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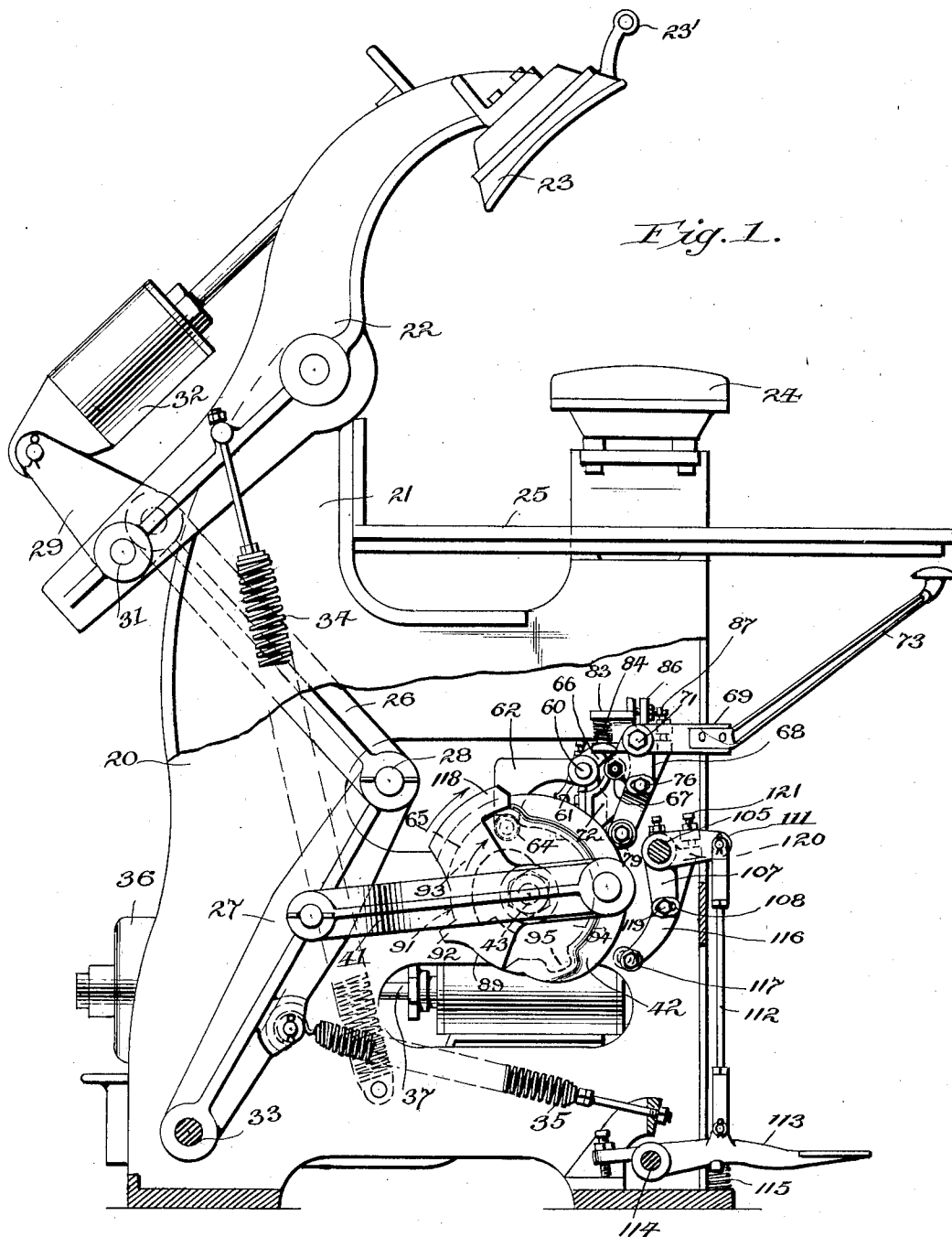
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Filed July 31, 1930

