

**SECRET**

PATENTED AUG. 13, 1907.

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3 SHEETS—SHEET 1.



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905 METAL DRAFTING

MURKIN DUE

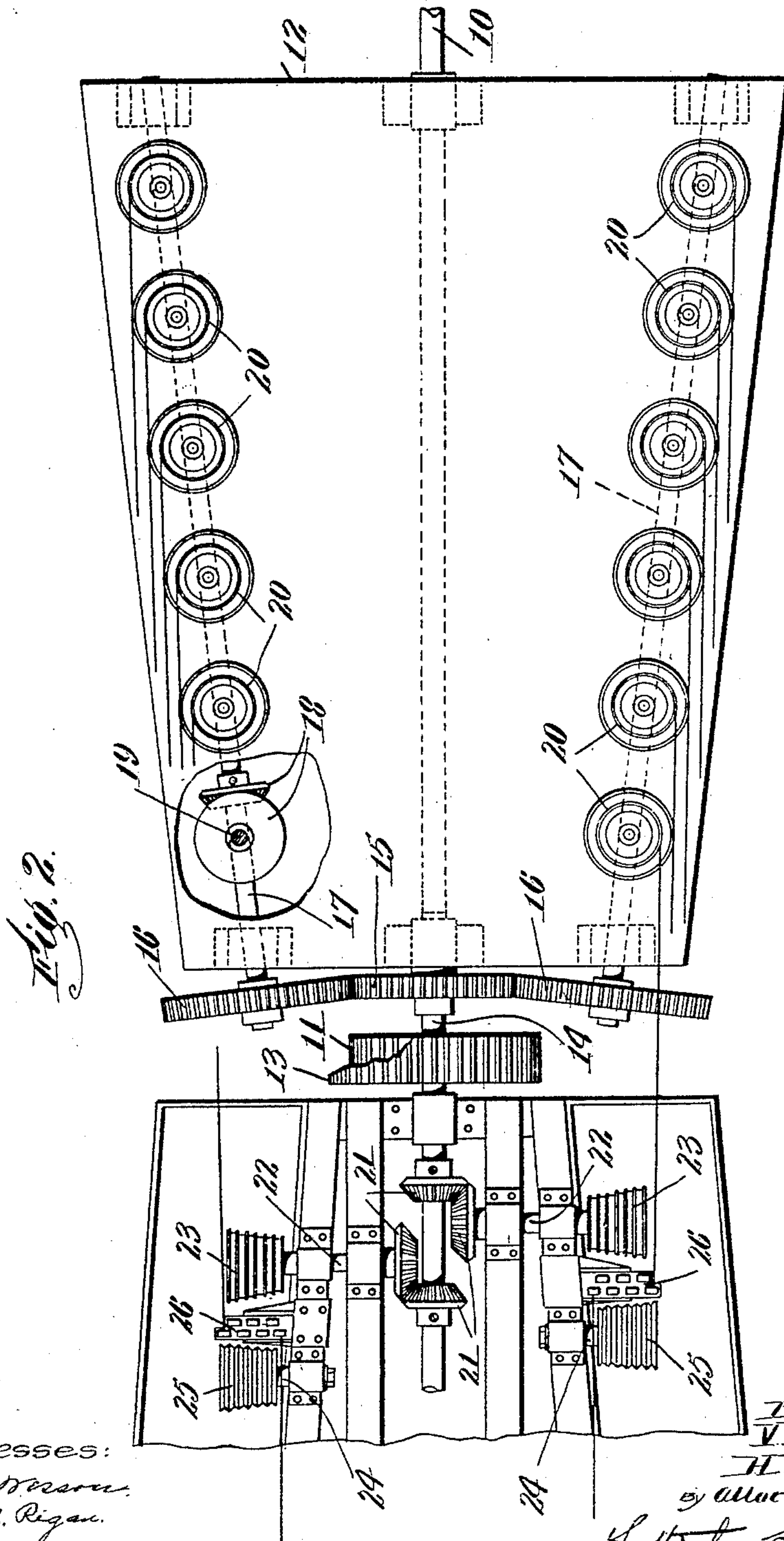
No. 863,149.

