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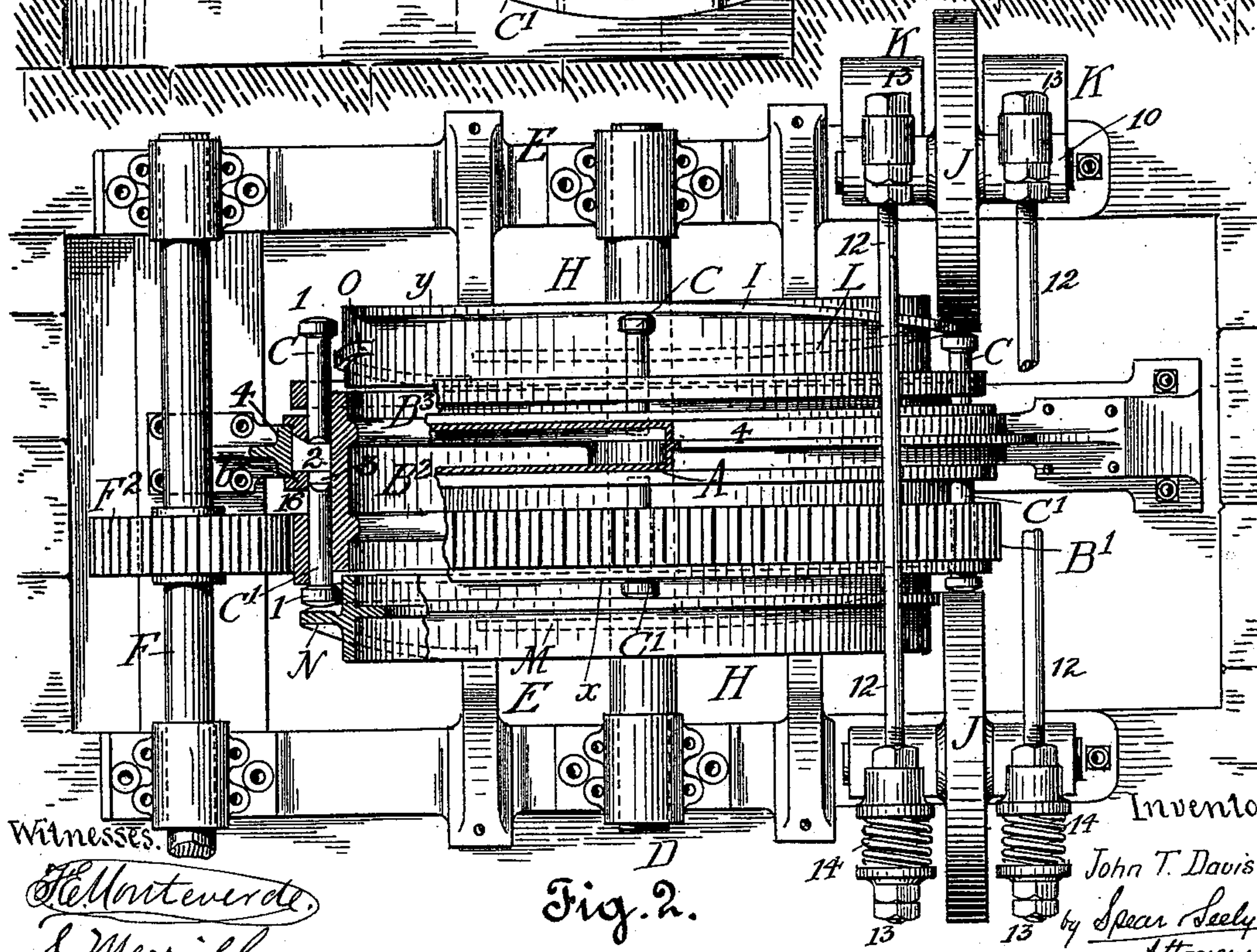
