(No Model.) 2 Sheets—Sheet 1.

G. W. KING.

HAND PRESS.

No. 369,990. Patented Sept. 13, 1887.

Fig. 1.

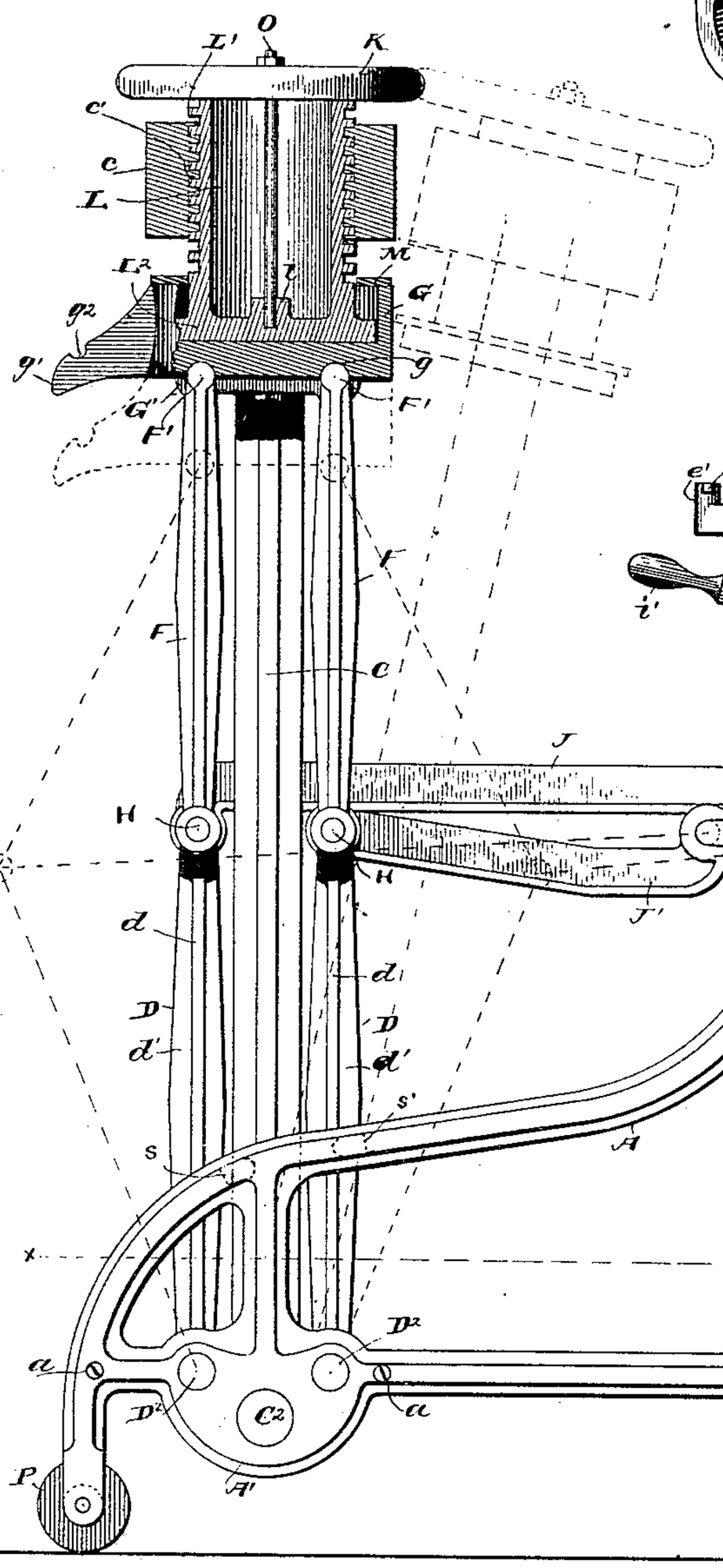


Fig. 5.

