

(No Model.)

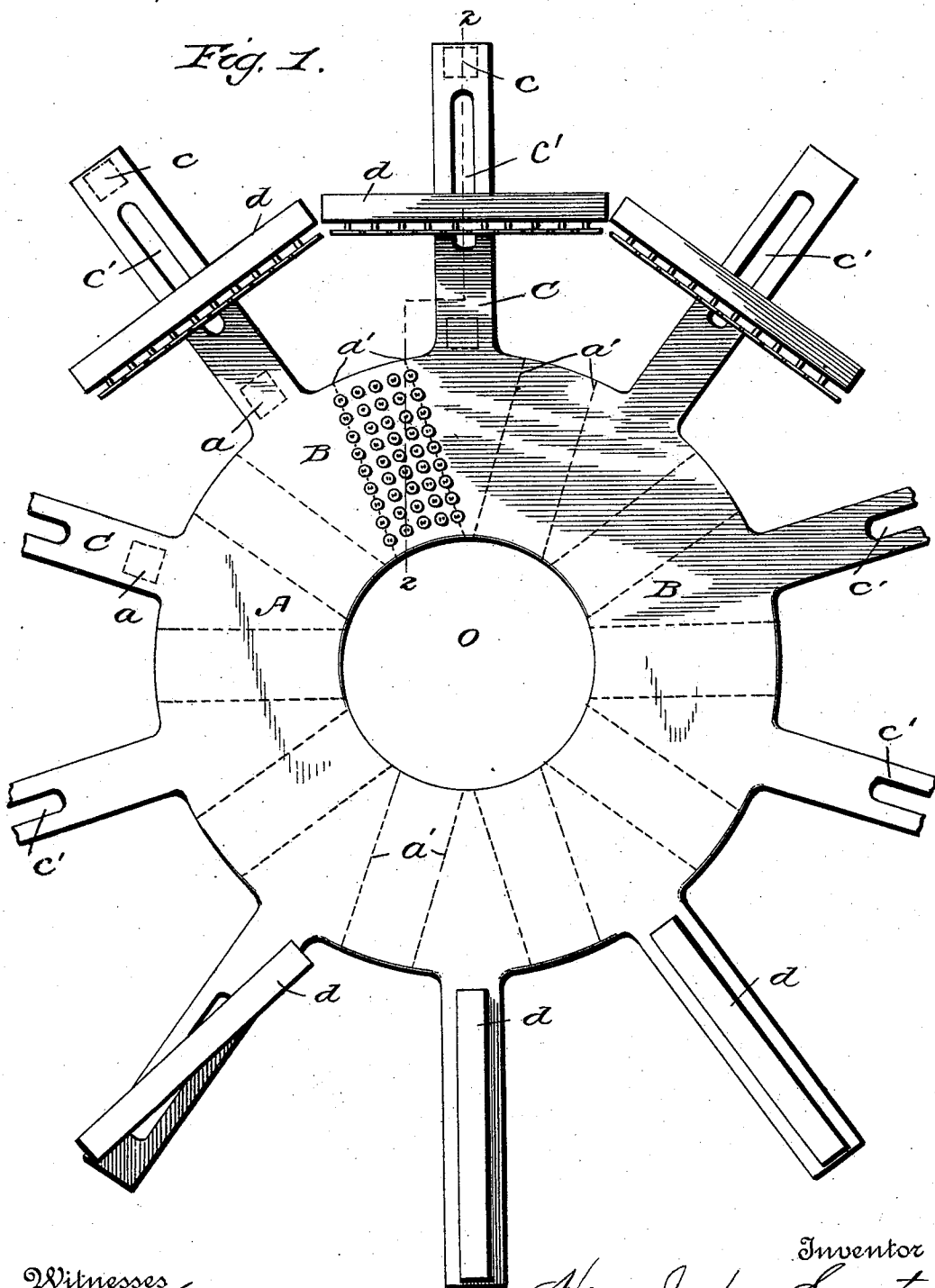
3 Sheets—Sheet 1.

