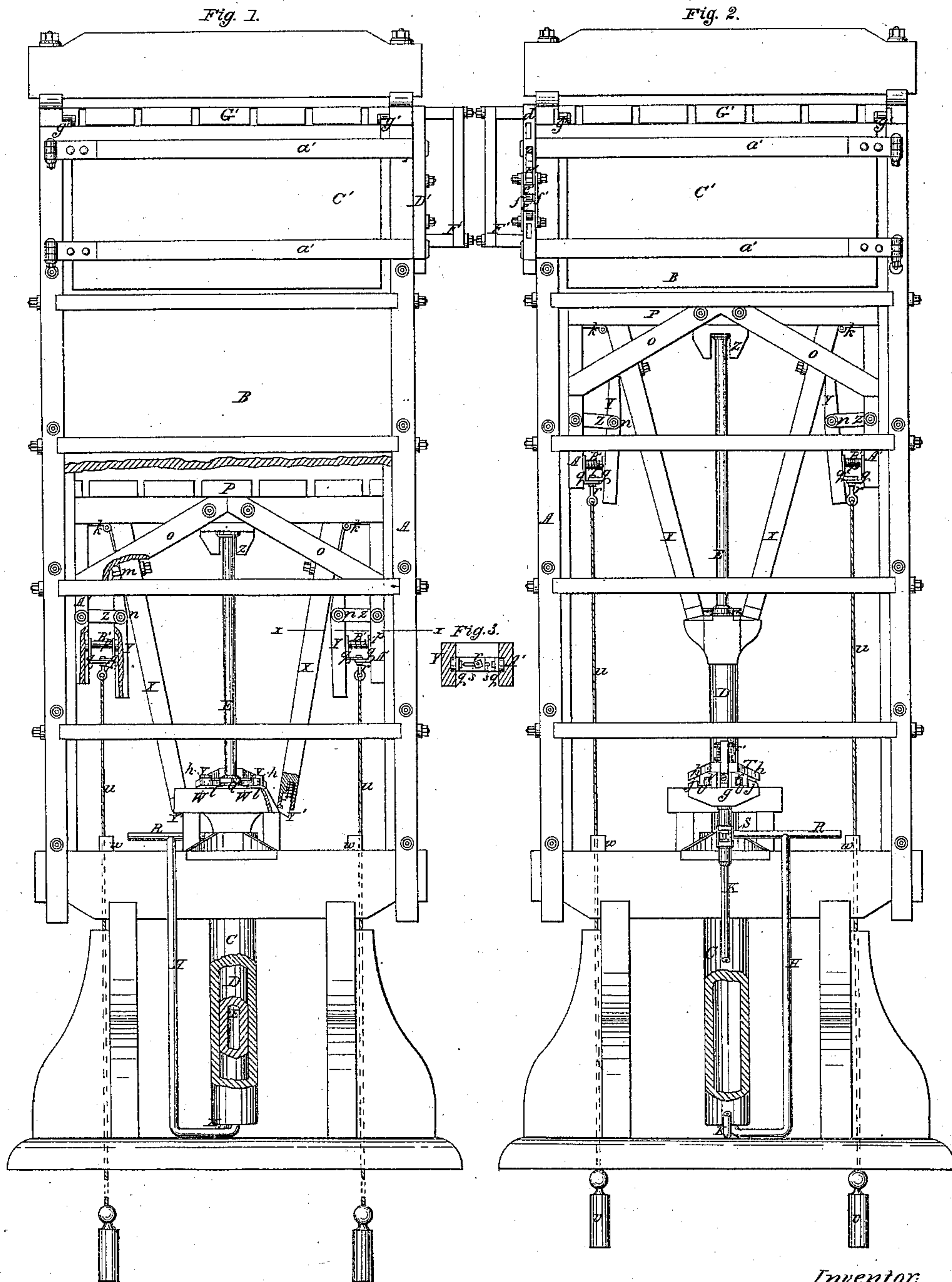


A.H. Emery,

Hydraulic Press,

No 63,875.

Patented Apr. 16, 1867.