6 Sheets-Sheet 1



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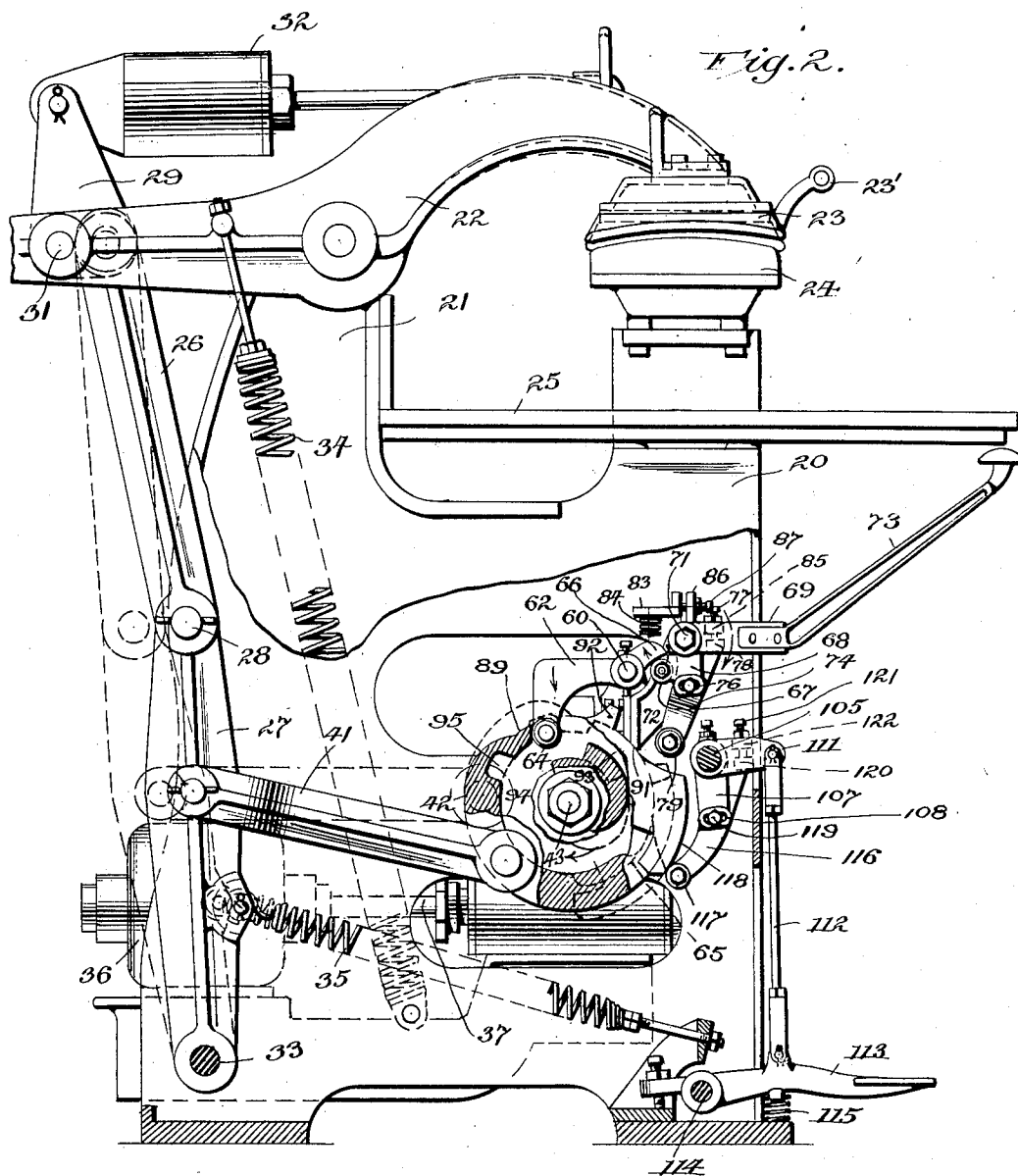
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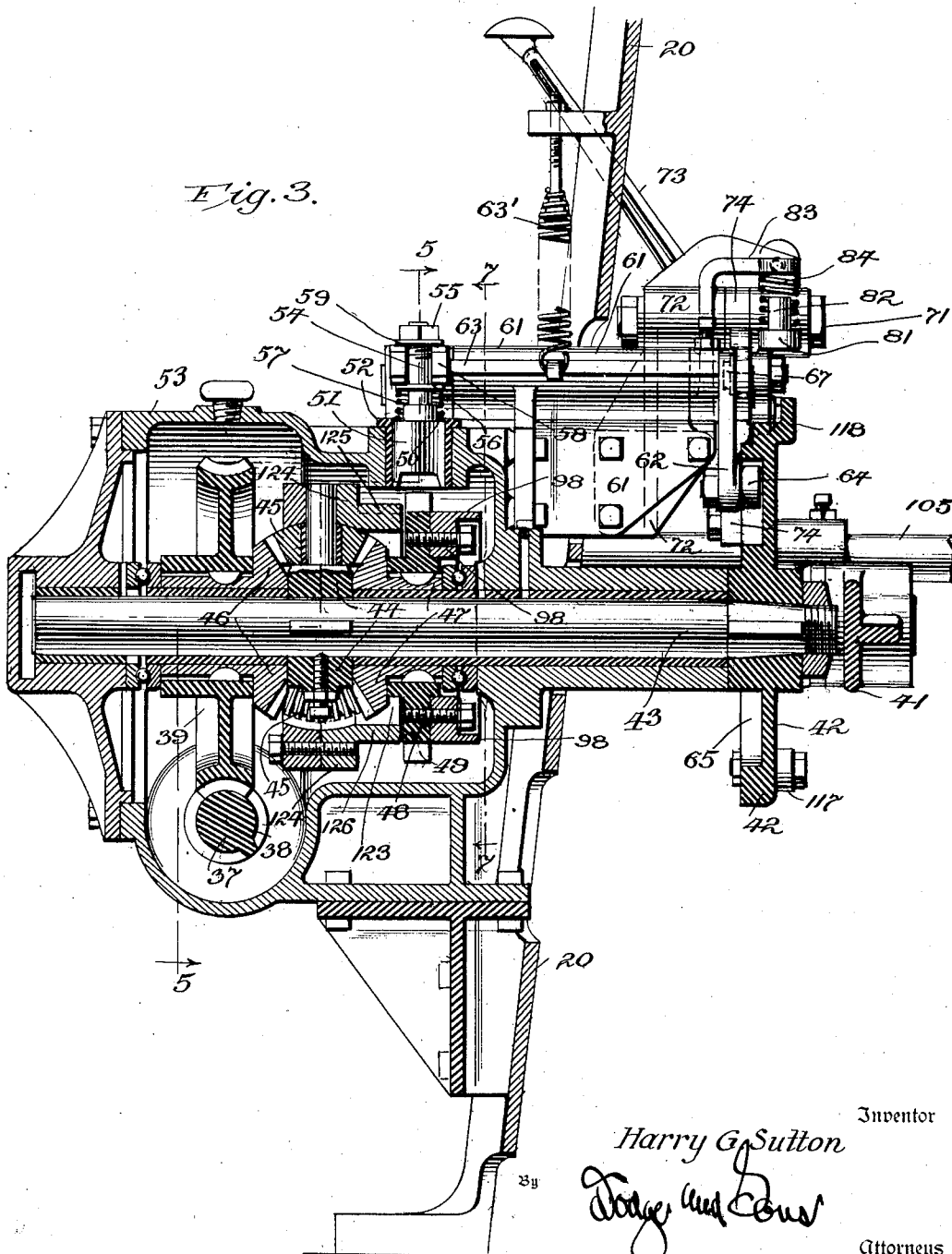
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Fig. 3.