H. J. SWARTS.
TELEPHONE SWITCHBOARD.

No. 574,642.

Patented Jan. 5, 1897.

Fig. 1.



Witnesses
Alfred T. Sage
Albert J. Swarts

Inventor
Henry Jasper Swarts,
by *Alfred T. Sage*
Attorney

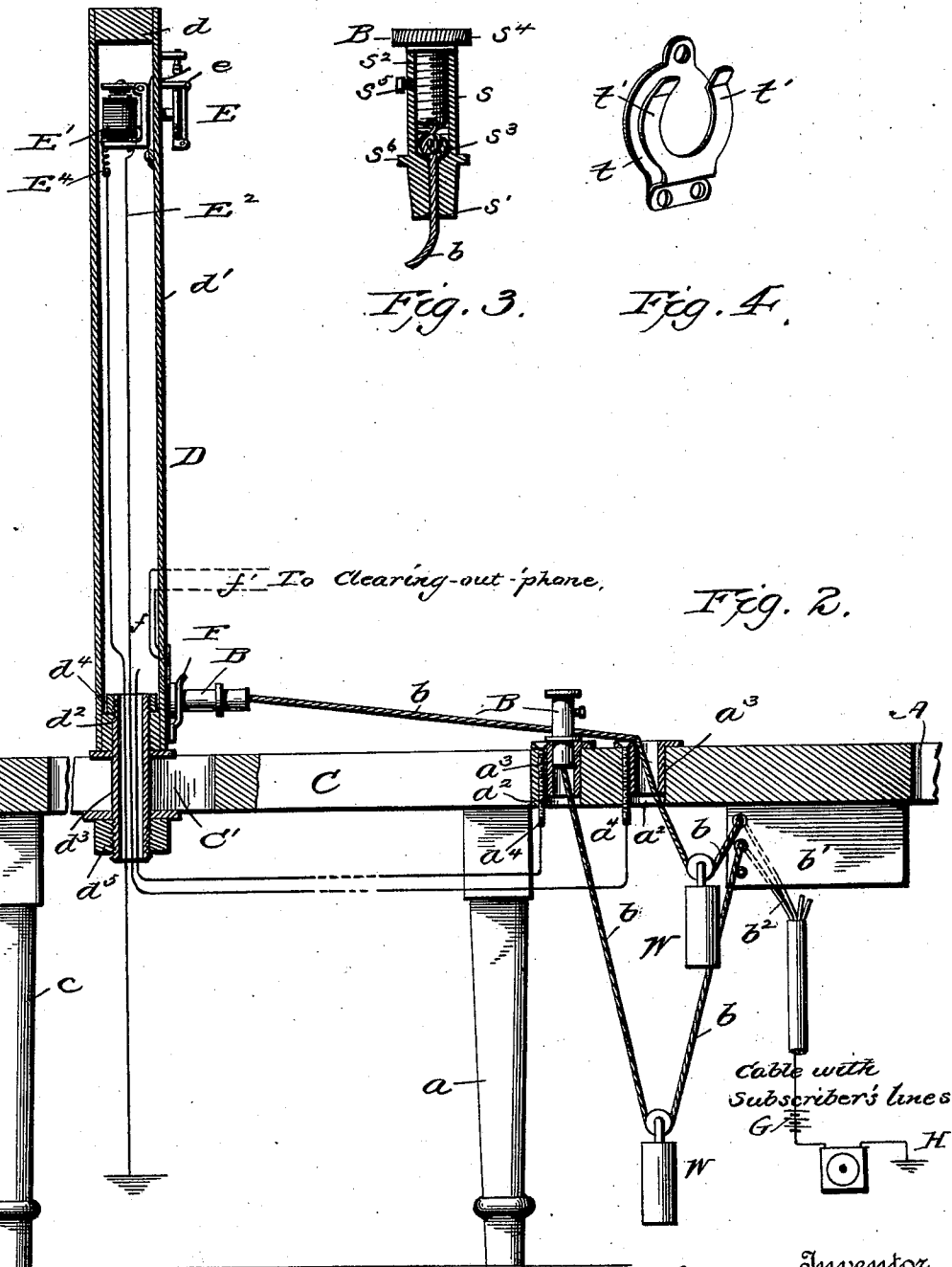
(No Model.)