Witnesses:
The Insh
Wm. Brown

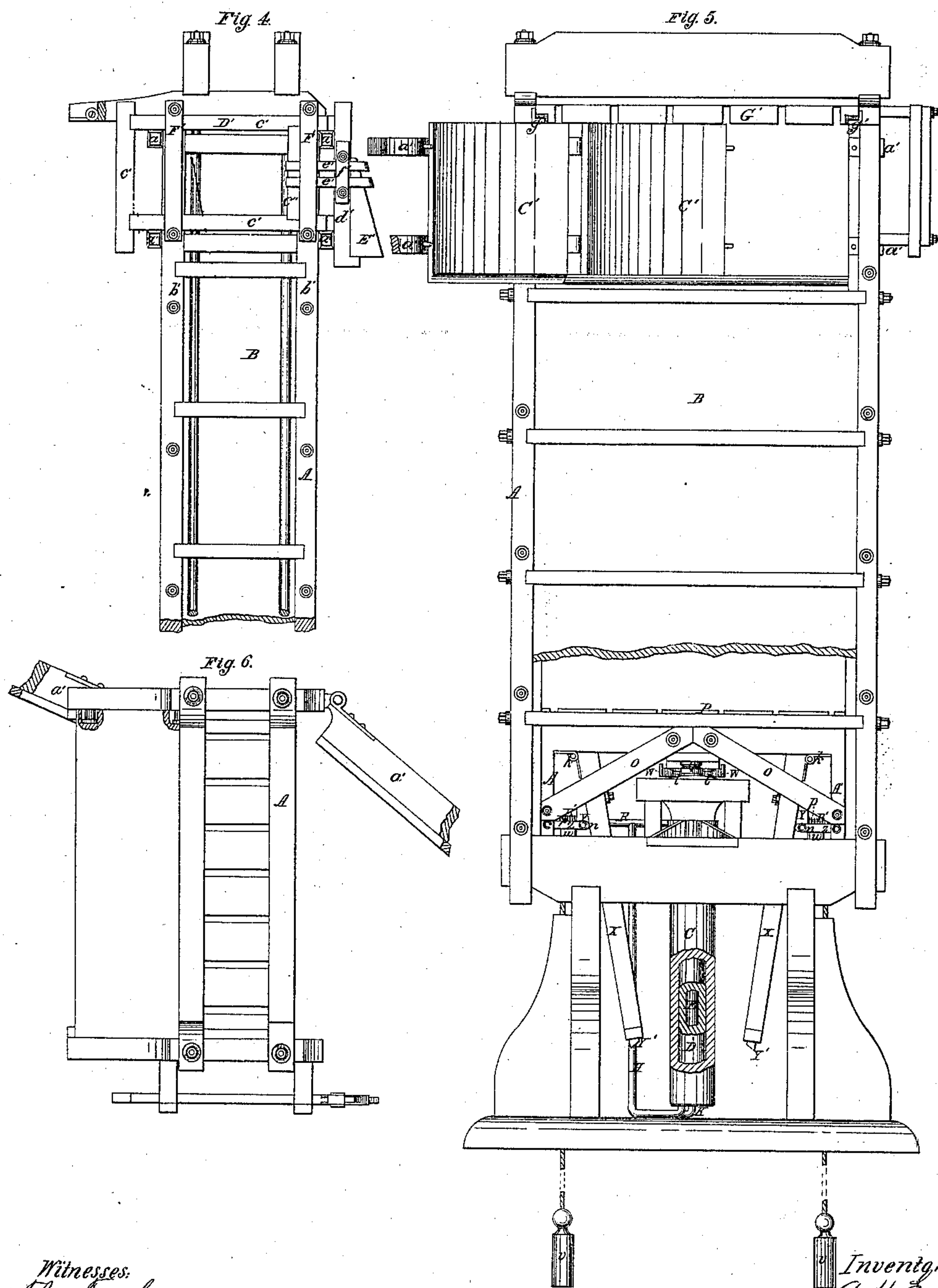
Inventor:
A. H. Emery
per
Attorneys

A. H. Emery.

Hydraulic Press.

N^o 63,875.

Patented Apr. 16, 1867.



Witnesses:
Geo. Busch
Wm. Brown

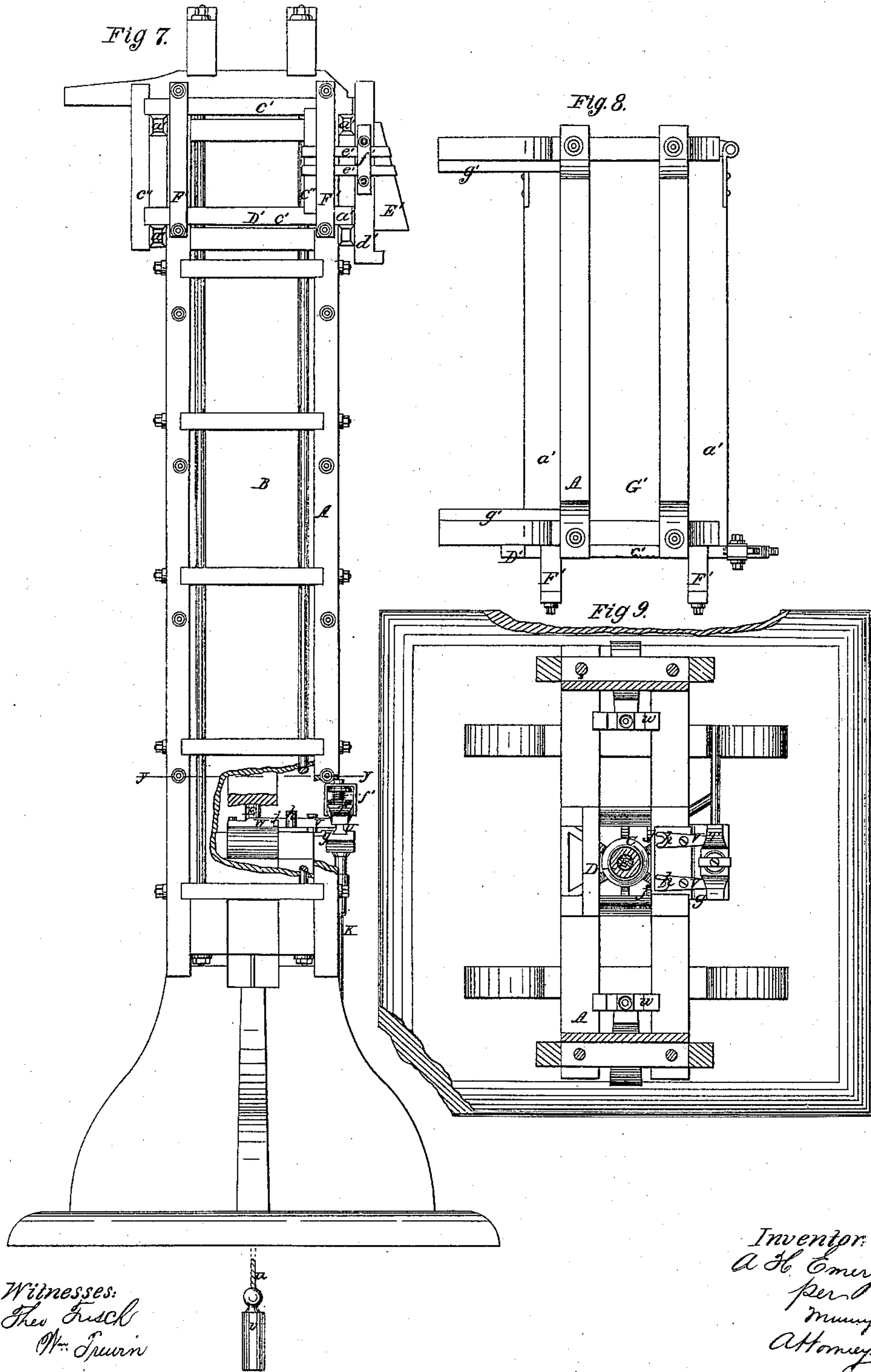
Inventor:
A H Emery
per ^{Manager}
Attorneys

