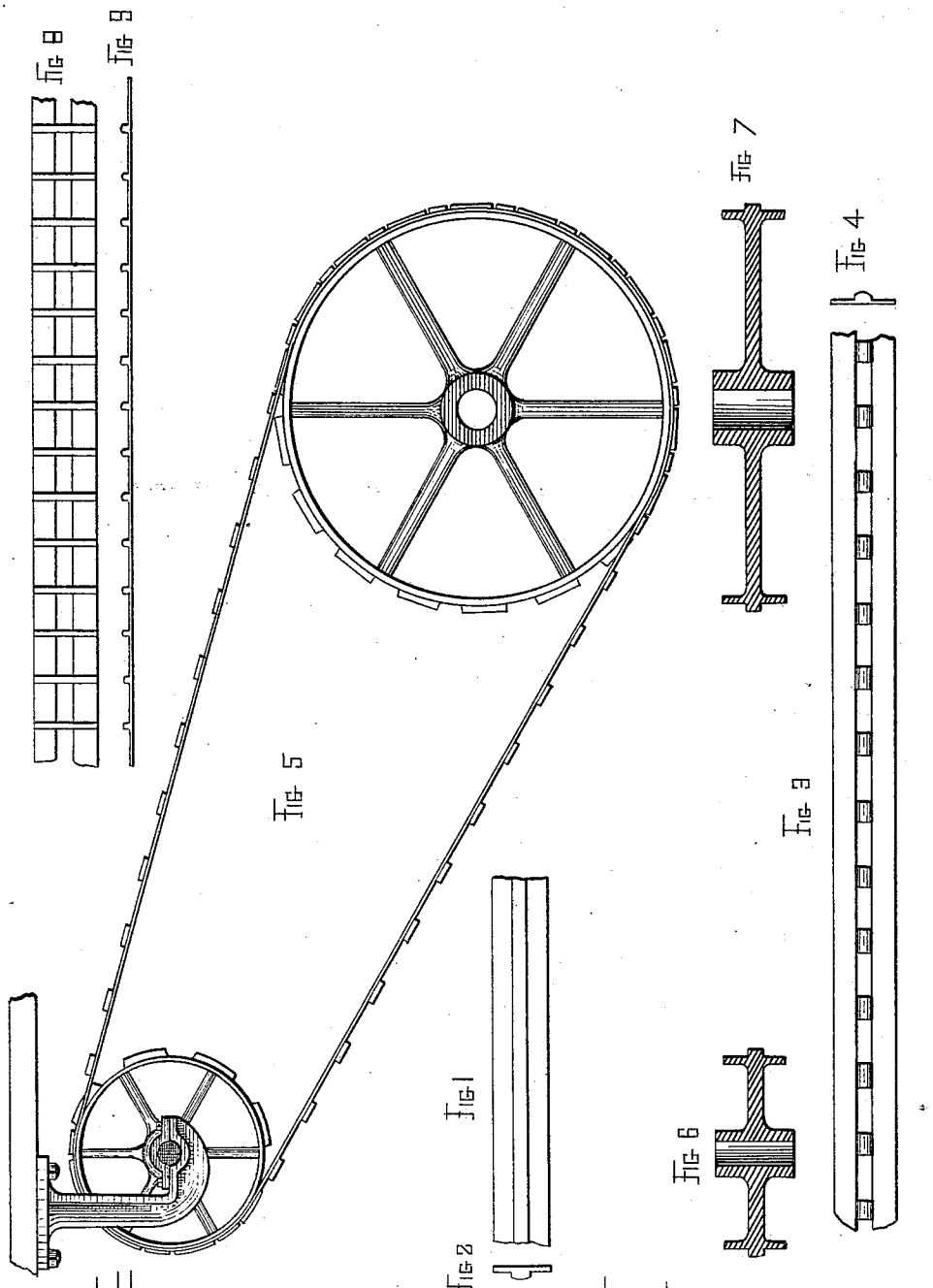
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J. REESE.

MACHINE BELTING.

No. 251,377. Patented Dec. 27, 1881.



