No. 731,735. PATENTED JUNE 23, 1903.

V. D. ANDERSON.

PRESS.

APPLICATION FILED FEB. 24, 1902.

NO MODEL. 5 SHEETS—SHEET 1.

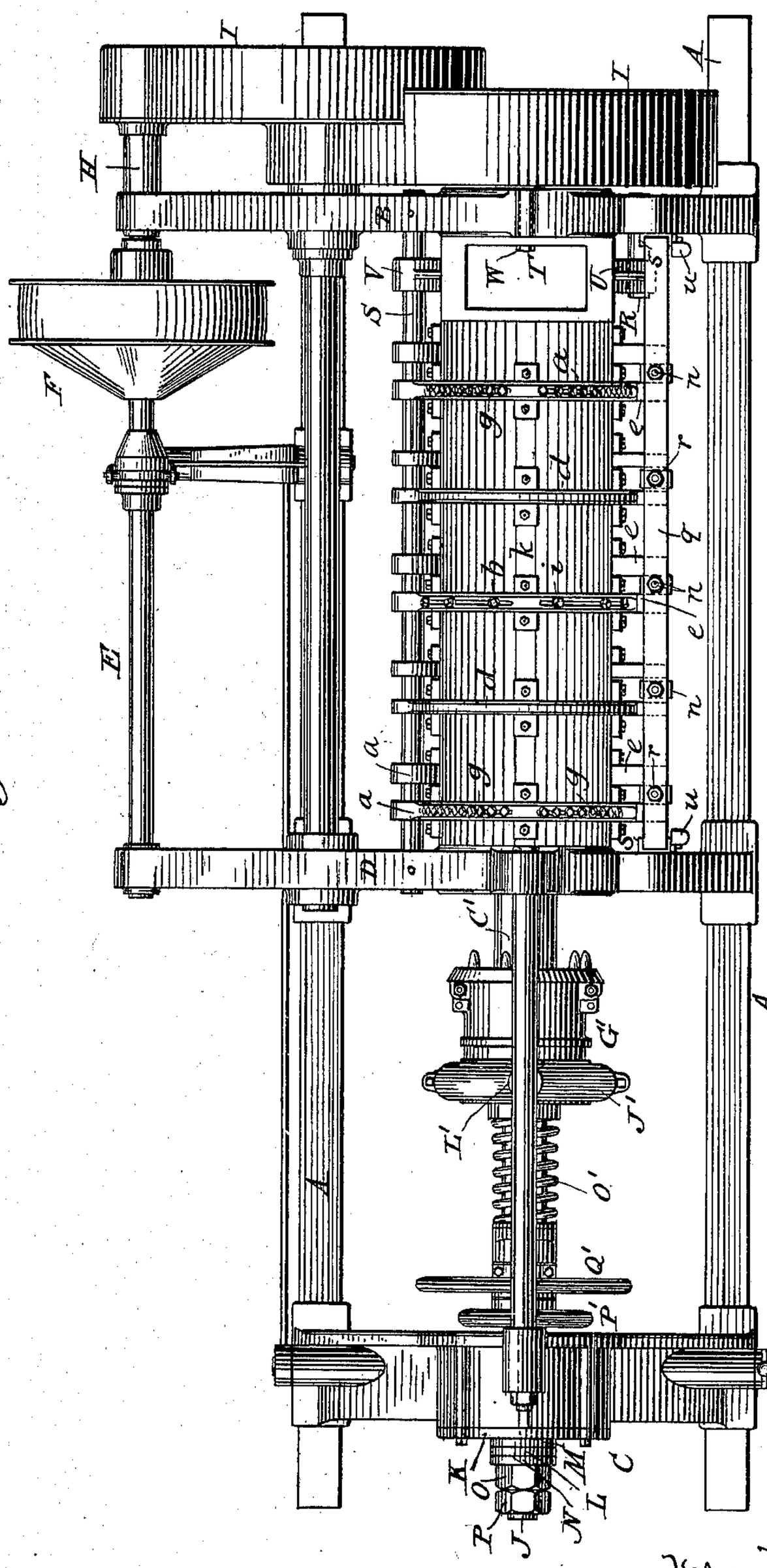

Fig. 1.

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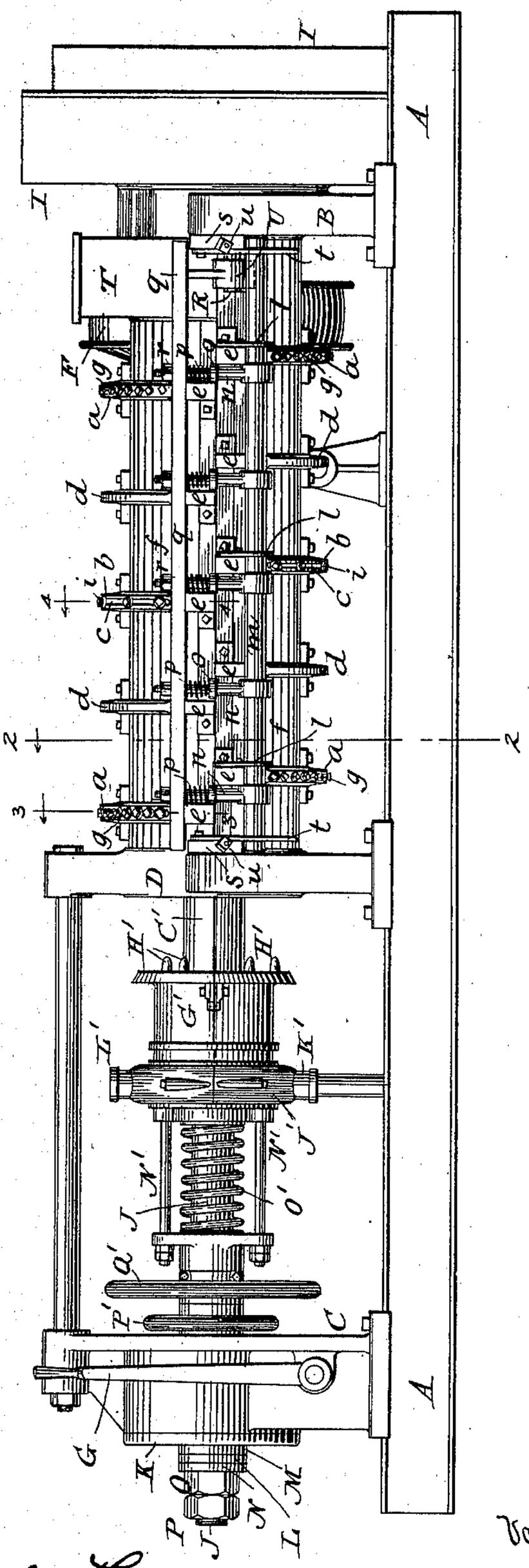
NO MODEL. 6 SHEETS—SHEET 2.

