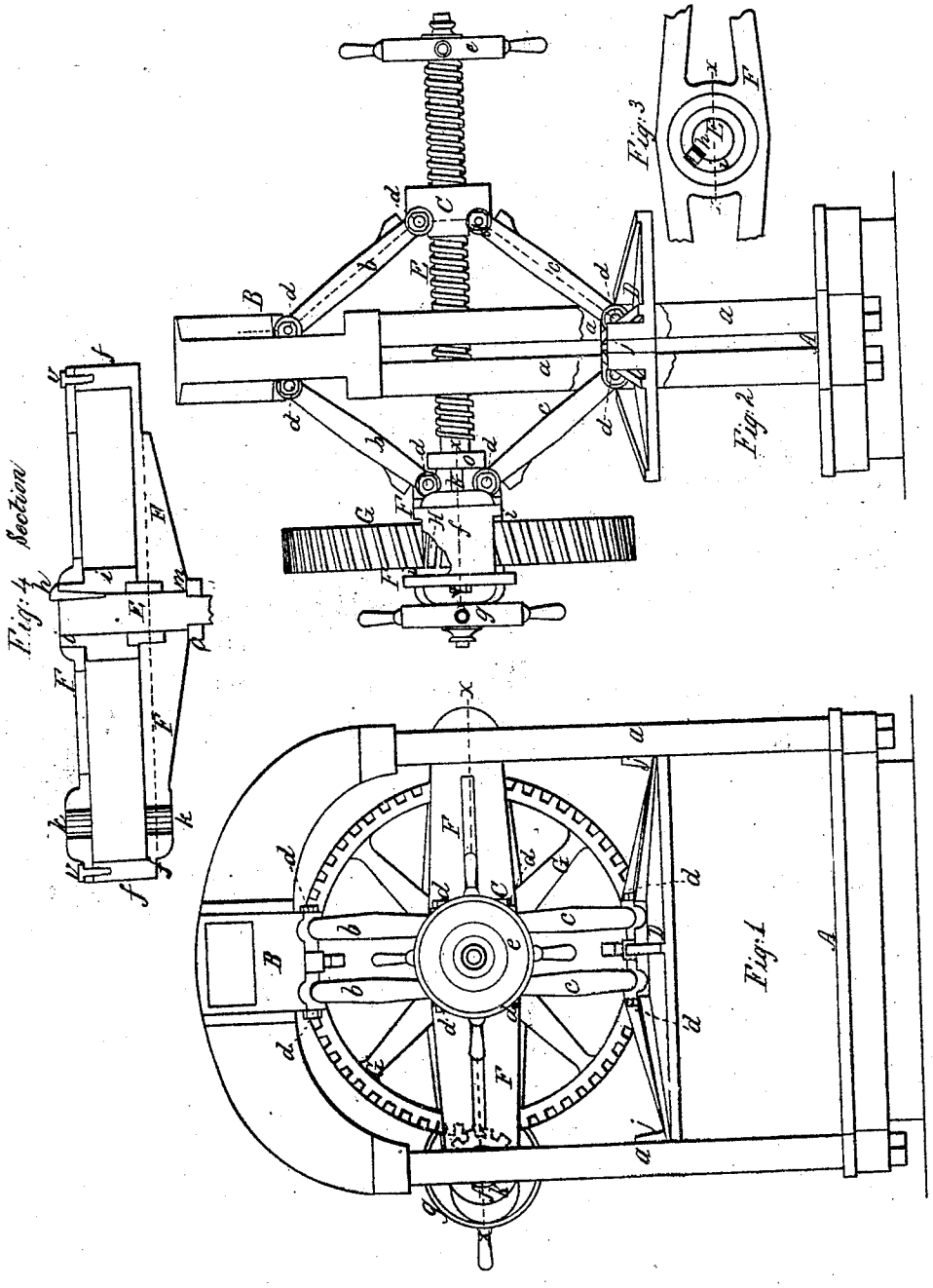
A. C. Semple,
Hay Press.

No. 9824. Patented June 28. 1853



UNITED STATES PATENT OFFICE.

AMZI C. SEMPLE, OF CINCINNATI, OHIO, ASSIGNOR TO WM. C. SEMPLE.

IMPROVEMENT IN PRESSES.

Specification forming part of Letters Patent No. 9,824, dated June 28, 1853.

To all whom it may concern:

Be it known that I, AMZI C. SEMPLE, of the city of Cincinnati, in the county of Hamilton and State of Ohio, have invented a new and Improved Press, important for pressing cotton, hemp, hay, tobacco, wine, linseed-oil, castor-oil, printers' or book-binders' standing presses, fullers, paper-mills, lard-oil, cheese, and baling goods, &c., which I call "Semple's Perfect Power-Press;" and I do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the annexed drawings, making a part of this specification, and in which—

Figure 1 is a front view of the press, and Fig. 2 a side view of the same. The other figures will be referred to in their proper places.

A represents the platform; B, the cap; and *a a*, the pillars, which support the cap.

b b are the arms of the toggle-joint, which connect the nuts with the cap, and *c c* the arms of the same, which connect the nuts with the platen.

D is the platen or follower, and E the screw through which the power is applied to operate the press. C is a nut, with a female screw therein to fit the screw E.