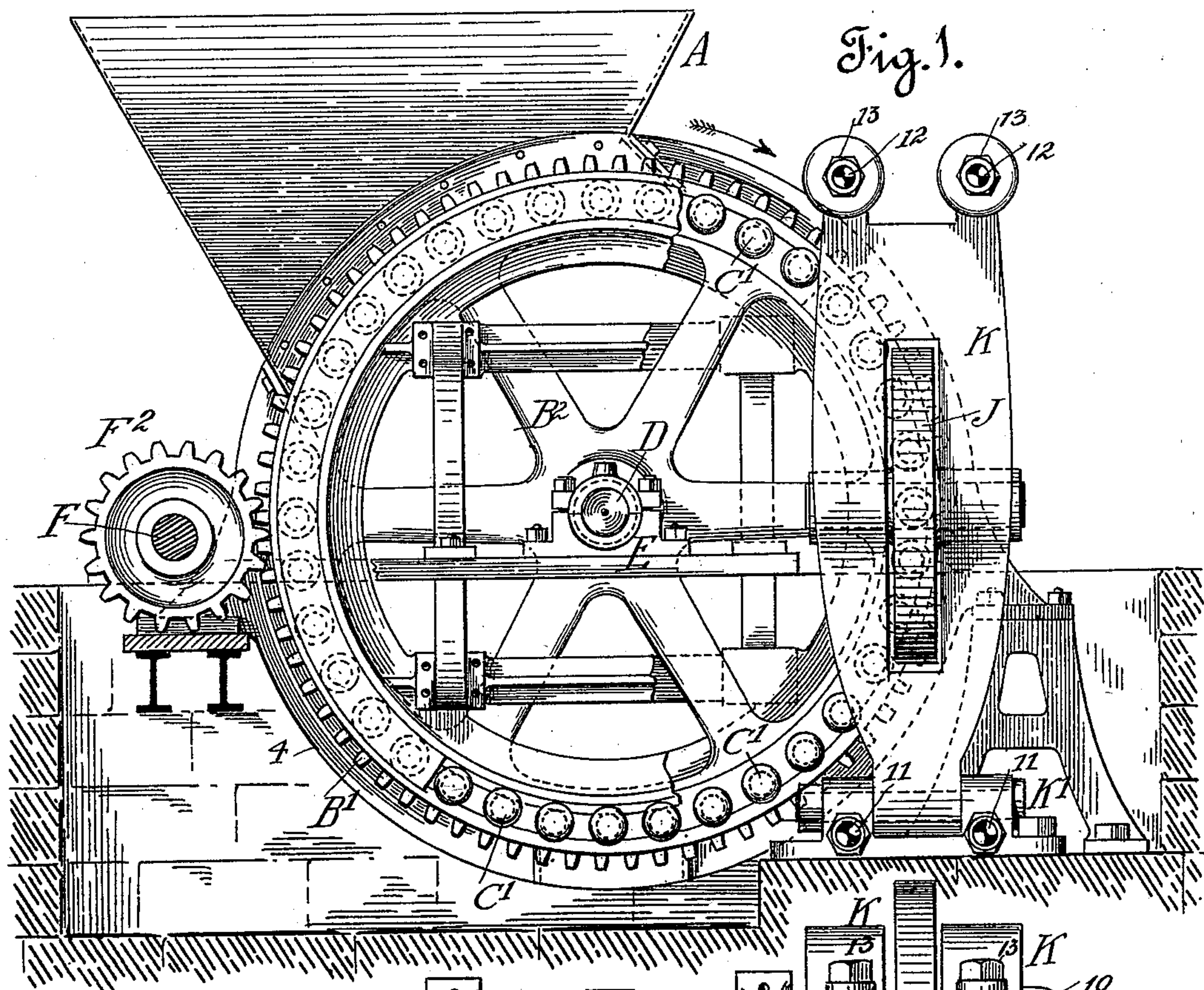
Patented Dec. 26, 1899.

