

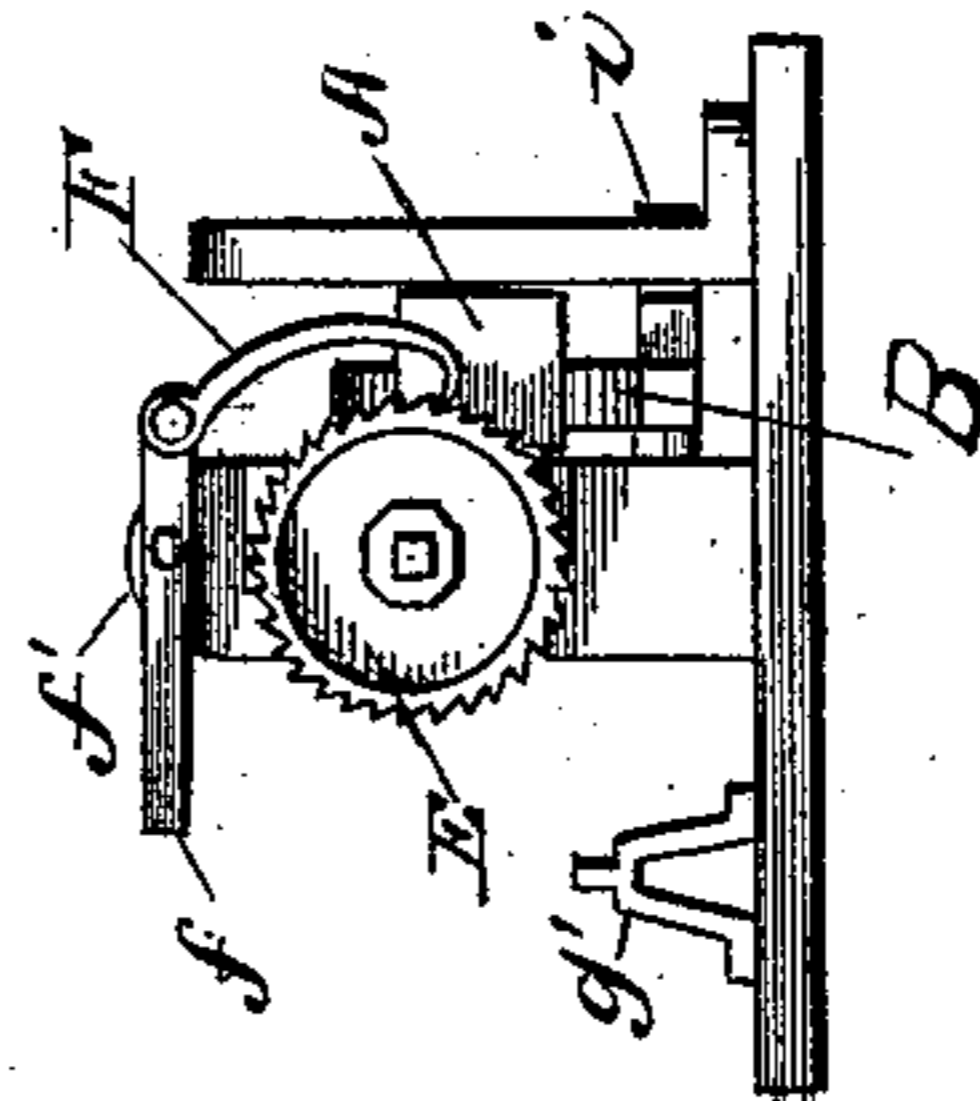
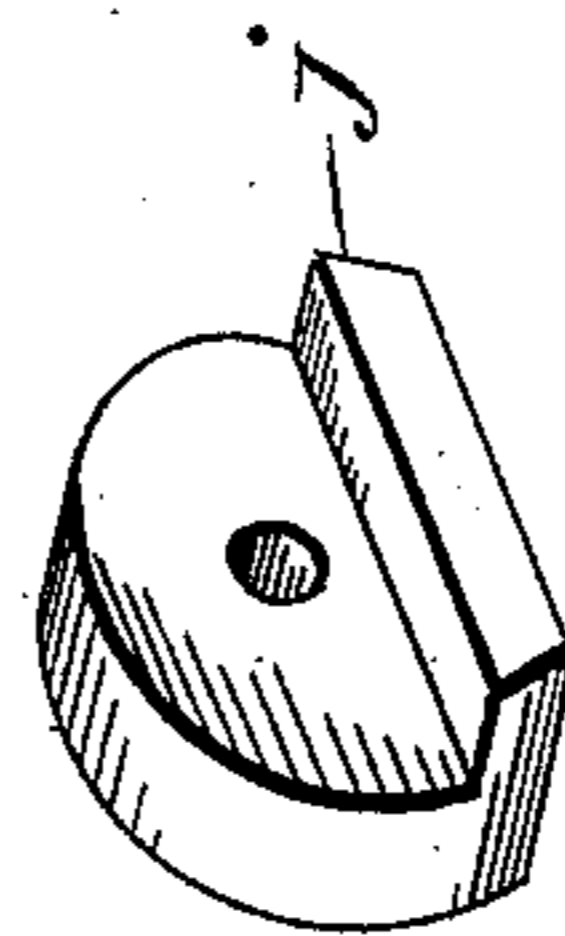
