S. H. Gray.

Felting Machine.

No. 16305 Patented Dec. 23, 1856.

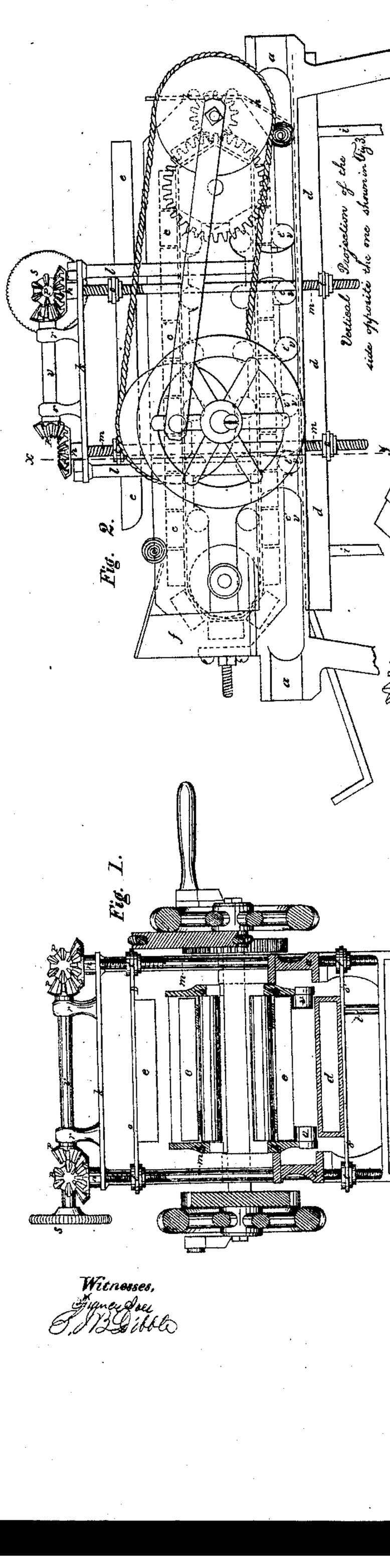

Fig. 2.

Vertical Projection of the side opposite the one shown in Fig. 3.