J. T. DAVIS.
BRIQUET PRESS.

(Application filed Jan. 31, 1899.)

(No Model.)

2 Sheets—Sheet 1.



Witnesses.

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Fig. 2.

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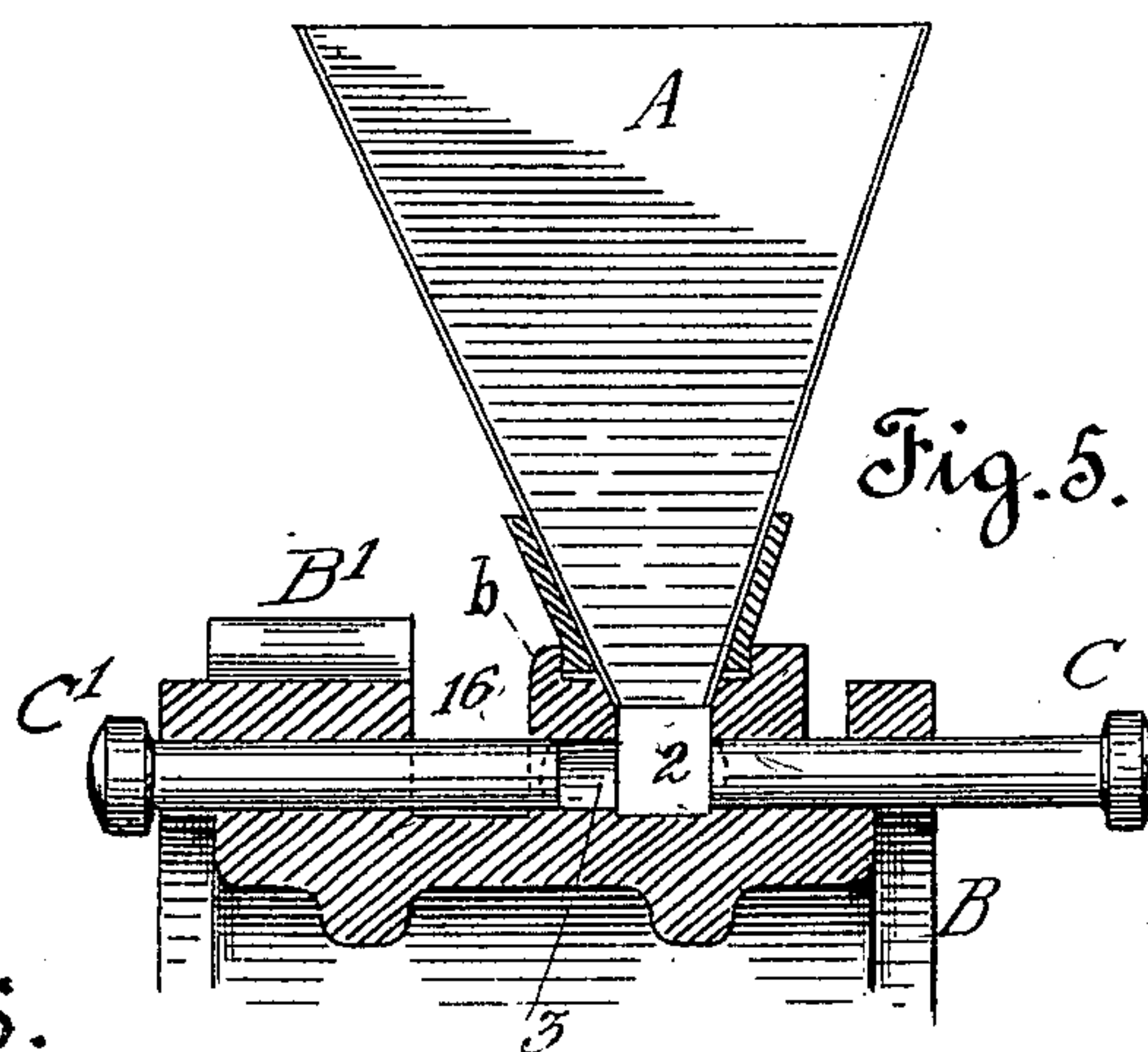
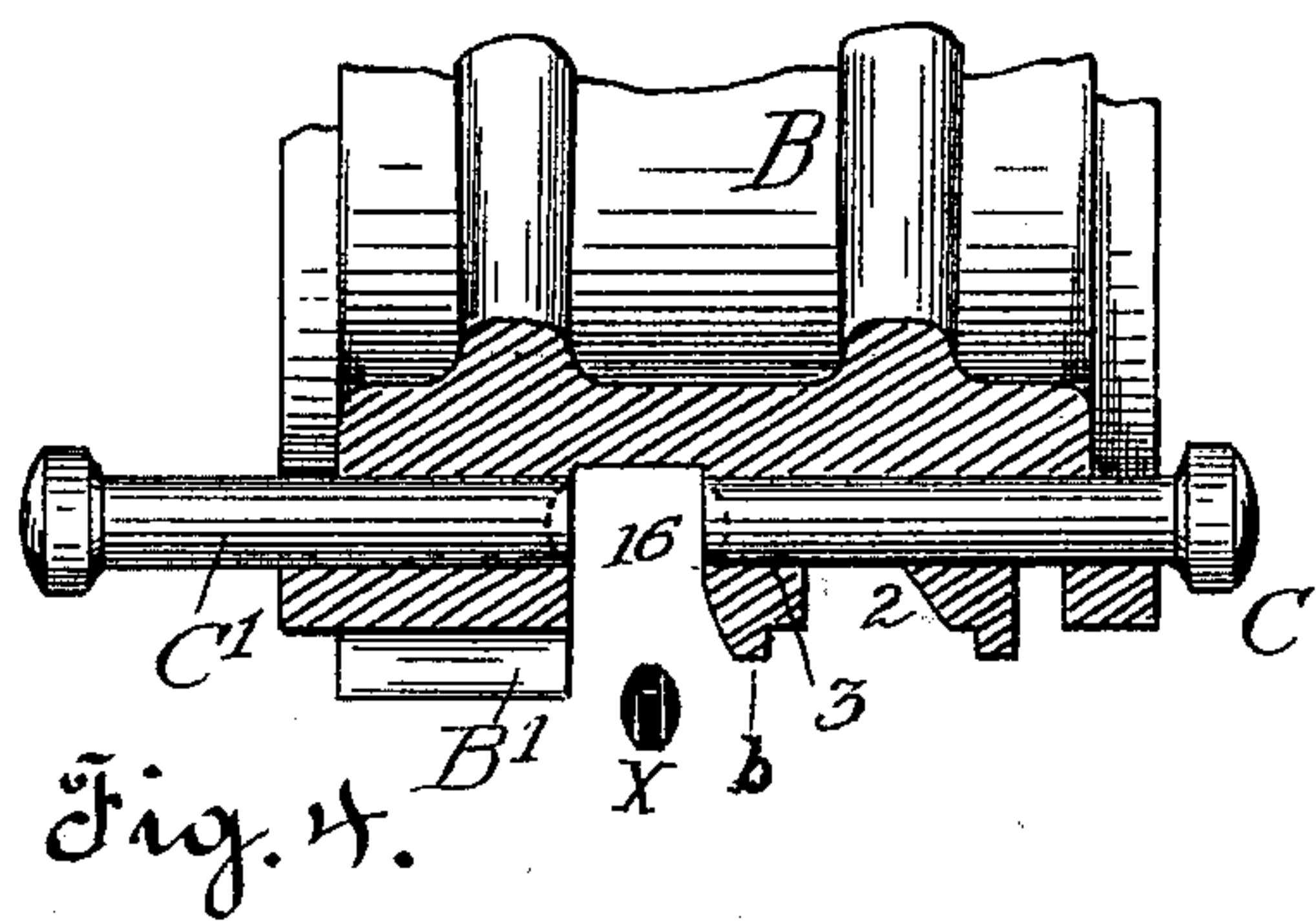
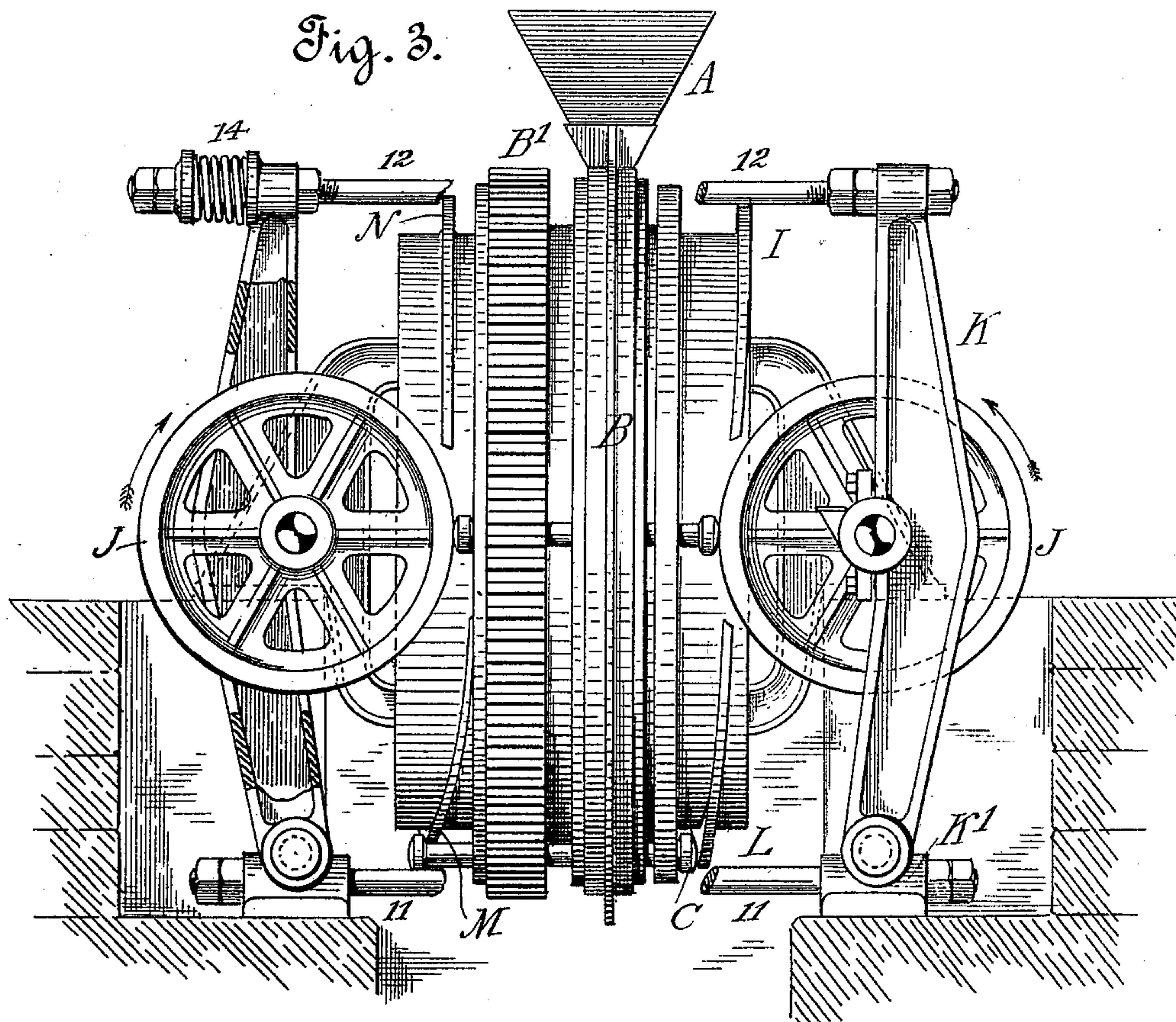