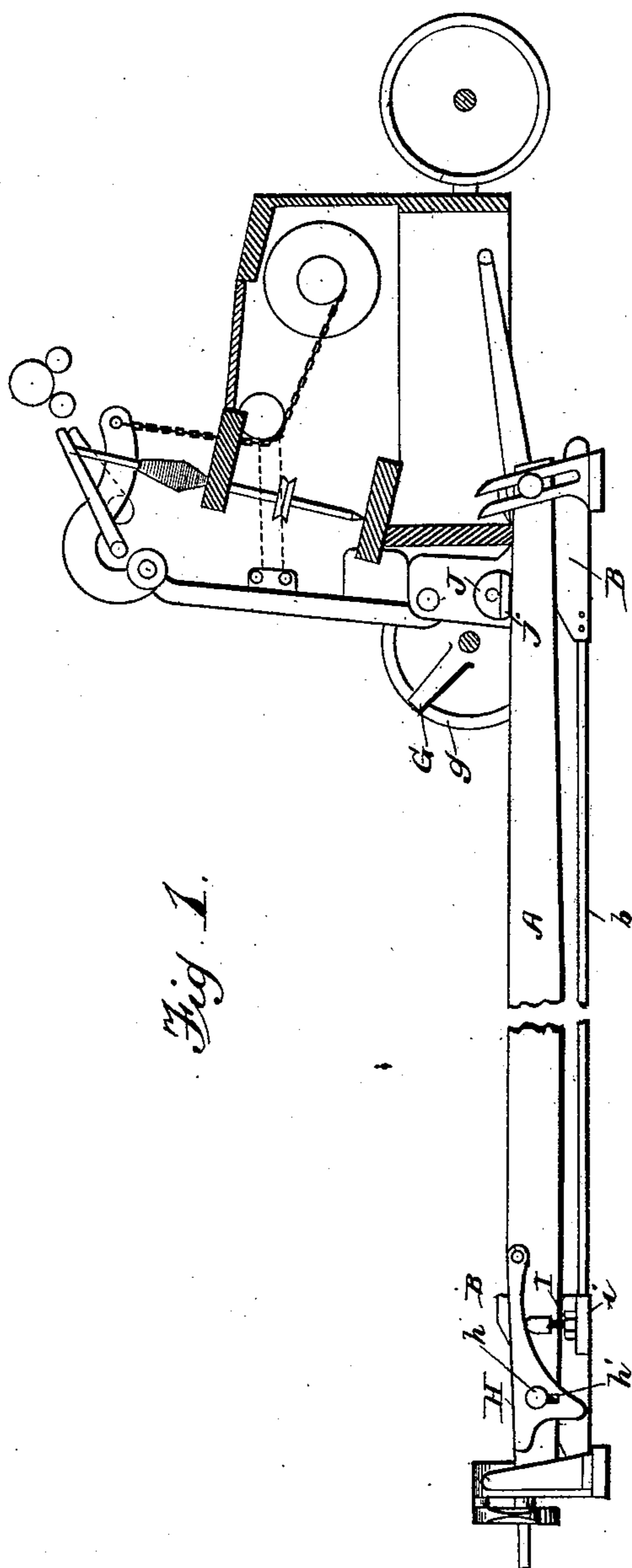
(No Model.)