A. H. Emery,

Hydraulic Press,

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Witnesses:
Thos. Fusch
Wm. Spurrin

Inventor:
A. H. Emery
per
Munroe
Attorneys

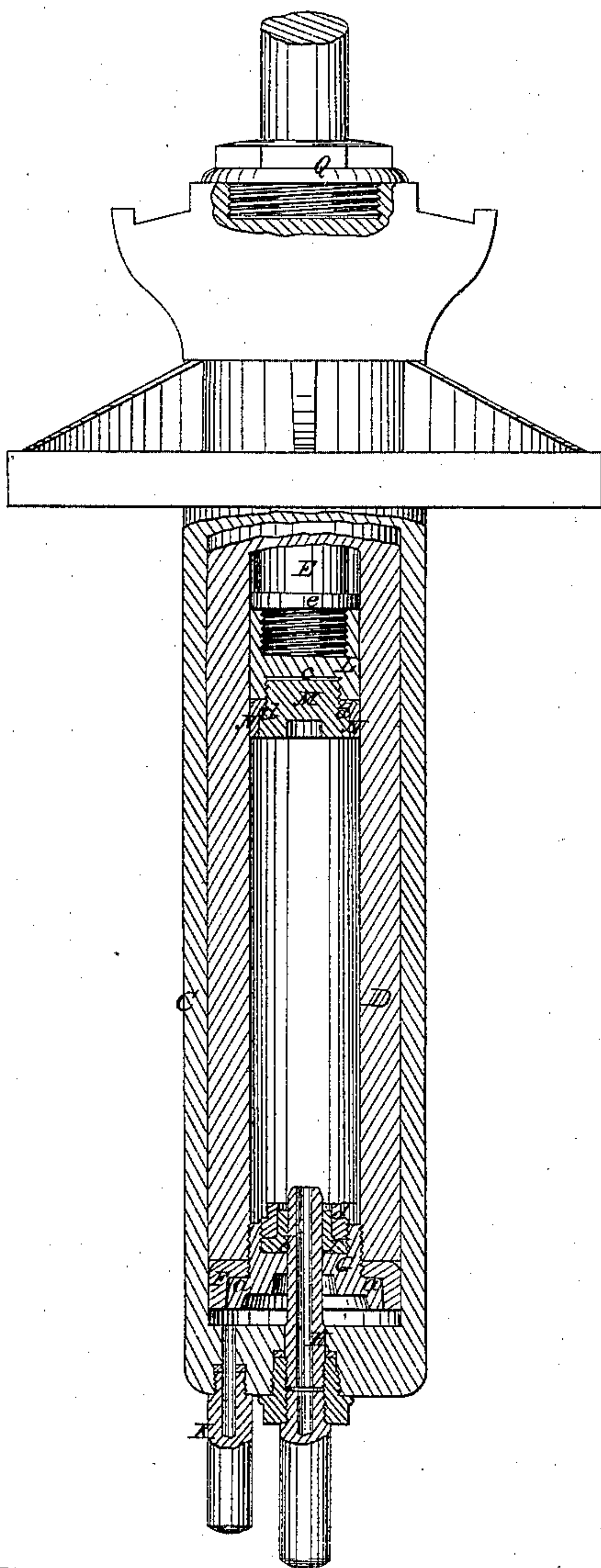
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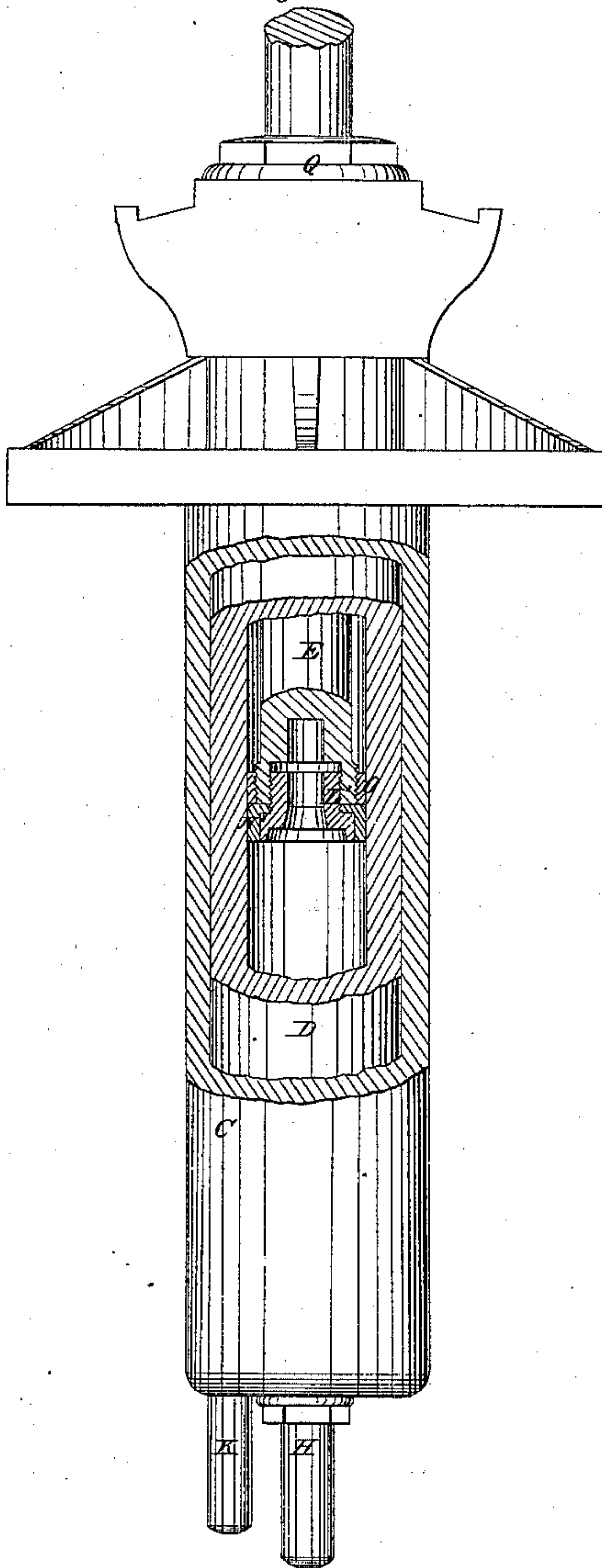
Patented Apr. 16, 1867.