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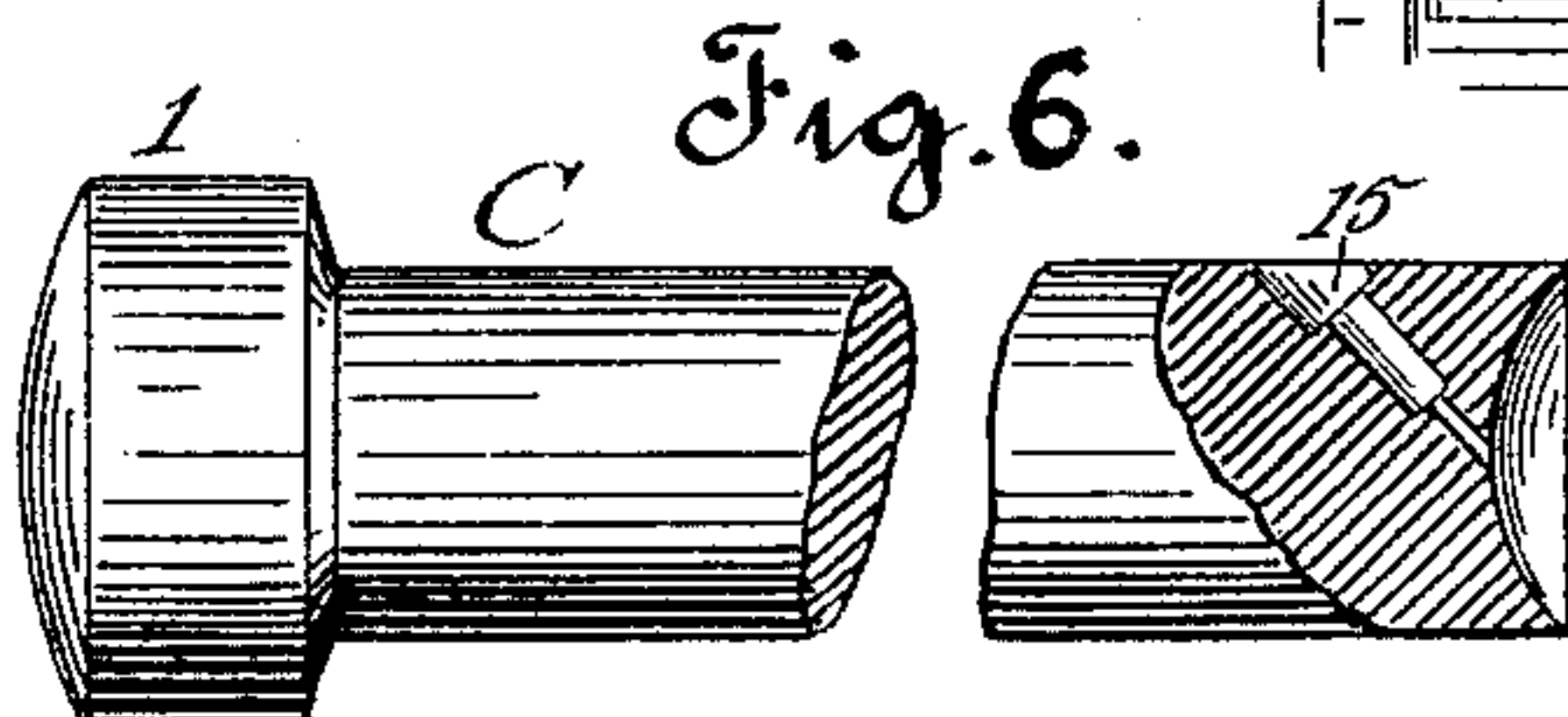
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(No Model.)

