No. 788,121. PATENTED APR. 25, 1905.

S. B. TOWNSEND.

CAN CAPPING TOOL.

APPLICATION FILED MAR. 16, 1904.

Fig. 1,

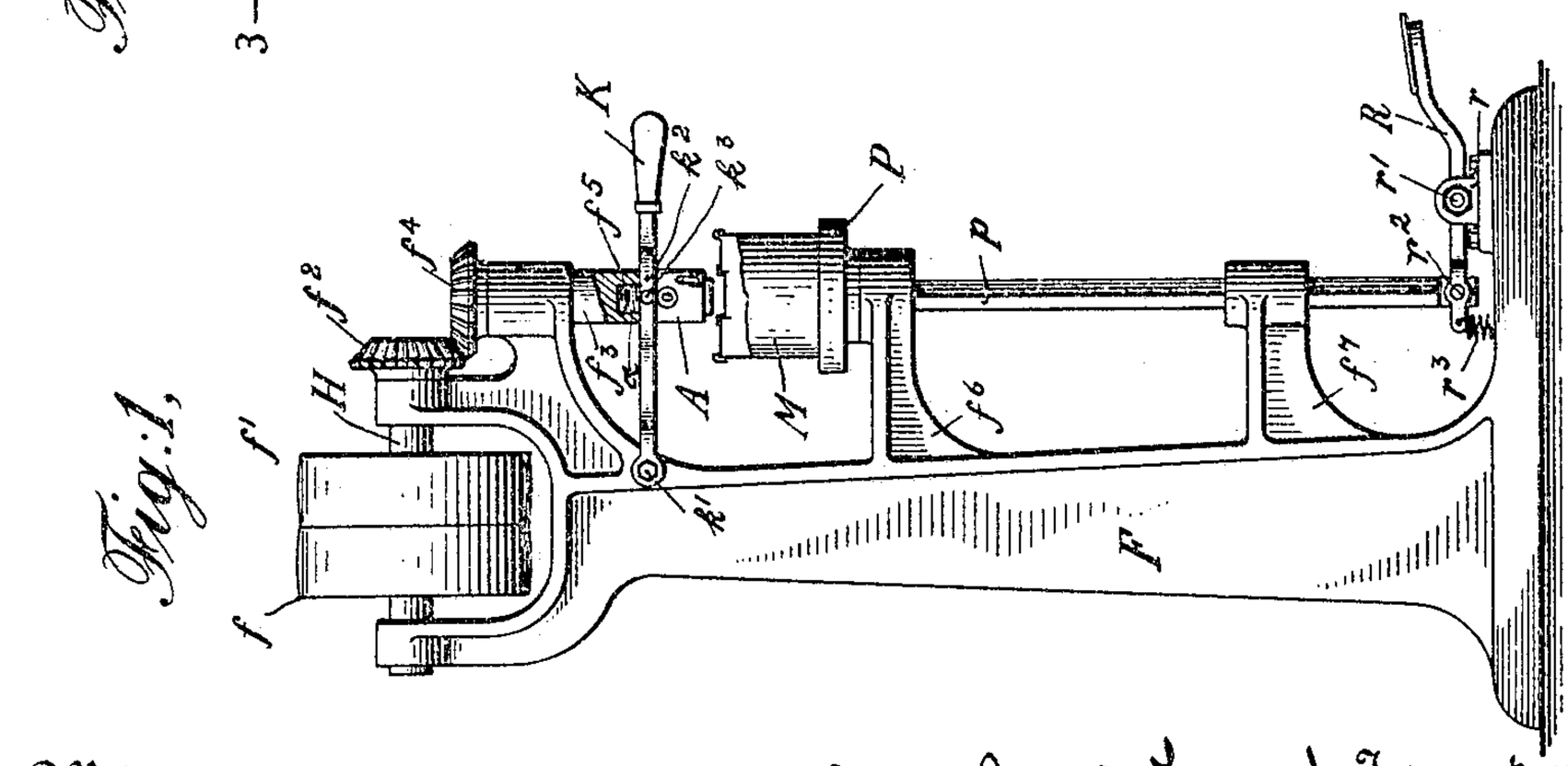


Fig. 2,

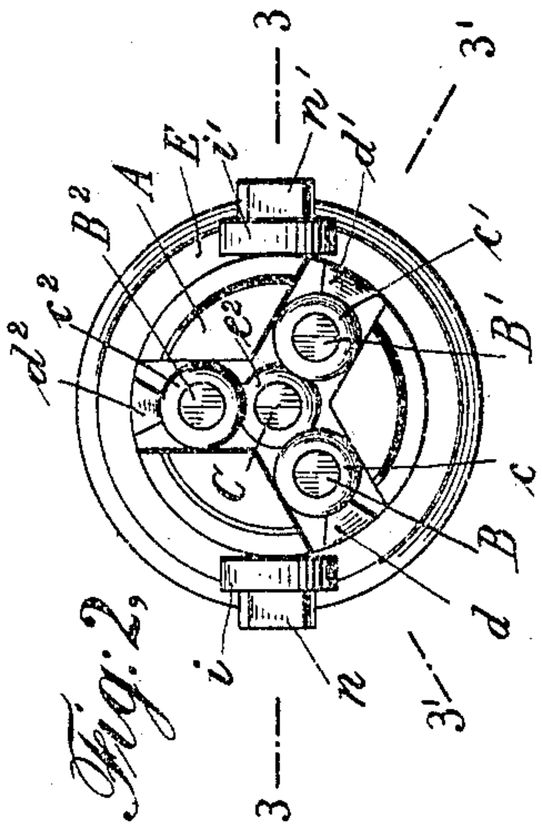


Fig. 3,

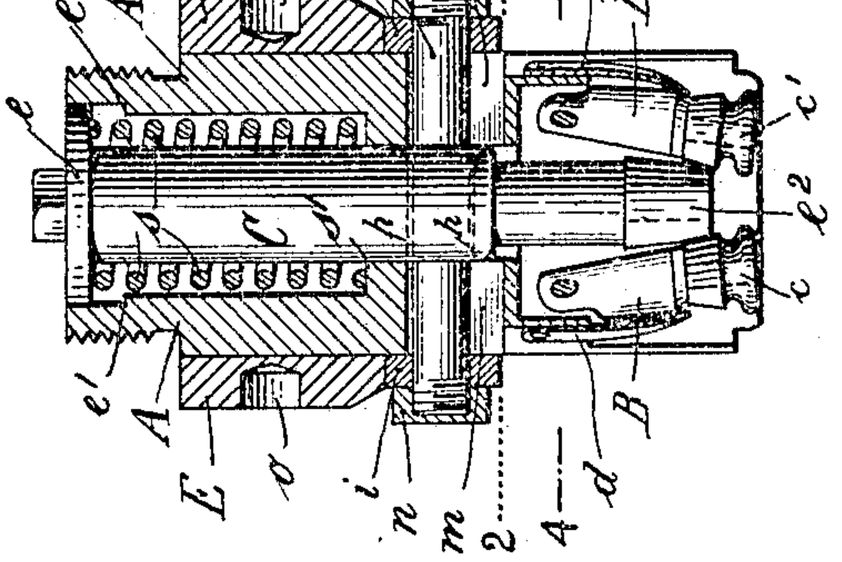


Fig. 4,

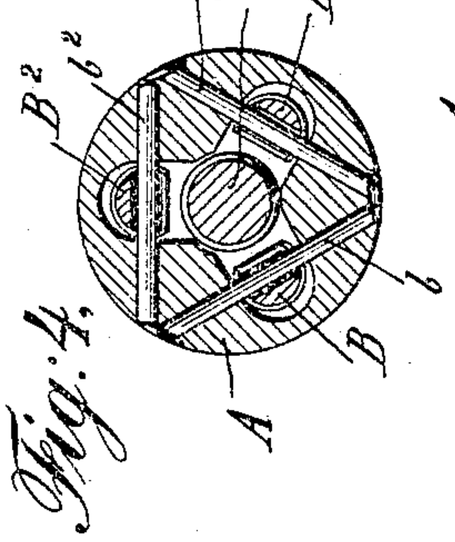


Fig. 5,

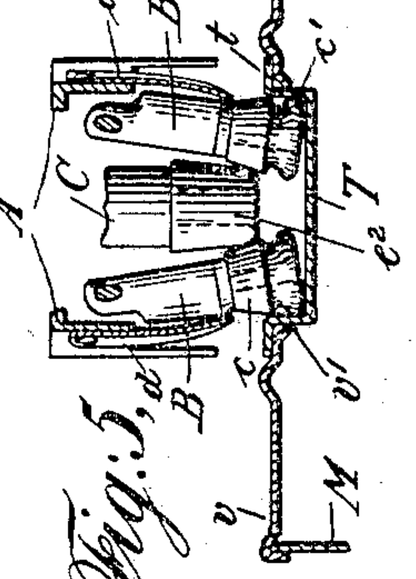


Fig. 6,

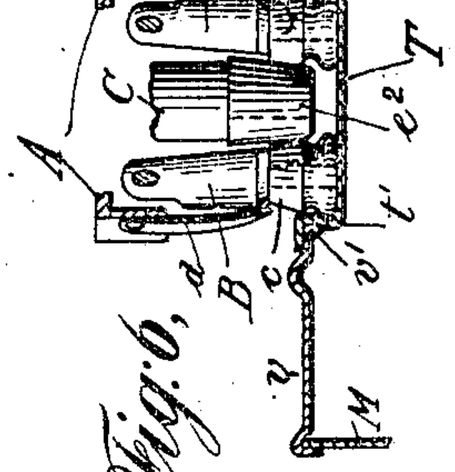
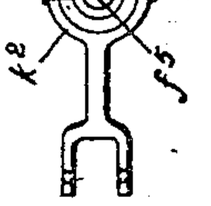


Fig. 7.



Witnesses
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No. 788,121. Patented April 25, 1905.

UNITED STATES PATENT OFFICE.

SAMUEL BREWSTER TOWNSEND, OF BREWSTER, NEW YORK.

CAN-CAPPING TOOL.

SPECIFICATION forming part of Letters Patent No. 788,121, dated April 25, 1905.

Application filed March 16, 1904. Serial No. 198,401.

To all whom it may concern:

