

J. North.
Brick-Machine.

N^o 72220

Patented Dec. 17, 1867

Fig. 1

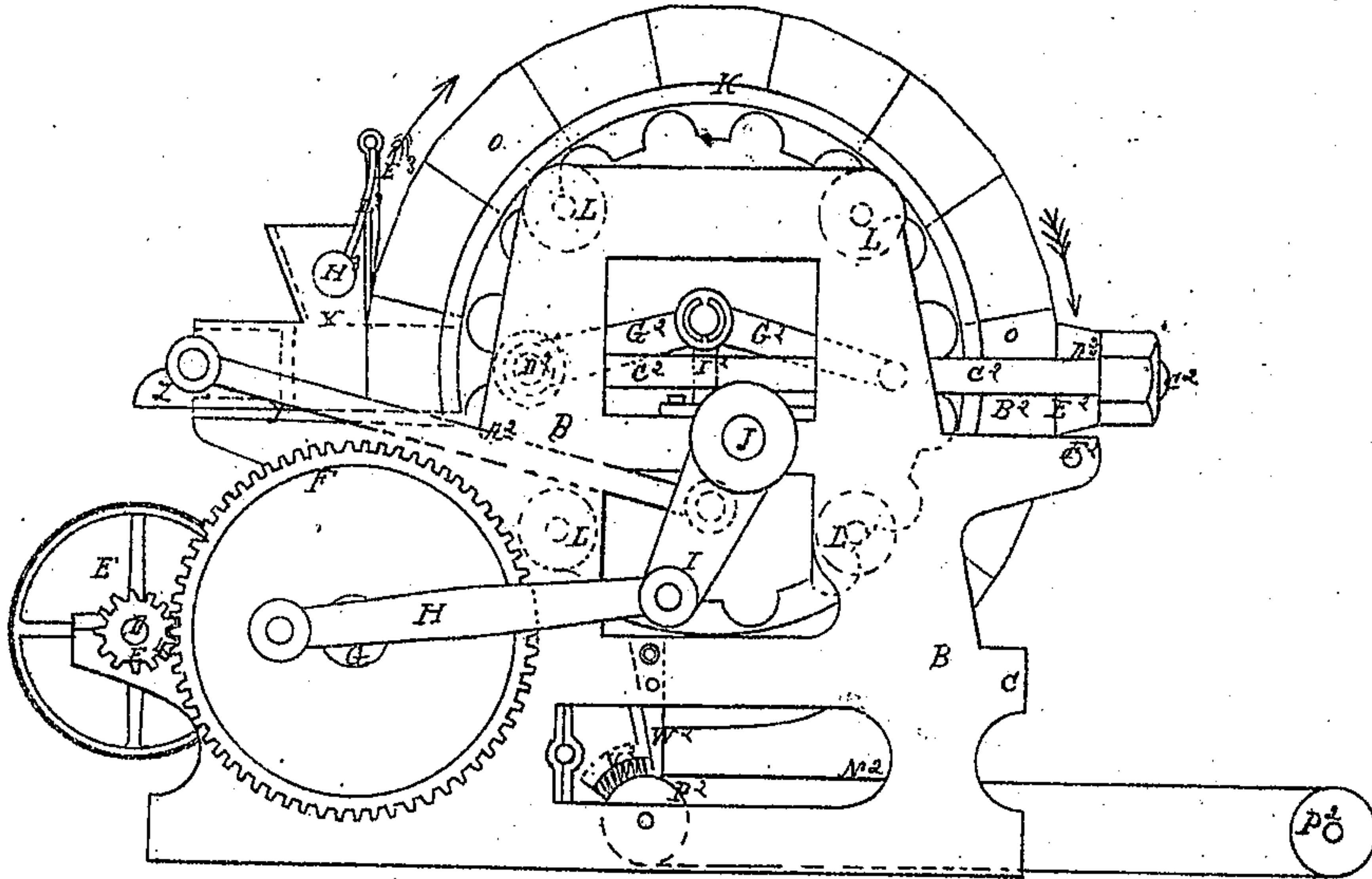
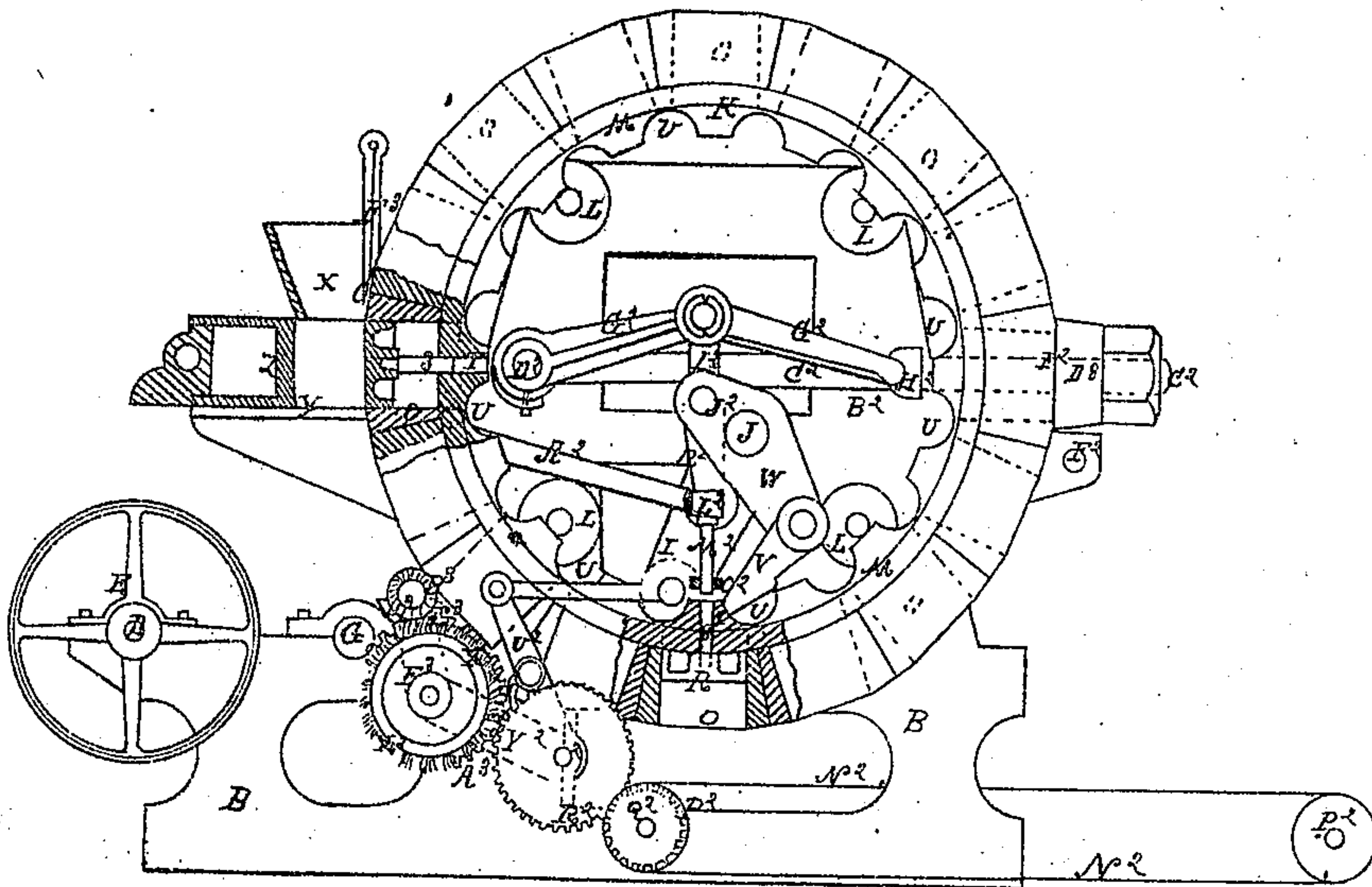