2 Sheets—Sheet 1.

P. N. DEXTER, Jr.
SPINNING MULE.

No. 483,906.

Patented Oct. 4, 1892.



Witnesses

Witnesses
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UNITED STATES PATENT OFFICE.

PARDON N. DEXTER, JR., OF SALMON FALLS, NEW HAMPSHIRE.

SPINNING-MULE.

SPECIFICATION forming part of Letters Patent No. 483,906, dated October 4, 1892.

Application filed November 13, 1891. Serial No. 411,805. (No model.)

To all whom it may concern:

Be it known that I, PARDON N. DEXTER, Jr., a citizen of the United States, residing at Salmon Falls, in the county of Strafford and State of New Hampshire, have invented certain new and useful Improvements in Spinning-Mules; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to improvements in spinning-mules; and it has for its object to remove or draw out the slack yarn on a self-acting mule.

In spinning-mules as generally used the position of the faller-wires is regulated by a smooth wheel or bowl which runs on the copping-rail, and the feed of the yarn and contour of the cop are determined by these wires. When the bowl is elevated, the faller-wires are lowered and they feed the yarn lower on the bobbin, and when the bowl is lowered the faller-wires are elevated and the yarn is fed higher on the bobbin. At each end of the copping-rail are shoes, suitably connected together and adapted to be automatically fed backward as the cop is being built. Thus the copping-rail, which is supported at each end of these shoes, is lowered at each stroke and the feed gradually carried to the point of the bobbin. The common construction of these rails is flat at their point, or in some cases an arm is hinged to the rail at a short distance from the end thereof and adapted to form an inclined plane on which the bowl may run as the copping-rail is lowered. In these mules the building of the bottoms is regulated by a quadrant on the mule, and when the bottom of the cop is finished the quadrant is idle until the next cop is commenced. In building these bottoms a great deal more slack yarn than necessary is gained in coming out of the mule, and my invention aims to draw down the faller-wires sufficiently to keep the yarn taut and remove the slack and kinks which will form on the bottoms when the yarn is slack at this stage of building the cop. This slack yarn is occasioned by uneven speed of the machine and other causes, and when the yarn is woven the kinks which went in on the bottoms of the cops will show

in the cloth, and thereby render it second quality of goods and unfit for the best quality, which causes a great loss and expense.

The object of my present improvements is to provide improved means for taking up the slack yarn, and thereby preventing the same from kinking, such improved mechanism causing the faller-wires to be drawn down farther than in the ordinary common spinning-mules, and by thus drawing down the yarn it is maintained in a taut condition and it will be wound tightly and smoothly on the bobbins. When the bottoms of the cops have been built, the attachment will have reached a point where it is out of the way of the bowl while the remainder of the cops are being built by the continued operation of the mule.

In some machines the bottoms are longer than in others, and I have also provided a device for regulating the attachment according to the length and size of the bottoms. This attachment will obviate many of the disadvantages of cop-building, as it will wind a harder bottom, and thus prevent the disagreeable kinking and broken bottoms which cause cop waste, and it will run off better on the bottom of the shuttle-spindle by not causing so much friction. Besides, the prevention of breaking, &c., will cause less stopping of the looms.