Fig. 10.



Witnesses:
Thos. Fusch
W. E. Emery

Fig. 11.

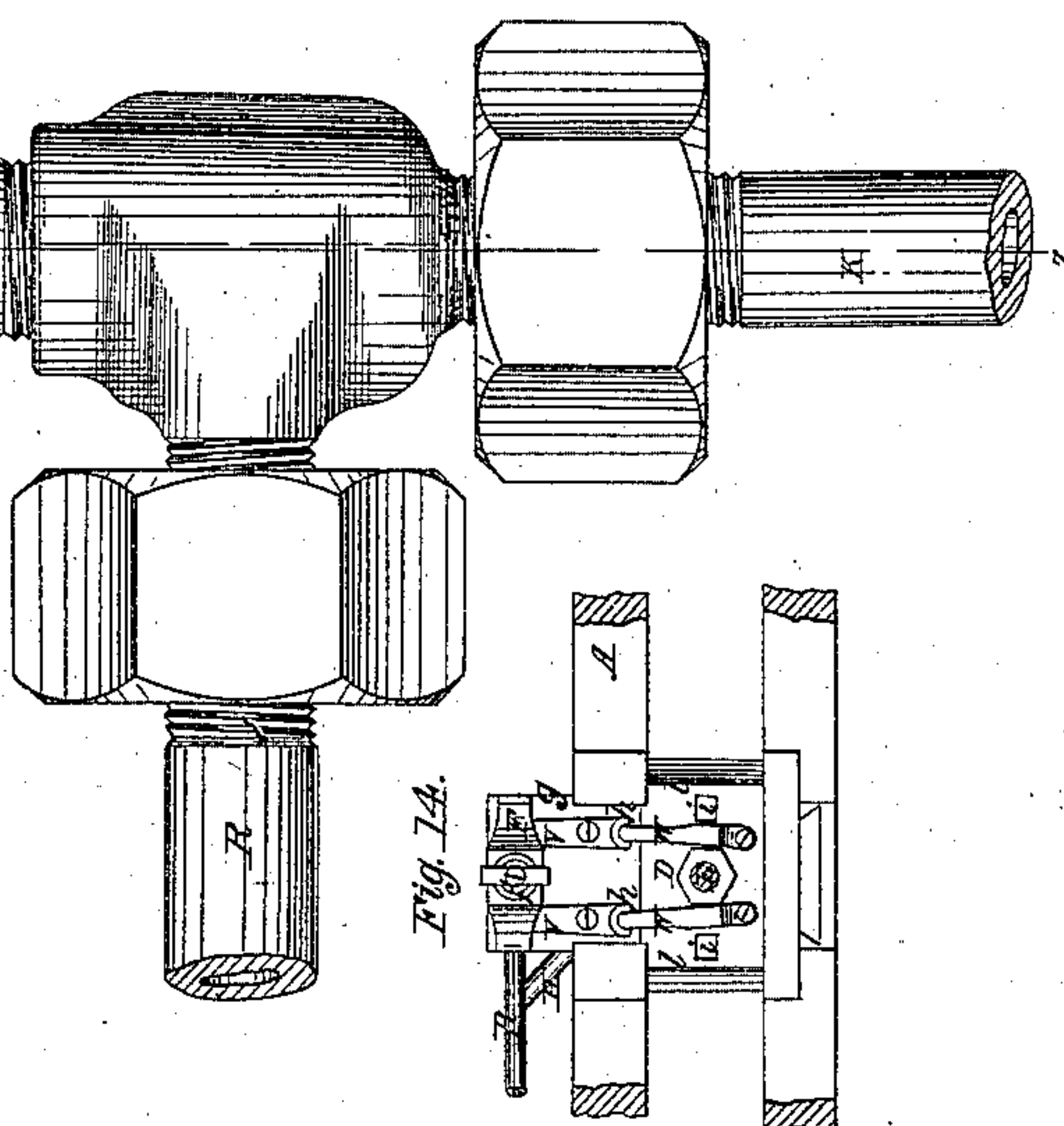