Fig. 2.



Witnesses
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NO MODEL. 5 SHEETS—SHEET 3.

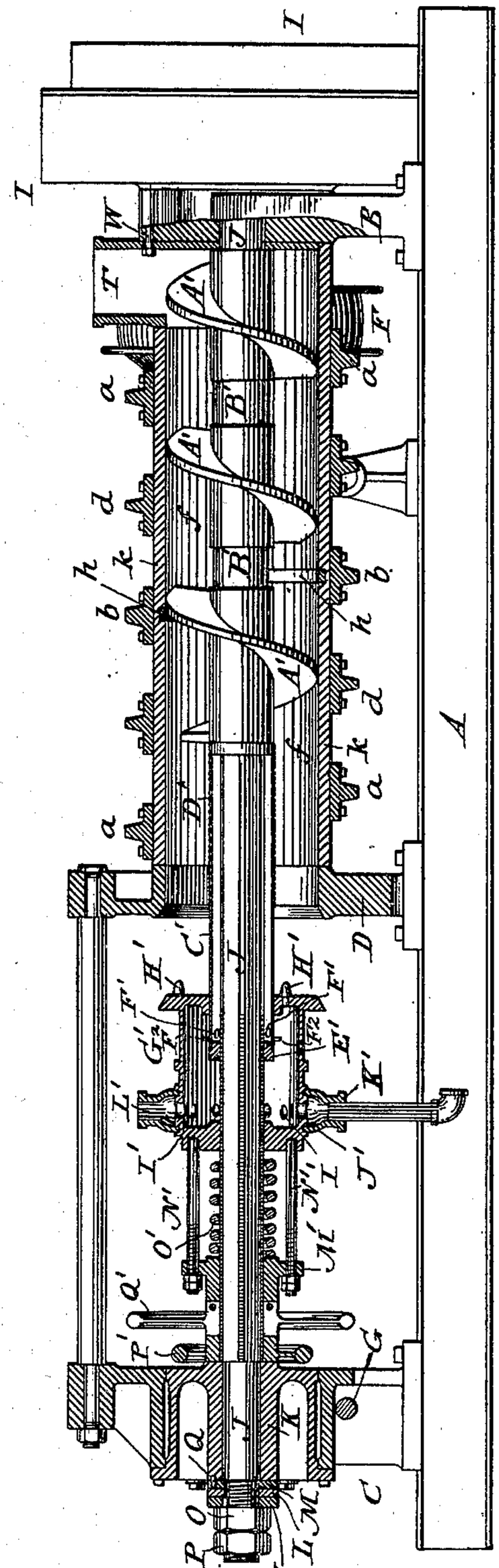

Fig. 3.

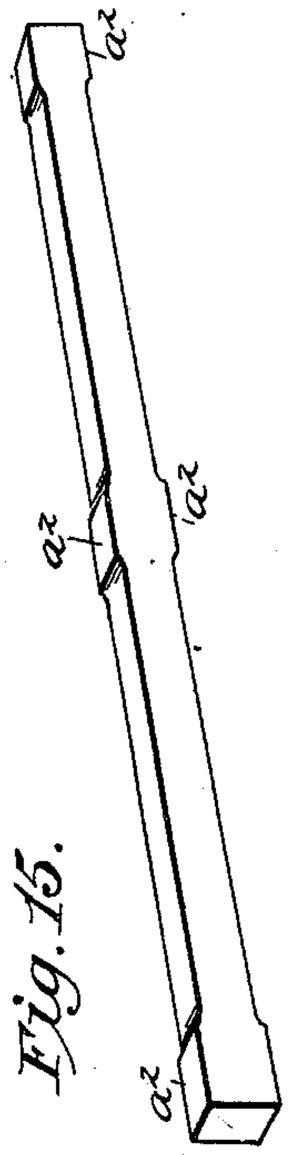

Fig. 15.

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NO MODEL. 5 SHEETS—SHEET 4.

Fig. 4.