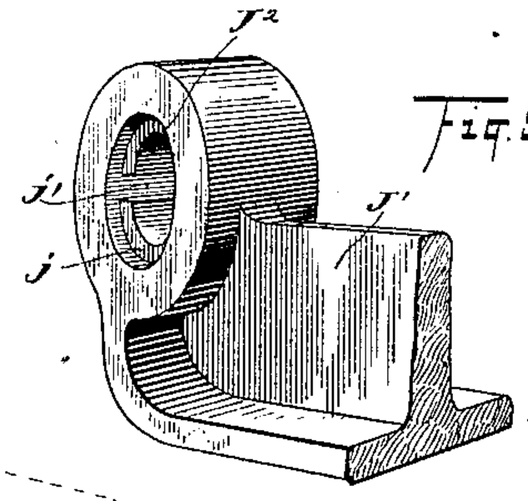
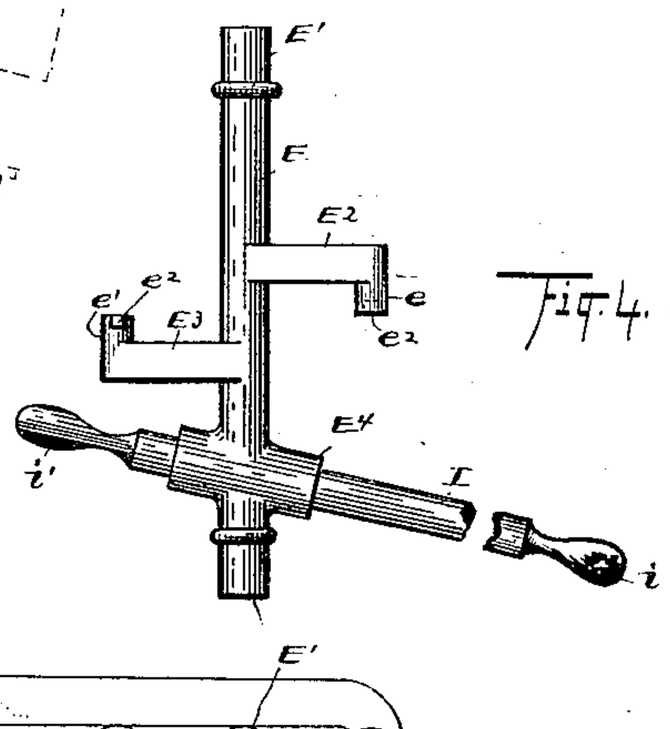


Fig. 4.



WITNESSES
N. S. Amstutz
A. Bosquet

Geo W. King INVENTOR

(No Model.) 2 Sheets—Sheet 2.

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Fig. 6.

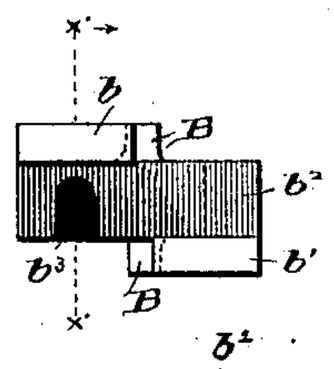

Fig. 2.