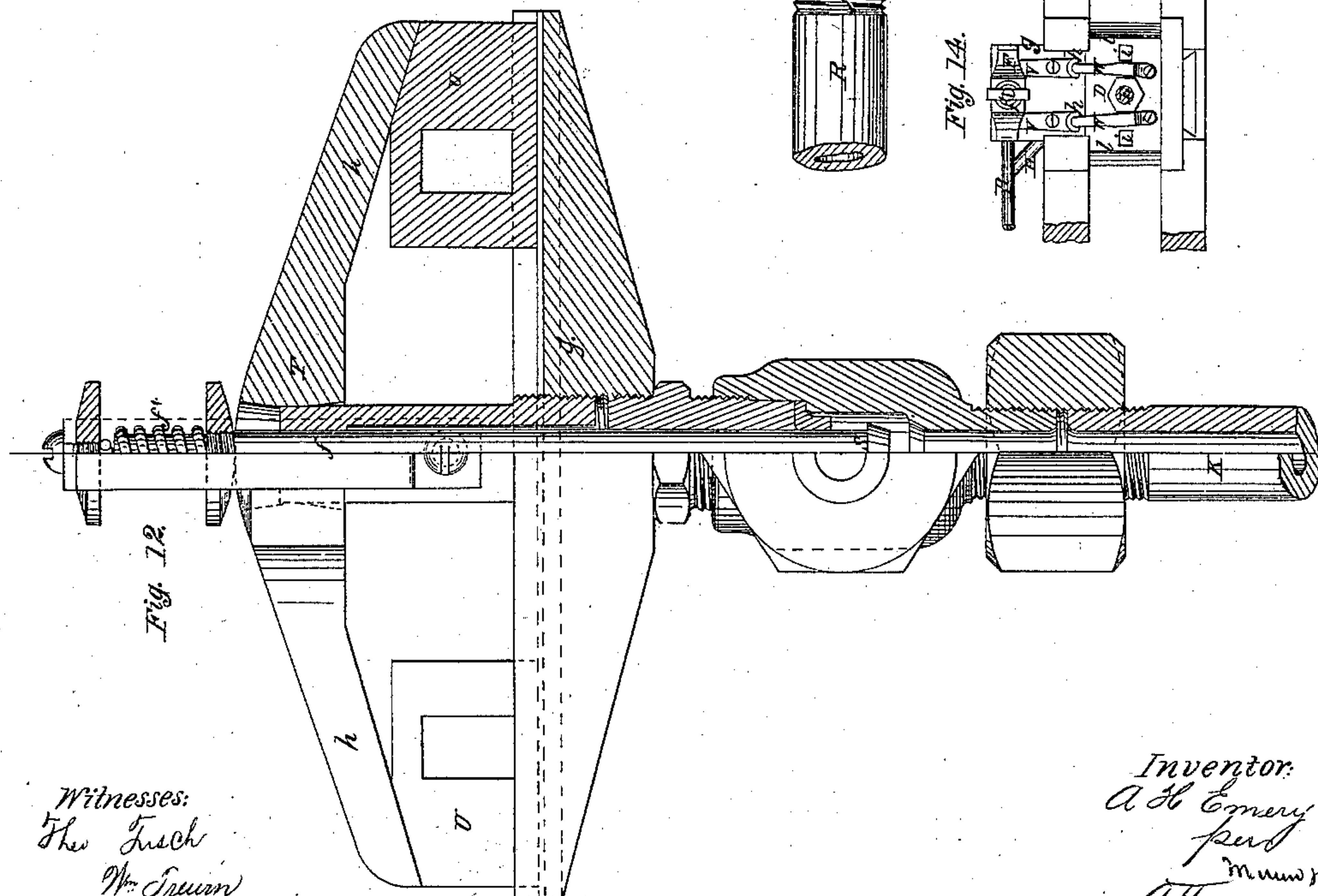
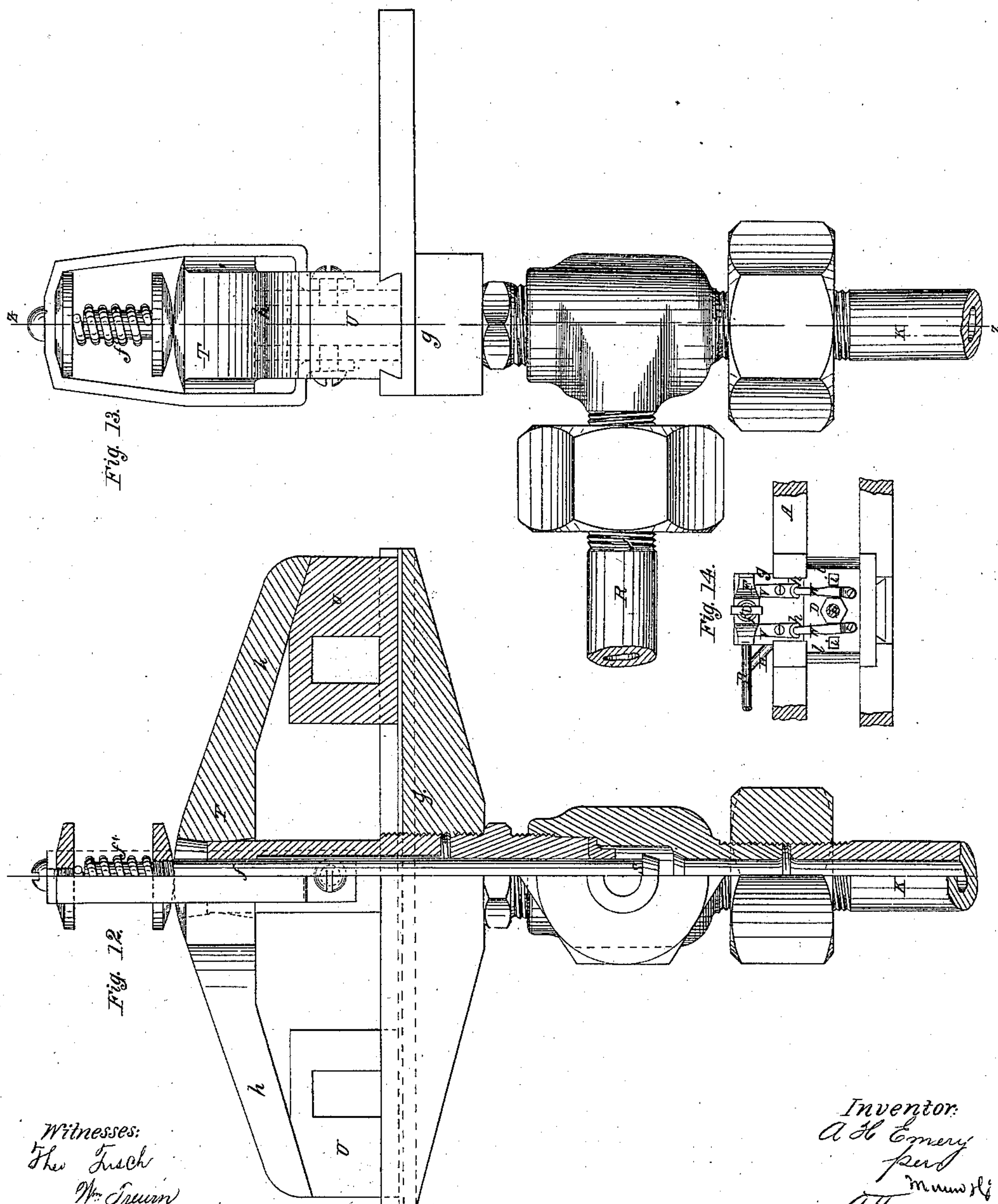