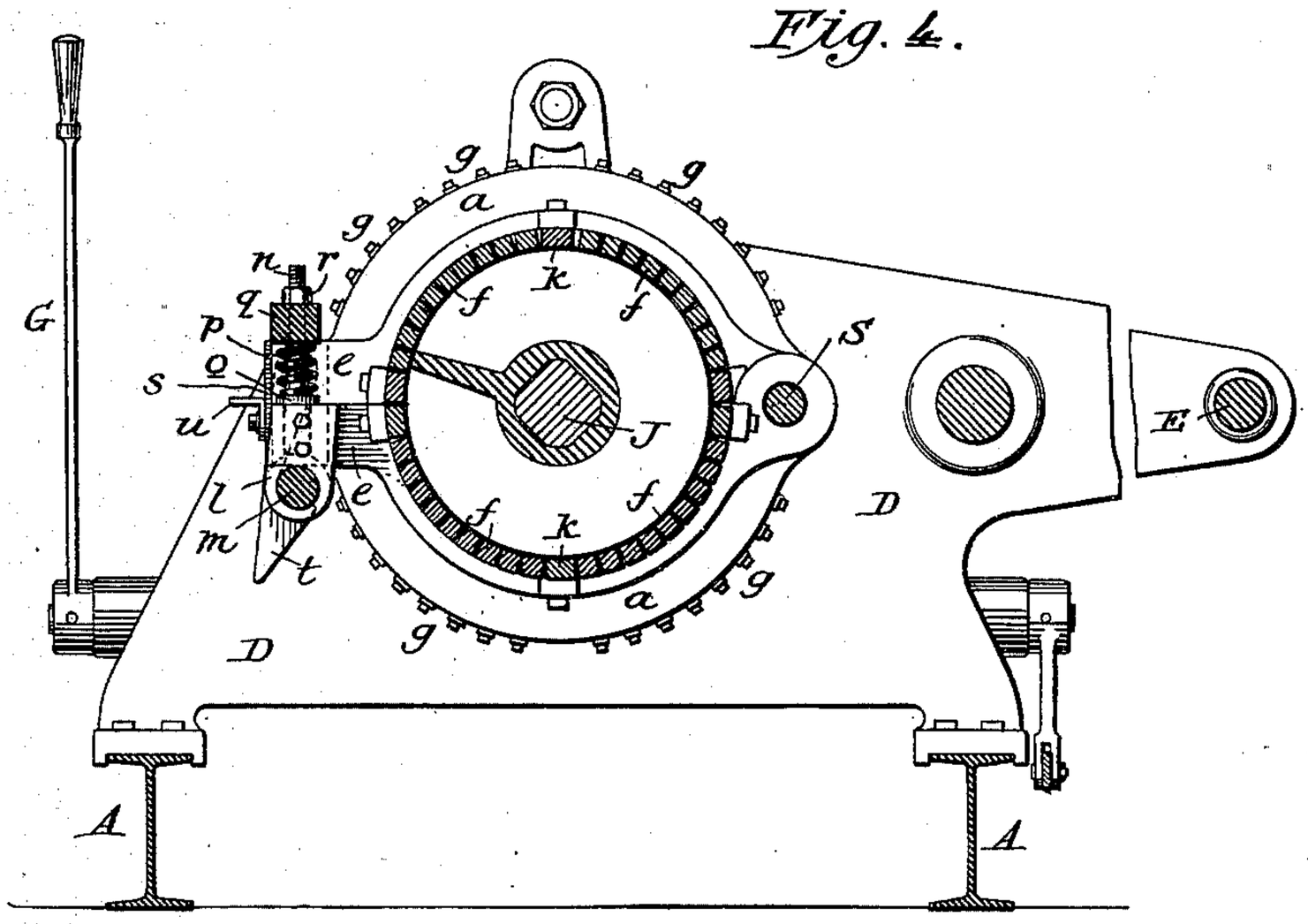
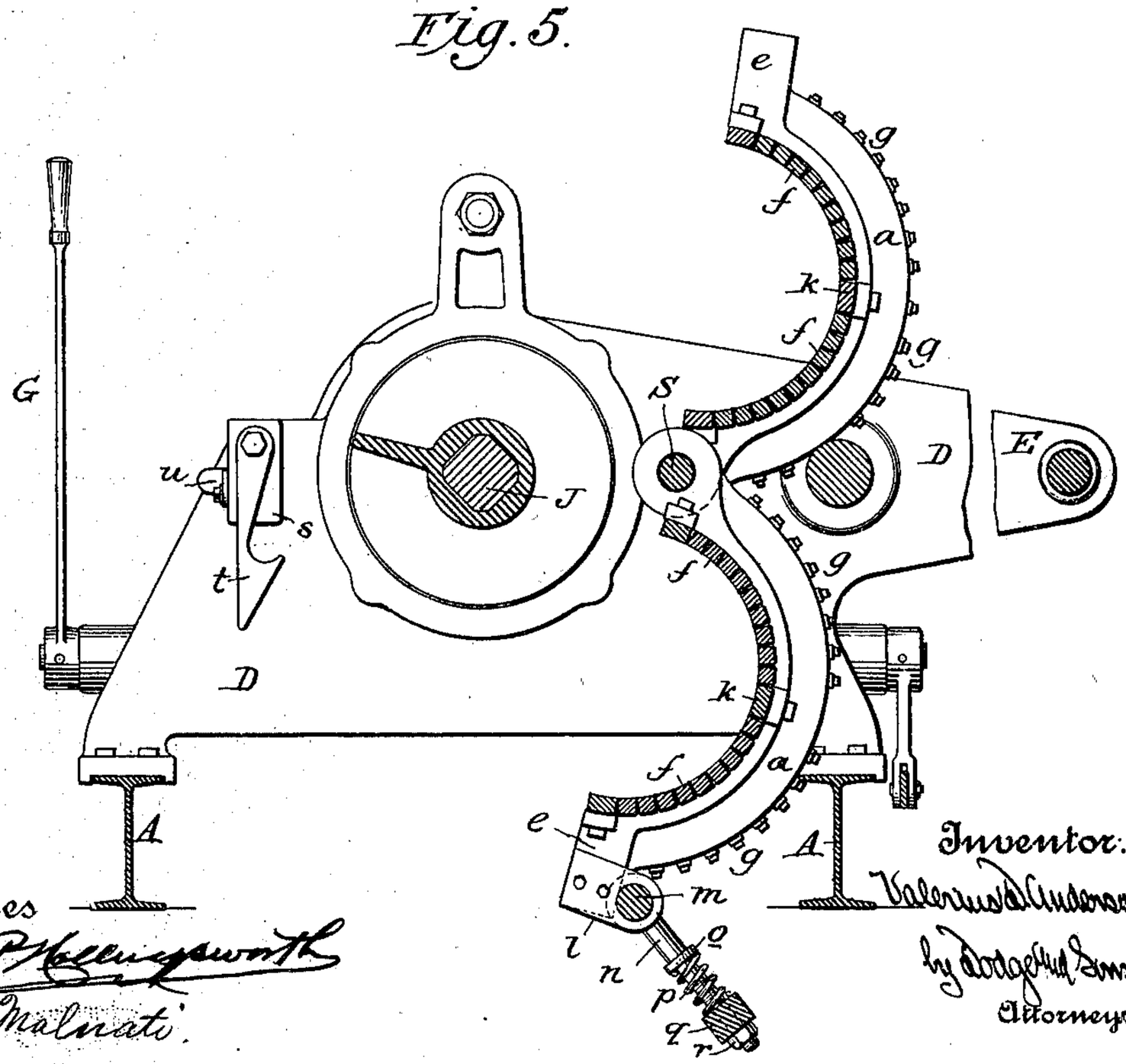


