

D. SINGH.
 ROTARY TYPE BRICK AND BRIQUETTING PRESS.
 APPLICATION FILED AUG. 29, 1921.

1,408,310.

Patented Feb. 28, 1922.
 3 SHEETS—SHEET 1.

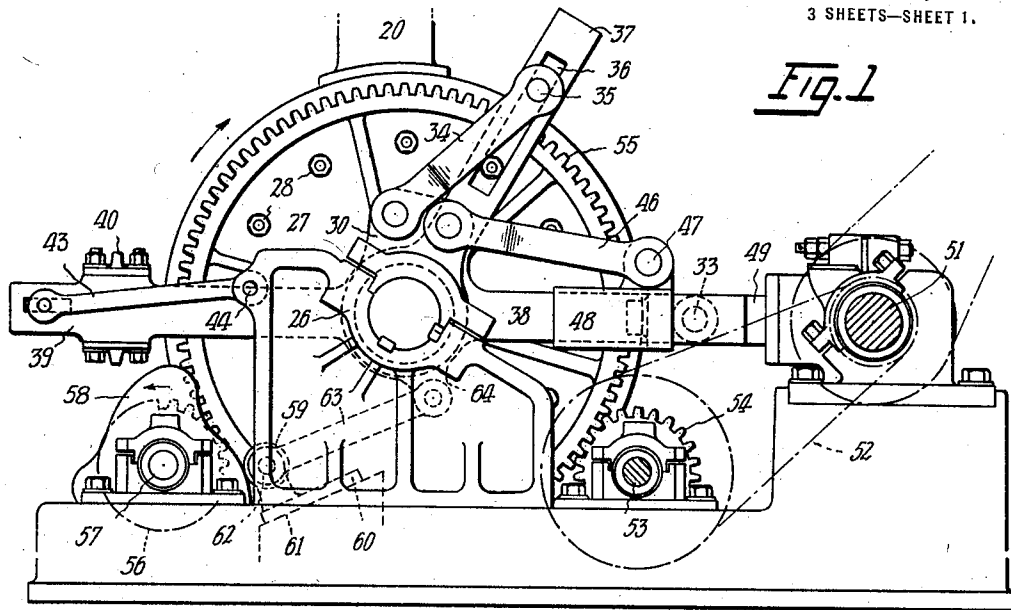


Fig. 1

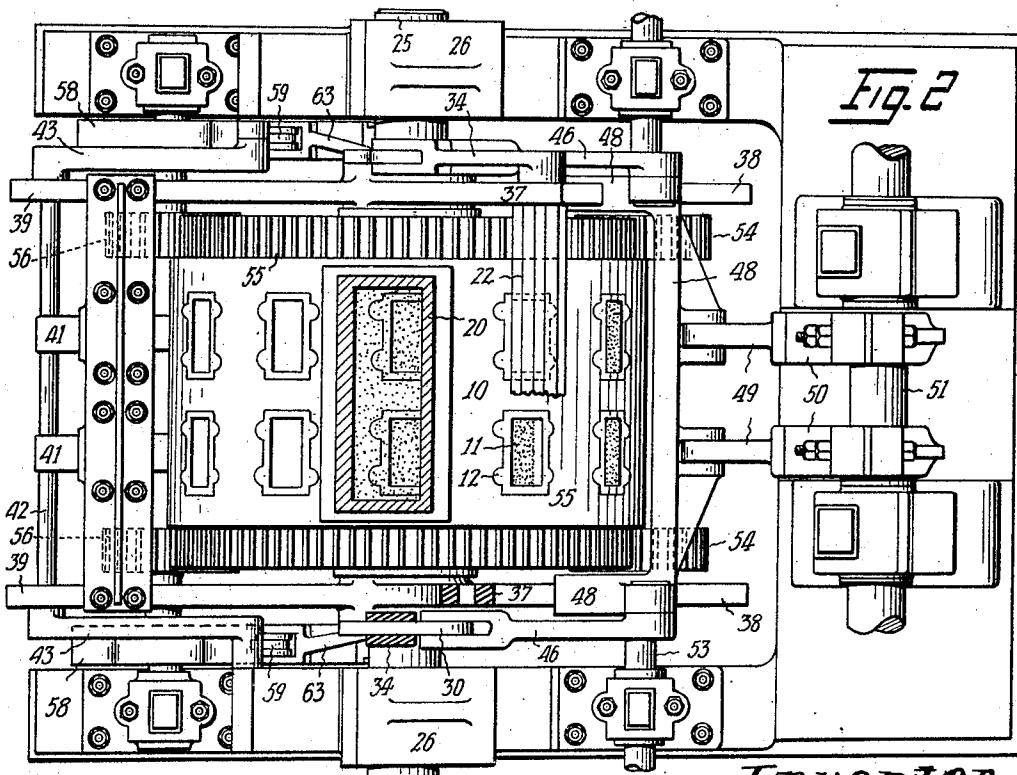