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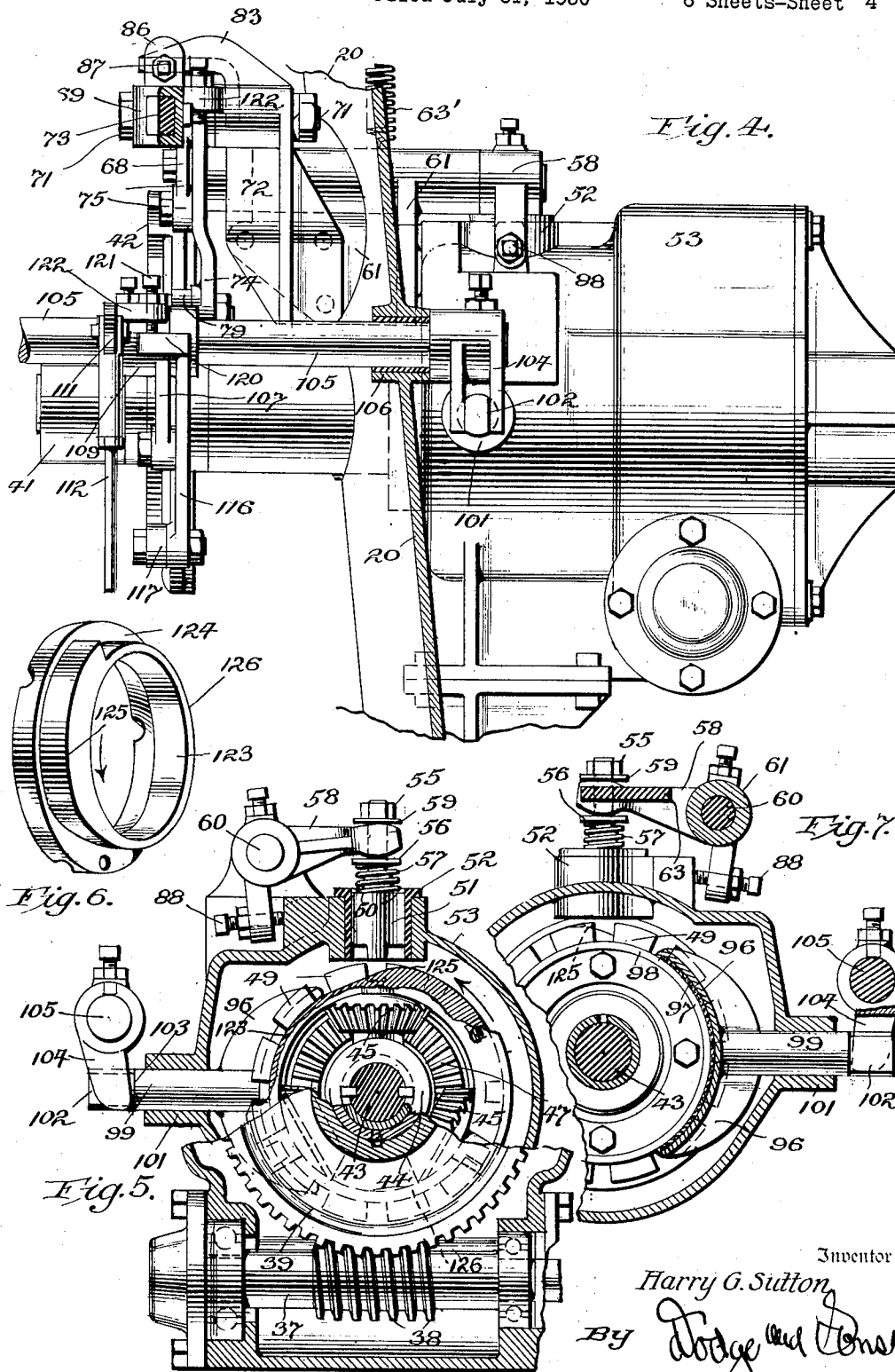
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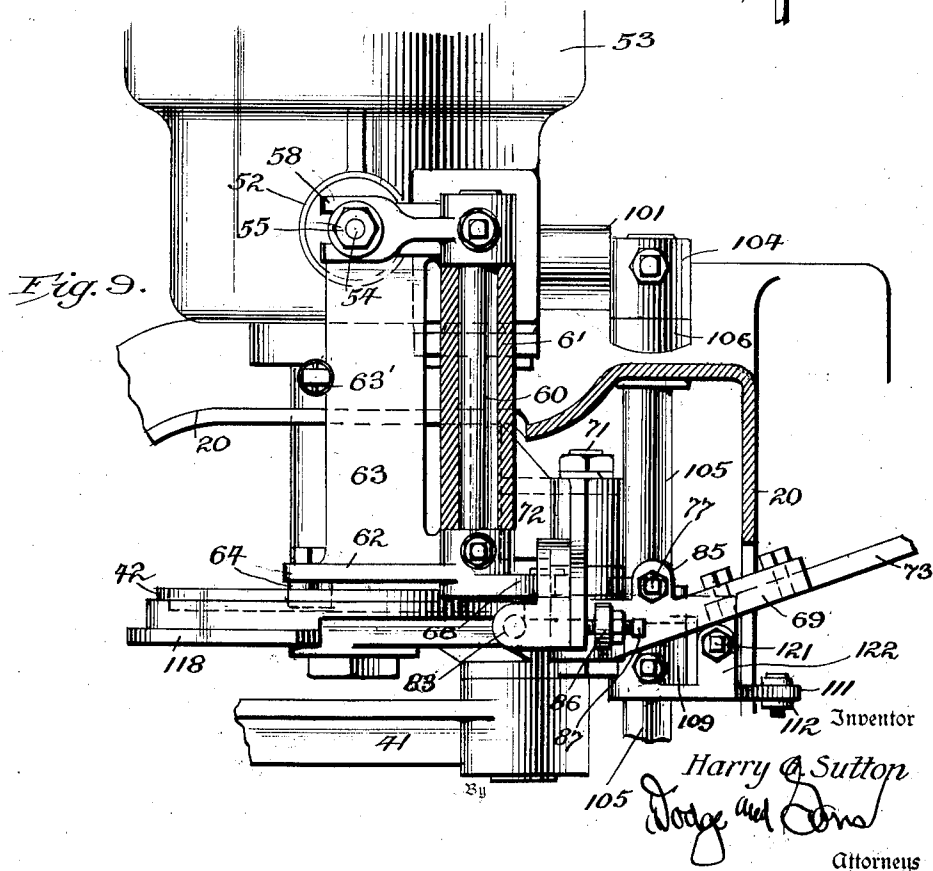
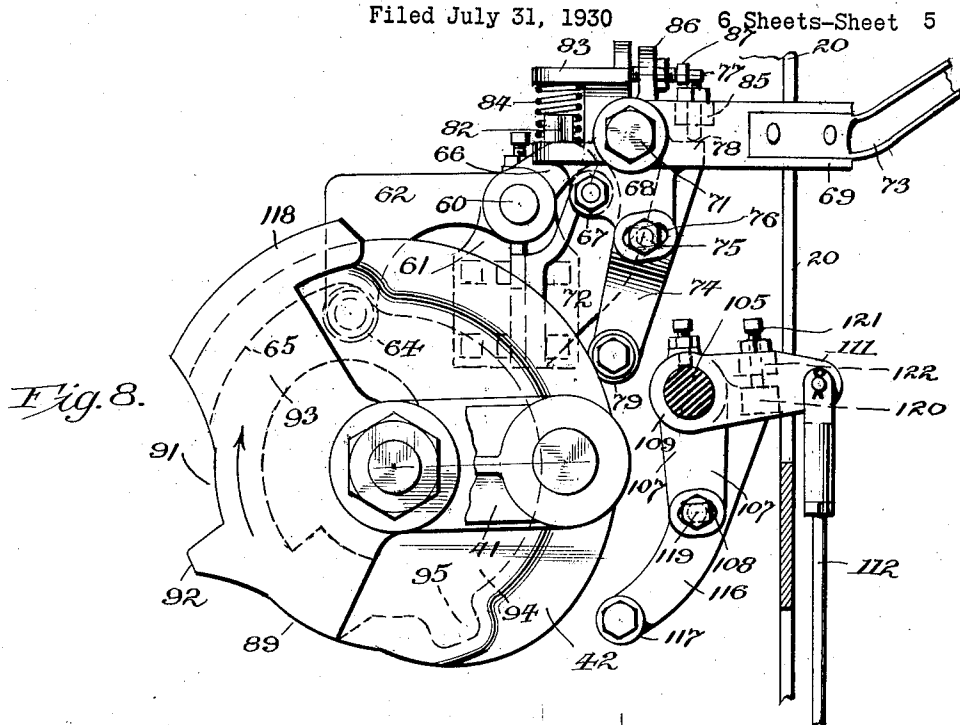
H. G. SUTTON