Fig. 5.



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NO MODEL. 5 SHEETS—SHEET 5.

Fig. 9.

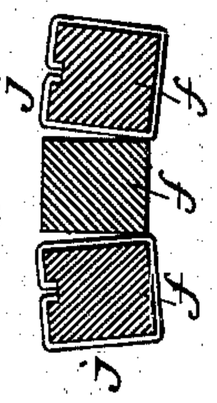


Fig. 10.

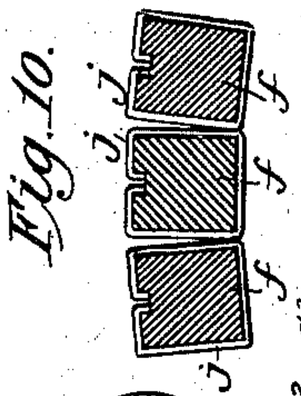


Fig. 7.

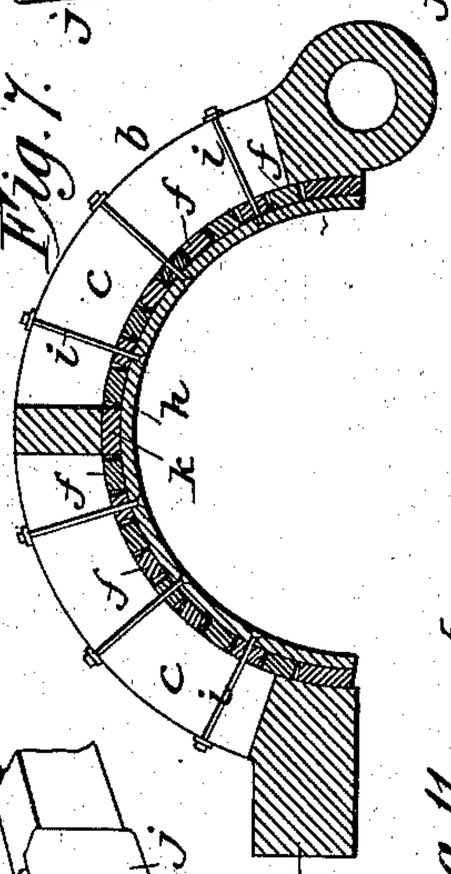


Fig. 8.

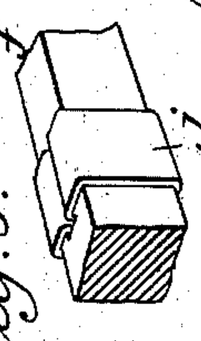


Fig. 6.

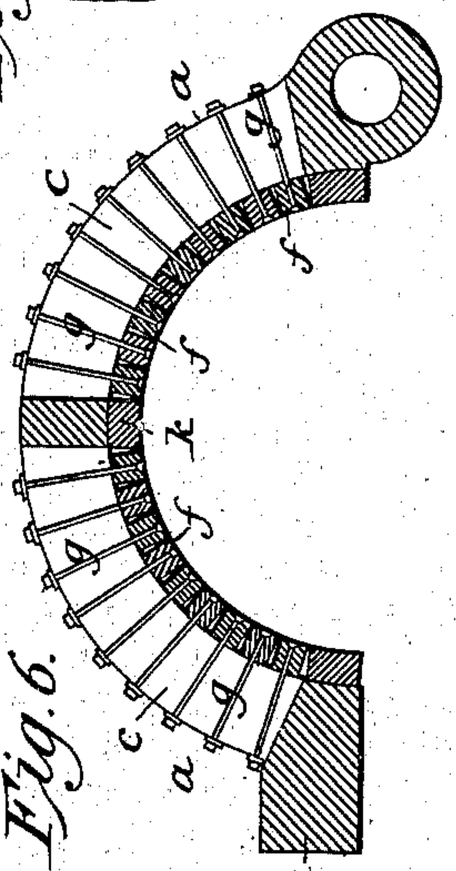


Fig. 11.