Be it known that I, SAMUEL BREWSTER TOWNSEND, a citizen of the United States, and a resident of the village of Brewster, county of Putnam, and State of New York, have invented certain new and useful Improvements in Can-Capping Tools, of which the following is a specification, reference being had to the accompanying drawings, in which—

Figure 1 is a side elevation of my improved tool in combination with one style of organized machine adapted for use therewith; Fig 2, a view, on enlarged scale, of the bottom of my tool; Fig. 3, a central partly-sectional view, the section above the dotted line 2 2 being taken on the line 3 3 of Fig. 2 and the section below the dotted line 2 2 being taken on the line 3′ 3′ of Fig. 2. Fig. 4 is a transverse section taken on the line 4 4 of Fig. 3. Figs. 5, 6, and 7 are views of details.

In the different figures similar reference letters refer to similar parts.

Certain types of metal cans used as containers for food products—such as condensed milk, for instance—have their openings for the insertion of their contents located in the head. These openings are after such insertion permanently and preferably hermetically closed or sealed by the application of a cap or lid, which is thereafter in part distorted, crimped, or expanded to make a more or less tight continuous joint with those portions of the can immediately surrounding such opening.

The object of my present invention is to produce an organized combination of means presenting novelties of form, location, mutual coaction, and adjustment whereby the required portions of such cap or lid may be more readily, economically, rapidly, and precisely expanded than heretofore and also the attainment of unprecedented economy in the construction of such means or tool and its associated mechanisms, also of enhanced durability and facility of operation. I attain these objects by my improved expanding-tool, which is constructed and operates as follows, viz: The various parts are composed of metal—say steel, for instance.