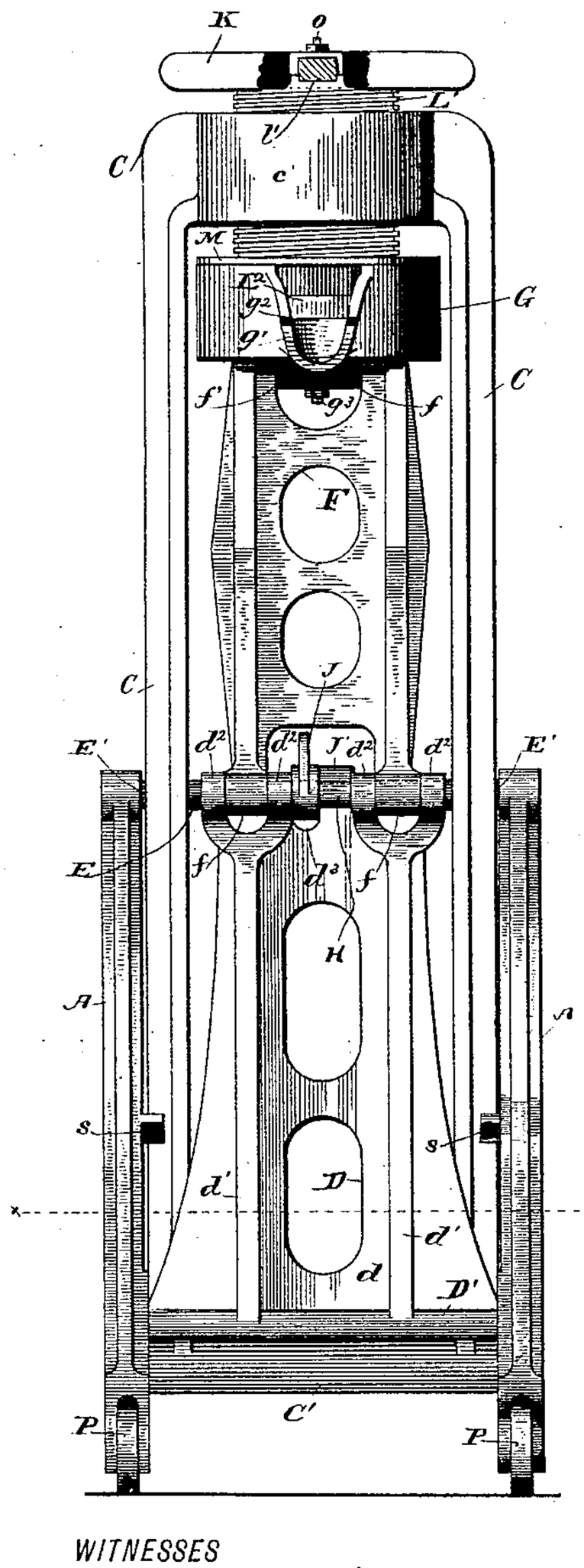

Fig. 7.

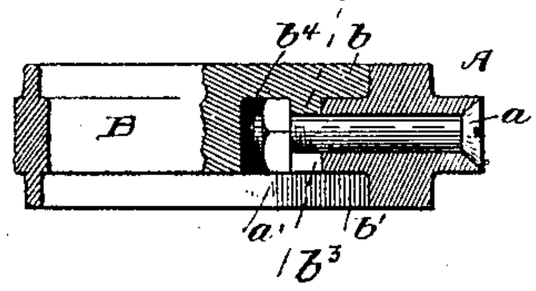

Fig. 3.

