreign body in the latter. Other very considerable disadvantages are connected with the direct and rigid connection referred to, and serious accidents are liable to occur if the frames give way.

The improved construction to which the present invention relates removes all these disadvantages.

The invention substantially consists in relieving the frames of the strains due to the compressing of the coal and transferring these strains to steel connecting parts which are independent of the frames.

The invention also comprises resilient means for regulating the pressure exerted on the coal to be compressed and for allowing the cylinders to move apart under the action of any strain which exceeds the maximum for which the regulating device is adjusted.

The invention also comprises means for assembling the frames with the aid of curved cross-bars integral with the latter and, further, relates to a special arrangement of the transmission-gear.

The annexed drawings illustrate one form of construction of the improved press.

Figure 1 is a side elevation of the machine; Fig. 2, an end elevation thereof, and Fig. 3 a longitudinal vertical section illustrating the means by which the frame is relieved of the strain due to the compression of the coal.

A and A' are frame parts connected to each other by means of the curved cross-pieces B and B', which are respectively integral with the said frame parts and meet in the central plane of the machine. The frame can, however, also be made in one piece provided with the same kind of cross-pieces. The recesses C and C' in the frame contain the bearings D and D' for the journals N of the cylinders M and M'. The bearings in the recesses C have no play and are fixed, whereas those in the recesses C' are movable in the longitudinal direction of the frame. The plate F, which is of suitable thickness, serves to fix the normal position of the bearings D' and the distance between the cylinders M and M'.

The plate G serves as an abutment between the bearings D' and the rod H, at the end of which latter a series of "Belleville" disks *j*, acting as a spring, is arranged. The spring *j* abuts against the cross-bar K, which has bearing against shoulders formed by the enlarged heads of the rods L and L'. These rods are carried through the frame to beyond the head Z of the frame, and on the ends of rods L and L' are screwed the nuts *a*, bearing against head Z. The spring *j* must be sufficiently compressed to exert the desired degree of pressure on the coal to be agglomerated.

The rods L and L' extend through practically the entire length of the machine, and the play allowed to the bearings D' and the abutment-plate G in the part G' of the recess C' relieves the frame of tensile strain due to the compression or displacement of the cylinders, the reactionary effect of said compression being directly transmitted to the rods L and L'. The latter are of rectangular section with the exception of those parts which are engaged by the nuts *a*. The section of the said rods at the end engaged by the nuts is considerably less than that of the other parts of the rods in order that if the latter should break the fracture will inevitably take place at that end. To prevent in case of fracture the ejection of the broken parts of the rods by the force of the spring *j*, each of said rods L and L' is



provided with a slot *b*, into which engages a tenon *c*, fixed to the frame, and a guard *d* is fixed in front of the nuts *a*. The tenons *c* have sufficient longitudinal play in the slots *b* to prevent interference with the requisite movement of the rods *L* and *L'*; but if fracture of the latter occurs the said tenons will prevent the ejection of the longer parts of the rods *L* and *L'* and the guard *D* will retain the shorter parts carrying the nuts *a*.

When the normal pressure required to compress or agglomerate the coal or the like between the cylinders *M* and *M'* is exceeded, the cylinders *M'* yield and force back the spring *j*. The frame is therefore never subjected to tensile strain whether the force tending to move apart the cylinders is normal or not.

The plates *E* serve to prevent the vertical displacement of the bearings *D* and *D'*.

Each pair of cylinders *M* and *M'* is rigidly connected to a gear-wheel *O*, and said wheels *O* are in gear with each other in order to render the rotary movement of the cylinders uniform. One of the gear-wheels *O* meshes with a pinion *P*, to which rotation is imparted by means of the shaft *Q*, the gear-wheels *S* and *T*, the shaft *u*, and the pulley *W*. *W'* is a loose pulley on said shaft *u*. The driving-gear described is not mounted on supports independent from the frame, but is directly supported by the bearings *R* and *V*, let into the frame of the press itself.

The material to be compressed may be fed to the space between the cylinders from the hopper *y* by means of the chutes *x x'*.

It will be seen that apart from the advantage resulting from the absence of strain on the frame the advantage of stability of the press as a whole is secured by the special method of connecting the two frame parts to each other and by the arrangement of the driving-gear in bearings fixed to the said frame itself.

I declare that what I claim is—

1. In a press for the purpose set forth, the combination of a frame a pair of molding-cylinders rotatable in opposite directions between which the material to be compressed is fed, bearings for said cylinders in the frame and strain-rods extending through the frame and externally thereof at both ends and having bearing externally against the frame rearwardly of said cylinder-bearings respectively so as to brace the frame between planes external to said bearings.

2. In a press for the purpose set forth, the combination of a frame a pair of molding-cylinders rotatable in opposite directions between which the material to be compressed is fed, bearings for said cylinders in the frame and strain-rods extending through the frame and having bearing rearwardly of said bearings respectively so as to brace the frame be-

tween planes external to said bearings together with means engaging said rods for protecting their ejection.

3. In a press for the purpose set forth, the combination of a frame a pair of molding-cylinders rotatable in opposite directions between which the material to be compressed is fed, bearings for said cylinders in the frame and strain-rods extending through the frame and having bearing rearwardly of said bearings respectively so as to brace the frame between planes external to said bearings together with means engaging said bars for protecting their ejection and a shield rearward of their ends said ends being of reduced strength.

4. In a press for the purpose set forth the combination of a frame, a pair of molding-cylinders rotatable in opposite directions, bearings for said cylinders in the frame, one of said bearings being fixed and the other movable, strain-rods extending through the frame from a plane external of the fixed bearing to a plane external of the movable bearing and a resilient device external of said movable bearing, the said strain-rods having bearing inwardly against said frame and against said resilient device respectively.

5. In a press for the purpose set forth the combination of a frame comprising two half parts each having curved cross-pieces meeting in the central plane of the press, two pairs of molding-cylinders rotatable in opposite directions, between which the material to be compressed is fed, one of said pairs having fixed bearings in the frame and the other pair longitudinally-displaceable bearings therein, a system of slotted rods extending through the frame, nuts on the ends of said rods adapted to bear against the frame, a guard-plate in front of said nuts a cross-bar on the other end of said rod system, rods connecting said cross-bar and movable bearings, springs intermediate the latter and said cross-bar and tenons on the frame adapted to engage the slots in the rods with longitudinal play, substantially as described.

6. In a press for the purpose set forth the combination of a frame comprising two half parts, each having curved cross-pieces meeting in the central plane of the press, two pairs of molding-cylinders rotatable in opposite directions between which the material to be compressed is fed, one of said pairs having fixed bearings in the frame and the other pair longitudinally-displaceable bearings therein, a system of slotted rods extending through the frame reduced ends to said rods, nuts on said reduced ends adapted to bear against the frame, a guard-plate in front of said nuts a cross-bar on the other end of said rod system, rods connecting said cross-bar and movable bearings, springs intermediate the latter and said cross-bar, tenons on the frame adapted

to engage the slots in the rods with longitudinal play, and means for rotating the aforesaid cylinders comprising intermeshing toothed wheels in connection with the cylinders and intermediate driving-gear having its bearings directly fixed to the frame, substantially as described.

In witness whereof I have signed this specification in the presence of two witnesses.

HUBERT JOSEPH DEBAUCHE.

Witnesses:

A. HAY,

GREGORY PHELAN.