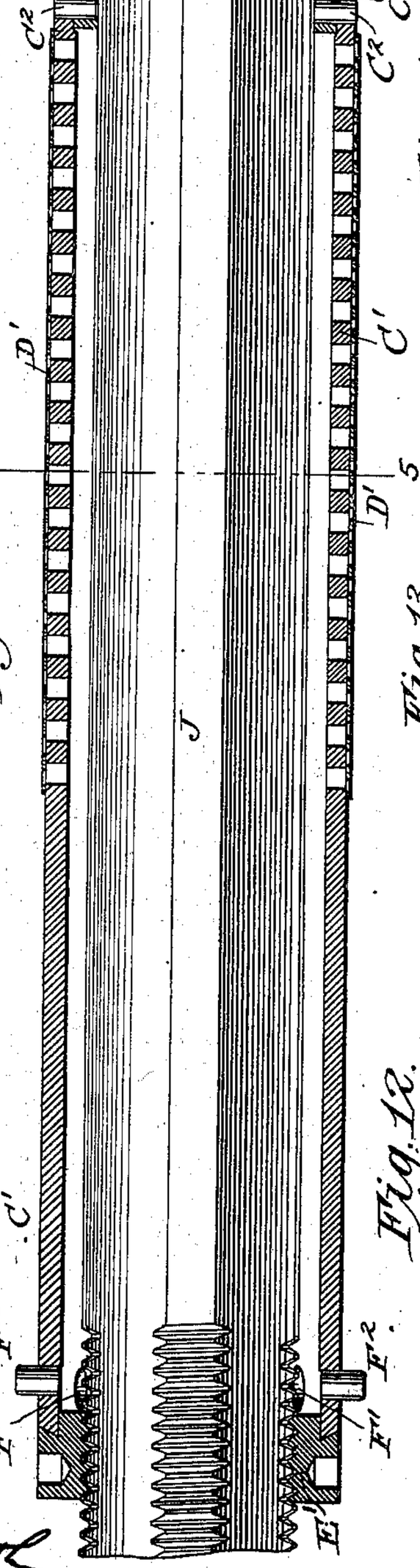


Fig. 14.

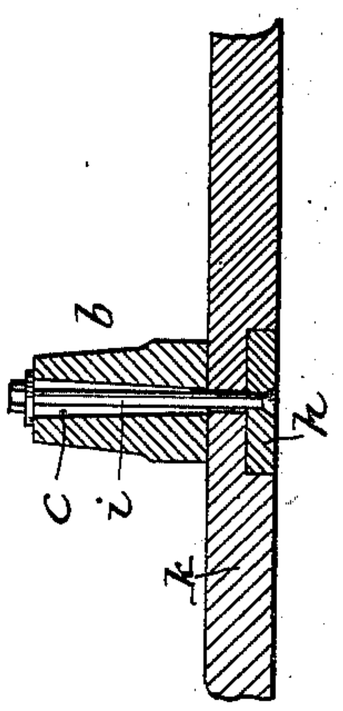


Fig. 13.

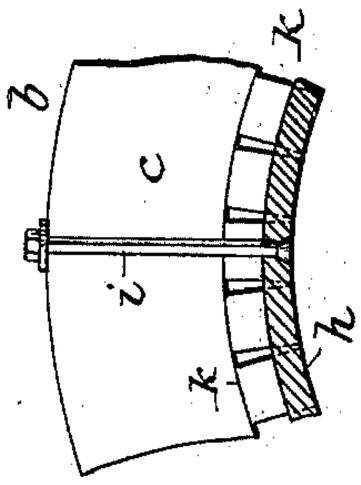
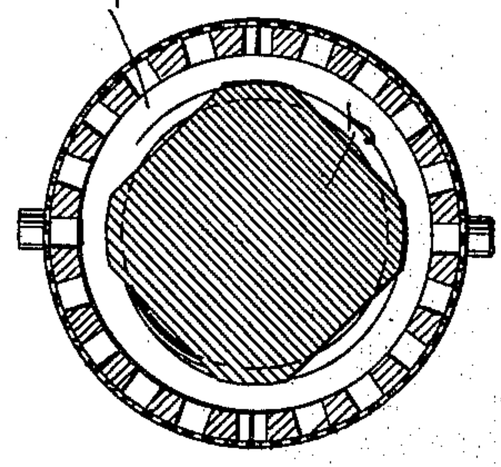


Fig. 12.



Witnesses
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No. 731,735. Patented June 23, 1903.

UNITED STATES PATENT OFFICE.

VALERIUS D. ANDERSON, OF CLEVELAND, OHIO.

PRESS.

SPECIFICATION forming part of Letters Patent No. 731,735, dated June 23, 1903.

Application filed February 24, 1902. Serial No. 95,404. (No model.)

To all whom it may concern:

Be it known that I, VALERIUS D. ANDERSON, a citizen of the United States, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new and useful Improvements in Presses, of which the following is a specification.

My present invention pertains to improvements in presses, the construction and advantages of which will be hereinafter fully set forth, reference being had to the annexed drawings, wherein—

Figure 1 is a top plan view of the press; Fig. 2, a side elevation thereof; Fig. 3, a vertical longitudinal sectional view; Fig. 4, a transverse sectional view on the line 2 2 of Fig. 2; Fig. 5, a similar view with the shell or casing of the press opened; Fig. 6, a cross-sectional view of the upper section or top of the shell or casing, taken on the line 3 3 of Fig. 2; Fig. 7, a similar view on the line 4 4; Fig. 8, a perspective view of a portion of one of the bars of the shell or casing; Figs. 9 and 10, cross-sectional views of a number of the bars, showing the means employed to secure variation of the spacing between the bars; Fig. 11, a detail view of a portion of the main shaft and the central drainer; Fig. 12, a cross-sectional view thereof on the line 5 5 of Fig. 11; Fig. 13, a detail view illustrating the means employed for supporting the inner adjacent ends of the bars which are employed to make up the shell or casing; Fig. 14, a similar view taken at right angles to that of Fig. 13, and Fig. 15 a perspective view of a modified form of bar employed in making up the shell or casing.

The present invention is in the nature of an improvement on the press shown and claimed in my former patent, No. 647,354, dated April 10, 1900, and is a carrying forward of the ideas set forth in said patent, together with the addition thereto of certain distinctly novel and valuable features.

Referring to the accompanying drawings, it will be seen that the bed or foundation of the press is preferably composed of two I-beams A, arranged parallel to each other and having secured thereto a head block or frame B, a tail-frame C, and an intermediate frame D.