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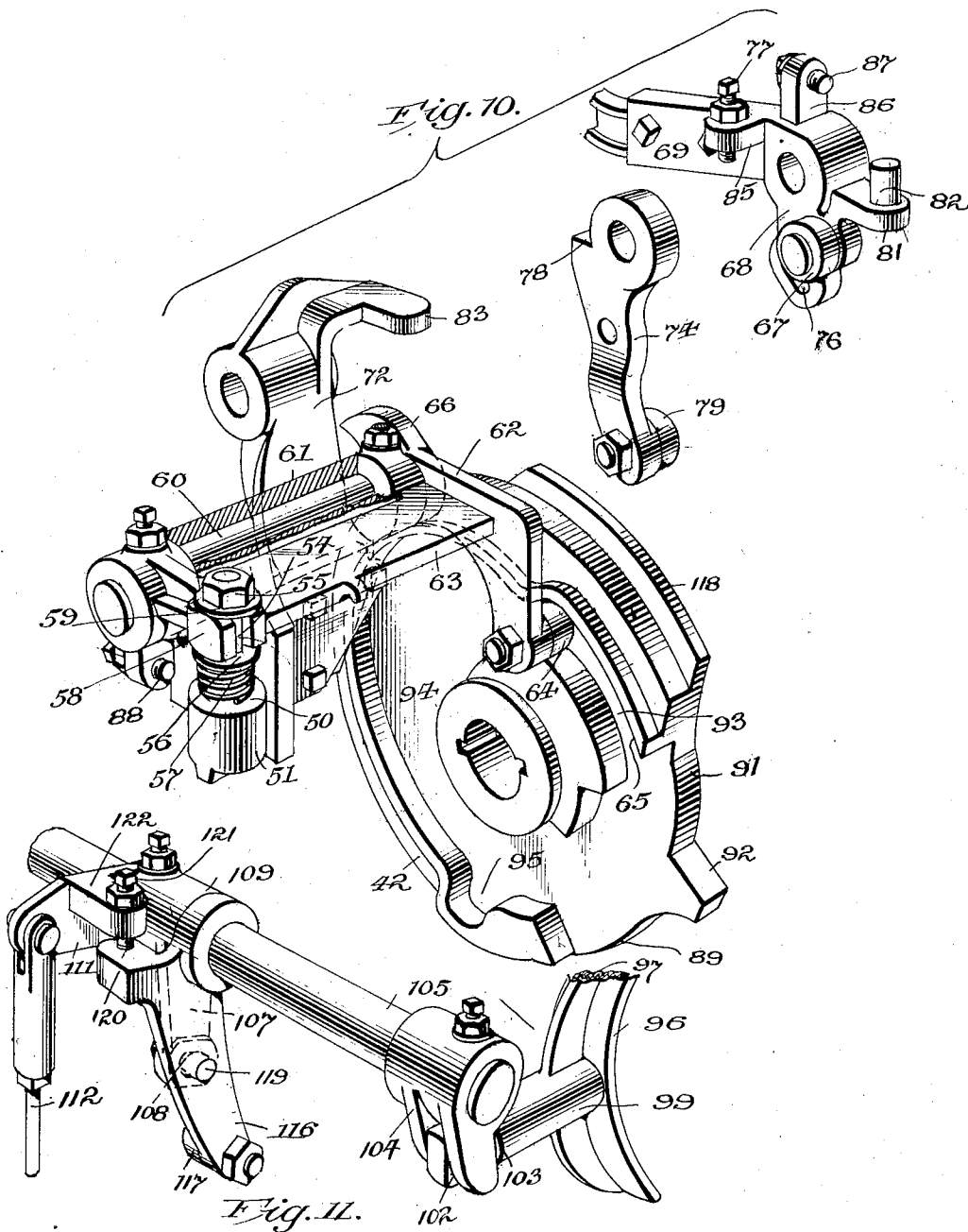
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6 Sheets-Sheet 6