Fig. 2



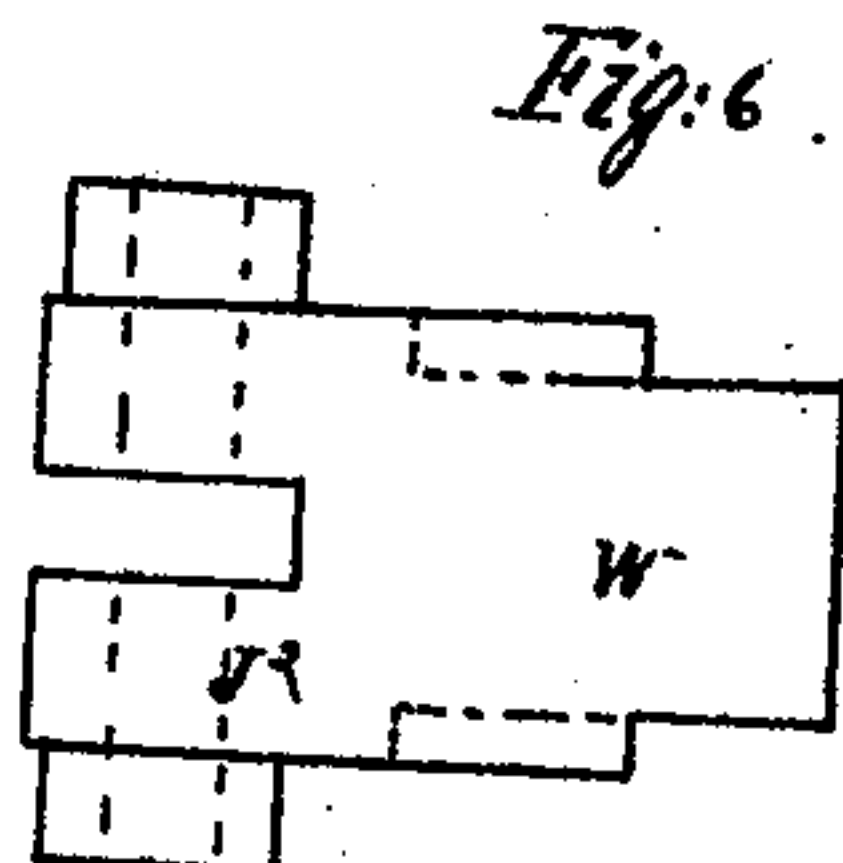
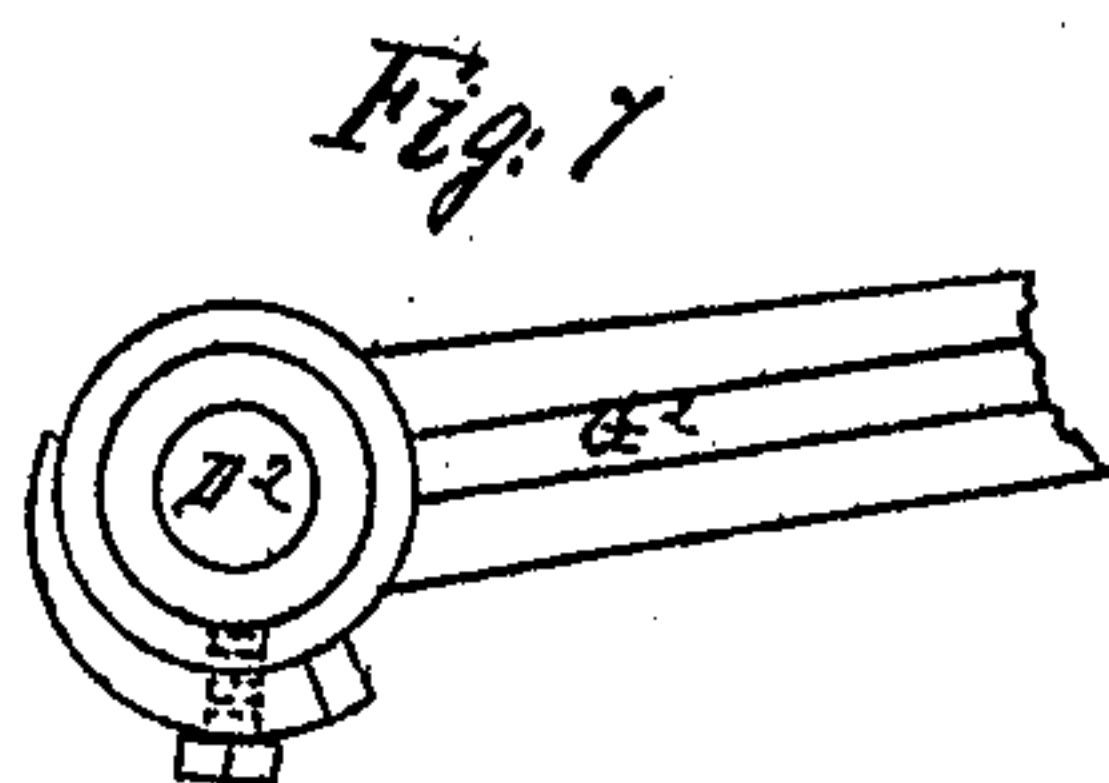
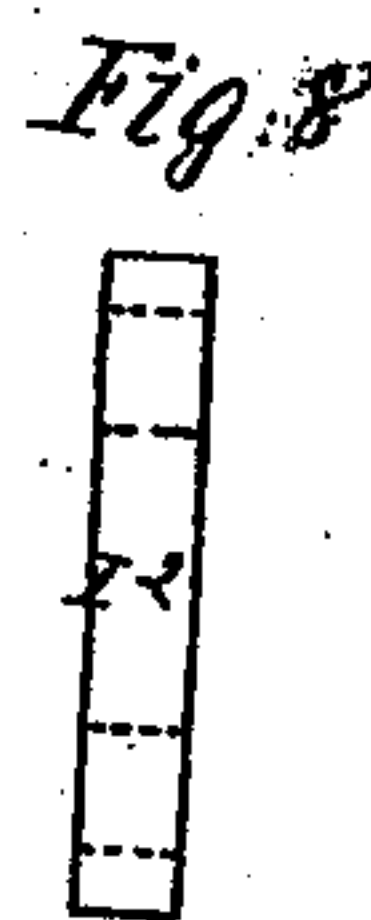