A is a supporting shell or head. A plurality of hangers B B′ B^2 are movably secured to and within A by being loosely journaled, respectively, upon a pin or rod *b b′* b^2, secured in shell or head A. (See Fig. 4.) To each hanger near its free end a roller *c c′* c^2, having its operative surfaces of required contour, is journaled.

d d′ d^2 are leaf-springs secured to A and disposed to bear inwardly against B B′ B^2, respectively, whereby the latter are caused to swing inwardly toward the central longitudinal axis of A as a common center into the position shown in Fig. 3 and retained there normally while not expanded for use, as hereinafter described.

C is an expander or core longitudinally movable within A and between B B′ B^2, to one end of which is rigidly secured a guide-disk *e*, which limits movement of C toward rolls *c c′* by engagement with the annular shoulder *e′*. C is maintained in normal position during intervals in operation by stress of helical spring *s*, through which C passes and which spring bears against *e* on the one end and against annular shoulder *s′* of A on the other.

e^2 is a roll journaled to one extremity of C, disposed to contact with the rolls *c c′* c^2 when C is moved toward the latter. A portion of the rolls *c c′* c^2 is beveled, as shown in the drawings. e^2 is correspondingly and reversely beveled. It follows that when C is forced in the direction of and between *c c′* c^2 B B′ B^2 are caused to swing against the stress of *d d′* d^2 simultaneously and equally outward relatively to the central longitudinal axis of A, whereby *c c′* c^2 are pushed outwardly and uniformly away from each other into the position required for operation, which position is reached when *e* brings up against shoulder *e′*. The complementary corresponding bevels of e^2 on the one hand and *c c′* c^2 on the other facilitate said expansion and separation, secure uniformity therein, and insure with the least friction and wear the maintenance of such expanded and operative position under pressure.

The expanding movement above described is imparted to the core C as follows: D is a

bar which passes through C in a perforation of the latter, (indicated by dotted lines *h h* in Fig. 3.) D also passes through A by slotted openings in the latter, *m m'*, sufficiently enlarged to permit requisite play between the parts. *i i'* are rolls loosely journaled upon D. *n n'* are nuts screwed upon the ends of D.

E is a collar movably fitted upon A and provided with recesses *o o'* for the reception of an actuating device, as hereinafter described.

To operate my improved tool, it is requisite to impart thereto rotatory motion around its central longitudinal axis and also intermittent longitudinal movement to its expander-core C. The said motions may be imparted by any convenient instrumentality. In Fig. 1 I have shown my said tool combined with one type of such instrumentalities, F representing a rigid frame, in the upper part of which is journaled the horizontal shaft H, provided with the usual loose and working pulleys *f f'*, and also a beveled gear f^2. Likewise journaled in F is the vertical counter-shaft f^3, provided with a beveled gear f^4, intermeshed with f^2. My shell A, with its comprised parts as above described, is jointed to the lower extremity of counter-shaft f^3 in any convenient way, as by screwing the threaded portion thereof into a correspondingly-threaded bore in said counter-shaft, as at f^5, Fig. 1, where a part of the shaft is shown as broken away to show the resulting screw-joint. K is a hand-lever secured to F by a pivotal connection *k'*. The arm of said lever is medially expanded into a collar k^2, concentrically disposed on the outside of collar E and provided with two inwardly-projecting trunnions k^3 k^4. (See Figs. 1 and 7.) The said inwardly-projecting trunnions enter into and loosely engage with the recesses *o o'* of collar E.

From the foregoing it will be apparent that when pulley *f'* is rotated, as by belting thereon connected with any suitable source of power, head A, with its contained devices, will be likewise rotated, and the required longitudinal movement may be imparted to expander C by pushing hand-lever K downward as required.