2 Sheets—Sheet 2.



Witnesses.
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UNITED STATES PATENT OFFICE.

JOHN THOMAS DAVIS, OF SAN FRANCISCO, CALIFORNIA, ASSIGNOR TO
JOHN TREADWELL, OF SAME PLACE.

BRIQUET-PRESS.

SPECIFICATION forming part of Letters Patent No. 640,109, dated December 26, 1899.

Application filed January 31, 1899. Serial No. 704,019. (No model.)

To all whom it may concern:

Be it known that I, JOHN THOMAS DAVIS, a citizen of the United States, residing at San Francisco, in the county of San Francisco and State of California, have invented certain new and useful Improvements in Briquet-Presses, of which the following is a specification.

My invention relates to machinery for molding and pressing material into forms and shapes, and as embodied herein has special reference to the manufacture of briquets or eggettes of artificial fuel. The composition of such a fuel is usually produced by combining low-grade material, such as culm or coal-dust, with other ingredients which act as a binder, forming a compressible mass.

The object of my invention is to form hard solid shapes from this or other material cheaply and with great rapidity.

I have embodied my invention in a mechanical structure, which I shall now proceed to describe and which is illustrated in the accompanying drawings.

Figure 1 is a side elevation of the machine. Fig. 2 is a plan view with parts in horizontal section. Fig. 3 is a front elevation. Fig. 4 is a section of the rim of the rotary wheel, showing the position of the pressing-plungers when discharging a briquet. Fig. 5 is a section of the wheel-rim at the point of feed. Fig. 6 is a detail view of one of the plungers.

The material is fed from a hopper A to the grooved periphery of a rotary wheel B. This wheel carries a large number of oppositely-movable compressing plungers or pistons C C', of which one concentric row or series is shown in the drawings, but which can be arranged in two or more concentric series in order to increase the capacity of the machine.

The wheel B is mounted on a shaft D, journaled in a supporting-frame E. It derives its rotation by being geared down from a shaft F, having a pinion F², which engages with a spur-gear B' on the periphery of wheel B. Fig. 2 best shows the construction of the wheel in its relation to the compressing-plungers. It must be wide enough to receive the gear B' and the feed and pressing recesses and also to provide bearings of suitable length for the sliding plungers. Hence it is preferably provided with a long hub, giving it steadiness

in rotation, and with the two series of spokes B² B³ to insure the necessary strength.