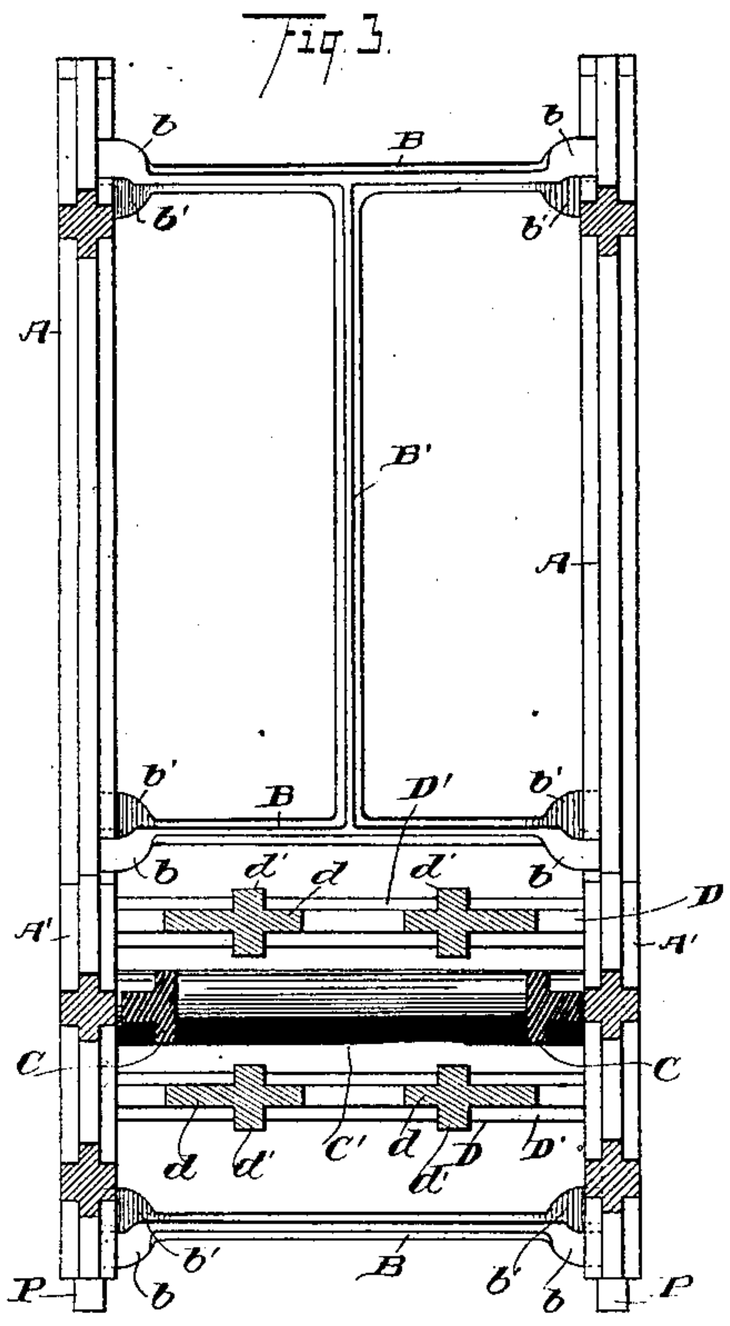

Fig 8.

WITNESSES

A. S. Armstrong

A. Bodynek

INVENTOR

Geo W. King

UNITED STATES PATENT OFFICE.

GEORGE W. KING, OF CLEVELAND, OHIO.

HAND-PRESS.

SPECIFICATION forming part of Letters Patent No. 369,990, dated September 13, 1887.

Application filed July 1, 1887. Serial No. 243,094. (No model.)

To all whom it may concern:

Be it known that I, GEORGE W. KING, of Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new and useful Improvements in Hand-Presses; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it pertains to make and use the same.

My invention relates to improvements in hand-presses designed more especially for extracting beef-juice, although well adapted to various other purposes, in which toggle-joints are compounded with the crank-movement, to the end that great pressure may be had and the press quickly and easily operated. The cup in which the beef is pressed is connected with the toggle-joints, and the plunger is connected with a swinging frame or yoke, to the end that when the plunger and cup are separated the yoke and plunger may be swung back out of the way to give free access to the cup. A screw and hand-wheel are provided to adjust the plunger endwise according to the thickness of material being pressed.

My invention also relates to the details of construction hereinafter described and claimed to the end that the press can be made at a small initial cost.

As a concentrated hydrogenous food and remedy in cases of fomentive dyspepsi a and in many cases of weakened digestion beef-juice has become famous, and is likely to retain its prestige. Heretofore beef-juice has usually been extracted by means of small hand screw-presses, that, so far as I know, are the only apparatus that the market affords for such purpose. I have therefore devised and reduced to practice the press illustrated in the accompanying drawings.

Figure 1 is a side elevation, partly in section. Fig. 2 is a front end elevation. Fig. 3 is a plan on the line *x x*, Fig. 2. Fig. 4 is a plan of the cranks and operating-lever. Fig. 5 is an enlarged view in perspective of one end of link J′ in detail, hereinafter described. Fig. 6 is an enlarged end view of one of the cross-bars. Fig. 7 is an elevation, partly in section, on the line *x′ x′*, Fig. 6. Fig. 8 is a side elevation showing a modification, hereinafter described.