Witnesses
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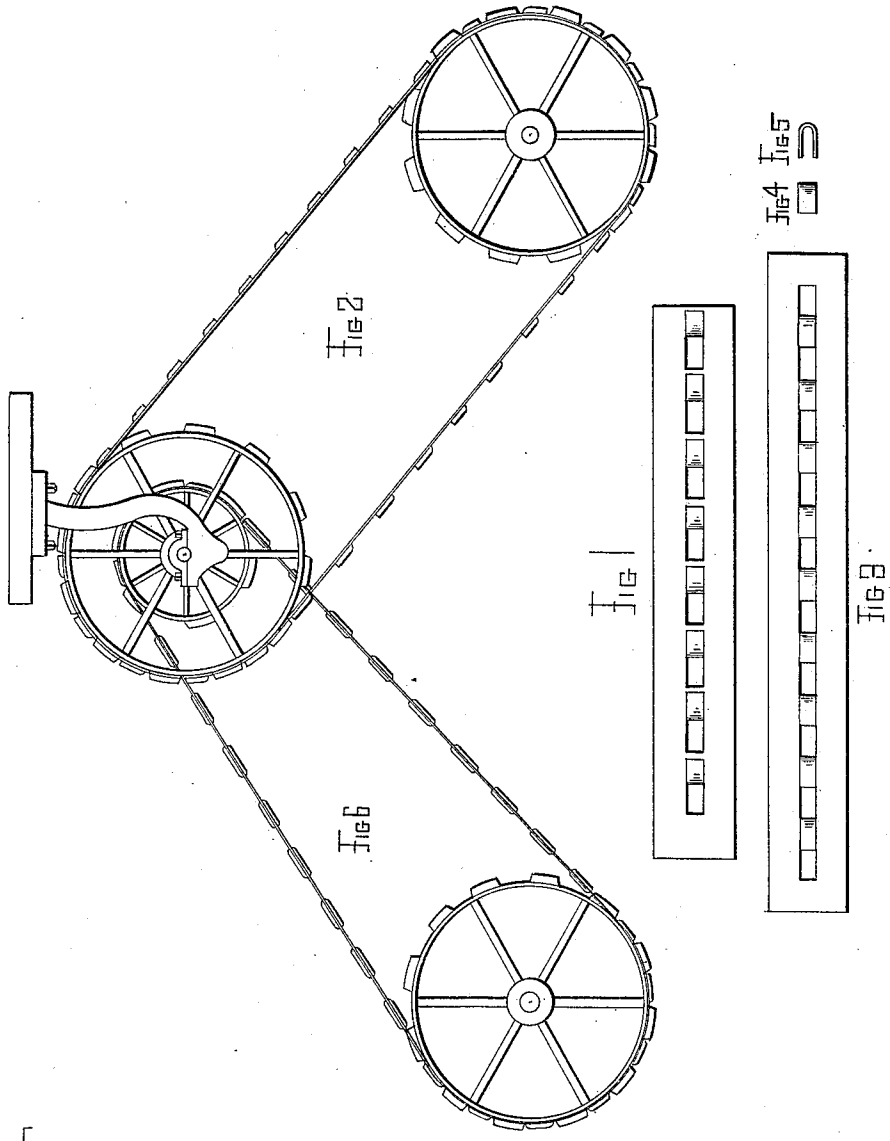
N. PETERS. Photo-Lithographer. Washington, D. C.

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4 Sheets—Sheet 3.