In the solid periphery of the wheel B and extending inwardly and parallel with the axis are formed holes or guides for the sliding plungers C C', provided with heads 1. The middle part of the rim is formed with an open feed-groove 2, the bottom of which is the solid part of the rim. Into this groove on one side open the guide-passages for the series of plungers C. Parallel with the feed-groove is an open discharging-groove 16. In the flange b, formed between the two grooves and communicating with both, is a series of molds 3 in line with the respective plungers. These molds are parts of the lateral passages formed in the solid metal of the rim and are approached and closed by the oppositely-movable plungers in the act of compression. The open feed-groove 2 is covered by a flanged guard-plate 4, which is continuous around the wheel excepting beneath the feed-hopper A. Thus the feed-groove is kept continuously supplied with the material as it revolves beneath the open hopper, the guard 4 retaining the material in place. The plungers C work against the mass of material, pushing the required quantity into the molds, and hence no accurate regulation of the feed is necessary, the plungers simply pushing the required amount of material automatically into the molds against the plungers C'. The feed-groove being constantly supplied there is always a mass of the material for the successive plungers to work upon. It will be understood that the material compressed by this machine is ordinarily composed of a low-grade base mixed with a binding composition and is in pulverized form, which feeds readily into the groove and molds, but which is of such character that under heavy pressure it assumes and retains any solid form and shape given to it. In the present machine the plungers are shown as cup-shaped, producing a briquet of the form shown in Fig. 4 at X.

The oppositely-moving plungers in this machine perform three separate functions or operations to complete the formation of a briquet. In the first place those on one side are caused to push the proper portion of material from the feed-groove into the molds and

to hold it there, both plungers keeping the open ends of such molds closed. In the second place they are caused to compress the material in such molds, and in the third place one of them is retracted while the other is pushed farther inwardly to discharge the pressed briquet through the open space 16. The first and last of these operations are caused by stationary cam-sections placed adjacent to the rim of the wheel and which bear against the heads of the plungers. The compression is produced by oppositely-placed rollers, between which the plungers are successively forced. While the hopper is delivering material to the feed-groove both plungers are withdrawn and are in the position shown in Fig. 5. For the sake of clearness I follow the operation of a single pair of plungers through a revolution of the wheel, the same operation being successive with the other pairs of the series. When the plungers arrive at the feeding-point, they are in the position shown in Figs. 2 and 5. The feed-groove is entirely open. The plunger C' is closing the mold 3. The plunger C is at the opening into the feed-groove. The material fills the groove and enters the molds. On each side of the wheel B is supported a hollow drum or frame H, each of which carries cam-sections shaped so as to compel the proper movements of the plungers by bearing upon or behind their heads. From the position of Figs. 2 and 5 to the position of Fig. 3 (where the pressing is done) the plunger C' remains stationary, as indicated by the straight line x in Fig. 2. The plunger C also remains stationary, as indicated by the straight line y , at the end of which it has passed beneath the hopper. At the same point the cam-section I bears upon its head and for a quarter-revolution forces it gradually inwardly across the feed-groove, pushing such material as lies in its path into the mold and against the plunger C'. Such material is then held between the two plungers and under a certain amount of compression. At the quarter-revolution the briquet is finally formed by an increase in pressure produced by a pair of rollers J J, between which the plungers are forced to pass. The construction of these rollers is fully shown in Figs. 2 and 3. Each roller is journaled in boxes 10 in standards K, hinged to a base-plate K', the opposite standards being tied by rods 11 and 12 and held by nuts 13. Strong pressure-springs 14 upon the upper rods are supplied to permit the standards to yield on their hinges to any abnormal pressure, such as might be caused by the presence of a lump of hard substance in the pulverized material. The amount of pressure produced by the passage of the pistons between these rollers depends upon the character and consistency of the material. The amount of pressure can, however, be regulated as desired by slight adjustment of the wheel-standards on the rod 12. The rollers cause both plungers to penetrate slightly into the molds, compressing the

