D. C. McCAN.

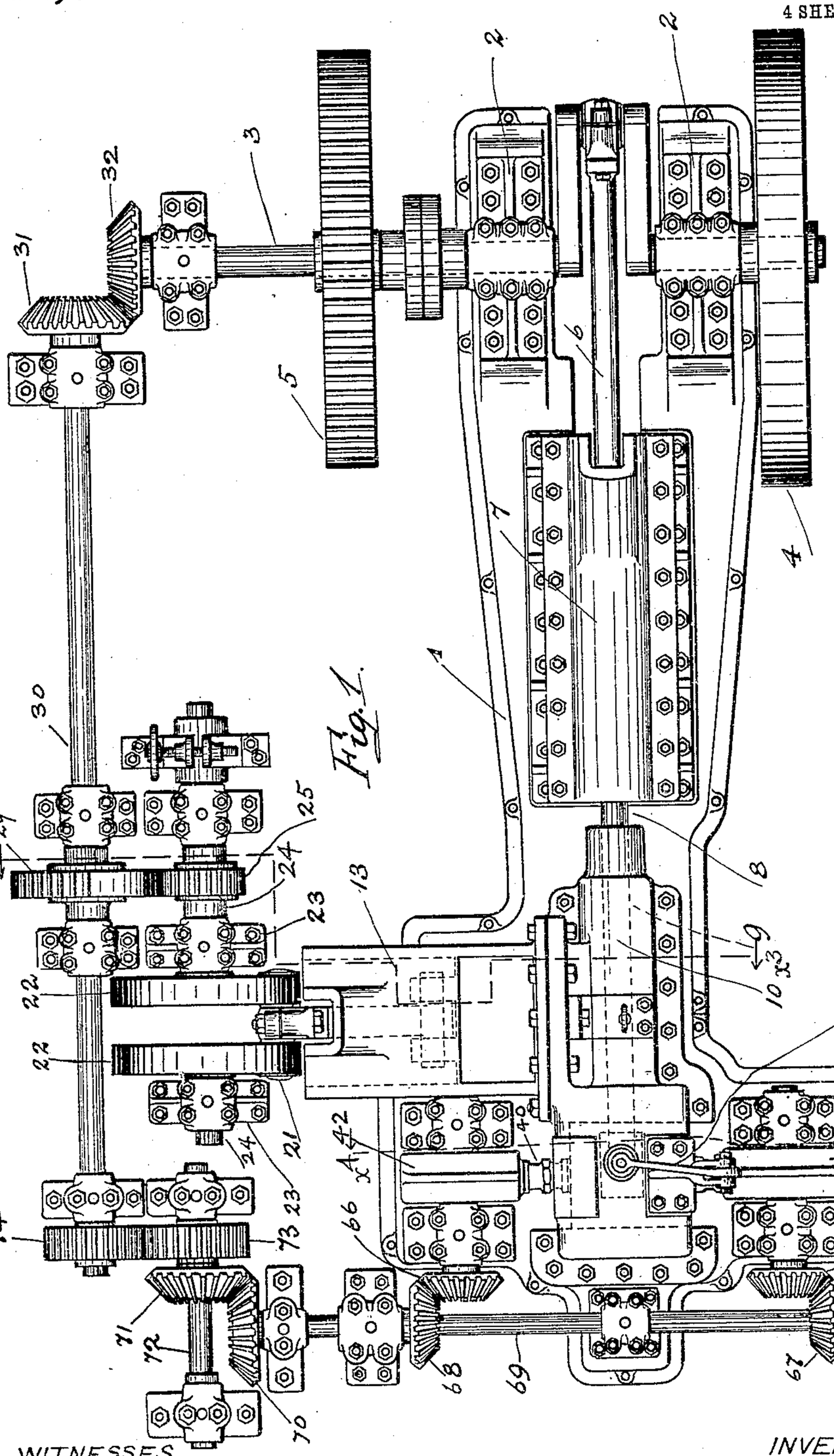
FUEL PRESS.

APPLICATION FILED SEPT. 22, 1909.

962,716.