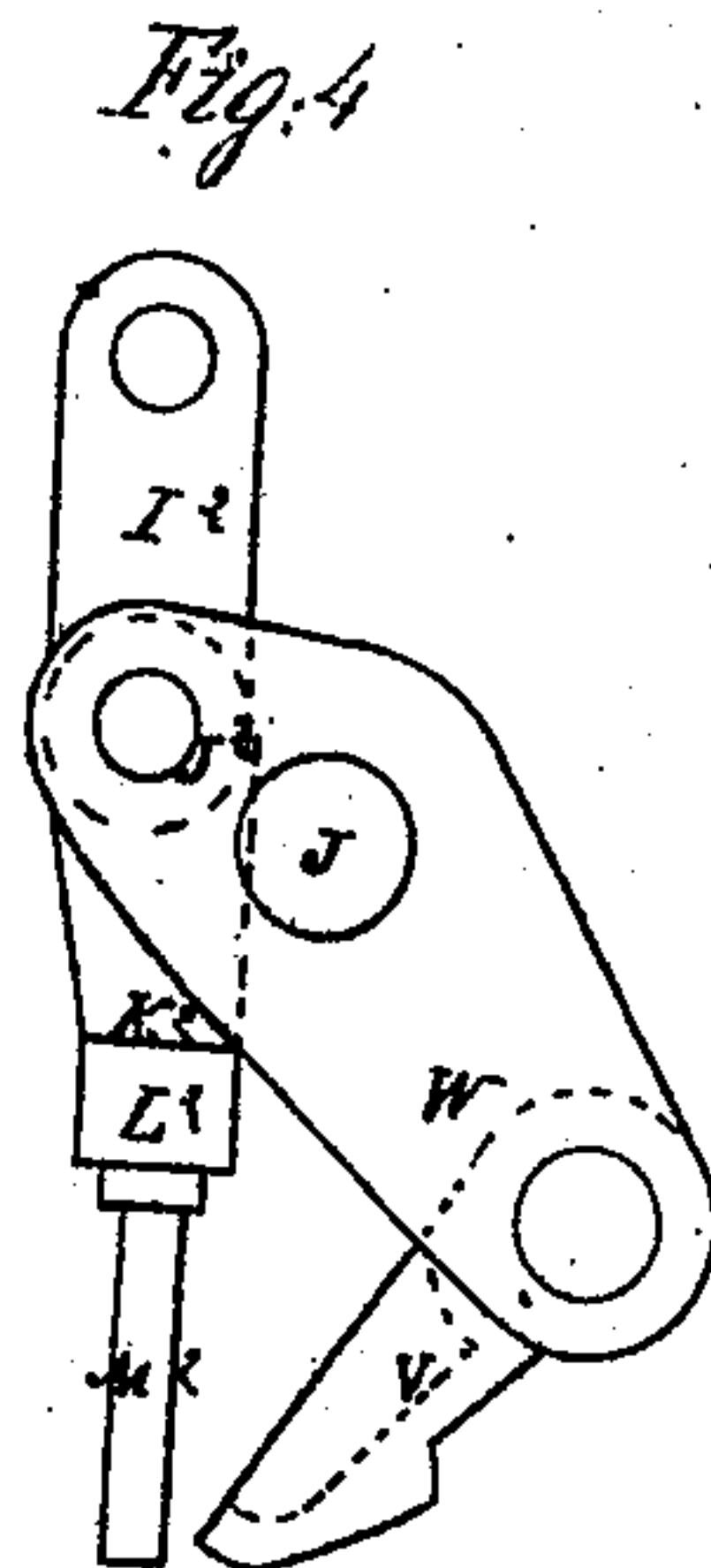
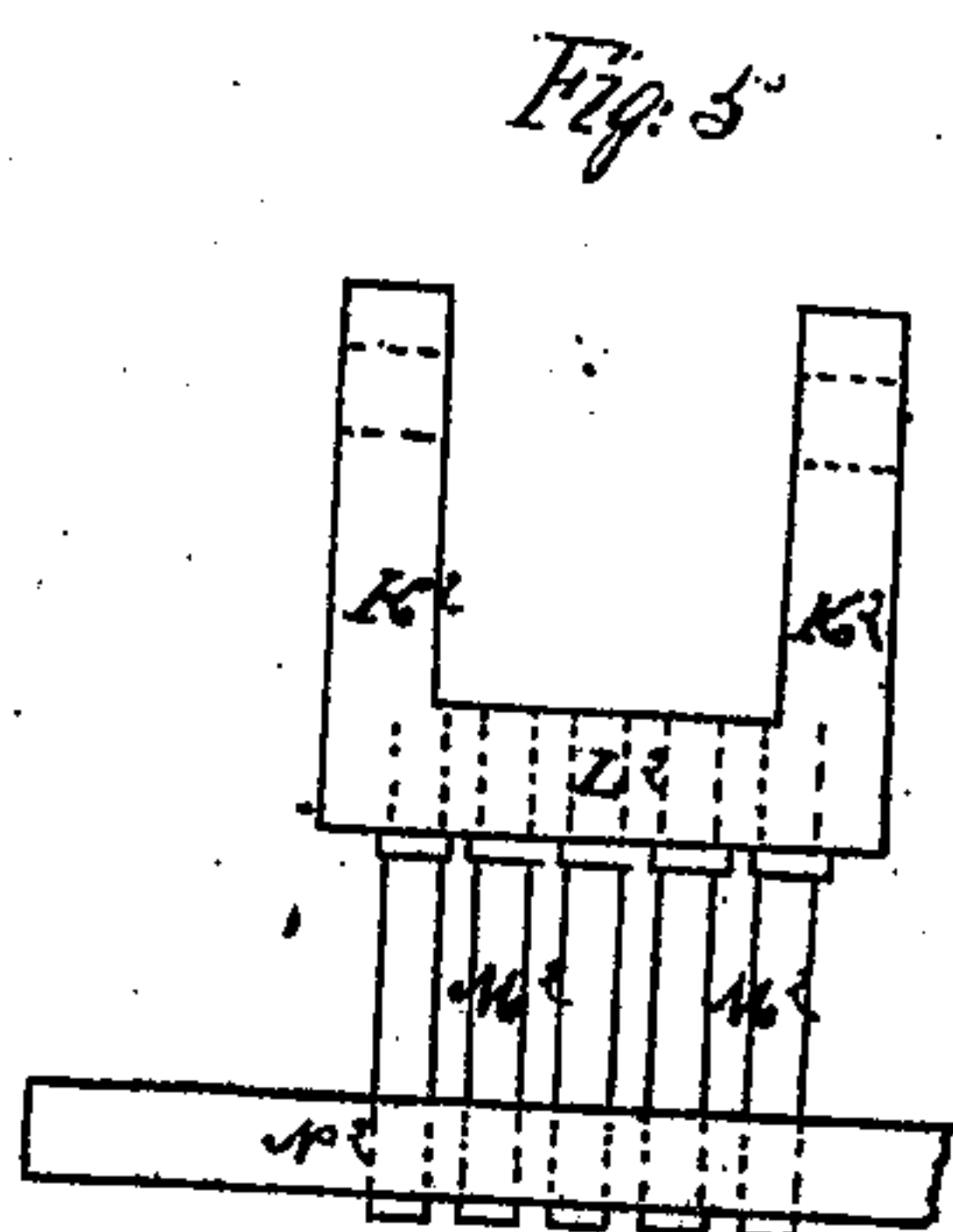