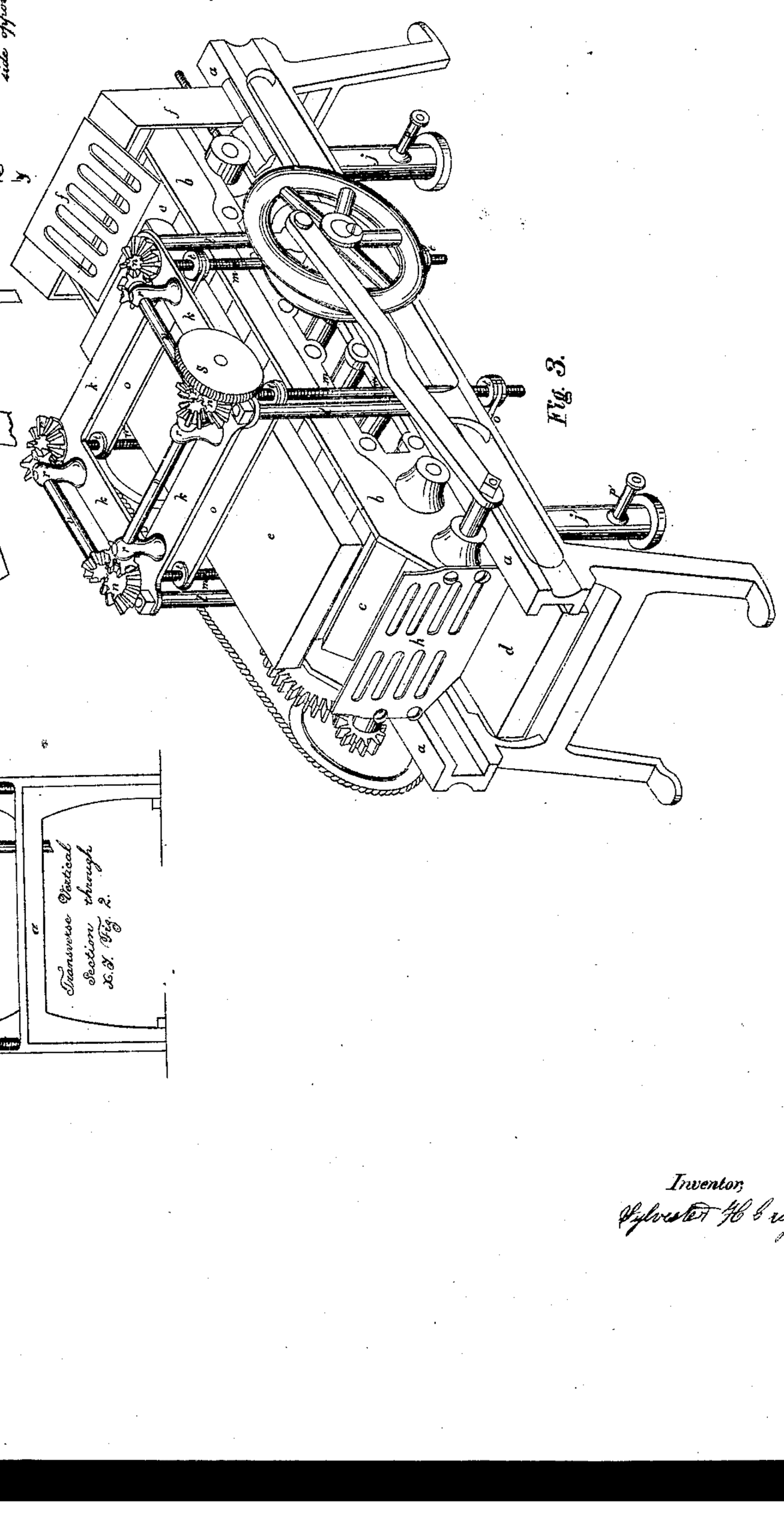

Fig. 3.

Fig. 1.

Transverse Vertical Section through S. H. Fig. 2.

Witnesses,
Signed Sec
E. J. B. Dibble

Inventor,
Sylvester H. Gray

UNITED STATES PATENT OFFICE.

S. H. GRAY, OF BRIDGEPORT, CONNECTICUT, ASSIGNOR TO IVES & GRAY.

MACHINERY FOR SIZING HAT-BODIES.

Specification of Letters Patent No. 16,305, dated December 23, 1856.

To all whom it may concern:

Be it known that I, SYLVESTER H. GRAY. of Bridgeport, in the county of Fairfield and State of Connecticut, have invented certain new and useful Improvements in Machines for Felting and Sizing Hat-Bodies; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, making a part of this specification, in which—

Figure 1 is a transverse vertical section through XV in Fig. 2. Fig. 2 is a vertical projection of the side opposite the side shown in Fig. 2. Fig. 3 is an isometrical perspective view.

The same letters indicate like parts in all the figures.

I construct and operate the machine to which I apply by improvement substantially in the same manner as the machine for felting and sizing hat-bodies, for which, or for certain improvements in which, Letters Patent of the United States were issued to me, bearing date the 3d day of June 1856, *a* being the frame of the machine described in said Letters Patent; *b*, the vibrating carriage carrying the endless bed *c;* and *e* the upper and *d* the lower presser plates.

The improvements for which I now desire to obtain Letters Patent may be described as follows:

1. When the hat-body is introduced into the machine through an orifice in the upper pressure plate *e* as in the machine above referred to, the back vibratory motion of the vibratory carriage *b* frequently jerks the hat-body backward from under the upper pressure plate *e*, and throws it out of the machine. To prevent this I construct the upper pressure plate *e* without any orifice and employ, to introduce the hat-body into the machine, a mouth-piece *f* attached to the frame *a* and standing above and inclining toward the endless-bed *c*. The hat-body is thrown upon the mouth-piece *f*, rolls down upon the endless bed *e*, and is retained in that position by the mouth-piece *f*, until the rotary motion of the endless-bed *c* carries it under the upper pressure plate *e* and forward through the machine.

2. Instead also of delivering the hat-body at the rear end of the machine, when it has passed through between the upper pressure plate *e* and the endless bed *c*, as is the case in the machine heretofore patented by me, I now employ a guide *h* attached to the rear end of the vibrating carriage *b*. The guide *h* receives the hat-body when it has passed through between the upper pressure plate *e* and the endless bed *c*, conducts it down upon the lower pressure plate *d* and carries it forward on plate *a*, until the rotary motion of the endless bed *c* carries it forward between the endless bed *c* and the lower pressure plate *a* to the front of the machine, there to be received by the operator. By this improvement the machine is rendered self-feeding at the rear end.