F is an elongated nut or box, which receives the end of the screw. The thread of the screw is turned off at this end, leaving the surface smooth and cylindrical, and a shoulder is left on the shank working against a collar on the nut or box, to prevent the screw from being drawn out of the nut. This shoulder is seen at *m*, Fig. 4, and the collar at *o*.

e is a hand-wheel for operating the screw, firmly connected therewith; and it is obvious that when turned in the proper direction the nuts C and F will approach each other, and the platen will be forced down and the work done. The screw, it will be seen, has but a single uniform thread, and travels through the nut C only, and the nut F travels with it. There may be projections *j* on the ends of the platen, working between the pillars, to prevent the platen from tilting when it has no resistance, and to guide it down fairly upon the thing to be pressed.

The elongated nut F may be constructed in the manner represented in Fig. 4—in two parts firmly attached to each other, leaving an open space in the middle. It constitutes at the same time a box for the unthreaded end of the screw, a block to resist the thrust of toggle-arms, and a frame to receive and support multiplying-gear for increasing the power of the press to any desired extent. A large pinion is placed within this frame upon a continuation of the unthreaded part of the screw. Its hub is seen at *i i*, and is capable of revolving with or without the screw. When the key *h* is used, the pinion and screw will revolve together, and when removed the screw may revolve without moving the pinion. On an axis placed in the boxes *k k* a small pinion is placed, working into the larger one, and the hand-wheel *g* is placed upon the axle of the small pinion, and thus greatly increased power with proportionate diminution of motion will be attained. It is obvious, also, that for very light work these pinions may change places with great advantage, and that additional gearing may be placed in this frame for the purpose of increasing power or speed, according to the duty to be performed. Thus for ordinary work the hand-wheel *e*, directly on the end of the screw, would be used. For heavy work the hub *i i*, with its large pinion, would be connected by the key *h* to the screw, and power would be applied to the hand-wheel *g* on the shaft of the small pinion, and when light work is required the large and small pinions might change places and the hand-wheel be placed upon the shaft of the large one. It will be perceived, therefore, that the same press, on my plan, is adapted to every variety of speed or power within the strength of its parts, and may be adapted immediately and successively to all these varieties of duty.

Heretofore, when attempts have been made to use the multiplying-gearing in connection with the screw of a double-toggle press to give the required power, the gearing has been partially sustained and guided by an auxiliary frame, and this frame has been firmly supported by the main frame of the press. This mode of construction renders the press cumbrous and expensive. This, however, is not the principal evil. When the press is in operation, the platen, by unequal resistance, gen-

erally assumes such a position as will give an inclination to the screw. The nut in the meantime is so held by the auxiliary frame that it cannot conform to the position of the screw, and consequently the screw binds in the nut, and the nut and screw cut each other to pieces, and soon become inoperative; but even if the nut could adapt itself the gearing on the screw would change its position relatively to the gearing which works into it, so that they could not, under great power, co-operate effectively. These difficulties have been found to be so serious as to render the application of gearing to the double-toggle press entirely unsuccessful, and it has uniformly been abandoned after every attempt, and could never be generally introduced. These hitherto insurmountable difficulties I have entirely overcome in my press by disconnecting the gearing-frame entirely from the frame of the press or any other stationary part, and connecting it only with the nut at the threadless end of the screw, and supporting and guiding it only by the toggle-arms, with their connections. No attempt has heretofore been made to effect this important combination, and no double toggle has heretofore existed to my knowledge which would admit of this improvement; nor am I aware that the idea of connecting the gearing-frame with the nut, and sustaining it by the toggle-arms wholly independent of the frame, had ever occurred to any mind prior to my invention.

My invention therefore consists, principally, in combining the gear-frame with the screw, and sustaining both in the same relative positions independently through the medium of the nut, the toggle-arms, and their connections. For this purpose I connect each parallel pair of arms firmly together, so that their positions relatively to each other cannot be changed. (See *b b* and *c c.*) Joined by plates at the end of each arm, or extending across both, perpendicular thereto and a part thereof, I form long journal-shaped pieces, as seen near *d d.* In the cap and platen, and in the upper and lower inner edges of the nuts, I make concave sockets of proper form to fit and receive the journal-shaped ends of the toggle-arms, and allow of their vibrating or vibrating therein partially around their axes. The ends of the arms are prevented from coming out of these sockets by pins, caps, or any other convenient device, so that when the press is in operation the whole thrust of the arms shall come upon the long sockets, through the medium of the long journal-shaped ends of the arms.

By this construction it will readily be seen that when the press is in operation the toggle-arms opposite to each other will always be in the same plane, and the openings through the nuts constantly in the same line, so that no binding can be caused by irregular lateral motion of the nuts. So far as motion perpendicular to the screw is concerned, the double toggle is perfectly rigid, and will sustain and accurately guide the nuts, screw, and gear-frame against any disturbing force applied to operate the screw, or otherwise; and if there be any degree of yielding in or nearly in the direction of the length of the screw, or in the plane of the toggle-arms, the gear-frame, with the nut, will have a motion which will perfectly preserve their relative positions to the screw, so as to work equally well when the screw is inclined. It should have been remarked that these arms are all precisely alike, being cast in the same mold.

The importance of my invention will be easily appreciated when it is recollected that multiplying-gear has never been successfully applied to the double-toggle press, and that no screw applied directly to the platen can resist the power required in many branches of the arts, and that my press may be substituted in many instances where no press hitherto known (but the hydraulic press) would answer the purpose.

Having fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

Sustaining the gear-frame of a double-toggle press by the toggle arms and joints independent of and disconnected from the frame of the press, by attaching the same firmly to the nut, as described, in combination with supporting the screw by the nuts thus sustained only, the whole being arranged substantially as described.

A. C. SEMPLE.

Witnessses:
GEO. F. GILBERT,
H. N. GILBERT.