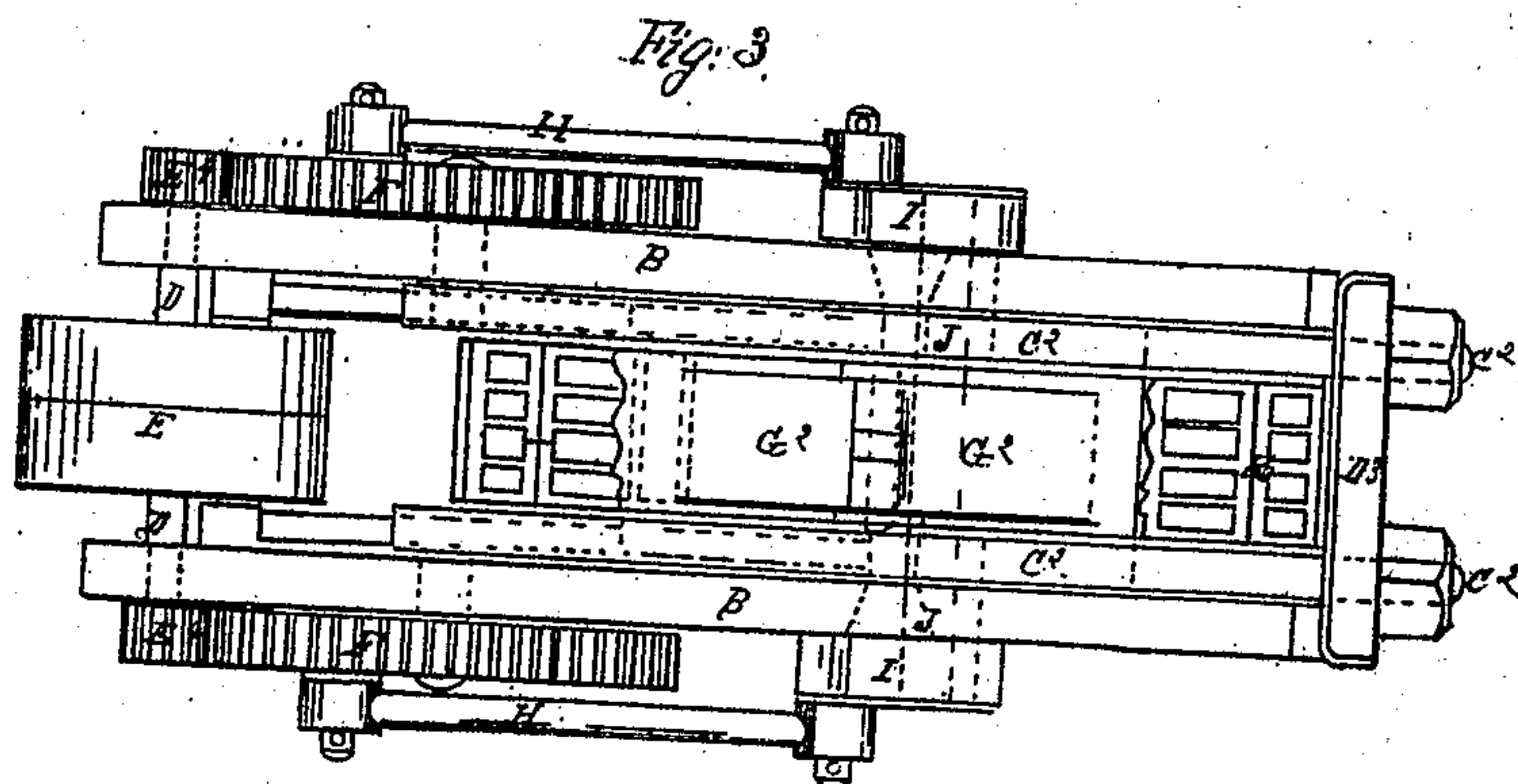
Witnesses
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United States Patent Office.