A A represent the side frames. These are usually made of cast-iron, and are rigidly connected by cross-bars B, two of which latter are preferably integral with the longitudinal tie-bar B′ to brace the frame-work. (See Fig. 3.) As a matter of economy the frame-work is fastened together by short "stove-bolts" *a*, countersunk holes having been cast in the side frames for the passage of these bolts. The respective ends of the cross-bars have lips *b* and *b′*, for embracing the inside ribs of the side frames, the two lips being turned laterally to the right and left, (see Fig. 3,) so that the lower lip is entirely out from under the upper lip, by reason of which in molding a parting is had without setting a core. Vertical webs b^2 connect the two lips just back of the ends of the latter. These webs abut the inside ribs of the side frames, and the webs are provided with slots b^3, opening downward, so that each slot will leave its own core in the mold. The securing-bolts *a* pass through these slots, and the nuts *a′* of the bolts are held in pockets b^4, cast in the cross-bar next inside the webs, the said pockets opening downward, so that they also leave their own cores in the sand in molding, all of which will be readily understood by molders. The side frames have heavy parts A′, the latter having holes cast therein for receiving, respectively, the trunnions C^2 of the yoke C and for receiving the trunnions D^2 of the lower arms of the toggle-joints. The upper ends of the side frames have holes "cast in" for receiving the ends E′ of the crank-shaft E. The lower arms, D, of the toggle-joints are alike, and consist of rollers D′, the latter terminating in trunnions D^2 aforesaid, together with webs *d*, ribs *d′*, and ears d^2, all cast integral. The ears d^2 are arranged in pairs to embrace depending ears *f* of the upper arms, F, of the toggle-joints, all of these ears being cored laterally to receive the pintles H, the latter for small presses being usually about a half-inch in diameter and made of steel. The arms F terminate above in rollers F′, that are seated in corresponding grooves, *g*, made in the under surface of cup G. A small bolt, g^3, cast in, depends from the bottom of the cup for securing the cap G′. The latter fits the under side of rollers F′ and fills laterally the space *f′*, so that the afore-

said cap and bolt hold both arms F in place vertically and laterally.

The crank-shaft E has arms E^2 and E^3, extending in opposite directions to serve as cranks, and these arms have, respectively, wrists *e* and *e'*, arranged as shown in Fig. 4. A thimble, E^4, is set slightly oblique from perpendicular to the shaft, but is preferably in the same plane with the cranks, the cranks, shaft, and thimble being cast integral. Thimble E^4 is made to receive the wooden lever I, the latter terminating in handles *i* and *i'*, wood being preferable for this purpose, as it is more agreeable to handle than metal. The sleeve and lever are omitted from Fig. 1, so as not to obscure the cranks and links. The obliquity of the thimble brings the handle *i* outside of the yoke C when the lever I is reversed. Links J and J' connect with the wrists *e* and *e'* and with the respective pintles H. Link J is curved downward at the ends, as shown in Fig. 1, so as to extend over the rear pintle, and so as to engage the top of the crank-shaft when the parts are in the position shown in solid lines, Fig. 1, such engagement of the link with the crank-shaft forming a stop for the cranks when the latter reach the dead-center line. The shorter link, J', trends upward, as shown, and when the cranks are reversed link J', by engaging the under side of the crank-shaft, stops the crank on the other dead-center. Wrists *e* and *e'* have lugs e^2 or teats next the free ends thereof, and the links have annular recesses *j* on the inner face thereof for the lugs e^2 to operate in, by which arrangement the inner faces of the links are brought about flush with the free ends of the wrist, and consequently the two links can be made to operate side by side and close together, it being desirable to attach the links to the toggle-joint as near as possible to the center of the pintles H. Grooves *j'* of the links span the lugs e^2 in assembling the links on the wrist.