With these ends in view the invention consists, first, in the combination, with the movable shoes and the copping-rail, of the supplemental rail pivoted on the side of the copping-rail at the outer end thereof and having the curved lower edge, so that said rail is wider at its free end than at its pivoted end, a bracket carried by the forward shoe and extending under the copping-rail to the other side thereof, and the adjusting vertical support carried by said bracket to receive the pivoted rail and move back and forth with the forward shoe along the curved lower edge of said pivoted rail, whereby the pivoted rail is raised and lowered.

The invention further consists in the combination, with the shoes and the copping-rail, of the supplemental rail pivoted at its narrow inner end on the side of the copping-rail and having a curved lower edge, so that said rail is wider at its free end than at its pivoted end, the adjustable support on the forward

shoe upon which rests the pivoted rail, whereby said rail will project above the coping-rail when the cop is commenced and gradually fall to a level therewith as the shoes and support are moved backward, and the bowl or dog arranged to move on the coping-rail and having a lateral projection to run on the incline formed by the pivoted rail.

When the machine is in position to commence the cop, the coping-rail is supported on the widest portion of the shoes, which are projected to their greatest distance beyond said rail, and the extreme forward end of the pivoted rail rests on the adjustable screw carried by the forward shoe, and this end projects above the coping-rail proper. As the mule operates, a dagger strikes the pawl and works the ratchet, which moves the shoes backward and lowers the rail; but at the same time the bowl or dog slides along the coping-rail, and as the pivoted rail projects above the coping-rail at this stage of building the cop the projection on the bowl will slide upon this pivoted rail, and thus lower the faller-wires, tighten the yarn, and draw out the kinks therein. When the bowl slides back off of the pivoted rail onto the coping-rail, it will continue to wind the yarn on the cop in the usual manner. It will be readily seen that as the operation progresses the forward shoe and adjustable screw are fed backward, thus allowing the pivoted rail to drop at a greater relative speed than the coping-rail and by the time the bottom is finished the pivoted rail will be on a level with the coping-rail and the bowl will not rise up at the end of the stroke as when the cop is commenced.

To enable others to more readily understand my invention, I have illustrated the same in the accompanying drawings, in which—

Figure 1 is a side view of the working parts of a mule, showing the bottom of a cop nearly finished and my attachment on the coping-rail. Fig. 2 is a top plan view of the coping-rail and the means for operating the shoes. Fig. 3 is a side elevation showing the attachment elevated and the machine in position to start the cop and build the bottom. Fig. 4 is a similar view showing the machine as it stands after the bottoms of the cop are completed. Fig. 5 is an elevation of the opposite side of the coping-rail. Fig. 6 is a front view. Fig. 7 is a detail view of the bowl or dog.

Referring to the drawings, in which like letters of reference denote corresponding parts in all the figures, A designates the coping-rail, which is supported on the shoes B by the headed pins *a*. These shoes are connected together by a rod *b*, and they are arranged to slide back and forth. A ratchet E is fitted on the feed-screw *d* in front of the pillow-block, and said screw is retained in its proper position in the block by collars *e* on the screw, which fit closely against either side of the block. The ratchet-gear is operated by a pawl F,

loosely secured on one end of an arm *f*, pivoted at or about its middle to a standard *f'* on the pillow-block. As the mule moves forward, a dagger G on the wheel *g* strikes the free end of this arm *f* and operates the pawl and ratchet to move the shoes B backward, and this wheel *g* is arranged to run on a track *g'* on the base-plate. After the arm *f* has been depressed and the screw operated the pawl F drops back into position of its own weight into engagement with the ratchet-wheel. On the opposite side of the coping-rail a small rail H is pivotally secured thereto, and the front end of said pivoted rail has a limited vertical movement and is guided on a pin *h*, which extends through a slot *h'* in the pivoted rail. The pivoted rail is wider at its front end than at the pivot end, and the lower edge thereof is curved, while the upper edge is straight, as shown in the drawings. The pivoted rail is operated by an adjusting-screw I on a bracket *i* on the forward shoe B, which is adjusted to provide for mules having bottoms of different sizes, and it is arranged to move back and forth with the shoe beneath the pivoted rail. It will be seen that when the shoes are moved forward and the mule is in position to begin building the bottom of the cop the adjusting-screw I is beneath the wide front end of the pivoted rail which thus projects above the coping-rail, and forms an incline on which the bowl or dog is adapted to run, and as the shoe B is gradually worked backward by the feed-screw the adjusting-screw I slides under the curved lower edge of the pivoted rail and allows said rail to descend to the level of the coping-rail, and as the bottom of the cop is finished by this time the pivoted rail is out of the way and will not interfere with the further operation of the bowl or dog, which at this stage will slide along the coping-rail and also the pivoted rail, both of which are level on their upper edges. The slack of the yarn also becomes less as the bottoms are being built and the cop increases in size, and finally when the conical part of the cop at the bottom is formed and the full size attained the ordinary construction of the coping-rail and shoes is sufficient to prevent kinking, &c.