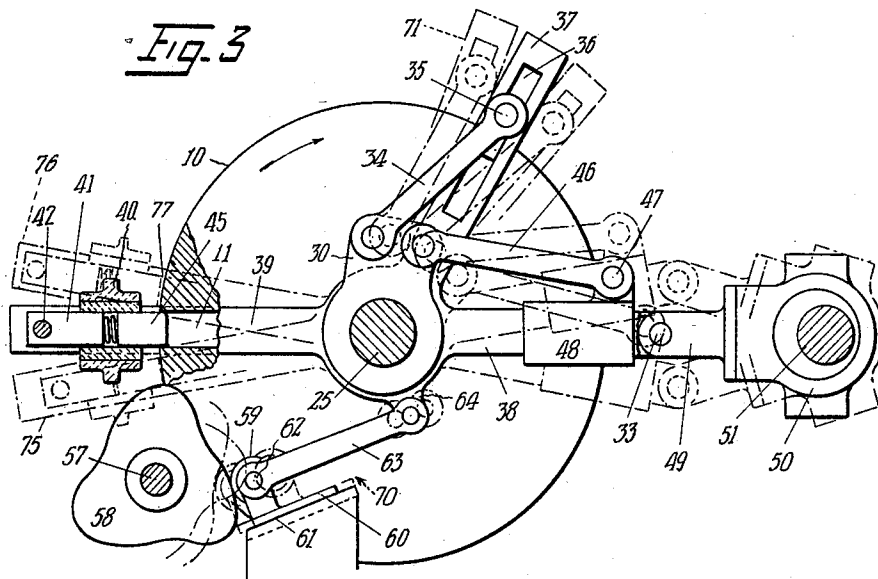
Fig. 2

Inventor
 D. Singh,
 By Mark Clark
 Atty.

D. SINGH.
ROTARY TYPE BRICK AND BRIQUETTING PRESS.
APPLICATION FILED AUG. 29, 1921.

1,408,310.

Patented Feb. 28, 1922.
3 SHEETS—SHEET 2.