JOHN NORTH, OF NEW YORK, N. Y.

Letters Patent No. 72,220, dated December 17, 1867.

IMPROVED BRICK-MACHINE.

The Schedule referred to in these Letters Patent and making part of the same.

TO ALL PERSONS TO WHOM THESE PRESENTS SHALL COME:

Be it known that I, JOHN NORTH, of the city, county, and State of New York, have invented certain new and useful "Improvements in Machines for Pressing or Moulding Bricks, Tiles, or other Blocks, from clay or other material or materials," and that the following description, taken in connection with the accompanying drawing, forms a full and complete specification, wherein I have set forth the nature and principles of my said improvements, whereby my invention may be distinguished from all others of a similar class, together with such parts as I claim and desire to have secured to me by Letters Patent.

The improvements embraced in the present invention relate to that class of machines for the pressing or moulding of bricks, tiles, or other blocks from clay or other material or materials, in which a wheel or other frame is arranged to move in a circular plane, and is provided with a mould, or a series of moulds, in or around its periphery or edge or circumference; and this invention consists—

First, in hanging or suspending the mould-wheel, made of a ring or annular shape, upon a series of rollers, at suitable points around the inner periphery or circumference of the wheel to maintain it in position, while at the same time it is free to be revolved for bringing the moulds around and in its periphery or edge in regular order or succession, in position for being filled with the clay or other material used in the hopper.

Second, in so constructing the mould-wheel or frame and connecting it with the driving-power or shaft employed as to have an intermittent rotary motion, in combination with a follower, or plunger or plungers, so arranged within the hopper containing the clay or other material, that when the said mould-wheel or frame is stationary, or at rest, such plunger or plungers will then be moved forward and toward the same, carrying the clay, &c., along with it and into the mould or moulds of the wheel then in position therefor, when, as the wheel moves forward, the pressure of such plunger therein will be released.

Third, in the combination, with a mould-wheel or frame arranged to have an intermittent rotary motion, and adapted for having its moulds filled with clay in a similar manner to that hereinabove stated as constituting the second feature of the present improvements, or in any other suitable manner, of a frame so disposed about the wheel, and connected with the driving-shaft or power used, that when the wheel is stationary or at rest, it will receive such operation as to cause a pressure through the plunger or plungers of the mould or moulds, then in position or line therewith, to be exerted on the clay in the moulds in one direction, while being confined in the other direction by the said frame, and thus compressing the clay, &c., forming it into more compact and perfect bricks, tiles, or other blocks, according to the peculiar shape of the moulds, but, as the wheel moves forward again, will be released and freed therefrom, the amount of pressure exerted by the said presser-frame, as above stated, being susceptible of adjustment at pleasure.

Fourth, in the combination, with a mould-wheel or frame arranged to have an intermittent rotary motion, of a suitable device or devices for clearing the bricks, &c., from the moulds of the wheel, as such moulds in regular order and succession are brought around thereto, after having been filled with the clay, &c., or such clay compressed therein, which clearing-device or devices are so arranged and connected with the driving-mechanism or power as to have the necessary and proper movement, and at the time when the wheel is stationary or at rest, the bricks, &c., as thus cleared from the moulds, falling upon suitable tables or other surface properly located therefor, or, as in this invention, upon an endless band or apron, the arrangement of which forms another and the next part of the present improvement.