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V. F. BRUCE & H. S. BJUHR.  
MULTIPLE WIRE DRAWING MACHINE.

APPLICATION FILED OCT. 22, 1906.

3 SHEETS—SHEET 2.



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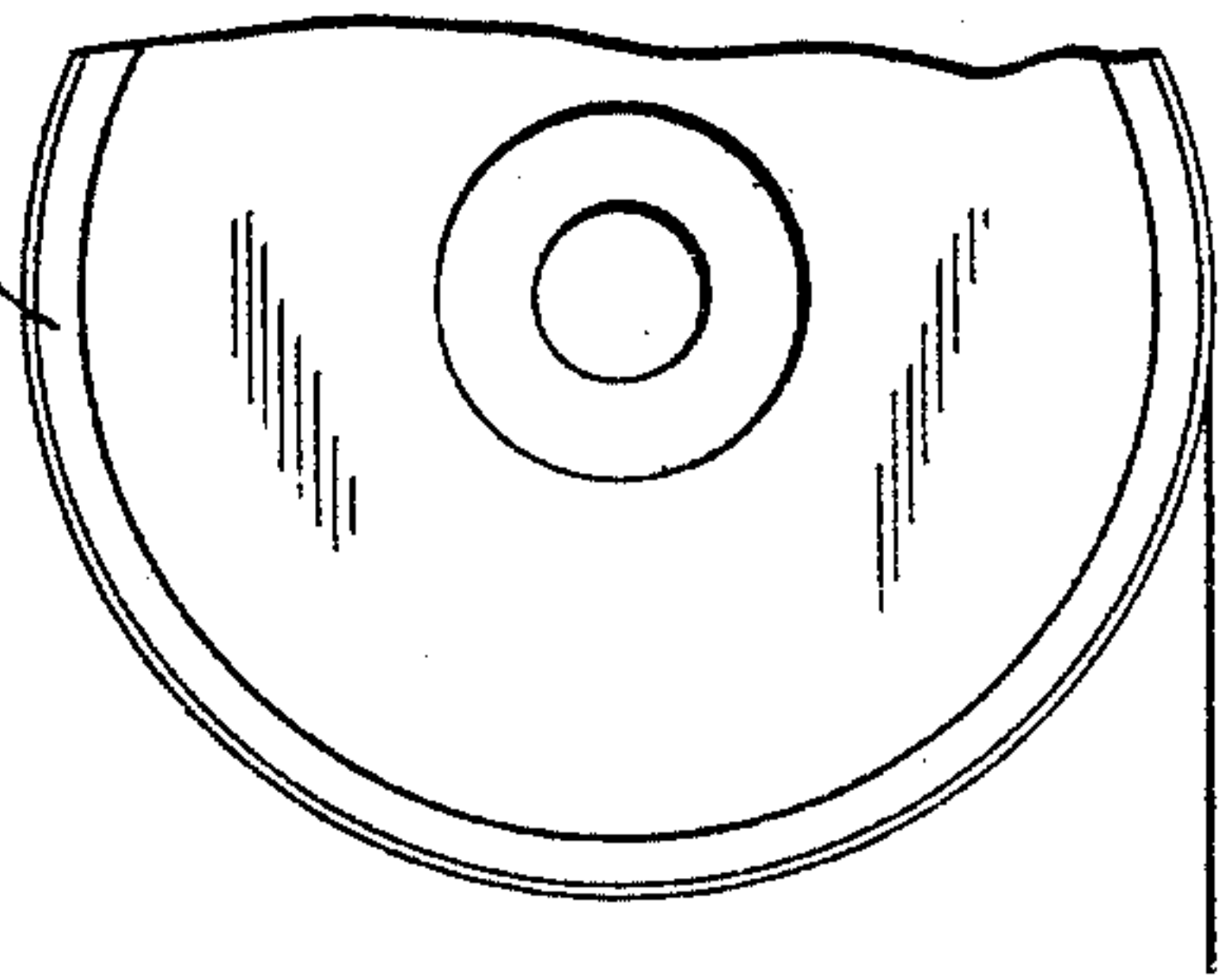
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3 SHEETS—SHEET 3.

