J. Hayden & R. Hyde.

Button Mach.

No. 6635. Patented Aug. 7. 1849.

Fig. 1.

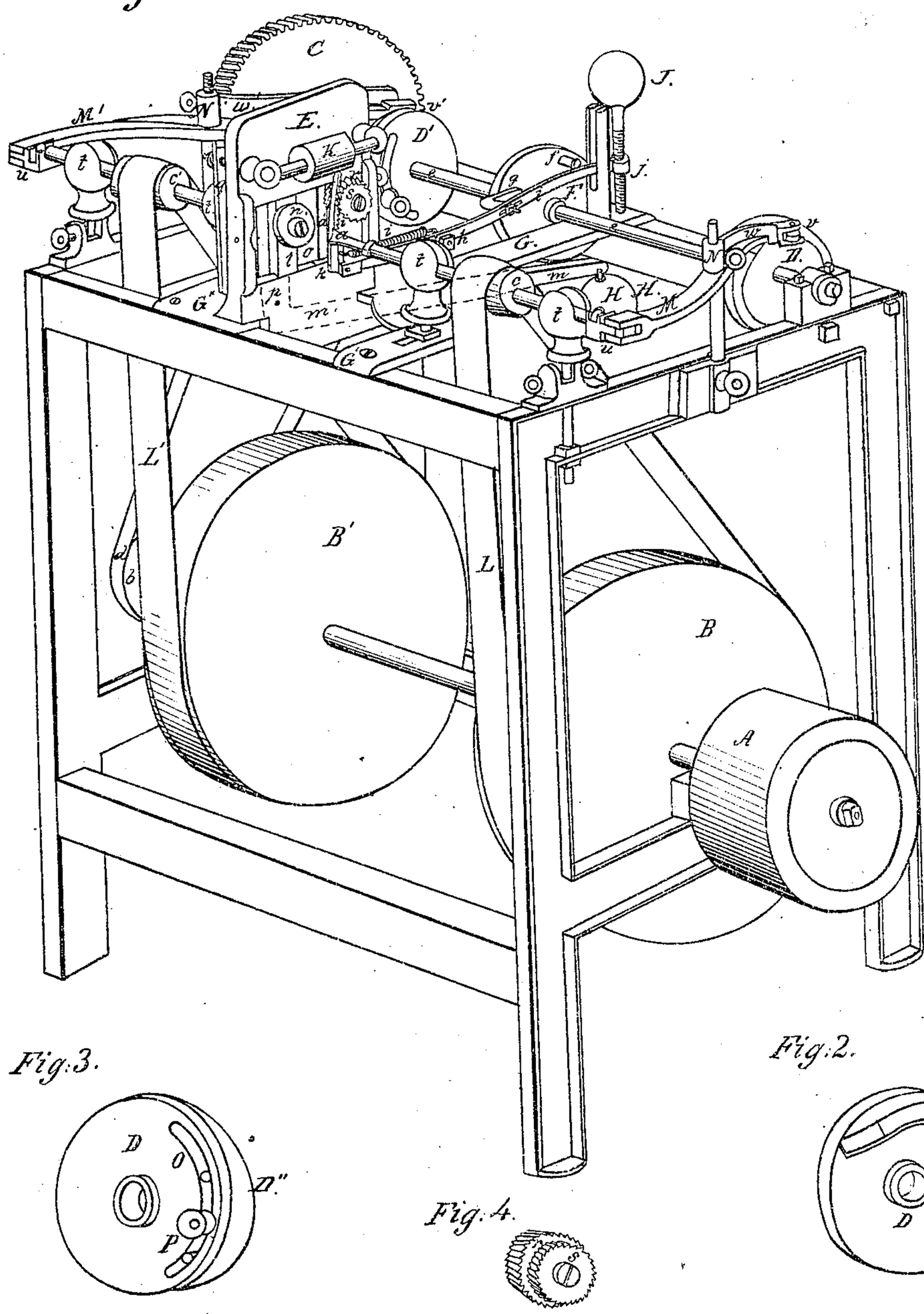

Fig. 3.

Fig. 2.

Fig. 4.

UNITED STATES PATENT OFFICE.

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MANUFACTURE OF BUTTON-MOLDS.

Specification of Letters Patent No. 6,635, dated August 7, 1849.

To all whom it may concern:

Be it known that we, JOSIAH HAYDEN, of the town of Williamsburg, and RUFUS HYDE, of the town of Chesterfield, both in the county of Hampshire and State of Massachusetts, have invented a new and useful Improvement in Machinery for Making Button-Molds; and we 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 accompanying drawings, which make a part of this specification, in which—

Figure 1 is a perspective view of the whole machine, showing all its parts generally. Fig. 2, is a perspective view of the cam side of one of the cam wheels, showing the shape of the cam which vibrates the arbor of one of the bits. Fig. 3, is a perspective view of the opposite side of the same cam wheel, showing how the cam is attached to the wheel. Fig. 4, is a perspective view of the two ratch wheels which are used to produce the feeding motion, and to sustain the strip firmly against the upright plate by the side of which the strip feeds.