3 Sheets—Sheet 2.

H. J. SWARTS.
TELEPHONE SWITCHBOARD.

No. 574,642.

Patented Jan. 5, 1897.



Witnesses
Alfred Spindler.
Albert Spindler.

Inventor
Henry Jasper Swarts,
by Alfred T. Gage,
Attorney

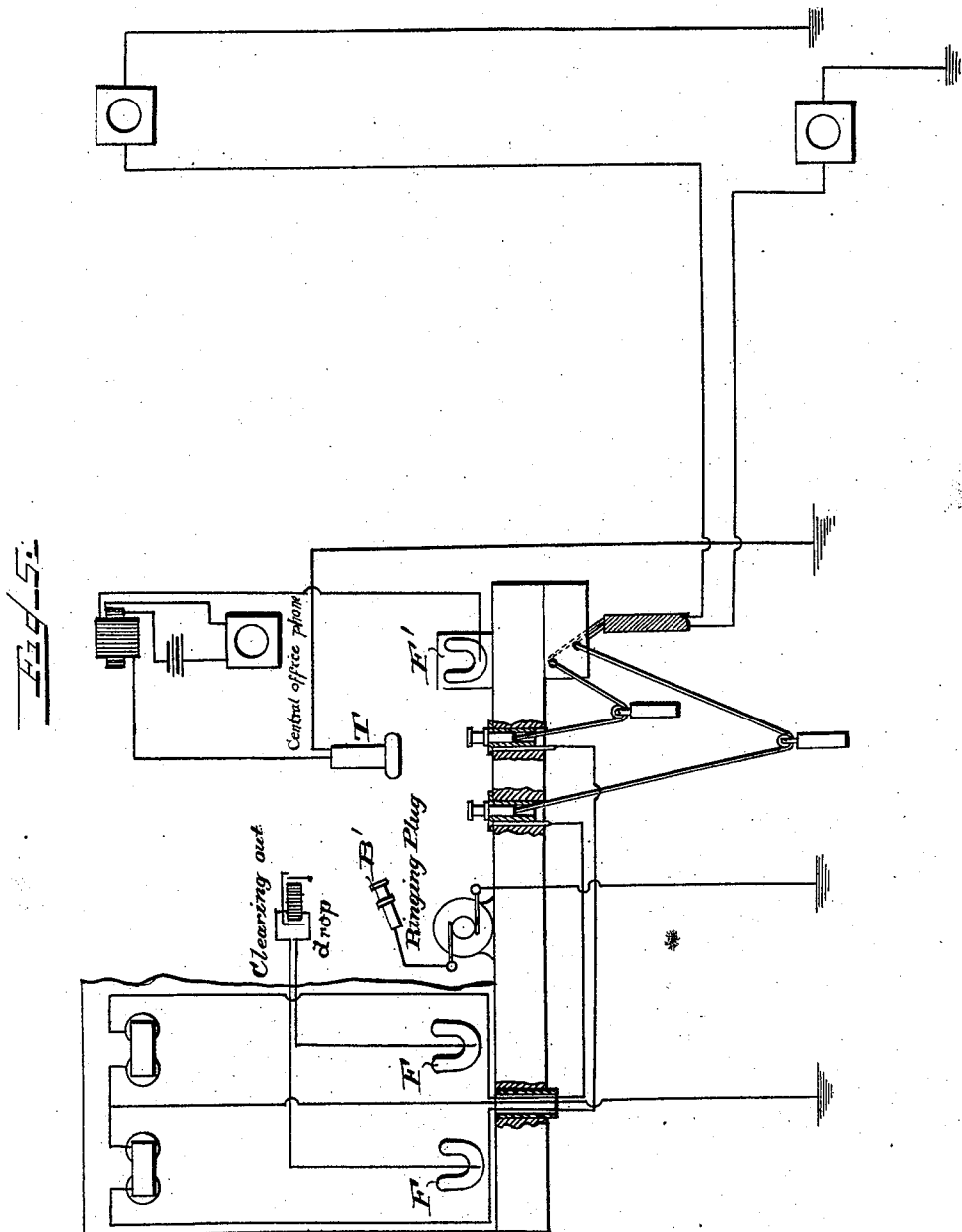
(No Model.)