Inventor:
A. H. Emery
per
M. W. Emery
Attorneys

A.H. Emery,
Hydraulic Press,

N^o 63,875.

Patented Apr. 16, 1867.



Witnesses:
 Theo Tisch
 Wm. Freum

Inventor:
A H Emery
per
Attorneys

United States Patent Office.

A. H. EMERY, OF NEW YORK, N. Y.

Letters Patent No. 63,875, dated April 16, 1867.

IMPROVEMENT IN HYDRAULIC PRESS.

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

TO ALL WHOM IT MAY CONCERN:

Be it known that I, A. H. EMERY, of the city and State of New York, have invented a new and useful improved Hydraulic Baling-Press; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to make and use the same, reference being had to the accompanying drawing, forming a part of this specification, in which—

Figures 1 and 2, sheet No. 1, are elevations of my invention.

Figure 3, a horizontal section of a portion of the same, taken in the line *z z*, fig. 1.

Figure 4, sheet No. 2, a side view of the office part of the same.

Figure 5, an elevation of the same.

Figure 6, a plan or top view of the same.

Figure 7, sheet No. 3, a side view of the same in elevation, a portion of the framing being broken away to show the working parts.

Figure 8, a plan or top view of the same.

Figure 9, a horizontal section of the same, taken in the line *y y*, fig. 7.

Figures 10 and 11, sheet No. 4, enlarged sectional views of the hydraulic rams pertaining to the same.

Figure 12, sheet No. 5, an enlarged part view of the mechanism by which the valve of the supply pipes is operated. This view is partly in section, taken in the line *z z*, fig. 13.

Figure 13, a side elevation of fig. 12.

Figure 14, a detached plan or top view of the compress-ram head and adjoining parts.

Similar letters of reference indicate like parts.

This invention relates to a new and improved hydraulic press, designed more especially for baling purposes; and it consists of a plurality of hydraulic rams arranged in such a manner with certain detail parts and with the plateau of the press that the rams are made to operate consecutively upon or against the plateau, and a packing and compress mechanism combined in one and the same press.

A represents the framing of the press, and B the press box. These parts may be constructed in any proper manner to insure strength and durability. C represents an upright cylinder secured in the lower part of the framing A. This cylinder is of cast iron, closed at its bottom, and has fitted within it a cylinder, D, which is allowed to rise and fall freely, and constitutes what I term a compress ram, (see more particularly figs. 10 and 11.) Within the cylinder D there is a rod, E, which I term a packing ram, the rod or ram E being allowed to rise and fall freely within D. The lower end of the cylinder or compress ram D is closed, and allowed to work water-tight in the cylinder C by means of a packing, F, secured in position by a ring, G, which is screwed into the lower end of D, the packing F being clamped between a shoulder, *a*, on the ring and the lower end of the ram D, as shown in fig. 10. H is a water-supply pipe which passes up through the bottom of the cylinder C, and through the ring G in the bottom of the compress ram D, and the leakage of water around the pipe H and through the ring is prevented by a packing, I, which is fitted around the upper end of the pipe H within a recess, *b*, in the upper surface of the ring G, and secured or clamped in position by a ring, J, screwed into the recess *b* of the ring G, as shown clearly in fig. 10. K is a water-supply pipe which communicates with the lower part of the cylinder C, as shown clearly in fig. 10. The lower end of the ram E has a nut, L, screwed upon it, with a recess, *c*, in its under side to receive a nut, M, between a shoulder, *d*, on which and the lower end of nut L a packing, N, is secured or clamped by screwing up nut M. The upper end of the nut L abuts against a collar, *e*, on the rod or ram E, which collar serves as a stop, as will be hereinafter described. A modification of this packing and stop is shown in fig. 11, N^x being the packing, L^x the nut, which is screwed directly into the lower end of the rod or ram E, and O a ring, which is fitted on an external screw-thread on the lower end of the ram, the ring O serving as a stop in lieu of collar *e*. P is the plateau of the press, which is fitted and works in the press box B. The upper end of the rod or ram E bears against the under side of the plateau P, and it will be seen that when water is forced through the pipe H into the lower part of the compress ram D the water will act against the ram E, which I term the packing ram, as previously alluded to, and the plateau P will be raised until the stop *e* or O comes in contact with a nut, Q, in the head of the compress ram, at which time the compress ram D is made to rise by water entering the lower end of the cylinder C through