Patented June 28, 1910.

4 SHEETS—SHEET 1.



WITNESSES

G. H. Bagueguiot

Fred Mertz

INVENTOR

David C. McCan

BY Anton Gloetzner

ATTORNEY

D. C. McCAN.

FUEL PRESS.

APPLICATION FILED SEPT. 22, 1909.

962,716.

Patented June 28, 1910.

4 SHEETS—SHEET 2.

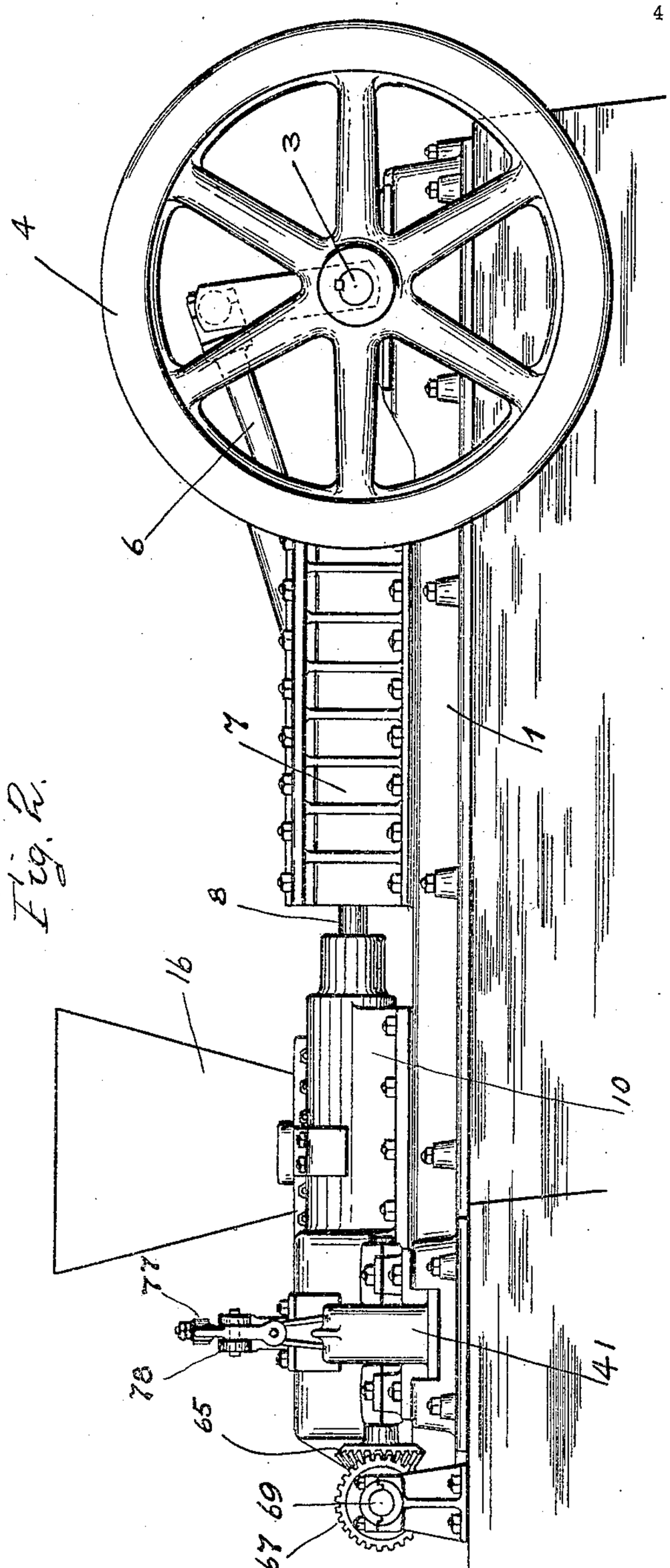


Fig. 2.

WITNESSES

A. L. Francis

Chas. A. Finks

INVENTOR

David C. McCan

BY Anton Gloetzner

His ATTORNEY

D. C. McCAN.

FUEL PRESS.