3 Sheets—Sheet 3.

H. J. SWARTS.
TELEPHONE SWITCHBOARD.

No. 574,642.

Patented Jan. 5, 1897.



WITNESSES.

J. A. Taubenschmitt,
J. D. Kungberg.

INVENTOR.

Harry J. Swarts
by his attys
Whitaker & Powell

UNITED STATES PATENT OFFICE.

HENRY JASPAR SWARTS, OF KNOXVILLE, TENNESSEE, ASSIGNOR OF ONE-HALF TO A. J. DOUGLAS, OF SAME PLACE.

TELEPHONE-SWITCHBOARD.

SPECIFICATION forming part of Letters Patent No. 574,642, dated January 5, 1897.

Application filed December 24, 1895. Serial No. 573,213. (No model.)

To all whom it may concern:

Be it known that I, HENRY JASPAR SWARTS, a citizen of the United States, residing at Knoxville, in the county of Knox and State of Tennessee, have invented certain new and useful Improvements in Telephone-Switchboards; 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.

This invention relates to improvements in switchboards for telephonic circuits of that description where at the central station the circuits of a system converge. It has for its object the provision of such a device whereby floor-space is economized and also the number of attendants necessary to attend the switchboard, and also to provide an improved wiring for the same.

It consists in the novel construction, combination, and arrangement of parts such as will be hereinafter fully described, pointed out in the appended claims, and illustrated in the accompanying drawings.

In the accompanying drawings, in which similar letters of reference designate corresponding parts, Figure 1 is a plan view of the switchboard with parts broken away and the annunciator-boards arranged in different positions to illustrate their adjustability. Fig. 2 is a vertical section on the line 2-2 of Fig. 1. Fig. 3 is an enlarged detail section of one of the connecting-plugs. Fig. 4 is an enlarged detail view of one of the clasps. Fig. 5 is a diagrammatic view showing the circuits of my switchboard.

Referring to the drawings by letter, A designates the main table, polygonal in form, supported by the legs *a a*. In the present instance the table is shown as having ten sides. This number of sides especially adapts it to support the connections of the wires of a thousand subscribers. It is divided into ten sections by the lines *a' a'*, radiating from the center of the table to the periphery of the same. In each of these sections one hundred connecting-plugs are mounted. As the construction of these plugs is the same, as well as the wiring leading to and from the same in each section, a description of one and its adjuncts will suffice. In the table a socket *a²*

is formed and has mounted therein the metallic cup *a³*. In this cup is seated, when not in use, the plug B. The latter is attached to the end of the wire *b*, which leads through the cup *a³* to the board *b'*, attached to the under side of the table. It is proposed to have ten of these boards, and to each of them the wires, such as *b²*, of a hundred subscribers' lines lead. At the board the wires are divided, and each one is connected with a wire *b*, leading to a plug B. Each of these plugs is numbered to correspond with the number of the subscriber to whose wire it is connected.

Radiating from the table A are the extensions C C, supported at their outer ends by the legs *c c*. Each extension is provided with a vertical slot *c'*, which extends inwardly to a considerable distance from the outer end of the extension. The annunciator-boards D D are adjustably mounted in upright positions on these extensions. Each board consists of a frame *d* and a facing *d'* attached thereto. Through the lower side *d²* of the frame a tube *d³* extends. An annular shoulder *d⁴* projects from the upper end of the tube. It may be a nut, as shown, or the upper end of the tube may be flared out to form the same. The lower end of the tube is screw-threaded for the reception of the nut *d⁵*. In mounting the board on the extension the tube *d³* is inserted in the slot *c'* and the nut *d⁵* turned up until the extension and the lower side *d²* of the frame are clamped between the shoulder *d⁴* and the said nut, thereby securing the board in place.