*Fig. 3.*

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# UNITED STATES PATENT OFFICE.

VICTOR F. BRUCE AND HUGO SWANSON BJUHR, OF WORCESTER, MASSACHUSETTS.

## MULTIPLE-WIRE-DRAWING MACHINE.

No. 863,149.

Specification of Letters Patent.

Patented Aug. 13, 1907.

Application filed October 22, 1906. Serial No. 339,936.

*To all whom it may concern:*

Be it known that we, VICTOR F. BRUCE and HUGO SWANSON BJUHR, citizens of the United States, residing at Worcester, in the county of Worcester and State of Massachusetts, have invented a new and useful Multiple-Wire-Drawing Machine, of which the following is a specification.

Our invention relates to a machine for drawing wire by means of dies and drawing heads; the principal object thereof being to provide such an arrangement of dies, drawing heads, and guide rolls that the machine will not be limited, as is usually the case at present, to the treatment of a single wire, but may be employed for simultaneous treatment of a large number of wires if desired.

Further objects of the invention are to provide for taking each wire from the last die of the series through which it passes to the block frame, and winding the whole series in a convenient and efficient manner, passing the wires across the space between the drawing heads and winding blocks at a short distance apart so that the drawing mechanisms for the several wires can be located compactly and driven from a single source of power, the blocks also being driven from the same source of power, and generally to improve the construction and operation of wire drawing machines of this general character.

Reference is to be had to the accompanying drawings, in which

Figure 1 is a plan of that portion of a wire drawing machine on which the drawing heads are located, showing one embodiment of our invention. Fig. 2 is a plan of the end of the same and of the block showing the connection between these two parts of the machine, and Fig. 3 is a plan on an enlarged scale showing the course of the wire through one of the drawing-units.

Referring first to Fig. 2, the main driving or power shaft 10 is shown having a gear 11 thereon. This shaft passes from one end of the block frame 12 to the other, and transmits power from the gear 11 to a gear 13 on a driven shaft 14. This driven shaft, either in a single piece or in sections, extends from one end of the drawing frame to a point beyond the other end thereof, and is provided with a gear 15 supported by the block frame. This gear operates side gears 16 which are located on shafts 17 carrying bevel gears 18 for operating vertical shafts 19, on each of which is located a block 20. On the shaft 14 is also located a series of bevel gears 21 for operating horizontal shafts 22. Each of the shafts 22 carries a drawing head 23 which may be of any desired construction, but is preferably of the stepped form, ordinarily designated as conical. Each of the drawing heads 23 is accordingly positively rotated, and adjacent to it is located a stud 24 on which is loosely journaled a guide roll 25 having a number of grooves corresponding to the number of steps on the drawing-

head. Between each head and roll is a die-holder 26 provided with a series of dies. The course of the wire through each one of these units is shown in Fig. 3. It is drawn from a source of supply as a reel or the like, through the first die of the series in the die-holder directly on to the smallest step of the drawing head. It is passed one or more times around this step and then back to the first groove through the guide roll, and from there through the next die of the series, and to the next step of the drawing head, and so on in repetition until from the last step of the drawing head it passes back to the last groove of the guide-roll, and from this through the last die of the series, and then over to the block frame where it is wound up by the corresponding block 20. One block is provided for each of the drawing units consisting of a drawing-head, guide-roll, and die-holder.

By observing the course of the wire through the drawing-head and guide-roller, as shown in Fig. 3, it will be observed that a construction has been adopted in which the number of steps on the drawing-head, and the number of grooves on the guide-roller is the same, and that the number of dies exceeds this number by one. The wire passes first to the smallest step of the drawing-head through a die without first passing over the guide roll, and the offsetting of the guide roll permits the withdrawal of the wire from the last groove of the guide-roll through a die without passing over an additional step of the drawing-head.