It will be observed that in the position shown in Figs. 1 and 4 the one lug e^2 extends above wrist *e'*, while the lug on wrist *e* extends below the latter, and that the groove *j'* of link J' is on the rearward side of hole J^2, (see Fig. 5,) while with link J the groove *j'* is on the forward side of hole J^2. The grooves *j'* are therefore on the opposite sides of holes J^2 from where the wrists press hard in operating the machine; also, in placing the links upon the wrist the links have to be turned rearward to cause grooves *j'* to register with lugs e^2, and when the links are in position on the wrists and turned forward to couple with the toggle-joints the said grooves and lugs are brought into such relative position that they never pass each other in operating the press; otherwise a groove and lug might interlock and cause a breakdown.

In Fig. 2 it will be observed that the web *d* of the lower arm of the front toggle-joint is notched at d^3 to receive the forward end of link J, by which arrangement the link is held in place endwise of the pintle H. The lower arm of the rear toggle-joint is reversed, and consequently the notch d^3 is brought in position to receive the forward end of link J'.

The cup G has a discharging-spout, *g'*, the latter having notches g^2, for holding the bail of a suitable container for receiving liquid extract. Yoke C has at the bottom a roller, C', connecting the side arms of the yoke, the roller terminating in the aforesaid trunnions C^2. Above, the yoke has a hollow cylindrical head, *c*, with internal screw-threads, *c'*, cast in. These screw-threads engage external screw-threads, L', made on the body of the plunger L. The plunger is cast hollow, as shown in Fig. 1, to save metal. The head of the plunger L^2 fits loosely in cup G. An upwardly-projecting hub, *l*, receives the bolt O, the latter being cast in.

K is a hand-wheel for operating the plunger, notches *l'* being cast in the upper edge of the plunger to receive the spokes of the hand-wheel, the securing-bolt O passing through a suitable hole made at the center of the hub of the wheel. A follower, M, fits loosely outside the plunger above head L^2. When the cup G is depressed, the follower is left suspended on head L^2. When cup G is elevated, the follower rests on the rim of the cup and prevents the juice from squirting out between the rim of the cup and the head of the plunger.

In operating the press the plunger is screwed up or down, according to the thickness of meat or other material to be pressed. With the handle *i* turned forward the toggle-joints are turned outward in the position shown in dotted lines, Fig. 1, thereby depressing cup G below the line of the plunger-head, after which the yoke is canted rearward, leaving the cup G unobstructed. Lugs *s* and *s'* are cast on the inner faces of the side frames to stop the yoke in its upright or in its inclined position. After the material to be pressed is laid in the cup G the yoke is turned forward to bring the plunger over the cup, after which the lever I is reversed—that is, turned over rearward. The arms of the respective toggle-joints are brought in line simultaneously with the cranks reaching their dead-centers, whereby a very great pressure may be had between the plunger-head and cup-bottom, such pressure being ample for all practical purposes, and is had by applying a few pounds' pressure to the handle *i*. With the parts working freely a finger of the operator is sufficient to turn the lever I rearward until the plunger-head is brought to bear on the material in the cup, and this should occur with the lever I inclining rearward approximately at an angle of forty-five degrees to the dead-center line of the cranks. From thence the operator presses down on the handle *i*, and if it is found that the lever I cannot be brought down to a horizontal position with moderate force applied thereto the operator raises the lever slightly, and by means of the hand-wheel backs up the

plunger a trifle, and then brings the lever I down to its horizontal position. If, on the other hand, too little pressure has accrued, the handle *i* is raised and the plunger is screwed down perhaps an eighth or quarter turn, more or less, as may be required, after which the operator again brings the lever to its horizontal position. The operator having one hand on the lever and the other hand on the hand-wheel, these manipulations are made in a moment. When the handle *i* is turned forward, the handle *i'* is in position for raising the rear end of the press, after which the press is easily moved about on the rollers P. With the arrangement of toggle-joints and mechanism for operating the same, the cup G is moved in a vertical line without other guidance than it receives from the toggle-joints. The material for the press may be nearly all of cast-iron, and no fitting is required except to drill the small holes for the axial pins of the rollers P. The press can therefore be made at a small initial cost.