3. Inasmuch as the hat-body becomes too cold to be worked to advantage when the time consumed in its passage through the machine is so much increased, I construct the lower pressure plate *a* hollow, and of iron or any suitable material to receive and contain steam or hot air, whereby the hat-body is kept hot in passing through between the lower pressure plate *d* and the endless bed *c*. The steam, or hot air, is introduced into the hollow pressure plate or steam chest *d* through the pipe *i* Fig. 2 and suffered to escape, together with the hot-water from the condensation of the steam inside the steam chest *d*, through the pipe *i'*. The pipes *i* and *i'* are inserted in cylindrical chambers *j* and *j'*, Fig. 3, provided with suitable stuffing boxes to admit of the pipes *i* and *i'* rising and falling in them, as the pressure plate or steam chest *d* in which the pipes are inserted and fastened is raised and lowered, and at the same time prevent the escape of the steam or hot air. A small pipe *p*, Fig. 3, provided with a suitable steam cock, is inserted in the chamber *j* through which the steam or hot air is introduced into the chamber and thence into the pressure plate *d*, and a similar small pipe *p'* Fig. 3, also provided with a steam cock, is inserted in the chamber *j'*, through which the steam and water, or hot air, are suffered to escape.

4. I also set the upper pressure plate *e* and the lower pressure plate *d*, at square distances, or at any required distances, from the endless bed *c*, and then cause them to approach toward and recede from the endless bed simultaneously, equally and by one operation. To do this, a frame *k* is supported at a convenient distance above the endless bed *c* by four upright posts *l l* attached to the frame of the machine A. Passing through and revolving in holes in either

corner of the frame *k*, are four perpendicular rods *m m* having threads cut on each end, extending to a suitable distance below the endless bed *c*. The frame *k*, should be fixed far enough above, and the rods *m m* should extend far enough below the endless bed *c*, to admit the upper and lower pressure plates to recede from the endless bed as far as they will be required to recede therefrom. Four small pinions *n n*, with beveled cogs on their peripheries, are fastened on the upper ends of the rods *m m*, above the frame *k*, and engage six other small pinions P P, also having beveled cogs fastened on the ends of three small horizontal shafts *q q*, properly supported by and revolving in six pillow blocks *r r* fastened to the frame *k*. One end of one of the horizontal shafts carries a band-wheel S, within reach of the operator, by turning which the horizontal shafts *q q* and the rods *m m* are caused to revolve simultaneously.

Two cross bars *o o* are attached to the upper side of the upper pressure plate *e*, and two other cross bars *o' o'* are attached to the lower side of the lower pressure plate *d*. To the ends of these cross-bars are attached adjustable nuts *t t* to receive the screws on the ends of the rolls *m m*. The screws, or threads, on the ends of the rods *m m*. At two of the opposite angles of the frame *k* are right hand screws, and at the other two opposite angles of the frame *k*, are left hand screws. The screws, or threads, on the lower ends of the rolls *m m* at the corresponding angles, are the reverse of those on the upper ends.

The pressure plates *e* and *d* are set at any required distance from the endless bed *c* by means of the adjustable nuts *t t*, and by the arrangement of right and left hand screws on the rods *m m*, above described, the operator, by turning the band wheel S, in one direction causes the pressure plates to approach, and by turning it in the opposite direction, to recede from, the endless bed *c*, equally simultaneously and by one operation.

5. To support the endless bed *e*, prevent it from sagging and keep it in a straight line in its revolution on the under side of the vibrating carriage *b*, I employ two rows of short friction rollers *v v*, Fig. 2, one row on each side of the vibrating carriage, revolving on studs *t' t'*, Fig. 2, fixed in the sides of the vibrating carriage. These friction rollers extend a short distance underneath the endless bed, on the under side of the vibrating carriage, but not so far as to interrupt the hat-body in its passage between the endless bed and the lower pressure plate.

What I claim and desire to secure by Letters Patent is—

1. Attaching the guide *h* to the rear end of the vibrating carriage *b* in the manner described for the purposes specified.

2. I claim the use of the adjustable steam chest *d* in combination with the vibrating carriage *b* and the revolving endless bed *c*, on carriage *b*, made and operating substantially in the manner and for the purpose specified.

SYLVESTER H. GRAY.

Witnesses:
FRANCIS IVES,
S. I. B. DIBBLE.