material into the final shape of a briquet. The shape shown is a narrow cylinder (formed by the cylindrical wall of the mold) with rounded ends, (formed by the cup shape of the plungers, as shown in Fig. 4.) Each plunger has an oil-duct 15 to supply lubricant to the pressing-surface. Continuing their revolution and passing from between the rollers a cam L commences to push the plunger C still farther into the mold, while at the same time a cam M commences to retract the plunger C' by bearing behind its head. These motions continue until the plungers have arrived at the bottom of the wheel, at which time the briquet has been pushed entirely out of the mold and falls through the open space 16 in the rim, Fig. 4. The plunger C' has been retracted far enough to entirely clear this space. Both plungers then remain stationary until they approach to or about the three-fourths revolution, when a cam N pushes the plunger C' inwardly to close the mold, Fig. 5, while a cam O pulls the plunger C outwardly to the edge of the feed-groove. The plungers then pass beneath the hopper, and the described revolution is repeated.

I have described herein and illustrated in the drawings a practical embodiment of my invention, which nevertheless is not the only embodiment of which such invention is capable, since it is evident that modifications may be made therein by those skilled in the art without departing from its principle. I do not therefore limit myself to the construction shown and described, as I desire to avail myself of all modifications and equivalents that fall properly within the spirit of my invention.

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

1. In a briquet-press, a rotary wheel having a rim provided with a continuous groove, a series of molds opening from said groove, and oppositely-acting plungers movable transversely in said rim.

2. In a briquet-press, a rotary wheel having a continuous groove in its rim, and oppositely-acting plungers movable transversely in said rim, in combination with a feed-hopper opening into said groove and adapted to discharge material which is massed in said groove, and a guard-plate extending around the wheel from one end of the hopper to the other for closing said groove.

3. In a briquet-press, a rotary wheel having a feed-groove in its rim, and molds communicating with said feed-groove, in combination with a plunger having a bearing in said rim, and adapted to travel across the said feed-groove, and in conjunction with a second plunger to compress material in said molds.

4. In a briquet-press, a rotary wheel having a peripheral feed-groove and a series of molds opening into it, of transversely-movable plungers, and stationary cams for controlling the movements of said plungers.

5. In a briquet-press, a rotary wheel having a peripheral feed-groove and transversely-sliding plungers, of rollers situated in the path of said plungers for forcing said plungers simultaneously toward each other and thus compressing the material, and springs for holding said rollers in operative position.

6. In a briquet-press, a rotary wheel having a peripheral feed-groove and pressing-plungers, in combination with pressure-rollers adapted to act upon said plungers, and cams arranged relatively to said plungers for retracting one of said plungers and advancing the other, so as to discharge the completed briquet.

7. In a briquet-press, a rotary wheel having concentric series of plungers, arranged in oppositely-placed pairs and movable transversely in the wheel, in combination with a pair of pressure-rollers, and a yielding support for each roller, so arranged that said rollers shall stand in the path of said pairs of plungers and force them inwardly.

8. In a briquet-press, a rotary wheel having a concentric series of plungers, in combination with standards hinged at their bases, and carrying pressure-rollers, said rollers being arranged relatively to said plungers so that the heads of the plungers pass between and are operated by the said rollers.

9. In a briquet-press, a rotary wheel having a solid rim, an open feed-groove formed in said rim, a series of holes or passages extending through said rim from side to side and an open discharge groove or recess; in combination with oppositely-moving plungers, and

means for operating them, whereby they are caused to isolate portions of the material delivered to the feed-groove into a part of said passage, to hold such material there, to compress said material into a briquet, and finally to discharge the briquet through the said open discharge-groove.

10. In a briquet-press, and in combination with a rotary wheel and a concentric series of plungers working therein a pair of pressure-wheels, a pair of hinged standards in which said wheels are journaled, and springs for permitting said standards to yield upon their hinges.

11. In a briquet-press, a rotary wheel having a solid rim provided with parallel feed and discharge grooves, molds located in the flange between said grooves, transverse guide-passages in the rim of the wheel on both sides of and in line with said molds, plungers fitted to slide in said guide-passages, and means for operating said plungers.

12. In a briquet-press, a rotary wheel, oppositely-movable plungers in the rim thereof, a pair of rollers set in the path of said plungers for forcing them simultaneously toward each other, springs acting upon said rollers, and means for regulating the pressure of said springs.

In testimony whereof I have affixed my signature, in presence of two witnesses, this 14th day of January, 1899.

JOHN THOMAS DAVIS.

Witnesses:

L. W. SEELY,
JOHN TREADWELL.