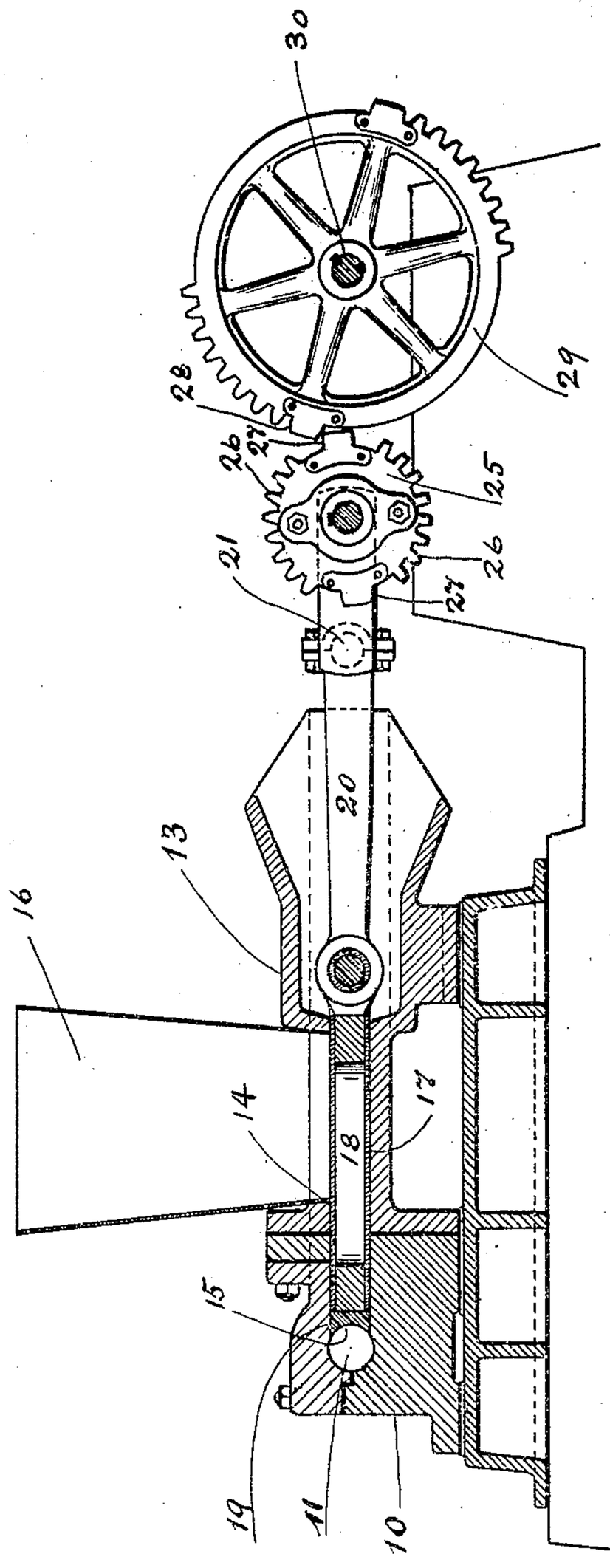
APPLICATION FILED SEPT. 22, 1909.

962,716.

Patented June 28, 1910.

4 SHEETS—SHEET 3.

Fig. 3.



WITNESSES

Geo. H. Barry

H. H. Glass.

INVENTOR

David C. McCan

BY Anton Gloetzner

his ATTORNEY

ANDREW B. GRAHAM CO., PHOTO-LITHOGRAPHERS, WASHINGTON, D. C.

D. C. McCAN.

FUEL PRESS.

APPLICATION FILED SEPT. 22, 1909.

962,716.

Patented June 28, 1910.