Our improvement consists in so constructing the machine that by inserting a strip between the upright plate and the friction roller which is attached to its horizontally parallel to its face, and setting the machine in motion, the whole strip will be worked into button molds without any further attention to the machine. And in having two bits, in separate arbors, one to cut each side of the mold, but cutting at different times, alternately; the arbors of which bits receive a gradual vibratory motion toward, and from, the strip, by means of levers, one end of each of which levers works against the cam on one or the other of the cam wheels, so that one is drawn back while the other is cutting. And by a ratch wheel, which is worked by a rack attached to one end of a lever, which causes the feeding motion, at the proper time, so that the machine may be constantly fed.

We make the frame of the machine of four legs, with cross bars at the bottom and top, in the usual way, as seen in Fig. 1, with an arbor resting on two of the lower cross bars, in appropriate bearings. On one end of this arbor, outside of the frame, we place the driving pulley, A, Fig. 1, which carries the whole of the machinery. On the same arbor, and between the two lower bars, we place two large pulleys, B, and B′, which, by means of bands, L, and L′, work the two arbors, *c*, and *c′*, which hold the bits, *a*, and *a′*, which cut out the mold. And on the other end of this first mentioned arbor, and outside of the frame, we place a graduated, or sectional pulley, *b*, which by means of a band, *d*, works another graduated, or section pulley, also outside of the frame, which revolves on a stud attached to the frame, near the upper corner of the back side of the frame. Attached to this pulley is a small pinion which drives a toothed wheel, C, placed on the outer end of the arbor *e*, *e*, of two cam wheels, D, and D′, and revolves the two cam wheels with a slow and equal motion. Near the center of the arbor of the two cam wheels is a wheel, F, about the same size as the cam wheels, in the side of which is fixed a pin, or detent, *f*, which in each revolution of the wheel comes in contact with a projecting arm, *g*, on the side of the lever, *i*, which raises up the outer end, *j*, of the lever, depressing the inner end, *k*, which is supported in a fulcrum, *k*, attached to a cross bar, G, which runs from the front to the back of the frame, resting on and attached to the front and back top bars. This cross bar is made open, or forked, leaving a space between the two parts G′, and G″, which rests on the top of the front bar of the frame.

An upright plate, E, of cast iron is attached by screws, to the edge of the prong, G″, of the cross bar G. In the central part of this plate is a mortise, *o*, in the front side of which mortise is placed a sliding piece, *l*, which is attached to a bent, or elbow shaped, lever, *m*, *m*, represented in part by the dotted lines.

The fulcrum of this lever, (*m*, *m*,) is at the elbow, *p*, and the upper part presses a friction roller, *n*, against the edge of the strip, or material, from which the molds are to be cut, and thereby presses the other edge of the strip against the periphery of the ratch wheel, *r*, (which is also attached to the upright plate E.) The back end of this lever, (*m*, *m*,) is forced, and held, down by a weight, H.

To the front side of this ratch wheel, *r*, which acts on the edge of the strip, is at-

tached a smaller ratch wheel, *s*, with the teeth cut in the opposite direction, (as shown more distinctly in Fig. 4.)

The lever, *i*, has an arm *i'*, attached to its ends *k*, by a joint pin. This arm, *i'*, is cut, on one side, with teeth which forms a rack to work on the periphery of the small ratch wheel, *s*, against which it is pressed by a spiral spring, *i''*, attached to the lever, *i*, near its fulcrum, *k*, so that when the pin, or detent, *f*, on the wheel, F, raises the back end of the lever, *i*, the arm *i'*, is drawn down and the teeth of the rack take the hold of the teeth of the small ratch wheel, *s*, and revolves it sufficiently to feed the strip to the size of the mold; and as soon as the pin, or detent, *f*, is relieved from the projecting arm, *g*, of the lever, *i*, the back end of the lever, *i*, is pressed down by a weight, I, when the rack, *i'*, will readily pass up on the periphery of the small ratch wheels, *s*, which is then held stationary by the pressure of the strip, by means of the pressure of the friction roller, *n*, against the opposite edge of the strip. The strip is fed between the upright plate, E, and a friction roller, K, which is held horizontally parallel to the face of the upright plate, E, by set screws which pass through springs, as seen at *q*, on the back side of the plate, E. These springs will always hold the friction roller, K, sufficiently firm against the strip to keep it steady, and yet allow of its being drawn down by the feeding ratch wheel, *r*.