On each board are mounted the annunciators of the subscribers, whose connectors are mounted in the adjacent section of the table. These annunciators may be of any description suitable in the premises. In the present instance one is shown consisting of the drop E, normally held in place by the spring-pressed catch *e*. This catch is operated by a magnet E'. The latter is placed in circuit with the subscriber's line to which the annunciator belongs by the wire E², which passes down the back of the board and through the tube *d³* to the screw *a⁴*, passing through the flange of the cup *a³* to the under side of the table. A ground-wire E⁴ passes along the back of the board and has connected with the same the ground ends of the wires forming

the helices of these several magnets. The wire E^1 leads through the tube d^3 to a suitable ground connection.

To the face of the annunciator-board are attached the clasps $F F$ for the plugs $B B$. These clasps are arranged in pairs, twenty of the latter being the preferred number. The two members of each pair are connected by the wire f , and in the circuit formed by this wire is included the clearing-out drop f' .

The operation of the device is as follows. Ordinarily when the calls are busy there is an attendant for each annunciator-board. He is placed close to the main table, between the extensions, with the annunciator-board adjusted so as to be in easy reach. Suppose, for illustration, that subscriber No. 7 wishes to communicate with subscriber No. 9. The former completes the circuit formed of the ground-wire II , leading from his instrument, the wire B^2 , leading to the board b' , the wire b , connected with the plug B and leading from the board b' , the cup a^3 , in which the plug is seated, the screw a^4 , passing through the flange of the cup, the wire E^2 , which leads through the tube d^3 , to the magnet E' . The circuit is completed by the ground-wire E^4 , leading from the magnet. The circuit is supplied with suitable generators, as $G G$. By completing this circuit the magnet is energized and thereby disengages the drop E , which falls and discloses the subscriber's number, "7." The operator then places himself in communication with the subscriber by means of any of various devices in ordinary use, or by the construction indicated in Fig. 5, which is the one I prefer. In this construction F' is a clasp located conveniently to the position of the operator. T is the operator's telephone, which is connected to the clasp F' . (See Fig. 5.) When a subscriber calls up the central office, the operator places the subscriber's plug in clasp F' and communicates with him. When this has been done and it is learned that he wishes to communicate with subscriber 9, plugs 7 and 9 are placed in one of the pairs of clasps $F F$, and the circuit is completed through the clearing-out drop. Subscriber 9 may be called up by any of the various devices now in use or by the device shown in Fig. 5, in which U is a generator having a ground connection and its opposite pole connected to a plug B' . After the plugs 7 and 9 are placed in the clasps $F F$ the operator places the plug B' in contact with one of the clasps and operates the generator, preferably by a treadle, and the call is effected. As 7 has disconnected his signal from the line by the removal of his phone, 9 will alone receive the call. Should, however, subscriber 7 have returned his phone to its hook both subscribers will be called.

By means of the clearing-out drop f' the operator can ascertain when the subscribers have finished their conversation and replace the plugs.

It is to be observed that an operator from

his position at a section can reach the plugs of any other section on the board and attach them to his particular annunciator-board. The loop formed in the wire b allows such a transposition of the plug. To keep a tension on the loop to draw the same through the cup a^3 on the replacement of the plug, the weight W is provided.

At certain times one operator can attend to all the calls. To facilitate his work, an opening O is formed in the center of the table, in which he can be seated. By moving the annunciator-boards inwardly he can have access to the same without moving from his position.