Fifth, the combination, with a mould-wheel or frame that is arranged to have an intermittent rotary motion, and is provided with a device or devices for clearing the bricks, &c., from its moulds, when the wheel is stationary, as such moulds are brought around thereto, of an endless travelling belt or apron for receiving such bricks, as they are cleared from the moulds, for conveying them from the machine, or to any desired locality, when such belt or apron is arranged to have an intermittent motion, and so connected with the driving-mechanism as to be at rest when the mould-wheel is stationary, but to be moved as such wheel moves, whereby a clear surface or part of the apron is presented to receive the bricks, &c., from the wheel, and by proper adjustment of the connecting driving-mechanism the necessary forward movement of the belt enabled to be secured for the deposit of the bricks in close order and position upon the same.

Sixth, so arranging the brushes for clearing or cleaning the mould-wheel or frame of a machine for pressing bricks, &c., from dust, when such wheel has an intermittent rotary motion, and for oiling the surface of the wheel so cleared as to have an intermittent rotary motion in conjunction with that of the wheel; these brushes being so disposed as to act upon the mould-wheel at a point or points between that at which the bricks moulded are discharged or cleared therefrom and that at which the moulds are filled with clay, and for

the clearing-brush to act at a point in advance of that of the oil-brush, so as to leave a clear surface in the wheel therefor.

Seventh, in arranging, for action upon the periphery or edge of the wheel wherein the moulds are located, a device for scraping the edge of such wheel as it passes forward from the hopper containing the clay so scraped off back again in the hopper.

Eighth, so securing the moulds within the mould-wheel as to be susceptible of attachment therein or removal therefrom, as desired for repairs or the insertion of new ones, &c.

In the accompanying plate of drawings my improvements in machines for pressing or moulding bricks, tiles, or other blocks, from clay or other material or materials, are illustrated—

Figure 1, plate 1, being a side elevation of a machine for such purpose, made according thereto.

Figure 2, plate 1, another elevation of the same, and from the same side as that in fig. 1, but with such side-supporting frame removed, and the mould-wheel and other parts at points in vertical sections.

Figure 3, plate 2, a plan or top view.

Figures 4, 5, 6, 7, and 8, being detail views, to be hereinafter referred to.

A, in the drawings, represents the supporting framework of the machine, which, in the present instance, consists of two parallel upright side frames, B, of suitable form for carrying the working parts, and braced or connected together by cross-beams or bars C at proper points.

D, the driving-shaft, having a pulley, E, with which to connect it with the driving-power employed. This shaft D is arranged to turn in bearings at one end of the side frames B, across from one to the other of which it extends, and outside of such frames, at each end, is provided with a similar pinion-wheel, E', that is arranged to engage with the large gear-wheels F on the outer ends of a transverse horizontal shaft, G, hung in suitable bearings of the side frames B, across from one to the other of which it extends, these gear-wheels F being upon the outside of the frames B.

H, pitman-rods, hung by one end to the face of the gear-wheels F, eccentrically therewith, and one to each wheel, and at the other to the outer ends of crank-arms I, that are fixed to a transverse horizontal shaft, J, hung in bearings of the side frames B, and extending across to the other side of the same. Through the shafts J the several parts of the machine, that is the mould-wheel, follower in clay-hopper, presser-frame, travelling endless apron or belt, mould-clearers, cleaning and oiling-brushes, &c., are operated, as and by means of connections to be hereinafter and below described.

K, a wheel or frame made of an annular or ring shape, and supported in an upright or vertical position between the side frames B, upon a series of rollers, L, arranged upon the inside periphery or edge M of the wheel; these rollers in the present instance being eight in number, four upon each side, and by means of shoulders of the wheel's inner edge M preventing any lateral or side motion of the wheel if turned around upon its rollers L in a vertical plane. This wheel, around its periphery or edge, is provided with a series of moulds, O, at suitable and equal distances apart, the size, number, and particular shape of which will depend upon circumstances, and, in the present instance, it is shown as being adapted to receive sixty-four moulds, in sixteen sections, of four each. These sections extend across the width of the wheel or frame, and are inserted in the frame or wheel, and there secured by screws O or other fastening-devices, so as to be susceptible of removal therefrom for being repaired or new ones substituted therefor, and each mould of the series provided with a separate and distinct plunger or follower, R, that by a stem, S, on their inner sides, project through poles T in the wheel or frame toward the centre of the same. This frame R, upon its inner edge or periphery, is provided at regular and equal distances apart with a series of similar semicircular recesses or notches, U, with which, as the shaft J, hereinbefore referred to, is rocked by the revolution of the driving-shaft D, through the connecting parts above described, a pawl, V, in regular order engages, and thus causes the wheel to be carried around with an intermittent motion in the direction represented by the arrow in the drawings; this pawl V being hung to the outer end of a crank-arm, W, on the rocker-shaft J, in suitable position therefor.

X, the hopper or box in which the clay or other material is placed, from which bricks, &c., are to be moulded or pressed. This hopper X is located at one side of the mould-wheel or frame, and is supported upon a platform, Y, of the frame B.

Z, the follower or plunger, arranged to move in hopper X in a direction or line towards the periphery of the mould-wheel, and thus to press forward and into such moulds of the same as may be in position therefor, the clay contained in the hopper. To this follower Z, at its outer end, two connecting-rods, A², are hung, one upon each side, and such rods at their other ends to the inside faces of the crank-arms I, hereinbefore referred to, on shaft J, whereby, as shaft J is rocked or made to vibrate from side to side, the said follower will be moved into and out of the hopper, either more or less, according as the connecting parts may be adjusted, thus carrying and forcing the clay into the moulds, in position therefor, in its forward movement.