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UNITED STATES PATENT OFFICE

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ware

Application July 31, 1930. Serial No. 472,071

7 Claims. (Cl. 68—9)

The present invention relates to clothes press-
ing machines, and particularly to power operated
mechanism for applying final pressure to the
goods being pressed. More specifically the in-
vention pertains to a differential gear connection
between a motor and a toggle mechanism, a
safety device controlling this connection where-
by the application of final pressure is inhibited
until such time as the movable press head is so
closely spaced with respect to the press buck that
the operator is unable to insert his hands or
fingers between the cooperating press elements.

It is, therefore, the principal object of this in-
vention to provide means for locking the differ-
ential when it is desired to apply final pressure
to the press elements together with a cam which
prevents actuation of the locking means until the
press head has been lowered to a position im-
mediately above the buck and in proximity
thereto.

It is a further object of the invention to pro-
vide for automatic locking of the press head in
its final pressure position to permit application
of heavy pressure for as long a period as desired
and means for thereafter releasing the locking
mechanism to allow the head to be elevated.

Another object of the invention is to permit
preliminary lowering of the head by the power
mechanism, this preliminary movement being
limited, however, by other cam means which pre-
vents final application of pressure except by the
means specifically provided for this purpose.

Still another object of the invention is to pro-
vide means for releasing the differential lock if,
for any reason, the lock should be thrown into
engagement with the differential except by the
operator-operated means for actuating the lock.

Other details and their functions will be under-
stood from the following description from which
the operation and relation of the main features
of the invention will be apparent.

In the drawings there is illustrated a pre-
ferred embodiment of the pressing machine in
which the several mechanisms included in the
invention are incorporated.

Figure 1 is a side elevation of the machine in
open position, certain of the parts being removed
and portions of the machine being shown in sec-
tion.

Fig. 2 is a side elevation similar to Fig. 1 ex-
cept that the head is lowered and the lock con-
trolling cam is shown in the position it assumes
immediately prior to the application of final
pressure.

Fig. 3 is a sectional elevation of the differential
gear and lock controlling cam.

Fig. 4 is a front view partly in section of the
differential control.