4 SHEETS—SHEET 4.

FIG. 5

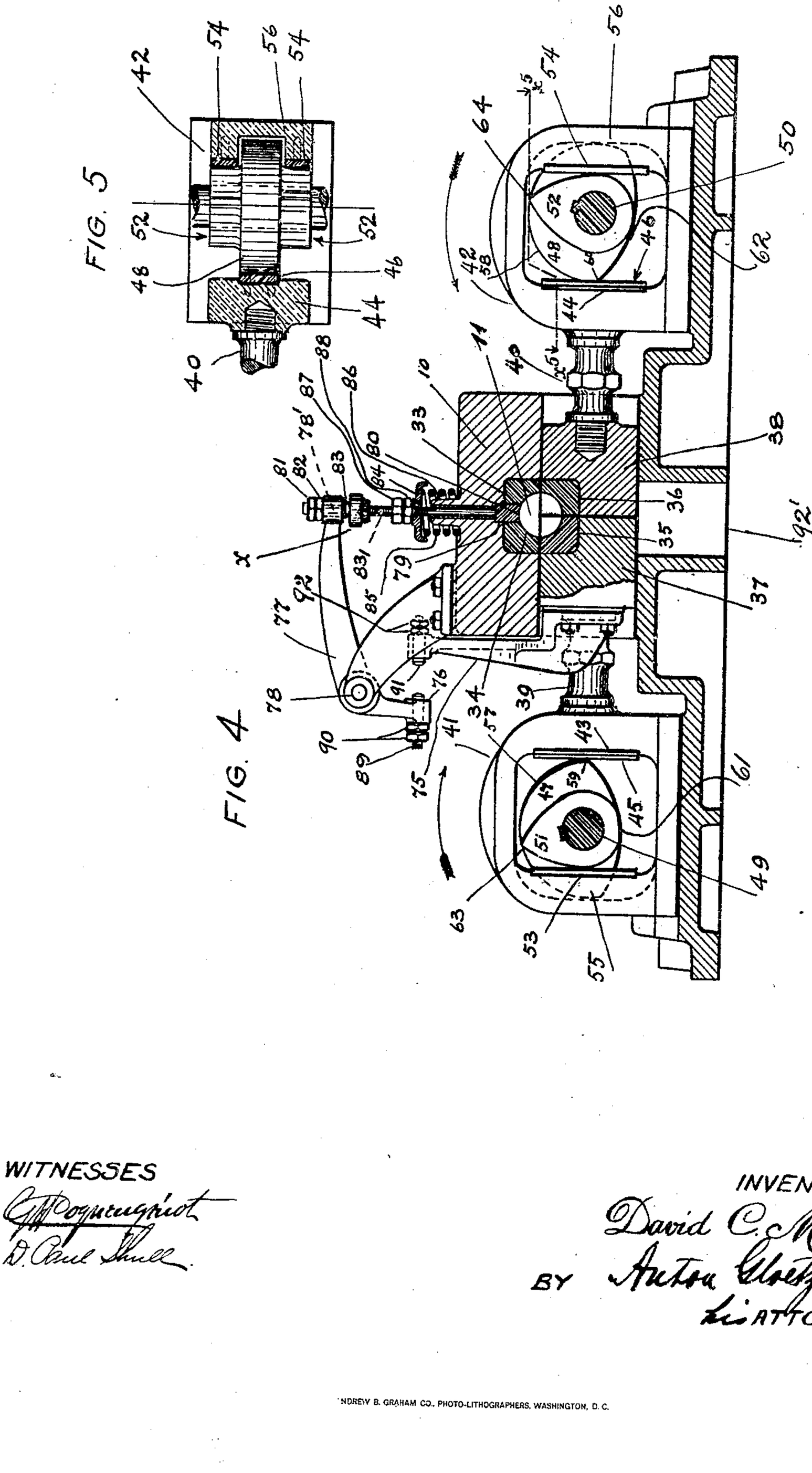


FIG. 4

WITNESSES

D. Paul Shull.

INVENTOR

David C. McCan

BY Anton Eberhardt

ATTORNEY

UNITED STATES PATENT OFFICE.

DAVID C. McCAN, OF LOS ANGELES, CALIFORNIA.

FUEL-PRESS.

962,716. Specification of Letters Patent. **Patented June 28, 1910.**

Application filed September 22, 1909. Serial No. 519,032.