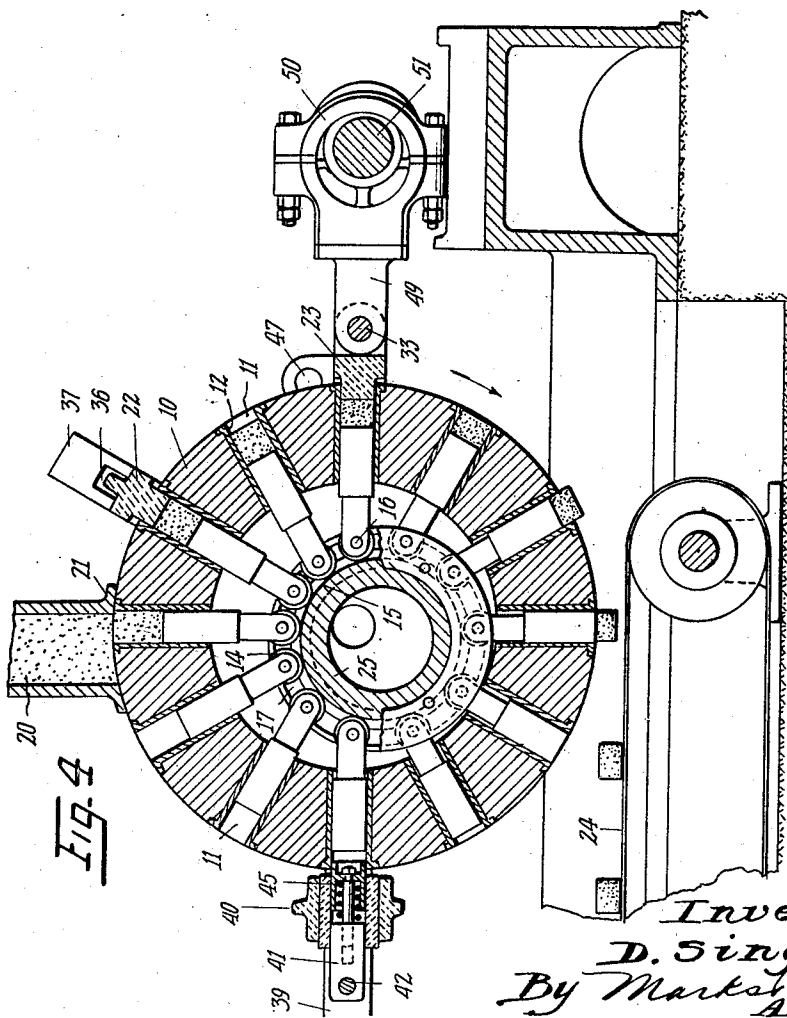
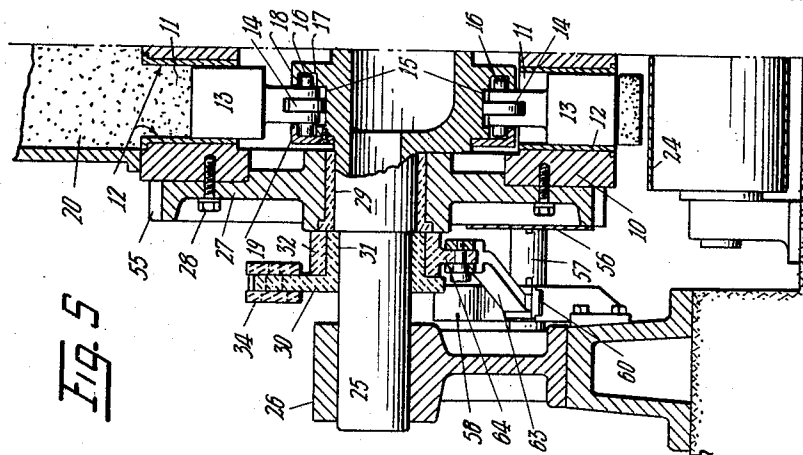
Inventor
D. Singh,
By Mark C. Clark
Attys.

D. SINGH.
 ROTARY TYPE BRICK AND BRIQUETTING PRESS.
 APPLICATION FILED AUG. 29, 1921.

1,408,310.

Patented Feb. 28, 1922.

3 SHEETS—SHEET 3.



Inventor
 D. Singh,
 By Marked Clerk
 Attys.

UNITED STATES PATENT OFFICE.

DELPH SINGH, OF SYDNEY, NEW SOUTH WALES, AUSTRALIA.

ROTARY-TYPE BRICK AND BRIQUETTING PRESS.

1,408,310.

Specification of Letters Patent. Patented Feb. 28, 1922.

Application filed August 29, 1921. Serial No. 496,354.

To all whom it may concern:

Be it known that I, DELPH SINGH, a subject of the King of Great Britain and Ireland, residing at Sydney, New South Wales, Australia, have invented certain new and useful Improvements in Rotary-Type Brick and Briquetting Presses, (for which I have filed applications in the Commonwealth of Australia No. 12751, filed Aug. 14, 1920; in France, in Belgium and in Great Britain,) of which the following is a specification.

This invention relates to machines for pressing dry plastic stock to produce building bricks or fuel briquettes.

It consists of a machine of that type in which radially disposed mould boxes are contained in rotary drum structures and in which plunger dies are caused to effect compression of the stock in said mould boxes during the rotation of the drum, the charge entering the mould boxes as same pass the loading position, and the pressed brick or briquette being ejected as the mould boxes pass the delivery position.

According to the present invention the inner plungers which form the bottom dies receive radial motion from the eccentric abutment within the drum, whilst the top dies are carried in a rocking frame to which a follow movement is applied by cam action, the primary dies effecting initial compression and the finishing dies applying final pressure through toggle and eccentric action.

In the accompanying drawings Fig. 1 is a side elevational view of the machine;

Fig. 2 is a top plan view of same, certain parts being shown in section for clarity of illustration;

Fig. 3 is a semi-diagrammatic view showing the oscillating die frame and its operating means;

Fig. 4 is a longitudinal vertical section; and

Fig. 5 is a half-transverse vertical section.