It remains only to explain the operation of my improved tool when supported and actuated as aforesaid upon the can lid or cap to be expanded. M represents a can of the type in question. P is a work-holder to support the can rigidly secured to stem *p*, mounted in brackets f^6 f^7 on frame F. *p* is fitted in said brackets sufficiently loosely to admit of vertical movements therein and is preferably of rectangular or irregular cross-sections or otherwise adapted so as to prohibit rotary movement. R is a foot-lever secured to supporting-frame *r* by pivot *r'* and to stem *p* by pivot r^2. r^3 is a retractile spring secured at one end to R and at the other to F and operating to normally depress P to position. (Shown in Fig. 1.) Cam M being placed in position on work-holder P is raised by depressing R to required adjustment relatively to rolls *c c' c²*, the specific function of which upon the can-cap will now be described. Can M is provided with a top or head *v*, having an opening surrounded by flange *v'*. After the can has been filled the cap T is inserted into said opening in the position shown in Fig. 5 and is supported in that position by its annular flange *t*, resting upon head *v* around the aforesaid opening. The can and its lid or cap combined in the position shown in Fig. 5 are placed in position upon the work-holder P, as shown in Fig. 1. The foot-lever R is depressed and P thereby raised, together with the can, so as to bring the cap into the position relative to rolls *c c' c²*. (Illustrated in Fig. 5.) This done, hand-lever K is depressed, thereby moving core C downward and between rolls *c c' c²*, thereby wedging the latter outwardly apart from each other and into contact with the vertical sides of the cap below flange *v'*, as shown in Fig. 6. It will be understood that the shell A, with its connected parts, is being constantly rotated, as hereinbefore described. The rolls *c c' c²* rotate on their respective axes. The roll e^2 is rotated simultaneously on its own axis, thus avoiding undesirable friction. The said vertical sides of the cap below flange *v'* are, in proportion as pressure is exerted on K, expanded, as shown in Fig. 6, which represents the parts when the extreme limit of pressure producible by the longitudinal downward movement of C has been exerted, and thereby the cap is securely and hermetically locked to the head, owing to the annular expansion *t'* of the lid caused by the rolls, and which expansion, as will be observed by reference to Fig. 6, is strongly abutted and braced throughout its whole extent directly against the edge of the flange *v'*, while flange *t*, bearing against the top *v* of the can, prevents the cap from moving inwardly. When the parts have been held in the relation to each other illustrated by Fig. 6 sufficiently to insure the completion of the expansion and consequent hermetic sealing of the cap to the can-head, the hand-lever K is raised, the core C thereby retracted, the springs *d d' d²* swing the hangers B B' B² and their rolls *c c' c²* inwardly to normal position, thus withdrawing the rolls from their engagement with the lid shown in Fig. 6, when on releasing the pressure on the foot-lever R the spring r^3 will retract the work-holder P and the can M out of the way of the tool, so that the can may be readily removed and another substituted in its place for a repetition of the operation.

It will be understood that though I have in the foregoing described in detail a partic-

ular construction and arrangement of my invention I do not thereby intend to limit myself thereto beyond the terms of my several claims hereinafter made or the requirements of the prior art.

What I claim as new, and desire to secure by Letters Patent, is the following, viz:

1. In a can-cap-expanding mechanism, the combination of a rotatory shell, a plurality of equidistantly-disposed and radially-vibratable hangers suspended in, and equidistantly from the axis of rotation of, said shell, a roller journaled to the free end of each said hanger, a spring supported and disposed to press each said hanger inwardly toward said axes, a longitudinally-movable core having its longitudinal axis coincident with said axis of rotation, means to rotate said shell, and means to intermittently advance said core during said rotation longitudinally, between, and with equal pressure simultaneously against said rollers whereby said hangers and their said rollers are forced radially and uniformly outward.

2. In a can-cap-expanding mechanism, the combination of a rotatory shell, a plurality of equidistantly-disposed and radially-vibratable hangers suspended in, and equidistantly from the axis of rotation of, said shell, a roller journaled to the free end of each said hanger, a longitudinally-movable core having its longitudinal axis coincident with said axis of rotation, a roller journaled to the said core, means to rotate said shell, means to intermittently during said rotation advance said core including its said roller longitudinally, between and with equal pressure simultaneously against said rollers, whereby said hangers and their rollers are forced radially and uniformly outward, and a spring supported and disposed to press each said hanger inwardly toward said axis.

3. In a can-cap-expanding mechanism, the combination of a rotatory shell, a plurality of equidistantly-disposed and radially-vibratable hangers suspended in, and equidistantly from the axis of rotation of, said shell, a roller having a beveled portion journaled to the free end of each said hanger, a longitudinally-movable core having its longitudinal axis coincident with said axis of rotation, a roller journaled to said core and having a portion beveled inversely to the beveled portions of said rollers on said hangers, means to rotate said shell, means to intermittently during said rotation advance said core including its said roller longitudinally, between, and with equal pressure simultaneously, against said rollers of said hangers whereby the rollers are forced radially and uniformly outward, and a spring supported and disposed to press each said hanger inwardly.