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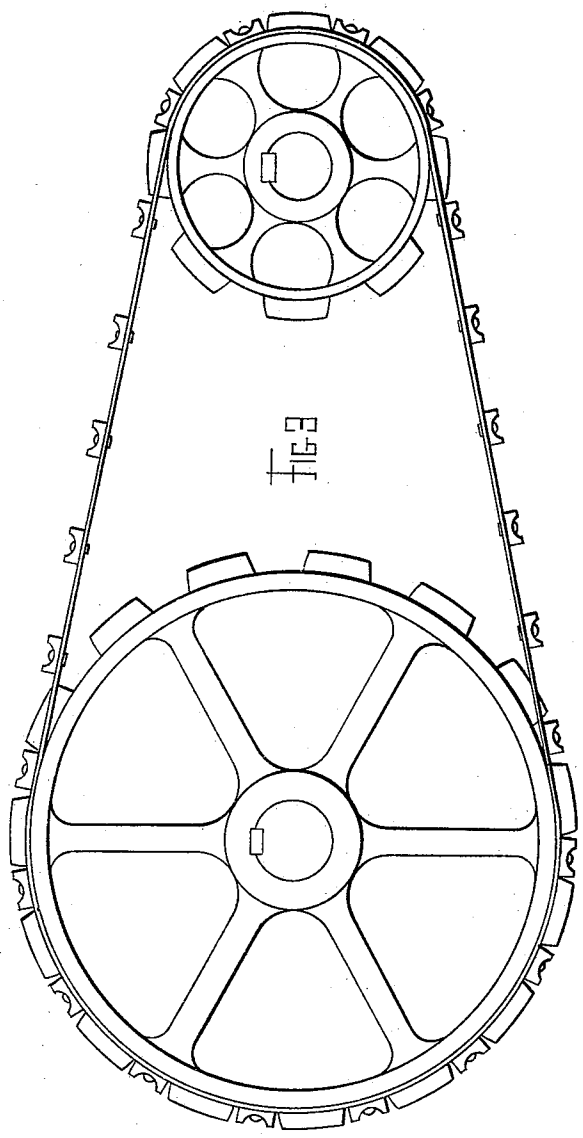


FIG 3

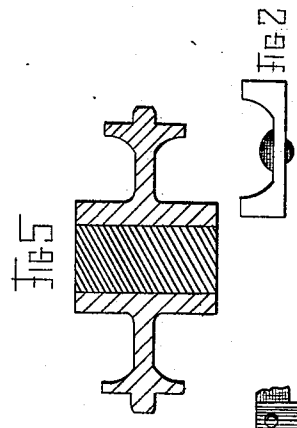


FIG 5

FIG 2

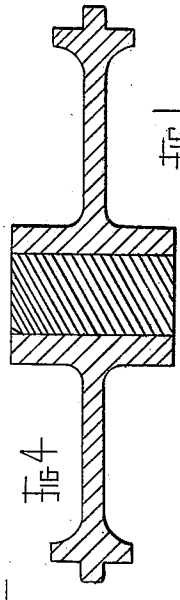


FIG 4

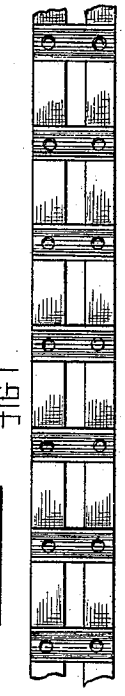


FIG 1

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(No Model.) 4 Sheets—Sheet 4.