Frames B and D extend out to one side and support suitable driving mechanism for the main shaft. Said driving mechanism comprises a driving-shaft E, having a clutch-pulley F secured thereto and adapted when thrown into operative relation through movement of hand-lever G and suitable connections to impart motion to a shaft H. Said shaft through suitable gearing, (not shown,) which is inclosed in housings or casings I, imparts a rotary motion to the main driving-shaft J of the press. The forward end of the shaft has its bearing in the head or frame B, while the opposite end has its bearing in a removable head or bushing K, bolted in the frame C and from which it may be readily removed. Upon the outer end of the shaft there are mounted heavy washers or rings L, M, and N, the intermediate member being preferably formed of brass, while the outer members are of steel. The washers are held in place by nuts O P, screwed upon the shaft, and the inner ring M is held against rotation by a pin Q, Fig. 3, which extends through it and into the removable head or bushing K. The outer washer N is keyed to the shaft and rotates therewith. Inasmuch as the strain which is exerted upon the shaft when the press is in action is toward the head of the machine, the construction just described forms, in effect, a thrust-bearing. Positioning the brass washer between the steel ones affords a bearing simple in construction, but effective under working conditions, and presents the advantages resulting from a brass surface working against a steel one.

Extending out from head or frame B is a stub R, and secured between said head and the intermediate frame D is a rod or shaft S, hereinafter referred to as the hinge shaft or rod. Hopper T is formed with lugs or ears U and V upon its sides, lug U passing over and being secured to stub R and the other ear or lug V embracing the hinge-shaft. A cap-screw W also extends through head B and helps to keep the hopper in place.

The outer shell of the press proper is composed of two parts, an upper and a lower section, both of which are pivotally connected to the hinge-rod S, so that they may be swung open and access had to the interior of the press when desired.

The construction of the sections will de-

pend upon the nature of the material to be treated, and under certain conditions they may be made similar to many of the perforate shells or casings now in common use, with the perforations extending throughout their entire length or throughout only a portion thereof. The particular formation shown in the accompanying drawings has been found highly efficient in actual practice. Both the upper and lower sections are practically the same except in certain details of fastening devices, and a description of one will therefore apply to the other.

Hinged to bar S is a series of semicircular-shaped ribs or arms, the outer ones *a* and central one *b* being formed with an opening or slot *c*, extending from the outer to the inner face thereof, while the intermediate arms *d* are solid. Each arm is formed at its free end with a lug or finger *e* for a purpose which will presently appear. Two series of bars *f* are secured to the ribs or arms against the nner faces thereof, one series being secured between each of the outer ribs *a* and the central rib *b*, so that the spacing between the various sets of bars may be varied throughout the length of the press. Each of the bars *f* is provided with an opening at its outer end, through which a bolt *g* is passed, said bolt passing up through the slot in the rib *a* and being secured thereto by a nut and washer, which spans the slot and rests on the upper or outer face of the rib. The inner end of each bar is reduced, as in Figs. 13 and 14, and rests upon a plate *h*, which lies flush with the inner faces of the various bars, said plate being held in place by bolts *i*, which pass up through slot *c* in ribs *b*, suitable nuts and washers securing said bolts in position. From this it will be seen that each set of bars upon opposite sides of the central rib *b* may be adjusted independently of the other and the spacing of each set varied as desired.

In order that the bars may be readily and evenly spaced as they are assembled, I propose to form a seat or depression in the outer face of each bar and to pass about the bar a strip *j*, of copper or like metal, as shown in Figs. 8, 9, and 10, the ends of the strip being forced down into the seat, thereby holding the strip against displacement. As will be readily understood and as will be seen upon reference to Figs. 9 and 10, the bars can come only so close together as the strips will permit, a close spacing being effected in Fig. 9 and a wider one in Fig. 10. By varying the gage of the copper or metal employed the spacing may be regulated to a nicety. The strips, as will be seen upon an inspection of Fig. 8, are narrow. Consequently practically the entire length of each bar is left unobstructed. In order to secure the ribs in proper position with relation to each other, to hold them in position when the bars are being removed or replaced, and to give stability to the structure, bars *k*, extending the entire length of the series of ribs, are permanently secured thereto.

Extending from the lugs *e* of the lower series of ribs are hangers *l*, in which is mounted a shaft *m*, said shaft being free to turn in the hangers. Pinned to the shaft is a series of eyebolts *n*, each bolt having a collar *o* fixed thereon, with a spiral spring *p* encircling the bolt and resting on the collar. A bar *q*, of a length equal to that of the shell of the press, is loosely mounted on the bolts and is held in place by nuts *r*.

Blocks *s* are cast upon the head-block B and the intermediate frame or section D, and hooks *t*, pivotally connected to stubs extending out therefrom, engage bar *m* when the lower or bottom section of the shell is swung up and serve to hold said section in place. After the parts are in place buttons *u* serve to lock the hooks against movement. When the top section is lowered or if it has been previously lowered, bar *q* is swung up over the lugs or arms *e*, passing over the top of the same, after which the nuts *r* are screwed down, firmly holding all the parts together.

When it is desired to open the shell or casing, the reverse operation takes place. Swinging bar *q* rotates shaft *m*, and said shaft by reason of the formation of the hooks *t* rolls out of engagement with the hooks, throwing the same outwardly, thereby permitting the lower section to be readily dropped down. The hooks, however, will normally stand in a position to engage the shaft when the lower section is elevated. As will be seen upon reference more particularly to Figs. 1, 2, and 3, the shell or casing makes a close fit with the hopper, as well as with the adjacent face of the intermediate frame or section D. Said section D is, as shown in Fig. 3, formed with an opening of the same size as and in line with the interior of the shell.

Shaft J, except for those portions which work in the bearings, is polygonal in cross-section, and mounted thereon within the shell is a series of separated screws A′. The particular arrangement of the screws is not essential, though for some materials the arrangement shown and claimed in my aforesaid patent is advantageous. It is not essential, however, to the operation of the press on all materials that such relation obtain, as the screws may be set in opposition to each other, and certain features of the press—such, for instance, as the formation of the shell—may be advantageously used with a press employing a continuous screw.