4. In a can-cap-expanding mechanism, the combination of a rotatory shell, a plurality of equidistantly-disposed and radially-vibratable hangers suspended in, and equidistantly from the axis of rotation of, said shell, a roller journaled to the free end of each said hanger, a longitudinally-movable core having its longitudinal axis coincident with said axis of rotation, means to rotate said shell, means to intermittently advance said core during said rotation longitudinally, between, and with equal pressure simultaneously against said rollers, whereby said hangers and their rollers are forced radially and uniformly outward, and means to intermittently retract said core to normal position.

5. In a can-cap-expanding mechanism, the combination of a rotatory shell, a plurality of equidistantly-disposed and radially-vibratable hangers suspended in, and equidistantly from the axis of rotation of, said shell, a roller journaled to the free end of each said hanger, a longitudinally-movable core having its longitudinal axis coincident with said axis of rotation, a roller journaled to the said core, means to rotate said shell, means to intermittently during said rotation advance said core including its said roller longitudinally, between and with equal pressure simultaneously against said rollers, whereby said hangers and their rolls are forced radially and uniformly outward, and means to intermittently retract said core to normal position.

6. In a can-cap-expanding mechanism, the combination of a rotatory shell, a plurality of equidistantly-disposed and radially-vibratable hangers suspended in, and equidistantly from the axis of rotation of, said shell, a roller having a beveled portion journaled to the free end of each said hanger, a longitudinally-movable core having its longitudinal axis coincident with said axis of rotation, a roller journaled to said core and having a portion beveled inversely to the beveled portions of said rollers on said hangers, means to rotate said shell, means to intermittently during said rotation advance said core including its said roller longitudinally between and, with equal pressure, simultaneously against said rollers, whereby said hangers and their rollers are forced radially and uniformly outward, and means to intermittently retract said core to normal position.

7. In a can-cap-expanding mechanism, the combination of a rotatory shell, a plurality of equidistantly-disposed and radially-vibratable hangers suspended in, and equidistantly from the axis of rotation of, said shell, a roller journaled to the free end of each said hanger, a spring supported and disposed to press each said hanger inwardly, a longitudinally-movable core having its longitudinal axis coincident with said axis of rotation, means to rotate said shell, means to inter-

mittently advance said core during said rotation longitudinally, between and, with equal pressure, simultaneously against said rollers whereby said hangers and their rollers are forced radially and uniformly outward, and means to intermittently retract said core to normal position.

8. In a can-cap-expanding mechanism, the combination of a rotatory shell, a plurality of equidistantly-disposed and radially-vibratable hangers suspended in, and equidistantly from the axis of rotation of, said shell, a roller journaled to the free end of each said hanger, a longitudinally-movable core having its longitudinal axis coincident with said axis of rotation, a roller journaled to the said core, means to rotate said shell, means to intermittently during said rotation advance said core including its said roller longitudinally, between and, with equal pressure simultaneously, against said rollers, whereby said hangers and their rolls are forced radially and uniformly outward, a spring supported and disposed to press each said hanger inwardly, and means to intermittently retract said core to normal position.

9. In a can-cap-expanding mechanism, the combination of a rotatory shell, a plurality of equidistantly-disposed and radially-vibratable hangers suspended in, and equidistantly from the axis of rotation of, said shell, a roller having a beveled portion journaled to the free end of each said hanger, a longitudinally-movable core having its longitudinal axis coincident with said axis of rotation, a roller journaled to said core and having a portion beveled inversely to the beveled portions of said rollers on said hangers, means to rotate said shell, means to intermittently during said rotation advance said core including its said roller longitudinally, between and, with equal pressure simultaneously, against said rollers, whereby said hangers and their rollers are forced radially and uniformly outward, a spring supported and disposed to press each said hanger inwardly toward said axis, and means to intermittently retract said core to normal position.

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