In carrying out my invention various modifications may be had in the mechanical construction without departing from the spirit and purpose of my invention. For instance, about every member of the press could vary more or less in form and still be made to answer the purpose. What in Figs. 1 and 2 is shown as cup G might be cast in two sections, the division being on the line *y y*, Fig. 8, if such construction were preferred. This would admit of the cup proper being removed in case the press were wanted for such purposes as would not require a cup.

What I claim is—

1. The combination, with upright toggle-joints having pivotal bearings at the lower ends thereof, of a cup mounted on and pivotally connected with the upper end of such toggle-joints, substantially as set forth.

2. The combination, with toggle-joints having pivotal bearings at the lower ends thereof and a cup mounted on the upper end of the toggle-joints, of cranks and links for operating the toggle-joints to move the cup vertically, substantially as set forth.

3. The combination, with upright toggle-joints having pivotal bearings at top and bottom, of swinging yoke having pivotal bearing at the lower end thereof, said yoke being adapted to swing in line with the toggle-joints or to swing laterally from over the toggle-joints, substantially as set forth.

4. The combination, with upright toggle-joints and cup mounted on the toggle-joints, substantially as indicated, of a plunger adapted to enter said cup, the said plunger being connected with a vibrating yoke, whereby the plunger may be moved from over the cup, substantially as set forth.

5. The combination, with upright toggle-joints, cup mounted on the toggle-joints, and cranks and links for operating the toggle-joints, substantially as indicated, of a vibrating yoke and a plunger connected with the yoke, the plunger being adapted to enter the cup when the yoke is in its upright position, substantially as set forth.

6. The combination, with suitable frame, toggle-joints, and yoke pivotally connected with the frame, substantially as indicated, of stops on the frame made to engage the yoke to limit the vibrations of the latter, substantially as set forth.

7. The combination, with toggle-joints, cup mounted on the toggle-joints, and a swinging yoke, substantially as indicated, having a hollow head, the head having internal screw-threads, of a plunger having external screw-threads for engaging the threads of the yoke-head, and a hand-wheel mounted on the plungers, substantially as set forth.

8. The combination, with swinging yoke, plunger, and reciprocating cup for receiving the plunger, the latter having an enlarged end or head, of a follower mounted loosely on the body of the plunger above the plunger-head to overlap the rim of the cup and rest on the latter when the cup is elevated, substantially as set forth.

9. The combination, with toggle-joints, a shaft having lateral arms extending in opposite directions, and wrists connected with the respective arms, of links for connecting the wrists with the toggle-joints, the one link having an upward trend, the other link having a downward trend, substantially as shown, whereby the links, by engaging opposite sides of the crank-shaft, limit the movement of the shaft to substantially a half-revolution in either direction, substantially as set forth.

10. The combination, with crank-shaft and cranks, substantially as indicated, of a lateral thimble made integral with the shaft, said thimble being oblique with the line of the shaft, substantially as set forth.

11. In a press, the combination, with toggle-joints, cranks, and crank-wrists having laterally-projecting lugs, of connecting-links provided with annular recesses and lateral grooves, substantially as set forth.

12. In a press, the combination, with toggle-joints, shaft, crank-arms extending in opposite directions from said shaft and separated sufficiently to accommodate both links between them, and crank-wrists located on the inner faces of said crank-arms and provided with laterally-projecting lugs, of links connecting the toggle-joints and cranks, each link being provided with an annular recess on its inner face and a groove, substantially as and for the purpose set forth.

13. The combination, with side frames having ribs on the inner faces thereof, substantially as shown, of cross-bars having lips on the respective ends thereof for embracing such ribs, the lips being arranged in pairs and turned in opposite directions, substantially as set forth.

14. The combination, with side frames, of

cross-bars having lips turned in opposite directions, substantially as indicated, and vertical webs connecting lips, said webs having slots for receiving the securing-bolts and pockets for receiving the nuts of such securing-bolts, the parts being arranged substantially as set forth.

In testimony whereof I sign this specification, in the presence of two witnesses, this 23d day of June, 1887.

GEORGE W. KING.

Witnesses:
CHAS. H. DORER,
ALBERT E. LYNCH.