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Fig 1

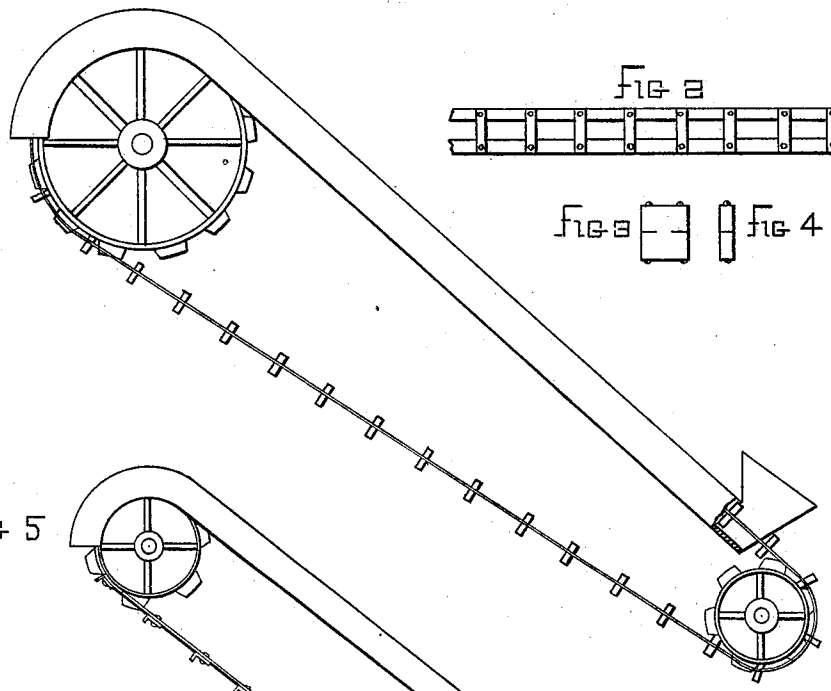


Fig 2

Fig 3

Fig 4

Fig 5

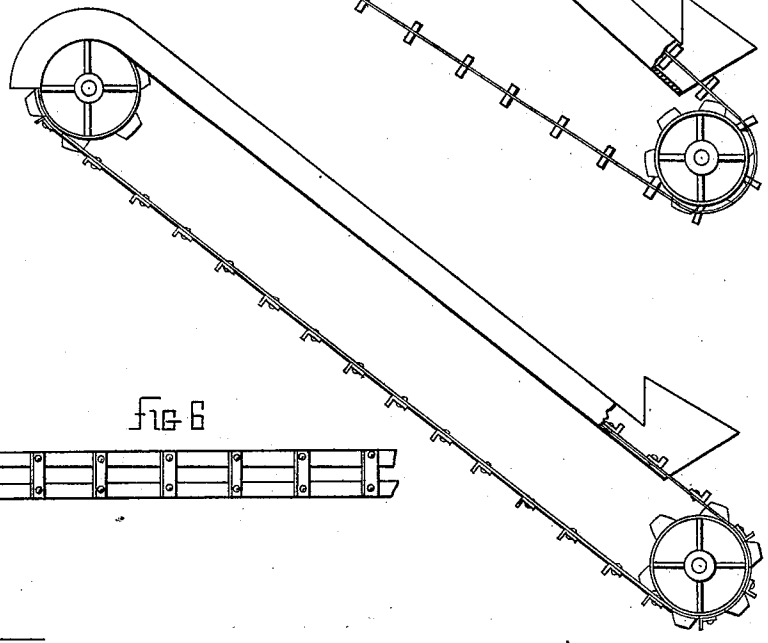


Fig 6

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UNITED STATES PATENT OFFICE.

JACOB REESE, OF PITTSBURG, PENNSYLVANIA.

MACHINE-BELTING.

SPECIFICATION forming part of Letters Patent No. 251,377, dated December 27, 1881.

Application filed July 25, 1881. (No model.)

To all whom it may concern:

Be it known that I, JACOB REESE, of Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Mechanism for the Transmission of Motion by Metallic Belting; and I do hereby declare the following to be a full, clear, and exact description thereof, reference being had to the accompanying drawings, in which—