Fig. 5 is a sectional view taken on line 5—5 of
Fig. 3, the parts thereof being broken for the
sake of clearness.

Fig. 6 is a perspective view of the safety cam
for releasing the differential lock.

Fig. 7 is a sectional view taken on line 7—7
of Fig. 3.

Fig. 8 is a side view of the cams and levers
which control the application of preliminary
and final pressures.

Fig. 9 is a top plan view, partly in section, of
the cams and levers shown in Fig. 8.

Fig. 10 is a perspective view of the differential
lock controlling cam and operator levers there-
for, some of the parts being disassembled and
shown in spaced relation for clarity.

Fig. 11 is a perspective view of brake operat-
ing means employed in the actuation of the
power means during preliminary lowering of the
press head.

Referring to the drawings, the press com-
prises the usual base frame 20 having an ex-
tension 21 thereabove to which is fulcrumed the
press head lever 22 carrying the movable press
element or head 23. A stationary press ele-
ment or buck 24 is secured to the frame above
the table 25. The press is closed by the usual
toggle mechanism comprising links 26, 27 piv-
oted to each other at 28. The link 26 is con-
nected to the lever 22 through a bell crank 29,
the latter being pivoted to the press lever 22
at 31 and to an adjustable resilient connection
32 between the bell crank and the front of the
press head lever. The link 27 is pivoted to
the frame 20 at 33. Springs 34 and 35 are
connected respectively to lever 22 and link 27,
as well as to the frame 20 normally to maintain
the toggle broken and the lever 22 in its ele-
vated position.

The power means for lowering the press head
includes a motor 36, worm shaft 37, worm 38
and worm gear 39. The toggle is adapted to be
connected to the motor through a link 41 piv-
otally connected at one end to link 27 and at
its other end to a disc 42 keyed to shaft 43.
Also keyed to shaft 43 is a spider 44 carrying
planetary pinions 45 which mesh with the dif-
ferential gears 46, 47, both of which are free to
rotate on shaft 43. Gear 46 is secured to worm
gear 39 and since the motor runs continuously
gear 46 is also a continuously rotating element.

Keyed to a boss on gear 47 is a locking ring 48 having teeth 49 on its periphery. Adapted to cooperate with the toothed periphery of the locking ring is a chamfered bolt 51 which is slidably mounted in a cylindrical guide 52 in the gear housing 53. The means for moving the bolt will be described hereinafter. It is apparent that if the bolt be elevated to disengage the toothed ring, the gear 47 and ring 48 will be rotated in a direction opposite that of gear 46, the spider being relatively stationary due to the resistance of the toggle mechanism. When the bolt is lowered, however, ring 48 and gear 47 will be held against rotation, at which time the spider 44, shaft 43 and disc 42 will be rotated. A 2 to 1 reduction between worm gear 39 and shaft 43 is thus effected, resulting in a very efficient utilization of the power input.

Disc 42 is provided with an irregularly curved periphery designed to act as a cam for controlling the means by which the bolt 51 is lowered into engaging relation with the toothed ring 48. The bolt lowering mechanism and cam control are clearly illustrated in Figs. 8, 9 and 10. The bolt is provided with a stem 54, the upper end of which is threaded to receive an adjusting nut 55. Interposed between a washer 56 and shoulder 50 on bolt 51 is a spring 57 for relieving the bolt should it strike the high portion of one of the teeth 49 during the bolt lowering operation. A forked arm 58 straddles the reduced end of the bolt having, between washers 56 and 59, flattened sides which cooperate with arm 53 to prevent rotation of the bolt. Arm 58 is mounted on one end of shaft 60 supported in bracket 61 secured to housing 53. On the other end of shaft 60 is secured a lever 62 having an L-shaped portion carrying a roller 64 which cooperates with an inner cam surface 65 on disc 42. Arm 58 and lever 62 are connected by a web 63 to which is fastened one end of a spring 63', the other end of which is adjustably secured to the frame 20. Adjustment of the tension of spring 63' determines the force necessary to depress the bolt. Lever 62 also has a projection 66 which bears against a roller 67 on the depending arm 68 of hand lever 69. The lever 69 is fulcrumed on shaft 71 supported in a bearing bracket 72 and has an extension 73 disposed within reach of the operator. Arm 74 is also pivotally supported on shaft 71 and is connected to lever 69 by means of a pin 75 passing through an arcuate slot 76 in arm 68. There is, therefore, obtained a lost motion connection between these two element. Depression of the arm 74 is effected by engagement of an adjustable stud 77 threaded in the arm 69 with a shoulder 78 on arm 74. Roller 79 on arm 74 rides on the periphery of the cam disc 42 and so long as the high portion of the cam is in the path of roller 79 the hand lever 69 is subject to very limited depression so that the bolt 51 cannot lock toothed ring 48. Lever 69 is also provided with a substantially horizontal projection 81 having a stud 82 thereon and between which and a lateral projection 83 on the bracket 72 there is interposed a spring 84. The purpose of this spring is to elevate the hand lever 69 when the operator releases the lever. Lugs 85, 86 on lever 69 are threaded to receive the adjusting screws 77 and 87, the former of which determines the position at which lever 69 engages shoulder 78 on arm 74, and the latter limits the elevation of the lever 69. For the purpose of limiting the rocking movement of the lever 62 which cooper-

ates with the inner cam on disc 42, there is provided an adjusting screw 88 on the bolt depressing lever 58 which is adapted to bear against housing 53 when the lever 62 has been raised a predetermined distance.