In Fig. 3 is shown an enlarged detail view of the plug B . It consists of the metallic shell s . The opening s' at one end is contracted to about the size of the wire with which it is to be used. The opposite end s^2 is enlarged and screw-threaded. An end of the wire b is introduced into the contracted end and has the insulation removed from the same, so that a proper electric contact will be made between it and the shell. The wire is knotted, as at s^3 , in the insulated part just after it passes into the enlarged recess in the plug. By knotting the wire in this way the insulation cannot be withdrawn from the wire and it will also aid in sustaining the weight W , thereby increasing the life of the wire by bringing a part of the strain thereon onto the insulating-covering. Screwed into the enlarged end s^2 of the shell is the cap s^4 . The latter serves to firmly hold the end of the wire in place and also forms a shoulder adapted to engage with the clasp F . A set-screw s^5 is provided to prevent accidental displacement of the screw-cap. The plug is provided with an annular shoulder s^6 intermediate of its ends, which insures a proper register of the plug with the socket a^3 and limits the movement downward of the plug in the socket.

In Fig. 4 is shown an enlarged detail view of the clasp F , attached to the annunciator-board with which the plug B is adapted to register. It consists of the main plate t and the spring-arms or bifurcated portions t' . With these arms the screw-cap s^4 of the plug is adapted to engage to hold the plugs in contact with the clasps when two subscribers' lines are by this means placed in communication.

The circuits employed in connection with my improved switchboard will be apparent from an inspection of Fig. 5. A detailed enumeration is not deemed necessary.

While I have illustrated the switchboard and table as a single structure, still it is obvious that my invention is not limited thereto, as the desired object of this invention might be produced by the grouping of two or more tables. It is also obvious that various changes may be effected in the construction and arrangement of parts without affecting the spirit of the invention as expressed in the appended claims.

Having described my invention and set forth its merits, what I claim, and desire to secure by Letters Patent, is—

1. A switchboard consisting of a series of 5 vertically-disposed annunciator-boards arranged around a common center, subscriber's-line plugs arranged in a series corresponding with the annunciators of each board between said board and the said center and provision 10 whereby the operator can be stationed at the said center, substantially as described.
2. In a switchboard, the combination with a table, having arms projecting therefrom, and provision whereby an operator can be 15 stationed at the center of the table, annunciator-boards mounted on said arms, said boards being adjustable to different angles in respect to said arms, and subscriber's-line plugs corresponding with the annunciators of each 20 board arranged on the table adjacent to said board, substantially as described.
3. In a switchboard, the combination with the table, of vertically-disposed annunciator-boards arranged around the said table and 25 adjustable toward and from the center of the table, subscriber's-line plugs corresponding to the annunciators of each board on said table adjacent to the said board and provision whereby an operator can be stationed at the 30 center of the table, substantially as described.
4. In a switchboard, the combination of the table, the slotted arms radiating therefrom, the annunciator-boards mounted on the said 35 arms, and the tubes mounted in the slots in the said arms and connected with the said boards, substantially as described.
5. In a switchboard, the combination of the table, the slotted arms radiating therefrom, the annunciator-boards mounted on the said 40 arms, the tubes mounted in the slots in the said arms and connected with the said boards, and the wires leading from the said tubes to the table, substantially as described.
6. In a switchboard the combination with

a table having a central opening to admit an 45 operator, of subscriber's-line plugs located on said table around said opening, substantially as described.

7. In a switchboard the combination with a table having a central opening to admit an 50 operator, of subscriber's-line plugs located on said table around said opening and means for receiving two plugs to connect their respective wires, substantially as described.

8. In a switchboard the combination with 55 a table having an opening at the center to admit an operator, of subscriber's-line plugs located on said table between the said table and its outer edge, a connecting device adapted to receive two plugs to connect their 60 respective wires, said connecting device including a clearing-out drop, substantially as described.

9. In a switchboard, the combination of the polygonal table having a central opening and 65 divided into sections by lines radiating from its center to the periphery thereof, and the plugs grouped in the said sections, substantially as described.

10. In a switchboard, the combination of the 70 table having a central opening permitting an operator to be stationed therein, the arms radiating therefrom, and the annunciator-boards mounted on the said arms, substantially as described.

11. In a switchboard, the combination of the 75 table having a central opening permitting an operator to be stationed therein, the arms radiating therefrom, and the annunciator-boards adjustably mounted on the said arms, 80 substantially as described.

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

HENRY JASPAR SWARTS.

Witnesses:

DAVID A. GANT,
JAS. H. WELCKER.