B², a frame, consisting of two side parallel bars, C², joined together at each end by cross-pieces D² and D³, the one, D², being round, and the other, D³, flat and smooth upon its inside surface or face E². This frame B² is arranged between the side frames B, outside of the wheel K, in a horizontal plane, resting by its side bars C² and end pieces D³ upon friction-rollers F², hung to the inside frames B, at suitable points therefor, and by its end bars D² extending across the wheel K, within the open centre of the same, and by its end piece D³ across the wheel, upon the outer periphery whereon, at times, as will be hereinafter explained, it is brought to bear.

G², toggle-levers, jointed together at one end, and arranged between the side bars C² of the frame B² to the cross-bar D², of which the outer end of such levers G² is hung, with the outer end of the other lever G² hung to a cross-bar, H², arranged to slide upon the side bars C², and in position to come to a bearing upon the inside of the mould-wheel, at a point opposite to where the cross-bar D³ of the frame B² bears upon the outside.

I², an arm hung to joint of toggle-levers G², and extending down therefrom, connecting it with the outer end of a crank-arm, J², of the rocker-shaft J, to which it is hung.

By means of this connection, above described, between the toggle-levers G² and the rocker-shaft J, as such shaft vibrates forward and backward, the said toggle-levers will be either brought to a straight position, or, in other words, in the same line with each other, or nearly so, or brought to a position either more or less angular from the joints to the outer ends, as the case may be, and according to the adjustment of the parts, and thus, in the one case, bring or cause the slide-bar H² and cross-piece D³ of the frame B² to close upon the wheel, and in the other to open therefrom, as is obvious.

K², a small frame, suspended from the crank-arm, hereinbefore referred to, of rocker-shaft J, and carrying by its cross-piece L² a series of stems or rods M², corresponding in number to that of the moulds in the section of the mould-wheels, and at distances apart corresponding to the holes at the inner end of such moulds through which the stems to their plungers play. These stems M² extend downward through guide-holes of a cross-piece, O², fixed in the framework B thereof, and are to operate in the moulds of the wheel, for clearing them of the bricks moulded or pressed therein.

N², an endless belt or apron, arranged below the mould-wheel K, for travelling in a horizontal plane, and in a direction from under the wheel to the outside of the framework A at one end. This apron N², at each end, passes over and around a roller, P², hung in suitable bearings of the side frames B, across from one to the other of which they extend.

Q², pinion-wheel on the ends of the inner roller P², with which pinion-wheels Q² engage similar gear-wheels R² upon the ends of a transverse horizontal shaft, S², hung in bearings of the side-frames B², and extending across from one to the other of the same.

T², pawls arranged to engage with the gear-wheels R², just above referred to, which pawls are hung to arms U², turning above and upon the shafts S² carrying such wheels R², and at their other or upper ends are connected with the crank-arms I of the rocker-shaft J upon the inside faces of the same.

By this connection, as the shaft J vibrates or moves forward and backward, the pawls in the one instance are made to revolve the gear-wheels R², and in the other instance to pass freely backward over the teeth, thereby, as is obvious, producing or giving an intermittent forward movement to the endless apron.

V², a brush, fixed to a cross-piece, W², between the two side frames B², and in position to brush the surface of the endless apron as it passes around and under such cross-piece.

X², a cylindrical brush, hung in and between the outer ends to arms Y² suspended from the shafts S², and carrying the gear-wheels R², through which the endless travelling apron is driven, which arms Y², at the outer ends, are supported upon bent coiled springs of the side frame B, suitably located to hold the said brush up and against the face of the mould-frame or wheel, as such wheel is revolved.

A³, gear-wheels on outer end of shaft, carrying brush X², just above referred to, and arranged to gear into the driving-gears R² for the endless apron. By these gears A³ the brush is driven, and with an intermittent rotary motion, as is obvious.

B³, a cylindrical brush, arranged by its centre shaft to revolve or turn within an oil-reservoir, C³, that is fixed between the two extension-arms D³ of the two arms Y², carrying the cylinder-brush X², hereinbefore referred to, this brush B³, by its shaft being suspended and turning in the upper ends of such extension-arms D³, and such extension-arms D³ turning upon the main arms, and their movement being limited by stops thereof, suitably located to prevent the upsetting or overturning of the oil-reservoir C³.

E³, gear-wheels on shafts of brush B³, and interlocking with gear-wheels A³ to the shaft of the other brush X², by and through the means of which gear-wheels E³, such brush B³ is rotated with an intermittent motion, as is obvious, thus oiling the face of the mould-wheel in contact with which it is arranged to revolve.

F³, a board or plate, suspended from upper end of clay-hopper or box, into which it extends, bearing, by its edge G³, against the face of the mould-wheel, from which it scrapes the clay as the wheel passes from the hopper, throwing it back into the same.

H³, weights applied to the arms I³ of the scrape-board, and serving to hold the said scraper for action against the face of the mould-wheel or frame.

Having thus, in detail, explained the construction and arrangement of the several parts composing my improvements in machines for moulding and pressing bricks, &c., and the manner in which they are connected together, I will now proceed to describe how and in what manner they operate together to produce the moulding and pressing of the clay, and other effects necessary for making it into bricks or tiles, &c., as the case may be.