Figure 1 on Sheet 1 indicates a plan view of a steel hoop having a thickened or ribbed center from which one form of my improved belt is manufactured. Fig. 2 on Sheet 1 indicates an end view of the same. Fig. 3 on Sheet 1 is a plan view of a section of belting produced by forming a series of slots at proper intervals from each other in the hoop shown in Figs. 1 and 2. Fig. 4 on Sheet 1 indicates an end view of the same. Fig. 5 on Sheet 1 indicates a side view of the belting mounted on pulleys provided with a series of projections at proper intervals upon its periphery to engage in the perforations of the metallic belt. Figs. 6 and 7 on Sheet 1 indicate cross-sections of the pulleys shown in Fig. 5. Fig. 8 on Sheet 1 is a plan view of another form of belting produced by forming a series of slots in a hoop having a transverse series of ribs rolled across its surface. Fig. 9 on Sheet 1 indicates an edge view of the same. Fig. 1 on Plate 2 indicates a third form of steel belting adapted to the use of my improvement, and is formed from a light flexible hoop of uniform thickness by punching a series of slots at proper intervals from each other in the center of the hoop, and then bending the metal from the perforations tightly down against the body of the hoop at the unpunched end of the slots, thus forming a double thickness at the wearing-points. Fig. 2 indicates a side view of this form of belt mounted on suitable pulleys. Fig. 3 on Plate 2 indicates a plan view of a modified form of the belting shown in Fig. 1, and is formed by punching the metal entirely away at the perforations and slipping and stamping onto the unpunched portions the clips shown in Figs. 4 and 5. Fig. 4 indicates a plan view of one of the clips. Fig. 5 indicates an edge view of the same. Fig. 6 on Plate 2 is a side view of this class of belting mounted on suitable pulleys. Fig. 1 on Plate 3 indicates a fourth form of belting adapted for heavy work. Fig. 2 indicates an end view of one of the cross-ribs of the same. Fig. 3 indicates this form of belting mounted on suitable pulleys. Figs. 4 and 5 indicate cross-sections of the pulleys. Fig. 1 on Plate 4 indicates a fifth form of steel belting mounted on suitable pulleys and in position for elevating sawdust or other material. Fig. 2 indicates a plan view of a section of the belt shown in Fig. 1. Fig. 3 indicates a side view of one of the cross-ribs of the same. Fig. 4 indicates an end view of one of the cross-ribs. Fig. 5 indicates a modified form of the belt shown in Figs. 1 and 2, mounted on suitable pulleys and adapted for elevating sawdust and similar material. Fig. 6 indicates a plan view of a section of the belting shown in Fig. 5.

Like letters of reference indicate like parts wherever they occur.

The object of my invention is to provide a cheap, durable, and efficient means for the transmission of a positive motion from one shaft to another by means of flexible metallic belting, either at a high or a low velocity. This object I have fully attained by means of the improved form of flexible metallic belts and the pulleys which I shall hereinafter more fully describe.

It has long been recognized as a desirable object to transmit power and to impart a positive motion from one shaft to another by means of metallic belting; but heretofore the forms of belting used were not well adapted to resist the shocks, jars, and strains to which they were subjected in overcoming the inertia of the machinery, &c. In all cases, so far as I am aware, the wearing portions of the belt have been so thin and possessed so small a power of resistance that rupture soon took place at such points. The remedy for this evil apparently may seem simple; but if the belt is made of sufficient thickness to enable the wearing-points to stand, the belt loses its elasticity, takes a permanent set in passing each pulley, causes a great loss of power, and becomes highly crystallized, and fracture soon takes place. Consequently no simple combinations of a belt and pulleys have been adapted for the transmission of power and positive motion at high and at low rates of velocity, and the use of metallic belts has been

almost exclusively limited to the employment of chains and of wire ropes or cables. The use of the wire involves great first cost, and considerable loss of power takes place, owing to the fact that the rope must be kept tight to prevent it from slipping on the pulleys, and the use of the chain is objectionable on account of being noisy, troublesome, and adapted only for the transmission of motion at a low velocity. In the use of my invention, therefore, I propose to obviate the preceding difficulties by producing a belt having a light elastic body and heavy, rigid, and durable wearing-surfaces, which shall either be rolled upon the hoop from which the belt is produced, or which may be formed separately, and then be attached at proper intervals to the light elastic body, thus securing thickness, strength, and durability at the points where those qualities are most desired, and still maintaining the elastic nature of the body of the belt, so that when mounted upon the proper form of pulleys I secure a simple combination which insures a cheap, durable means of transmitting power and a positive motion either at a high or a low rate of velocity.

In the production of the form of belting shown in Figs. 3 and 4 on Plate 1, I roll a steel hoop of the same width as is required for the finished belt, with a central longitudinal rib or thickened portion, as is shown in Figs. 1 and 2. The body of this hoop may be made very thin, light, and flexible, but the central longitudinal rib should be of at least twice the thickness of the body of the hoop. After the hoop has been rolled to the form described, a series of perforations, at proper intervals from each other, are formed through the central rib or thickened portion of the hoop, which is then riveted at the ends, and the belt is then in a finished condition and capable of use.

In forming the pulleys I cast them with a face slightly wider than the width of the belt and with a central rib running around the center of the periphery. The pulley is then bored and its face and central rib turned true, after which it is mounted on a gear-cutting machine and a series of transverse slots are cut through the central rib, so as to leave a series of projections, at proper intervals from each other, upon the face of the pulley.