To all whom it may concern:

Be it known that I, DAVID C. McCAN, a citizen of the United States, residing at Los Angeles, in the county of Los Angeles and State of California, have invented certain new and useful Improvements in Fuel-Presses, of which the following is a specification.

This invention relates to a press, and has particular reference to a machine for pressing waste material, such as shavings, sawdust and other carbonaceous substances into blocks for fuel purposes.

One of the objects of this invention is to provide a machine in which compression of a body or mass of loose material is effected in substantially two directions, namely horizontally and laterally, the lateral compression occurring at a time previous to the horizontal compression, thereby causing the actual pressure to be finally exerted on a mass that in itself is compact, and in which the particles of the mass are in a measure interlocked.

Another object of this invention is to provide a machine for making artificial fuel from waste material, in which a concentration of the strains due to high compression, eliminates the necessity for employing a binder in the product to cause cohesion of the shavings or other material composing the block.

Another object of this invention is to provide in connection with a machine for making fuel, an ejecting mechanism for discharging from the compression chamber the finished product.

With these and other objects in view, this invention consists of the features, details of construction and combination of parts as will be described in connection with the accompanying drawings and then be more specifically pointed out in the claims.

In the drawings, Figure 1, is a plan view of my invention. Fig. 2, is a side elevation of the same. Fig. 3, is a vertical section, on line x^3—x^3, Fig. 1, showing the hopper and the force feed mechanism operating in connection therewith. Fig. 4, is a sectional elevation on line x^4—x^4, Fig. 1, showing the movable sections of the compression chamber, and the means for operating the same, and Fig. 5, is a transverse section on line x^5—x^5, Fig. 4, showing the double acting cams for operating the sections of the compression chamber.

Specific reference being had to the drawings, 1, designates a sole plate having mounted thereon a plurality of pillow blocks 2, in which is journaled a crank-shaft 3, and on which is secured a fly wheel 4, and a cog wheel 5. Power is transmitted to said cog wheel 5 by a pinion, not shown, meshing with said cog wheel, and other mechanism for operating said pinion. Connected with said crank shaft 3, is a connecting rod 6 attached to cross head which operates in the guides formed on the inside of the housing 7 for the said cross head. 8 designates a plunger also connected to the cross head, and arranged to operate in a bore 9, provided in a cylinder 10, which is mounted on the sole plate 1, and to compress material in the chamber 11. Said plunger 8, is provided with a concave shoe, for the purpose of causing a centralization of the compression strains and a more intimate union with the wood particles.

Ordinary gravity cannot be depended upon to feed an amount of the material to be compressed to the compression chamber which is commensurate with the quantity capable of being compressed, and for this reason I have devised the force feed mechanism shown more clearly in the sectional illustration, Fig. 3. Bolted onto the side of the cylinder 10, and at right angles thereto, is a frame 13, provided with an aperture 14, which registers with a lateral aperture 15 in said cylinder 10. A hopper 16 is secured to said frame 13, and through this hopper waste material is fed to the receiving chamber 17, in the frame 13, in which receiving chamber a plunger 18 operates to force the material deposited therein from the hopper 16, into the compression chamber 11. The said plunger 18, serves not only to force material in the receiving chamber 17, but also forms one wall of the said chamber as seen in Fig. 3. For this reason, the end of the said plunger 18, is provided with a steel shoe 19 of concave contour to correspond with the cylindrical formation of the chamber 17. Pivoted to said plunger 18, is a connecting rod 20, which in turn is pivotally secured to a crank pin 21 mounted eccentrically of and between the disks 22, which are journaled in the pillow blocks 23. Since the aforementioned plunger 18, serves to form one of the walls of the receiving chamber 17, at the time of the compression stroke of the plunger 8, this wall or plun-