Having first supplied to the hopper the clay, or other material of which the bricks or tiles, &c., are to be made, by then turning the driving-shaft of the machine, motion will be imparted to the working parts thereof, so that the clay within the hopper, or which from time to time is supplied thereto, in any suitable manner, by hand or otherwise, will be carried and forced out of the hopper, through the motion of its follower, into the moulds of the wheel then opposite thereto, driving along the plungers of such moulds with it, when, the said follower having reached the limit of its forward movement, the wheel, that while such filling of its moulds was taking place was stationary, is then revolved sufficiently to bring its next series or sections of moulds to the hopper, when, again stopping, such moulds are filled by the action of the follower in the hopper, as above described, and another of the set or series of moulds brought to the hopper, and so on, as long as the wheel may be revolved, the several sections or series of the moulds being presented in regular and successive turn to the action of the follower in the hopper, for being filled with clay from the same. As one section of the moulds to the mould-wheel is being filled with clay, by the action of the follower in the hopper, as above described, and simultaneously therewith the clay in another section or series, previously filled from the hopper, is being acted upon by the presser-frame B², through the straightening out of the toggle-levers G² hung thereto, and such clay

thereby compressed into a more compact and solid shape. This action of this presser-frame on the clay is through the plungers of the moulds, which are caused, by the abutment and pressure against the same of the slide to the presser-frame, to freely press the clay up against the outside cross-piece D^3 of the presser-frame that is then brought against the periphery or face of the mould-wheel, when, before the mould-wheel is again moved forward, this presser frame is relieved and freed therefrom, the arrangement of its operating parts being such that, when adjusted, it will be so removed, the advantages of which are obvious. At the same time this filling of one section of the moulds with clay, and the compression of the clay within another section is taking place, as above explained, the bricks or blocks thus formed, but within another section of the moulds, are being discharged or cleared therefrom by the action of the parts provided for such purpose, as has been hereinbefore described, and delivered to the endless travelling apron arranged for their reception within the machine, the clearers being withdrawn from the mould-wheel, however, before it is again moved around. As the mould-wheel is revolved, the clearing and oiling-brushes, provided therefor, are rotated, and the travelling apron moved, but are all stationary when the wheel is at rest, at which time, as before described the filling of the moulds with clay, the compression of such clay within the moulds, and its discharge therefrom in a form corresponding thereto, all take place.

From the above description of the relative operation of the several parts to the machine, embraced in the present invention, it is plainly apparent that while the mould-wheel is to be turned, there is no pressure upon the same or upon the clay within the moulds, but the wheel is perfectly free and relieved, the advantage of which, in the saving of wear, friction, and power, are self-manifest without any further explanation.

That, furthermore, by the arrangement of the mechanism for driving the parts to fill the moulds to compress the clay therein and discharge it therefrom, is such as to be susceptible of being constructed in many ways, for ready and easy adjustment to suit clays, &c., of different consistencies, and for moulding and pressing bricks, &c., into a form more or less compact or firm, as may be desired.

That, furthermore, while every motion is positive, they are produced in such manner as to always insure the formation of perfect bricks or blocks, and to insure their being discharged from the moulds with all of their faces or sides free from being nipped or otherwise bruised or injured.

That, furthermore, by the arrangement of the brushes for brushing the travelling apron and the face of the mould-wheel, and for oiling the face of the latter, they can be always kept clean and clear from dust or dirt, or other substances which might tend to detract from the quality of the bricks produced in the machine.

In order to guard against the possibility of the bricks adhering to the plungers of the moulds, when such plungers are forced out to discharge the bricks, &c., therefrom, upon the endless apron N^2 , a rail or cross-piece, W^2 , hereinbefore referred to as carrying the brush V^2 , by means of which the endless apron is brushed, is so located as to form an abutment for such bricks, as the wheel is turned, and thus to "knock" them off, as it were, from the plungers to the moulds, if adhering thereto upon the endless apron.

By the operation of the clearers in the moulds their plungers are brought out to the face of the wheel, where they remain, until, by the action of the follower in the hopper, they are forced back into the moulds, but only as the clay presses them forward. By this means there is no possibility of an air-cushion being formed within the mould, between its clay and its follower, the advantage of which is self-manifest. When the compression of the clay takes place, the only air that is within the moulds, if any, being that which may be contained or be lodged in the clay itself as it is mixed.

As the plungers to the moulds of the wheel are forced in with the clay, by the forward movement of the follower in the hopper, they abut against the end bar of D^2 of the toggle-lever G^2 , and are thus limited in their movements, this surface of the cross-bar D^2 being made eccentric, as shown in fig. 7, and arranged for adjustment, and for being set, by means of a set-screw or otherwise.

Having thus described my improvements, what I claim, and desire to have secured to me by Letters Patent, is—

1. A mould-wheel or frame, made of an annular or ring-shape, and suspended upon rollers, substantially as and for the purpose described.
2. The combination of the mould-wheel or frame K , arranged so as to have an intermittent rotary motion, with the follower Z , or its equivalent, within the feed-hopper X and box Y , when such follower is arranged for operation with regard to the mould-wheel, substantially as and for the purpose described.
3. The combination, with a mould-wheel or frame, K , arranged to have an intermittent rotary motion, of the frame B^2 , so disposed and arranged about such wheel as to exert a pressure upon the clay within its moulds, substantially as and for the purpose specified.
4. The mould-wheel or frame K , arranged to have an intermittent rotary motion, the stems M^2 , the presser-frame B^2 , and the moulds $O O O O$, so combined and arranged as to operate simultaneously, substantially as and for the purposes set forth.
5. So arranging the endless belt or apron, in combination with the stationary clearer-board W^2 and brush V^2 , rocker-shaft arm I , and pawl-lever V^2 , when operated on the gear z , causing an intermittent rotary motion, substantially as and for the purposes described.
6. The brushes X^2 and B^3 , in combination with a mould-wheel, arranged to have an intermittent rotary motion, when such brushes are disposed for operation upon the said wheel, and are only revolved or actuated when the wheel is in motion, substantially as described for the purposes specified.

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