Referring to Fig. 8, it will be seen that the contour of the outer and inner cams on disc 42 are arranged to permit rocking of arms 62 and 74 only when the connecting link 41 is in certain positions with respect to the axis of the disc. The greater portion of the outer cam surface is concentric with the axis of the disc, there being provided, however, two depressions 89, 91 thereon, between which is a raised portion 92 in the form of a tooth. The inner cam has a track 93 in which the roller 64 is guided during the open or elevated position of the press head, the locking bolt 51 also being raised at this time. There is also an enlarged channel 94 disposed nearer the axis of the disc to permit lever 62 to be rocked downwardly to lower the locking bolt. A depression 95 in the inner cam track is so spaced with reference to the connection of the link 41 with the disc 42 that lever 62 may be elevated to raise bolt 51 when the press head is in its lowermost or final pressure position. It is, therefore, obvious, that final pressure may be maintained for as long a period as desired, since the toggle is straightened and the motor disconnected from the crank disc 42 when roller 64 rests in depression 95. When it is desired to elevate the press head after application of final pressure, the hand lever is depressed whereupon the power mechanism is reengaged to rotate the crank disc and break the toggle.

In Fig. 2 the disc 42 is shown in the position it assumes when the press head has been lowered to within a short distance of the buck. The depression 91 in the outer cam surface underlies the roller 79 on lever 74 of the bolt lowering mechanism and permits actuation of this mechanism. It is also apparent that when the parts are in the positions indicated in Fig. 2 the operator may grasp handles provided on the press head to "pat" the goods lying on the buck preliminary to the application of final pressure. When the hand lever extension 73 is depressed the differential gear is locked to couple the disc 42 with the motor whereupon the disc is rotated in a direction indicated by the arrows in Fig. 1 and 2. As the toggle is straightened to apply final pressure the tooth 92 on the outer cam engages roller 79 acting as a "kicker" to enable the operator to ascertain when final pressure has been applied. The lever 73 is then raised by the cam action of tooth 92 against roller 79 whereupon the spring 63' which elevates lever 62 and roller 64 enters depression 95 to release the locking bolt. In the meantime the tooth 92 rides past roller 79 bringing this roller into alignment with depression 89 on the outer cam surface. The extension 73 can then be depressed to break the toggle and raise the press head.

The power mechanism may be utilized for lowering the press head to preliminary pressing cooperation with the buck. For this purpose there is provided a brake adapted to hold the gear 47 stationary with respect to the machine frame. The brake comprises a brake shoe 96 having a brake lining 97 adapted to cooperate with a brake drum 98 bolted or otherwise secured to the toothed ring 48. The shoe 96 is provided with a pintle 99 slidably mounted in a guide 101 in the gear housing 53. Cooperating

with a squared portion 102 and shoulder 103 on the pintle 99 is a forked arm 104 fastened to shaft 105 mounted in a bearing 106 on the base frame of the machine. Also fastened to shaft 105 is an arm 107 having an arcuate slot 108 in its end. Integrally formed with the arm 107 on the boss 109 is an arm 111 forming with arm 107 a bell crank lever. Arm 111 is connected to a link 112, the other end of which is connected to a foot pedal 113 pivoted to the frame of the machine at 114. A spring 115 interposed between the foot pedal and the base frame normally holds the foot pedal in elevated position, at which time the brake shoe is released. Depression of the foot pedal engages the brake shoe with the brake drum 98 thereby effecting rotation of the disc 42. The toggle will then be straightened and the press head lowered.

In order that the press head may be brought into only preliminary pressing relation with the goods on the buck, means are provided for releasing the brake when the press head has been lowered a predetermined distance. These means comprise an arm 116, rotatable on shaft 105, having a roller 117 at its lower end and a cam 118 on disc 42. Arm 116 has a pin 119 thereon cooperating with slot 108 and a lateral shoulder 120 adapted to abut an adjustable stud 121 threaded in a projection 122 on the arm 111. Cam 118 is so positioned with respect to the connection of the arm 41 with disc 42 that it strikes the roller 117 when the head has been lowered to the position in which the hand lever 73 may be depressed. In other words, the initial outward movement of the arm 116 corresponds with the beginning of the application of final heavy pressure. When arm 116 is thrown outwardly by the cam 118, shaft 105 is rocked to release the brake from the brake drum and prevent further transmission of power from the motor to the disc 42. If it is desired to apply further power to the crank it is necessary to lock the differential by means of hand lever 73. In this manner power actuation of the press head is interrupted to prevent application of final heavy pressure by a movement of the foot pedal while the operator may have his hands on the buck. It is desirable that the operator have manual control over the press head lever during preliminary lowering of the lever and usually the head lever handle 23' is grasped by at least one hand to prevent opening of the press when the brake mechanism is released. Obviously, the press head may be manipulated by the operation for "patting" or otherwise positioning the head prior to application of final pressure by grasping the handle 23' with one or both hands.