Where the separated screws are employed, thimbles B′ will be placed intermediate the same as they are slipped onto the shaft.

A split sleeve or pipe C′, perforated throughout a portion of its length, surrounds shaft J and is connected to the outermost screw-section by pins C^2, which enter slots or elongated openings C^3, formed in the shell-sections. The slots permit the sleeve to be

moved lengthwise under the dovetail formed on the screw-section, the opposite end of the sleeve being held by a brass nut E′, screwed upon shaft J. The perforated section of sleeve C′ is surrounded by a perforate brass cylinder D′, while the opposite end is provided with discharge-openings F′.

A two-part or longitudinally-separable shell or casing G′ is mounted upon the shaft, being splined thereto, so as to partake of its rotary motion, but being free to be moved longitudinally thereon. Pipe or sleeve C′ extends into the shell or casing, as shown in Fig. 3. The forward face of the shell is provided with a series of pins H′, arranged at different distances from the periphery thereof, so as to act at different points or in different circular paths on the material ejected or forced out of the press and disintegrate the same. The shell is likewise provided with a series of openings I′ in its side wall. A hollow annular collar J′ encircles the shell at this point, said collar being provided with a discharge-orifice K′ and an inlet L′ for flushing this portion of the apparatus when desired. The collar remains stationary, while the shell rotates.

A collar M′ is splined to the shaft in rear of the shell, and rods N′, connected to said collar, extend forwardly and have their ends seated in sockets formed in the shell G′. A heavy coiled spring O′, encircling shaft J, is positioned intermediate collar M′ and the shell and serves to keep the shell G′, or the "disintegrating-head," as it may be termed, always against the material to be acted upon. Collar M′ serves to effect the initial adjustment, and its movement is brought about through the hand-wheels P′ and Q′

Pins F^2 serve to limit the rearward movement of the shell or casing, preventing the same from being drawn back too far.

In Fig. 15 a modified form of bar used in forming the shell or casing is shown. The bar is formed by planing out the sides of the same at intervals throughout its length, leaving projections a^2, which when the bars are assembled abut, leaving spaces intermediate the bars. This construction is employed where great pressure is to be exerted—as, for instance, in the extraction of oil. In such cases the pressure is so great that the bars are forced together in the direction of the rotation of the shaft, eventually cutting the copper strips above referred to and closing the openings between the bars. Under some conditions it may be found expedient to omit the disintegrating-pins H′ from the shell.

The operation of the press is as follows: The shell or casing being closed, material is fed into the hopper, and the operator or attendant throws the friction-clutch into operation through manipulation of lever G. Rotary motion is thereupon imparted to shaft J, the screws, the draining-tube C′, and shell G′, collar J′ remaining stationary. The material is then carried along by the first or "feed screw," as it may be termed, and forced into the space between it and the next screw, where it is compacted or pressed to a considerable extent, the liquid matter passing out through the openings in the shell. When the material in this portion of the press is compacted to a certain degree, it is taken up by the next screw in the series and again compacted or pressed into the next space. The material between the screw-sections does not rotate, and it is owing to this that the press is effective. The material is thus carried along until it reaches the discharge end of the press, where it is acted upon by the disintegrating-pins carried by the rotary shell G′. This shell forms in effect what may be termed a "head" or "plug" and serves to retard to a certain extent the too-rapid egress or discharge of the material, thereby permitting the last screw-section to effect a compression of the material. The extent of opening between the head or shell and the discharge end of the press will depend upon the nature of the material under treatment and will be regulated by the attendant through manipulation of the hand-wheels P′ and Q′. Any liquid which may be forced out of the material by the last screw will pass out through the openings in the shell of the press and into the draining tube or pipe C′. That portion which passes into the tube finds its way into shell G′, thence to collar J′ and into the discharge-pipe K′, which of course will be connected to a flexible pipe to convey the extracted liquid to any suitable point, thus keeping the discharge end of the press adjacent to the operator's stand dry. The shell or hollow head may be flushed when desired. When it is desired to open the shell or casing of the press, nuts *r* are loosened and bar *q* withdrawn from engagement with the lugs *e* of the upper section, when said section may be thrown back, as indicated in Fig. 5. By a further outward movement of bar *q* after the latches *u* are turned back shaft *m* is rotated in its bearing in hooks *t*, which rotary movement, owing to the curvature of the seats in the hooks *t*, causes said hooks to swing outwardly, freeing shaft *m* and permitting the lower section to be dropped down. The reengagement of the parts will be readily understood from the foregoing.

By the employment of the removable head or bushing K and making the head G′, collar J′, and wheel O′ longitudinally separable, so that they may be removed from the shaft, the screws may be readily withdrawn from the shaft through the opening in the frame C. This does away with the necessity of taking down the press when for any reason it is desired to remove the screws or the shaft itself.

Instead of making the forward face of the follower substantially flat it may be given a conical form.

Having thus described my invention, what I claim is—

1. In a press, the combination of a perforate shell or casing; a shaft mounted therein; a series of separated screws mounted on the shaft within the casing; a rotary hollow head working adjacent to the discharge end of the press; and a draining-tube extending from the interior of the press into the head.

2. In a press, the combination of a perforate shell or casing; a shaft mounted therein; a series of separated screws mounted on the shaft; a rotary hollow head working adjacent to the discharge end of the press; a draining-tube surrounding the shaft and extending from the last screw into the head; and means for draining the head.

3. In a press, the combination of a perforate shell or casing; a shaft mounted therein; a series of separated screws mounted on the shaft; a rotary hollow head working adjacent to the discharge end of the press; a draining-tube surrounding the shaft and extending from the last screw into the head; and a stationary hollow collar surrounding the head in line with a series of openings formed therein.