The bits, *a*, and *a'*, which cut the mold are fitted into the ends of arbors, *c*, and *c'*, which rest in puppet heads, *t*, *t*, *t*, *t*, and are revolved by means of the lands L, and L', passing around the two large pulleys, B, and B', while the outer ends of these arbors rest in bearings *u*, and *u'*, jointed to the ends of the levers, M, and M', while the other ends of these levers, with friction rollers, *v*, and *v'*, bear against the faces of the cam wheels, D, and D', and they work on fulcrums, N, and N', supported by the upper bars of the main frame, so that by the effect of the cams, (D'', Figs. 2, and 3,) the arbors *c*, and *c'*, of the bits, *a*, and *a'*, receive a vibrating motion, alternately, toward, and from the strip to be cut into molds in such a manner that only one bit will be cutting at a time.

The levers, M, and M', are pressed against the faces of the cam wheels, D, and D', by the springs, *w* and *w*, attached to the same standards, N, and N', which form the fulcrums of the levers. The cams extend nearly half way round the cam wheels, D, and D,' (as seen in Figs. 2, and 3,) and are attached to the wheels by means of binding screws, (as seen at P, Fig. 3,) which pass through curved slots, (as seen at O, Fig. 3,) in the web, or disk, of the wheels, and are taped into the body of the cams. These screws being movable in the curved slots, allows the cams to be adjusted, readily, to the required position, which is nearly on opposite sides of the center of the wheels. These cams must be so shaped that the friction rollers, *v*, and *v'*, on the ends of the levers, M, and M', may rise very gradually while the bit is cutting; and fall off somewhat suddenly when the cutting is completed, as seen at D'', Figs. 2 and 3, so as to draw back the bit on one side, before the other bit commences cutting. This arrangement will be readily understood by the user of the machine.

The pin, or detent, *f*, which raises the back end of the lever, *i*, which causes the feeding motion, must be so placed as to operate immediately on the last bit having completed its cutting, in order that the strip may be fed in time for the action of the bit which cuts the first side of the next mold.

The bit, *a*, (which is fully shown in Fig. 1,) is first pressed up by the lever, M, moved by the cam on the wheel, D, and finishes that side of the mold, when it is immediately thrown back by the force of the spring, *w*, when the ends *v'*, of the lever, M', comes in contact with the cam on the wheel, D', by which the other bit is pressed up to the work and cuts, and finishes the other side of the mold, and the mold drops out of the machine; and then the detent, *f*, on the wheel, F, comes in contact with the projecting arm, *g*, of the lever, *i*, raising it so that by means of the rack, *i'*, and the ratch wheels, *r*, and *s*, the strip is fed for another mold, and thus the machine continues until the strip is worked up; when another must be inserted, and so on, for any length of time; the arbor of the cam wheels making one revolution while the bits cut one mold.

The bits may be so shaped as to cut the mold in any desired shape, whether flat, concave, convex, or different on different sides.

All parts of the machine which may need adjusting, we secure by set, or binding screws, so that they may be readily adjusted,

The several parts of the machine may be differently located. And the strip may be fed horizontally. Or a jaw may be used instead of the friction roller, to press the strip against the ratch wheel. Or the horizontal friction roller, K, may be dispensed with, and the ratch wheels may be placed on an arbor situated where the horizontal friction roller, K, now is, and therefore work against the front of the strip; the strip being sustained in its proper position by jaws, or other guides made movable so far as is necessary. Or two friction rollers may be used instead of the ratch wheel and one friction roller, with the ratch wheel, (*s*, Figs. 1 and 4,) for the rack to work on, to give them a repeated rotary motion.

The advantages, of our improvement, con-

sist in making a self acting machine by so arranging the several parts that the strip may be fed by means of a ratch wheel worked by a lever, which lever is worked by the general operation of the machine, and will thereby save much time and labor in tending it, as one hand can tend from six to ten machines, as easily as they can one of the machines now in use. And, also, in the saving of timber, as there will be much less waste when worked by accurate machinery which regulates itself, than when fed by hand. And also each one of our machines will do much more work in the same time, as well as do it better and at less expense.

We do not claim any of the separate parts of the machine, as such, nor the use of any of the parts separately, as our invention, but—

What we claim as our invention, and desire to secure by Letters Patent, is—

The use of the ratch wheels (r, and s,) rack, (i',) and lever, (i,) (or one or more friction rollers rack and lever,) to produce the feeding motion, when combined with the method of holding the strip, and the alternate vibratory motion of the bits, produced by the operation of the cams, thus constituting a self acting, and self regulating machine, when the whole is constructed, arranged, and combined, substantially, as herein described.

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Witnesses:
JOHN TORREY,
JOSIAH B. HAYDEN.