The bowl or dog J is on a stud on an arm or "faller-lock," as it is generally called, and this arm is attached to the fallers, which guide the yarn while building the cop. A projection *j* is provided on one side of the bowl or dog and arranged to slide up the incline formed by the pivoted rail. The bowl or dog proper slides on the coping-rail, and when it reaches the incline of the pivoted rail the projection *j* slides on this rail until it has reached the level of the coping-rail.

The operation of this attachment is simple and may be readily understood from the foregoing description in connection with the drawings. As the mule starts to build the bottom of the cop, the pivoted rail is sup-

ported on the adjusting-screw and the bowl or dog runs up the incline formed thereby and lowers the faller-wires more than is done in ordinary mules and more than is necessary after the bottoms are completed. By thus depressing the faller-wires the yarn is drawn taut and is wound tightly to form a hard cop free of kinks and slack yarn.

I am aware that changes in the form and proportion of parts and details of construction may be made without departing from the spirit or sacrificing the advantages of my invention, and I therefore reserve the right to make such changes as fall within the scope of my invention.

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

1. The combination, with the shoes and the coping-rail, of the pivoted rail carried by the coping-rail and having a curved lower edge, so that said rail is wider at its free end than at its pivoted end, the pin on the coping-rail extending through a slot in the pivoted rail, and the screw carried by the forward shoe and adapted to support the pivoted rail, substantially as described.

2. The combination, with the base-plate, the shoes, and the coping-rail, of the pivoted rail arranged on one side of said coping-rail near the outer end thereof, the pillow-block, the feed-screw operating in said pillow-block and connected with the forward shoe, the collars *e* on said screw on either side of the pillow-block, the ratchet, the arm pivoted on the pillow-block and carrying a pawl adapted to engage with said ratchet, and the dagger carried by the mule-carriage and arranged to depress the pivoted arm to operate the pawl and

ratchet and work the shoes backward, substantially as described.

3. The combination, with the movable shoes and the coping-rail, of the supplemental rail pivoted on the side of the coping-rail at the outer end thereof and having the curved lower edge, so that said rail is wider at its free end than at its pivoted end, a bracket carried by the forward shoe and extending under the coping-rail to the other side thereof, and the adjustable vertical support carried by said bracket to receive the pivoted rail and move back and forth with the forward shoe along the curved lower edge of said pivoted rail, whereby the pivoted rail is raised and lowered, substantially as and for the purpose described.

4. The combination, with the shoes and the coping-rail, of the supplemental rail pivoted at its narrow inner end on the side of the coping-rail and having a curved lower edge, so that said rail is wider at its free end than at its pivoted end, the adjustable support on the forward shoe upon which rests the pivoted rail, whereby said rail will project above the coping-rail when the cop is commenced and gradually fall to a level therewith as the shoes and the support are moved backward, and the bowl or dog arranged to move on the coping-rail and having a lateral projection to run on the incline formed by the pivoted rail, substantially as and for the purpose set forth.

In testimony whereof I affix my signature in presence of two witnesses.

PARDON N. DEXTER, JR.

Witnesses:

JAMES COLLINS,
GEORGE E. JOY.