4. In a press, the combination of a perforate shell or casing; a shaft extending longitudinally thereof; a series of separated screws mounted thereon; a hollow head mounted on the shaft and rotatable therewith; a draining-tube extending from the last screw into the hollow head; a hollow collar surrounding the head in line with a series of openings formed therein; disintegrating devices carried by the forward face of the head; and means for adjusting the head longitudinally of the shaft toward and from the discharge end of the casing.

5. In a press, the combination of a perforate shell or casing; a shaft extending longitudinally thereof; a series of separated screws mounted on the shaft; a head also mounted on the shaft and rotatable therewith; a collar mounted on the shaft in rear of the head; rods extending from said collar and bearing at their forward ends in sockets formed in the head; a spring interposed between said collar and head; and means for moving the collar longitudinally of the shaft.

6. In a press, the combination of a suitable base; a head frame or block; a foot-frame; an intermediate frame; a shell or casing carried by said head and intermediate frames; a removable collar or bushing secured within an opening in the foot-frame, said collar being of a diameter as great as that of the interior diameter of the shell; a shaft extending longitudinally of the shell, said shaft bearing in the head-frame and the removable collar; a series of separated screws mounted on the shaft; a longitudinally-separable head mounted on the shaft and rotatable therewith; and means for adjusting the head toward and from the shell, substantially as described, whereby, by removing the shell from the shaft, and the bushing from the tail or foot frame, the screws may be removed from the shaft through the opening in the foot-frame, or the shaft itself removed without the necessity of taking down the press.

7. In a press, the combination of a suitable base; a head block or frame; a foot block or frame; an intermediate frame; a shell or casing carried by said head and intermediate frames; a removable collar or bushing secured within an opening formed in the foot-frame, said collar being of a diameter as great as that of the interior diameter of the shell; a polygonal shaft extending longitudinally of the shell, said shaft bearing in the head-frame and the removable collar; a series of screws mounted on the shaft and normally working within the shell or casing; and a head mounted on the shaft, rotatable therewith and adjustable toward and from the discharge end of the casing.

8. In a press, the combination of a suitable base; a head-frame; an intermediate frame; a foot-frame; a perforate shell or casing carried by the head and intermediate frames; a removable bushing secured in an opening formed in the foot-frame; a shaft extending through said bushing and seated at its forward end in the head-frame; a steel collar surrounding the shaft and bearing against the rear face of the bushing; a brass washer loosely mounted on the shaft and facing the steel washer; a second steel washer carried by the shaft and bearing against the brass washer; means for securing said washers in place; a series of separated screws mounted on the shaft within the shell; and a rotatable head movable toward and from the discharge end of the shell.

9. In a press, the combination of an operating-shaft; means for supporting the same; means carried by said shaft for causing a compression of the material; and a shell or casing surrounding said shaft and the means carried thereby, said shell comprising a series of ribs extending transversely of the axis of the shaft, and a series of bars extending transversely of said ribs and adjustably secured thereto, whereby the spaces between the said bars may be varied as desired.

10. A shell for a press, comprising a series of ribs; a series of bars extending transversely of said ribs; and means for adjustably connecting said bars to the ribs, whereby the spacing of the bars may be varied throughout the length of the shell, substantially as described.

11. In a shell for a press, comprising a series of ribs; means for maintaining said ribs in their proper relative positions; a series of bars extending from the outer ribs at one end toward the center rib; a second series of bars extending from said center rib to the other outer rib; and means for adjustably securing the bars to said ribs, whereby the spacing between one set of bars may be wider than that of the other set, substantially as and for the purpose described.

12. In a press, the combination of an operating-shaft; compressing means carried

thereby; suitable supports for said shaft; a longitudinally-separable two-part shell or casing hinged to one side of said shaft, each of said parts comprising a series of semicircular ribs; means for maintaining said ribs the proper distance apart; a series of bars extending transversely of said ribs; means for adjustably securing said bars to the ribs, whereby the spacing between the bars may be varied; and means for securing the parts of the shell or casing together when closed about the shaft and the compression means carried thereby.

13. A shell or casing for presses, comprising a series of bars; means for maintaining said bars in their adjusted position; and a narrow strip of metal passing about the alternate bars, whereby the spacing of the bars is determined when they are assembled, substantially as described.

14. In a shell or casing for presses, the combination of a series of bars; means for maintaining said bars in their proper adjusted position; and a narrow strip of metal secured to each bar throughout the series, at the same distance from the ends thereof, whereby when the bars are assembled the strips contact and determine the opening or space to be left between the bars, substantially as described.

15. In a press, the combination of a shaft; means for supporting the same; compression means carried by said shaft; a longitudinally-separable two-part shell or casing; each part comprising a series of semicircular ribs, the outer and central ribs being formed with slots which extend from the upper to the lower surfaces thereof; means for maintaining said ribs in position with reference to each other; a series of bars extending from the outer ribs toward the central rib; a series of bolts extending through the outer ends of the bars and passing through the slots formed in the ribs; means for securing said bolts in position; a bearing plate or bar supporting the inner adjacent ends of the two series of bars; means for maintaining said plate in position with reference to the central rib; and means for securing the shell-sections in their closed position.

16. In a press, the combination of a suitable shaft; means for supporting the same; compression means carried by said shaft; a longitudinally-separable casing, the parts thereof being hinged to one side of the shaft, each part of said casing comprising a series of ribs having projecting lugs *e;* bars secured to and extending transversely of said ribs; hangers *l* secured to the arms of said lower section; a shaft *m* carried by said hangers; eyebolts secured to said shaft; a bar Q mounted upon said bolts and extending throughout the length of the shell; means for securing said bar in its proper position with relation to the lugs of the upper ribs when the casing is closed; and means for engaging the shaft *m* when the lower section of the shell or casing is brought to position, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

VALERIUS D. ANDERSON.

Witnesses:
C. F. BAILEY,
E. H. BAILEY.