ger 18, must remain stationary and fixed during the compression of the material in the compression chamber 11. To accomplish this, I have mounted on the journal 24, in the pillow block 23, an intermittent gear 25, or a rotatory element, provided on diametrically opposite faces with teeth 26. Intermediate the terminus of each series or row of teeth 26, and also diametrically opposed, are two buffers 27, against which are arranged to impinge similar buffers 28, provided on a larger intermittent gear 29, which is keyed to a shaft 30, having a miter gear 31 which meshes with another miter gear 32 provided on the crank shaft 3, and through which motion is transmitted to said intermittent gears 25 and 29. The ratio of gearing of the intermittently engaging rotatory elements 25 and 29, being as two to one, it is obvious that the mutual engagement of the buffers 27 and 28 of the gears 25 and 29, and the resultant meshing of the gear teeth, will rotate the gear 25 for a half of its circumference, thereby causing either a forward movement of the feeding plunger 18, or a rearward movement of the same. The position of the plunger 18, and the crank 21, after having forced the material in the receiving chamber 17, is shown in Fig. 3, from which it will be seen that after the accomplishment of the forward movement of the plunger 18, the intermittent gears 25 and 29 are no longer meshed. In this position of the plunger 18, the compression plunger 8, begins to make the compression in the chamber 11.

When the gears mesh, the engagement of the faces will continue, until the plain surfaces thereof are reached. The smaller gear 25 being revolved half its circumference at each quarter revolution of the larger gear 29, will bring the crank 21 connected with the smaller gear, and its appurtenant parts, always on dead center, consequently giving two periods of rest, one to permit the material from the hopper 16, to fall into the path of the plunger 18, when it and the compression plunger 8, are retracted, and the other to hold the material in the receiving chamber 17, during the compression stroke of the plunger 8.

The compression chamber 11 is formed by a steel body 33 fixed within the main cylinder 10, which body has a concavity 34 designed to form a cylindrical chamber with the sections 35 and 36 which are fixed in the blocks 37 and 38 mounted and laterally slidable on the sole plate 1.

To prevent adhesion of the compressed block of fuel to the walls of the compression chamber 11, I have provided the ejecting mechanism shown more clearly in Fig. 4. Into the ends of the blocks 37 and 38 are screwed studs 39 and 40 which connect the boxings 41 and 42, slidably mounted on the sole plate 1. On the walls 43 and 44 of the boxings 41 and 42 are removably secured plates 45 and 46 against which, cams 47 and 48 are arranged to operate thereby to move the sections or blocks 37 and 38 in contact with each other at a time previous to the compression stroke of the plunger 8. Disposed on opposite sides of said cams 47 and 48, and keyed, together with said cams 47 and 48 on counter shafts 49 and 50, are cams 51 and 52 operating against plates 53 and 54 fastened to the opposite walls 55 and 56 of the boxings. In the position indicated in Fig. 4, the cams 47 and 48, traveling in the direction of the arrows, and engaging the plates 45 and 46, have forced the blocks or sections 37 and 38 toward each other, thereby closing the compression chamber 11. The circumferential peripheries 57 and 58 of the cams 47 and 48 being then in engagement with the plates 45 and 46 hold the blocks or sections closed during the compression of the material in the compression chamber 11, until by continued revolution, the points 59 and 60 of the cams 47 and 48 have cleared the plates 45 and 46. At the time that the elliptical faces 61 and 62 of the cams are passing the plates 45 and 46, the cams 51 and 52 engage the plates 53 and 54, causing thereby a retraction of the sections or blocks 37 and 38, this retractive movement of the blocks 37 and 38 continuing until the points 63 and 64 of the cams 51 and 52 have cleared the plates 53 and 54, at which time the cams 47 and 48 begin to close the blocks or sections. The counter shafts 49 and 50 on which the double cams are fixed, are provided with bevel gears 65 and 66 arranged in mesh with bevel gears 67 and 68, mounted on a counter shaft 69, on the end of which is keyed a bevel pinion 70 meshing with a bevel pinion 71 fixed on the counter shaft 72. Said counter shaft 72 also carries a spur gear 73 with which a spur gear 74 meshes, and through which spur gear, being fixed on the main driving shaft 30, motion is transmitted to the various elements connected therewith. On the section or block 37 is bolted an arm 75, arranged in line with one end 76 of a bell crank 77 fulcrumed in a support 78 provided therefor on the main cylinder 10. Through an eye 78′ provided in the other end of the bell crank lever 77, extends a pin 83 adjustable relatively to said bell crank end by nuts 81 and 82. An ejecting plunger 79 extending through the steel body 33, is provided with a head X against which said pin 83 is arranged to strike. This head X is adjustable on the screw threaded shank portion of the plunger 83. A dished disk 84 is also provided on said shank 83′ of the plunger 79, this disk being arranged to engage the helical spring 85 coiled about a projecting lug 86 on the main cylinder 10, and by