pipe K and acting against the bottom of D. The two supply pipes H K are connected at their upper parts by a pipe, R, (see fig. 2,) the water being forced into pipe R by a pump as usual. The pipe R communicates with the pipe K just above the valve S, the stem *f* of which passes up through a fixed plate, *g*, on the framing A, and through a cross-head, T, the arms *h h* of which incline downward, as shown in figs. 2 and 12. Between the cross-head T and the fixed plate *g* there are interposed two sliding wedges, U U, in which the outer ends of levers V V are fitted, said levers V having their fulera in the plate *g*, and their inner ends made or formed with recesses *h h*, as shown in fig. 9, to receive the ends of levers W W, which are attached to the upper end or head of the ram D, said head having two notches or recesses *i i* made in it, shown in fig. 14, the use of which will be presently explained. At the inner edge of the fixed plate *g* there are vertical projections, *j j*, which serve as rests for what I term lifters, X X. These lifters are attached to the under side of the plateau P by hinges or joints, *k k*, as shown in figs. 1, 2, and 5, and in the lower end of each lifter there is fitted an elastic or yielding pawl, Y', shown clearly in fig. 1, said pawls having their under surfaces inclined or bevelled so that they may be readily forced upon inclined surfaces *l l* on the compress-ram head D, and be made to catch into the recesses *i i* made in said surfaces. To the plateau P, at about the centre of one side of the same, there is attached a pendent wedge, Z, shown clearly in figs. 1 and 2. On the upper part of the stem *f* of the valve S there is a spring, *f'*, which has a tendency to keep said valve closed. In the outer side of each lifter, X, near its upper end, there is connected by a hinge or joint, *m*, a lever, Y. These levers Y Y have their fulera *n* in metal straps Z Z, which are attached to pendent arms A' A' secured to the ends of the plateau P, said arms working in contact with the sides of the press box, and braced by bars *o o*, as shown in figs. 1 and 2. Between the levers Y and the pendent arms A', to which they are attached, there are placed springs B'. These springs are fitted on rods *p* which pass through plates *q q*, arranged so that they may slide or expand and contract, the plates being of L-form and connected by a bolt *r* which passes through oblong slots *s*, (see fig. 3.) These plates *q* are fitted in vertical grooves made in the levers Y and pendent arms A', and to the bolts *r* cords *u* are attached, said cords extending down through the base of the framing of the press, and having knobs or weights *v* attached to them. In the lower part of the framing of the press, and about on a level with the top of cylinder C, there are inserted cross-bars *w w*, which serve as stops. These stops are in line with the plates *q q* and springs B', and their use will be shown in the operation of the several parts. At the upper part of the press box B there are two doors C' C' hinged at one end. These doors are provided with longitudinal battens *a'* which extend beyond the disengaged ends of the doors, and when the doors are closed extend beyond the posts *b'* of the framing, so that a clamp frame D' may be fitted thereon. This clamp frame is of rectangular form, and constructed of four bars *c' c' c'' c''* framed together, the upper and lower horizontal bars *c'* extending beyond one of the side-bars *c''*, and having a vertical bar *d'* fitted on them, the ends of the bars *c'* having tenons made on them to fit in mortises in the bar *d'*. To the vertical bar *c''*, which is near the tenons on the ends of the bars *c'*, two metal straps or loops *e' e'* are attached, the lower strap being a trifle longer than the upper one. The bar *d'* passes through the loops *e' e'*, and is retained in position by guide-plates *f'* attached to the sides of *d'* over the loops *e'*, (see figs. 4 and 7.) E' is a key or wedge, which is fitted in the loops *e' e'*, and when driven up in said loops serves to clamp the two doors C' C' in a closed state. The clamp frame D' is fitted in guides F', which admit of it being adjusted on and off from the ends of the battens *a'* with facility, and always retain said frame in proper position. On the upper part of the press box B there is a sliding top or head-plate, G', which works on ways or guides *g' g'*, which admit of it being readily moved or adjusted over and off from the top of the press box.