In the machine as shown in the drawings the drum 10 contains two courses of mould boxes 11—11, the moulds being arranged in pairs symmetrically, but it will be understood that the drum may contain only one such course of mould boxes or three or more courses, though in practice it will be probably found most effective with two courses of mould boxes as shown. These boxes are fitted with liners 12 which are replaceable. There may be any required number within

extreme limits of clearance of mould boxes in each course, but in practice twelve such boxes will be found to provide an effective and compact arrangement. In each box a bottom plunger die 13 is slidably fitted, and the lower ends of these dies are armed with rollers 14 adapted to run on the eccentrically disposed circular face 15 formed on the central portion of the drum shaft 25. The roller journals 16 run in guide grooves 17 in the ring flange 18 and the pinned on flange 19. In the rotation of the drum about the shaft the plunger dies 13 are caused to perform a cyclic movement. As each mould box attains the uppermost position immediately below the charging chute 20, the shoe 21 of which runs on the drum periphery, the plungers are at their lowest position, so that the stock runs from the chute 20 into the mould box and fills it as clearly seen in Fig. 4. As rotation of the drum continues, the mould boxes successively charged come into the range of the primary top dies 22 which operate to compress the stock in them, the plungers meantime gradually moving outward to the horizontal position where the final pressure is applied by the secondary top dies 23. From thence onward to the lowermost or ejecting position the bottom plungers 13 move downwardly forcing the pressed bricks or briquettes out through the moulds and discharging them on to a take off belt 24.

The shaft 25 is fixed in the bracket carriers 26; it is hollow and, as already described, its central portion is eccentrically disposed to form the grooved eccentric track on which the plungers 13 take their working abutment. The barrel 10 is carried on cheeks 27 pinned up to it as shown at 28; these cheeks taking their bearing on bushes 29 at either side of the machine, said bushes being fitted on the shaft 25. Between the bracket carriers 26 and the drum cheeks, the die cranks 30 mounted on the sleeved portions 31 of the die crank eyes, and the collars 32 of the rocking frame are mounted. Each die crank is connected by a link 34 to the cross head pin 35 of the primary dies 22, the cross head working in slots 36 in the guide horn 37, said guide horn forming part of the rocking frame 38. The rocking frame 38 is extended rearwardly at 39 and carries the cross beam 40 in which are mounted plungers 41, one for each course of moulds. A cross pin 42 passing through these plun-

gers is connected by free links 43 to the frame at 44 and each plunger is fitted with a spring loaded head 45 adapted to enter the mould box for a purpose herein described. Each die crank 30 is also connected by a link 46 and a cross head pin 47 to a sleeve frame 48. This sleeve frame carries the finishing dies 23 and it is connected by wrist pins 33 to the connecting rods 49 on eccentrics 50 on the main shaft 51. The main shaft is geared by a chain 52 to the intermediate shaft 53 which carries spur gears 54 intermeshing with the spur gears 55 on the sides of the drum, and these gears 55 in turn mesh with the spur gears 56 on the way shaft 57 to which are keyed the cams 58 which function to apply oscillating motion to the frame 38. This motion is applied by the cams 58 through contact rollers 59 on slipper guides 60 working on the angular slipper faces 61, the pins 62 being carried in the eyes of the rock links 63 which are pin connected to the lugs 64 on the oscillating frame 38. The sleeve frame 48 is adapted to slide on the horizontal portion of the oscillating frame 38. The gearing proportion is related throughout to procure correct timing of the movements of the various parts. The way shaft 57 is geared 4:1 from the drum wheels 55 and as each cam 58 is a three lift cam it will therefore apply twelve movements to the oscillating frame for each rotation of the drum, these twelve movements corresponding with the number of die boxes contained in each course, that is twelve.

The operation is as follows:—Commencing from the point at which the cams 58 are at maximum lift and the slippers 60 in their extreme forward position, as shown by the dotted line at 70 Fig. 3, the guide horn 37 is in the dotted position shown at 71 Fig. 3, and one of the mould boxes in each course, having received its charge of stock is moved clear from the lip at the foot of the charging chute 20. In this position the rear arms 39 of the rocking frame are in the down position shown at 75, Fig. 3, and the spring plungers 45 are bearing against the face of the drum 10. As soon as one of the mould boxes comes into alignment with a plunger 45 the plunger enters it. It will be noted that the plunger heads 41 are pulled inward when the arms 39 are swung downward, this inward pull being effected by means of the links 43 which, owing to the downward movement of the arms 39, are thrown into an angular position virtually foreshortening the position of the pin 42, drawing it towards the drum and therefore applying pressure to the heads 45. Rotational movement of the drum acting through the plungers 45 and the arms 39 moves the frame 38 with the drum, thereby holding the horn guide 37 and the sleeve guide 48