Now by reference to Fig. 1, it will be seen that each of the drawing units is arranged in this way, and moreover, that each unit is offset from the next one a sufficient distance to permit the wire drawn from the one in the rear to pass adjacent to the end of the next unit in front, and parallel with the wire drawing-frame to the corresponding reel of the block. This arrangement is secured by placing the bearings for the drawing-heads and guide-rollers on a rail located at an angle with respect to the shaft 14. This angle can be duplicated on the two sides of the machine, and consequently, a plurality of wires can be drawn simultaneously on the same machine without interfering with each other, and without increasing the size of the machine even approximately in any proportion to the space which would be occupied by a corresponding number of the machines as they have heretofore been constructed.

It is to be noted that there is a double offset, each drawing-unit being offset from the next one, and each drawing-head being offset from its guide-roll. By this double arrangement the advantages in space are secured.

It is to be noted that the shafts 17 are located at an angle similar to that of the rails on which the bearings for the drawing rolls are set, and that the blocks diverge in a similar manner; consequently, the wires pass from



the drawing machine to the block frame in substantial parallelism with each other so that they cannot interfere with each other, and yet very little additional space is occupied by them.

- 5 While we have illustrated and described a particular form in which we prefer to embody our invention, we are aware that modifications may be made therein by any person skilled in the art, and that other forms of drawing and guide rolls can be adopted without departing from the spirit of our invention as set forth in the claims.

Therefore, we do not wish to be limited to the particular constructions illustrated and described, but

What we do claim is:—

- 15 1. In a wire drawing machine, the combination of a series of dies, a drawing head adapted to receive wire directly from one, at least, of said dies, means for positively driving said head, a guide roll adapted to receive wire from said head and deliver it to another die of the series, 20 the axis of the opening in the last die of the series being located in a plane which is at right angles to the axis of rotation of the drawing head and which plane is past the end of the drawing head, the said last die adapted to receive the wire from the guide roll.
- 25 2. In a wire drawing machine, the combination of a series of dies, a conical or stepped drawing-head receiving wire directly from a source of supply through one of said dies, means for positively driving one of said heads, a loosely journaled conical guide-roll receiving wire from 30 said head and delivering it to the next step of the head through another die of the series, and receiving it back on another step, and means for drawing the wire from the last step of the guide-roll through the last die of the series and past the end of the drawing-head.
- 35 3. In a wire drawing machine, the combination of a shaft, a plurality of drawing heads, each positively driven

from said shaft, all of said heads being of the same length and each extending beyond the end of, and farther from the shaft than, the one in front, a plurality of loosely journaled guide-rolls, each corresponding with one of said heads, and means for drawing wires onto the heads and alternately over the guide rolls, and from the last groove of each guide-roll past the next guide roll and head and out of contact therewith. 40

4. In a wire drawing machine, the combination of a plurality of wire drawing units, each driven from the same source of power, and each offset from the one in front, whereby wires drawn from said units will pass the next of the units in front without interfering therewith. 45

5. In a wire drawing machine, the combination of a plurality of wire drawing units, each driven from the same source of power, and each offset from the one in front, whereby wires drawn from said units will pass the next of the units in front without interfering therewith, each unit comprising a drawing head, a guide-roll, and a set of dies, the drawing-head being offset from the guide-roll in the same direction that the unit is offset from the unit to the rear. 55

6. In a wire drawing machine, the combination of a series of wire drawing units, each one being offset from the one in front, a series of blocks offset in reverse order, and means for driving said wire drawing units and said blocks from the same source of power, whereby the wire drawn from the units will be wound upon the blocks and will extend from each unit to its block in parallelism with the other wires and out of engagement with the other wires, units, and blocks. 60 65

In testimony whereof we have hereunto set our hands, in the presence of two subscribing witnesses.

HUGO SWANSON BJUHR.  
VICTOR F. BRUCE.

Witnesses:

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