If, for any reason, the arm 58 or spring 63' should be broken and fail to hold the bolt 51 in its elevated position, the bolt may drop by gravity into engagement with the toothed ring 48. Under these conditions power would be applied to the press head. A safety device is, therefore, provided in the form of a flange 123 on the spider frame 124. It will be seen that the spider frame is made in two parts bolted together, one of these parts having the flange 123 thereon. The contour of this flange is shown in Figs. 5 and 6. The rise 125 of the cam corresponds to the open position of the press, while the low portion 126 of the cam corresponds to that phase of the operation of the machine wherein the locking of the ring 48 is effected by depression of the hand lever 73. It will be seen that if, for any reason, the bolt 51 should tend

to drop by gravity at any time other than that during which it is supposed to be lowered by actuation of the hand control means, the high portion of the cam which underlies the bolt will prevent it from dropping into the toothed periphery 49 of the ring 48.

From the foregoing description the operation and purpose of the several mechanisms will be apparent. It is obvious, for instance, that the application of final pressure can be effected only when the press head has been lowered sufficiently, either manually or by power, to prevent the operator from inserting his hands between the cooperating press elements. It will also be seen that the power means for lowering the press to preliminary pressing relation with the buck is limited so that serious injury to the operator is obviated by releasing the power mean for the interval between the preliminary pressing and final application of heavy pressure. Accidental operation of the power means by any means other than the brake-operated means for power application or the hand actuation of the differential lock is prevented by the cam which underlies the locking bolt.

While a specific form of the invention has been described, the arrangement of parts is subject to modification and it is, therefore, not intended to limit the invention to the embodiment herein illustrated and described.

What is claimed is:—

1. In a garment press, the combination of a buck; a head; constantly moving power means; mechanism connected to said head for lowering the head; means under control of the operator for transmitting power from said power means to said mechanism to effect preliminary lowering of the head; means for rendering said transmitting means ineffective when the press is in substantially closed position; and other means for thereafter rendering said transmitting means effective to produce final heavy pressure.

2. In a garment press, the combination of a buck; a head; constantly moving power means; mechanism connected to said head for lowering the head; a gear train including differential gearing for transmitting power from said power means to said mechanism, said differential gearing being normally ineffective to transmit power from said power means to said mechanism; means for arresting movement of one of the gears of said differential gearing to transmit power from the power means to said mechanism for lowering the press head a predetermined distance; means for rendering said arresting means ineffective when the press head has been lowered said predetermined distance; and means for thereafter arresting said gear to transmit power from said power means to said mechanism and produce final heavy pressure.

3. In a garment press, the combination of a buck; a head; constantly moving power means; mechanism connected to said head for lowering the head; means for transmitting power from said power means to said mechanism, said means being normally ineffective to transmit power; foot controlled means for rendering said transmitting means effective to cause preliminary lowering of the head; means connected with said mechanism for rendering said transmitting means ineffective to transmit power when the press is in substantially closed position; and manually operated means for thereafter rendering effective the power transmitting means to produce final heavy pressure.

4. In a garment press, the combination of a
buck; a head; constantly moving power means;
mechanism connected to said head for lowering
the head; a gear train including differential
gearing for transmitting power from said power
means to said mechanism, said differential gear-
ing being normally ineffective to transmit power
from said power means to said mechanism; a
foot controlled brake for arresting movement of
one of the gears of said differential gearing to ren-
der the power transmitting gearing effective for
lowering the press head a predetermined dis-
tance; means for automatically releasing said
brake when the press head has been lowered said
predetermined distance; and manually operated
means for thereafter arresting said gear to ren-
der the power transmitting gearing effective to
produce final heavy pressure.
5. In a garment press, the combination of a
buck; a head; constantly moving power means;
a pressure applying mechanism; differential
gearing for transmitting power from said power
means to said pressure applying mechanism, said
gearing being normally ineffective to transmit
power to said pressure applying mechanism; a
gear lock for arresting movement of one of the
gears of said differential gearing to effect power
transmission from said power means to said
pressure applying mechanism; and means posi-
tioned beneath said lock by said pressure ap-
plying mechanism when the head is in elevated
position and engageable with the lock when so
positioned to hold the lock out of engagement
with respect to said gearing.
6. In a garment press, the combination of a
buck; a head; constantly moving power means;
a toggle mechanism connected to said head for
lowering the head; a crank element for rocking
said toggle; differential gearing for transmitting
power from said power means to said crank ele-
ment; said gearing being normally ineffective to
establish power transmission between said power
means and said crank element; a gear lock for
arresting movement of one of the gears of said
differential gearing to establish power transmis-
sion between said power means and said crank
element; operator operated means for actuating
said locking means; means to prevent actuation
of said operator operated means when said head
is in elevated position; and means rotatable with
said crank element and engageable with the lock
to prevent engagement of the lock with said
gear when said press head is in elevated position.
7. In a garment press, the combination of a
buck; a head; constantly moving power means;
pressure applying mechanism connected to said
head for lowering the head; differential gearing
for transmitting power from said power means
to said pressure applying mechanism, said gear-
ing being normally ineffective to establish power
transmission between said power means and said
mechanism; a gear lock for arresting movement
of one of the gears of said differential gearing
to establish power transmission between said
power means and said mechanism; and a cam
movable with said pressure applying mechanism
and engageable with the lock when said head is
spaced from said buck to hold said lock whereby
the lock is prevented from engaging the gearing
except when the head has been lowered.
- HARRY G. SUTTON.

40	115
45	120
50	125
55	130
60	135
65	140
70	145
75	150