in alignment with two of the mould boxes in each course. Meantime, the rotation of the main shaft 51 continuing and reciprocating motion being transmitted therefrom through the connecting rods 49 to the sleeve frame 48, the secondary dies 23 are forced into the mould boxes in which they are engaged, whilst the primary dies are similarly forced into the mould boxes in which they are engaged, the primary die movement being applied from the sleeve frame 48 through the links 46, the die cranks 30 and the links 34. When the horizontal position is passed the retiring movement of the sleeve frame 48 effected by the outward movement of the connecting rods 49 operates to turn the cranks 30 so that the primary dies 22 are drawn out of the mould boxes in which they were engaged simultaneously with the withdrawal of the secondary dies 23 from the mould boxes. At the moment after the dies are clear of the drum face the upper position 76 of the rocking arms 39 is reached. In this position the spring plungers are withdrawn owing to the angular movement of the links 43, clearance being shown at 77. At this point each roller 59 is bearing in one of the depressions of the cams 58. Immediately thereafter the cam rotation operates to apply reverse oscillation to the oscillating frame 38 through the link motion 63 and the same cycle of operation is repeated, the primary and secondary dies successively entering the successive moulds and applying secondary pressure on the stock therein. As the moulds carrying the finally pressed stock leave the secondary dies 23 the outward movement of the bottom die plungers 13 continues and the bricks or briquettes are gradually forced out of the mould boxes and as the mould boxes successively reach the bottom position the finished bricks or briquettes are ejected therefrom on to the take off belt 24.

It will be understood that the cam shape, the clearances, the timing, and the angular adjustment of the parts must be carefully related so that each of them coact in unison to procure the required movements of the oscillating frame and the primary and finishing dies, and similarly that the movements of the bottom die plungers must be appropriately related to the movements of the top dies, having regard also to the position of the moulds in relation to the charging hopper and the take off belt.

What I claim as my invention and desire to secure by Letters Patent is:—

1. A rotary press of the type herein defined, characterized in that the stock is received by gravity into moulds located radially in a rotating drum, that primary and secondary dies are carried in an oscillating frame, and that said frame is caused to oscillate in stage movements by

cam action and is automatically interlocked with the drum during its movements in one direction, that pressure is applied to the secondary dies from eccentric mechanism co-acting directly on a sleeve frame and through linkage and free cranks to the primary dies substantially as herein described.

2. A press of the type herein described having a fixed axle with its central portion 10 eccentric to its flank portions, fixed bearings for said axle, a drum containing one or more courses of mould boxes arranged radially therein adapted for rotation about said axle, bottom plunger dies acting in said 15 moulds and operated by eccentric action in rolling over the eccentrically disposed portion of said axle an oscillating frame 38 with rear tail 39 mounted on the axle centre, free cranks 30 also mounted on the axle 20 centre, cams 58 acting through linkage 63 on said oscillating frame, a sleeve frame 48 carrying the final dies, linkage connecting the free cranks 30 to the primary dies, horn guides 37 for said primary dies and con- 25 necting rods 49 acting on the sleeve frame 48 for applying motion to said dies, a cross

beam 40 carried by the oscillating frame arms 39, linkage 43 controlling spring plunger movements in said cross beam, and means for applying timed rotational move- 30 ment to the shaft governing the movements of the connecting rods 49, the shaft carrying the cams 58, and the drum 10.

3. A press of the type herein described, comprising a drum such as 10 having a 35 course or courses of mould boxes therein said drum adapted for rotation on an axle having an eccentric portion, with bottom plungers 13 in said moulds controlled by the movements of their heels on the eccen- 40 tric portion of said shaft, in combination with connecting rods 49 acting through a frame 48 and free cranks 30 with intervening linkage to apply plunging movement to the top dies, and an oscillating frame 37, 45 38 and 39 with locking means on one of its members and oscillating means dependent upon cam motion coacting substantially as herein described with reference to the ac- 50 companying drawings.

In testimony whereof I affix my signature.
DELPH SINGH.