In forming the pulleys and belting it will be readily understood that in all instances the distance at which the slots are apart from each other in the belt will depend upon the distance at which the projections are apart from each other upon the center of the periphery of the pulleys, and that the projections must be exactly the same distance apart from each other upon each of the pulleys upon which the belt is to run.

Figs. 8 and 9 indicate another form, or more properly a modification of the form, of belting shown in Figs. 3 and 4. In this case the hoop is rolled of a uniform thickness in cross-section, but with a series of transverse ribs at regular intervals upon its upper surface; and in forming the belt the hoop is perforated in such a manner as to leave the ribs or the increased thickness of the metal to act as a wearing-surface immediately at the end of the perforations.

Fig. 1 on Plate 2 indicates another modification of the form of belting. In this case the hoop is rolled of equal or uniform thickness at all parts of the metal, and the slots are formed by only punching the metal partially away at the perforations, the clips remaining attached at one end of the slots which are formed; or, in other words, in forming the perforations the pieces of metal are only cut or punched away at both sides and one end of the slots, and remain attached to the hoop at the other end of the slots. After the hoop has been punched in the manner described the clips are turned sharply over the metal at the end of the slots and are tightened down under a drop-press; or they may be riveted down to the body of the hoop, if desired. The belt is then riveted at the end, so as to form a continuous perforated band of the length desired.

Fig. 3 indicates another modification of the belting, which is formed from a hoop of the required form and gage by punching a series of perforations at proper intervals from each other, the metal being punched entirely away at the perforations, and the clips shown in Figs. 4 and 5 are then slipped over the metal at the end of each perforation, thus forming a triple thickness to withstand the wear at those points. The hoop is then conveyed to a drop-press and the clips are stamped down on it.

Fig. 2 shows both of the preceding modified forms of the elastic steel belting mounted on pulleys.

Fig. 1 on Plate 3 indicates another modification of the form of the belting, which is formed by two strips of flexible metal joined together at proper intervals by heavy, strong, and rigid cross-bars of channel-iron of the form indicated by Fig. 2. This form of belting is designed for heavy work where wide belts are required and where it is an object to save material by its adoption. Fig. 3 shows the belt in position, and Figs. 4 and 5 show cross-sections of the pulleys on which it is mounted.

Fig. 1 on Plate 4 indicates another form of belting mounted on suitable pulleys and in position for elevating sawdust and other similar material. Fig. 2 indicates a plan view of a section of the belt, which is formed of two light elastic steel hoops or bands, which are joined together at proper intervals by strong and heavy cross-sections composed of hard wood, each of the sections being grooved at the ends, as shown in Fig. 3, and in forming the belt the hoops are inserted within the grooved ends of the cross-sections and fastened securely by a rivet passing down through the end of the cross-section.

Fig. 5 indicates another form of belting for elevating purposes. This form is made of two light flexible bands of metal joined together at proper intervals by cross-sections composed of

angle-iron. These cross-sections are made of sufficient thickness to withstand the wear, and of such height as may be required to carry the material to be elevated.

I am aware that metallic belts having slotted openings have heretofore been in use; but I am not aware that metallic belts have heretofore been known or used having longitudinal or transverse strengthening-ribs between such slots or openings.

I do not in this case claim the peculiar method of construction and form of pulleys described in the specification and shown in the drawings; but I reserve the right to do so in a future application.

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

1. A belt composed of a metallic band or bands provided with slots or openings at intervals, adapted to receive peripheral projections from suitable pulleys, and having longitudinal or transverse strengthening-ribs between such slots or openings, substantially as and for the purpose herein described.

2. The combination of a metallic belt having slots or openings at intervals, and having strengthening-ribs between the openings, and a pulley having peripheral projections, so as to engage in said openings, substantially as and for the purpose set forth.

3. As an improved article of manufacture, a belt composed of a metallic band or bands provided with slots or openings, and having the intervals between the openings re-enforced by strengthening-ribs, substantially as herein described.

JACOB REESE.

Witnesses:
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JOHN M. ROURKE.