The operation of the press, so far as the action of the water upon the two rams D E is concerned, has been previously alluded to in a brief manner simply to define or render clear the construction of the rams. I will now proceed to describe the operation throughout. In the first place we will suppose the plateau P to be down to its fullest extent in the press box B, as shown in fig. 5. When the plateau is in this position the springs B' are above the fulera *u* of the levers Y, and have a tendency to press the lifters X X towards the head of the ram D, and the valve S is in a closed state, as the pendent wedge Z, attached to the plateau, is between the levers W, and when the plateau reached its lowest point in descending, forced or spread apart said levers and moved the levers V V, which in turn actuated the wedges U U, moving them inward or towards the valve stem *f* so that the spring *f'* forced the valve S down upon its seat. The springs B' are above the fulera *u* of the levers Y, on account of the plates *q* having come in contact with the stops *w* previous to the plateau reaching its lowest point. The doors C' C' are opened, the head-plate G' raised to one side of the press box, and the latter filled with the substance to be compressed; the doors being closed, and the head-plate should back over the press box; the doors being firmly secured in a closed state by adjusting the clamp frame D' over the ends of the battens *a'*, and driving the key E' up in the loops *e' e'*, water is then forced into the pipe R by means of the usual pump provided with a valve as usual, graduated to suit the pressure required, and the valve S being closed, the water passes down the pipe H and up into the ram D, and acts against the ram E, raising the same, and consequently the plateau P, and packing or pressing the substance within the press box. The ram E rises until the collar *e* or O comes in contact with the rest Q on the ram-head D, at which time the lower ends of the lifters are pressed over the head of the ram D by the springs B', and the pawls Y' are thrown into the recesses *i i* in the head of the ram D, and the lower ends of the lifters in this movement strike the levers W W and actuate the levers V V, so that the latter will move the sliding wedges U U outward and raise the cross-head T, and thereby open the valve S so that the water will pass down the pipe K and up into the lower part of the cylinder C, and acting against the ram D will elevate it; said ram, through the medium of the lifters X X, acting upon the plateau D, which, under the pressure of the ram D, acts with an increased power owing to its greater area, the motion being reduced of course in proportion to the increase of power. Thus, in the first instance, the plateau acts or moves more rapidly under the pressure of ram E, owing to its small area,

and this is termed the packing ram, as it simply compacts or presses the loose substance in the press box, and prepares it to receive the increased pressure of the larger ram D, which, in consequence of its greater power, I term the compress ram. At the time the compress ram D reaches its highest or culminating point, the springs B' will be below the fulcrum *n* of the levers Y, on account of the knobs or weights *v* coming in contact with the base of the framing of the press before the plateau reaches its highest point. The substance being thus compressed the doors C C are opened, the compressed substance bound and removed from the press box, and the two rams allowed to descend by permitting a discharge of the water from within cylinder C and the ram D through pipe R, and the plateau P descends, the lower ends of the lifters X coming in contact with the rests *j*, which retains the lifters and plateau until the head of ram D descends sufficiently to allow the pawls Y' of the lifters X to be free from the recesses *i i* in the head of ram D, when the springs B', in consequence of being below the fulcrum *u*, as shown in fig. 2, throw the lifters off from the head of ram D and the plateau descends to its lowest point; the wedge Z passing between the levers W W and actuating the levers V V, so that the latter will move towards each other, the sliding wedges U U, and allow the spring *f'* to close the valve S. The plates *q q*, just previous to the plateau reaching its lowest point of descent, come in contact with the stops *w* and cause the springs B' to be adjusted above the fulcrum *u* of the levers Y, as shown in fig. 5, and all the parts will then be in the position described at the commencement of the operation.

I claim as new, and desire to secure by Letters Patent—

1. A plurality of rams arranged so as to operate consecutively upon the plateau of a press, substantially as set forth.
2. Operating or moving the plateau of a press by means of two or more columns of water or other liquids, whenever these columns of water or liquid are so arranged that the plateau is moved through a part of its stroke by one or more of the acting columns, but not all, and through the rest of its stroke by a part of or the whole of the columns so used.
3. The arrangement of two or more concentric rams placed one within the other, and enclosed within a fixed cylinder to operate upon the plateau of a press, substantially as shown and described.
4. The arrangement of the supply pipe H with the fixed cylinder C and the two rams D E, for the purpose of operating the smaller ram E while the larger one remains stationary, substantially as set forth.
5. The arrangement of the supply pipe H, sliding packing I, and compress ram D, substantially as and for the purpose set forth.
6. The arrangement of the two sliding packings F I, packing-ring G, and the compress ram D, substantially as described.
7. The two supply pipes H K arranged and combined with the fixed cylinder C, packing and compress rams E D, to operate substantially as shown and described.
8. The shoulder or stop *e* or O, on the packing ram E, with the nut Q in the compress ram, arranged to operate substantially in the manner as and for the purpose set forth.
9. The two supply pipes H K, with the valve S, arranged to operate in connection with the packing and compress rams E D, substantially in the manner as and for the purpose specified.
10. The levers V V, sliding wedges U U, and valve *s*, arranged to operate in the manner substantially as and for the purpose set forth.
11. The lifters X X, plateau P, and compress ram D, combined and arranged to operate substantially as and for the purpose specified.
12. The combination of the lifters X X, compress ram D, and levers Y, arranged to operate substantially as and for the purpose set forth.
13. The sliding wedges U U, plateau P, levers W W Y Y, spring *f'*, and valve S', combined and arranged to operate substantially as and for the purpose specified.
14. The plateau P and lifters X X in combination with the levers Y Y and the springs B' or their equivalents, arranged to operate substantially as and for the purpose set forth.
15. The springs B' arranged with the levers Y Y, stops *w*, and the cords *u*, to operate substantially as and for the purpose specified.
16. The lifters X X, pawls Y' at the ends of the lifters X X, the recesses *i* in the compress ram D, and the rests *j j*, all combined and arranged to operate substantially as and for the purpose specified.
17. The arrangement of the clamp frame D', wedge E', and the clews or loops *e' e'*, substantially as and for the purpose set forth.

A. H. EMERY.

Witnesses:

WM. F. McNAMARA,
WM. DEAN OVERELL.