means of which helical spring the plunger 79 is held normally in inoperative position. To regulate the tension of the said spring 85, and also to hold said dished disk 84 in contact with said coil, I provide nuts 87 and 88. In the end 76 of the bell crank 77 is a stud 89 adjustable relatively to said bell crank end 76 by nuts 90, a similar stud 91 adjustable by nuts 92 being also provided in the end of the stationary arm 75, the purpose of which arrangement is to cause an earlier or a later contact of the two studs 89 and 91.

It is obvious from the above description that during the retractive movement of the block or section 37, the stationary arm 75 secured thereto, engages the bell crank 77, causing thereby a depression of the plunger 79 within the compression chamber 11, and ejecting the compressed fuel block from the said chamber, through the discharge opening 92′ in the sole plate 1. Upon the closing movement of said block or section 37, the spring 85 forces the plunger to its normal position, namely on a line with the curvature of the chamber 11.

What I claim, is:—

1. In a fuel press, a compression chamber formed in three sections, a plunger operating therein, means to force and compact material in the path of said plunger, intermittent gears connected with said forcing means to move two of said sections relatively to said third section, and means connected with one of said movable sections and said third section to eject the contents of said chamber therefrom.

2. In a fuel press, a main cylinder having a compression chamber formed in three sections, and a bore in communication with said compression chamber, a compressing plunger operating in said bore, a plunger disposed at right angles to and arranged to force and compact material in the path of said compressing plunger, means to hold said forcing plunger stationary during the compressive and retractive strokes of said compressing plunger, gears to operate said means, means to move two sections of said compression chamber relatively to the third section, and mutually coöperating means connected with one of said movable sections and said third section to eject the contents from said chamber.

3. In a fuel press, a main cylinder having a sectional compression chamber, a plunger operating therein, a hopper, a feeding plunger beneath said hopper arranged to force and compact material in the path of said plunger, intermittent gears to operate said feeding plunger, means to operate said gears, boxings connected with the sections of said compression chamber, and means in said boxings to open and close the sections of said compression chamber.

4. In a fuel press, a cylinder having a sectional compression chamber, a compression plunger operating therein, and intermittent feeding mechanism to force and compact material in the path of said compression plunger, ejecting means operating in said compression chamber, means to move the sections of said compression chamber, and means connected with one of said sections and controllable by the movement thereof in one direction to operate said ejecting mechanism.

5. In a fuel press, a cylinder having a sectional compression chamber, a bore in communication therewith, and a lateral aperture communicating with said bore, a compression plunger operating in said bore, a hopper frame disposed at right angles to said cylinder, a feeding plunger contained in said frame and arranged to operate in the aperture of said cylinder, said feeding plunger being arranged to force and compact material in the bore of said cylinder and in the path of said compression plunger, and also to close the aperture communicating with said bore, means to periodically reciprocate said feeding plunger, and means to open and close the sections of said compression chamber.

6. In a fuel press, a cylinder having a sectional compression chamber provided with rounded ends, and a bore communicating with said compression chamber, a plunger operating in the bore of said cylinder, said plunger being provided with a concave shoe, a feed plunger operating at right angles to said compression plunger to force and compact material in the path of said compression plunger, means to intermittently reciprocate said feed plunger to force material in said bore and hold said plunger in line with said bore, an ejecting mechanism operating in said compression chamber, a bell crank to operate said ejecting mechanism, means on one section of said compression chamber to operate said bell crank, and means to open and close said sections to control said ejecting mechanism.

In testimony whereof I affix my signature in the presence of two witnesses.

DAVID C. McCAN.

Witnesses:
H. H. Glass,
C. Poquengruote.