No. 708,936. Patented Sept. 9, 1902.

# A. A. STROM.

## STRUCTURAL METAL BEAM.

(Application filed July 15, 1902.)

(No Model.)

Fig. 1.

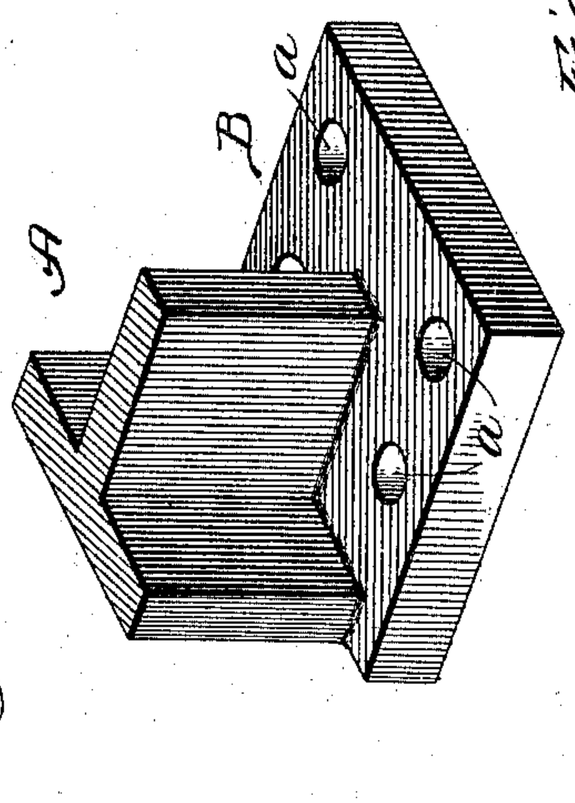



Fig. 2.

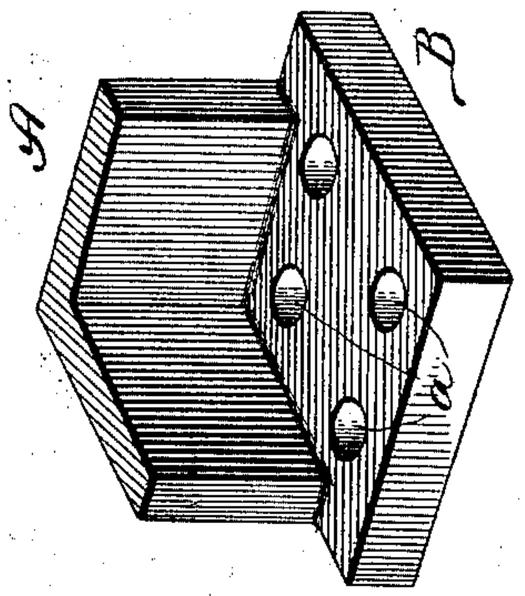



Fig. 3.

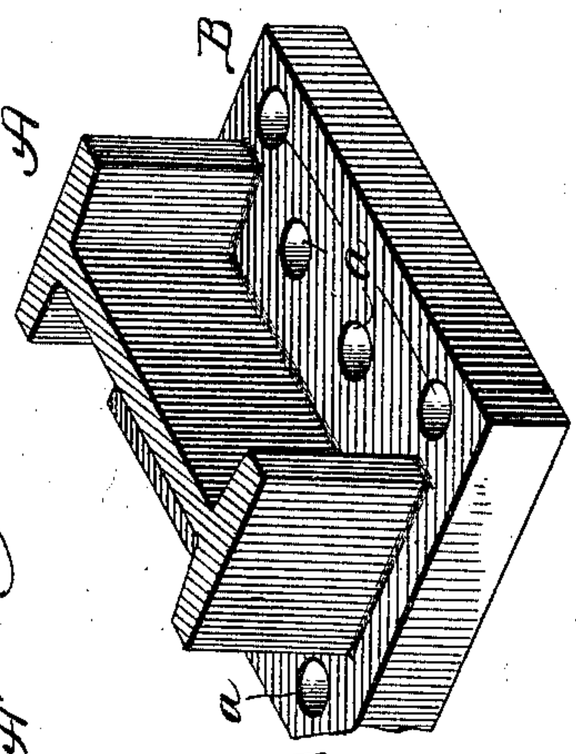



Fig. 4.

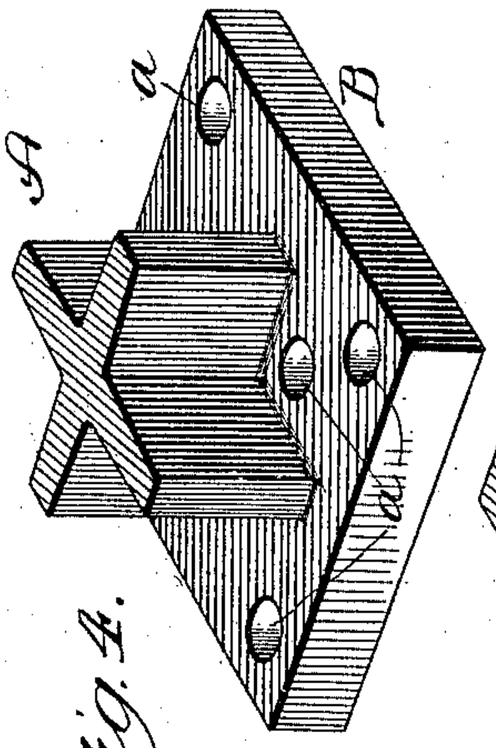



Fig. 5.

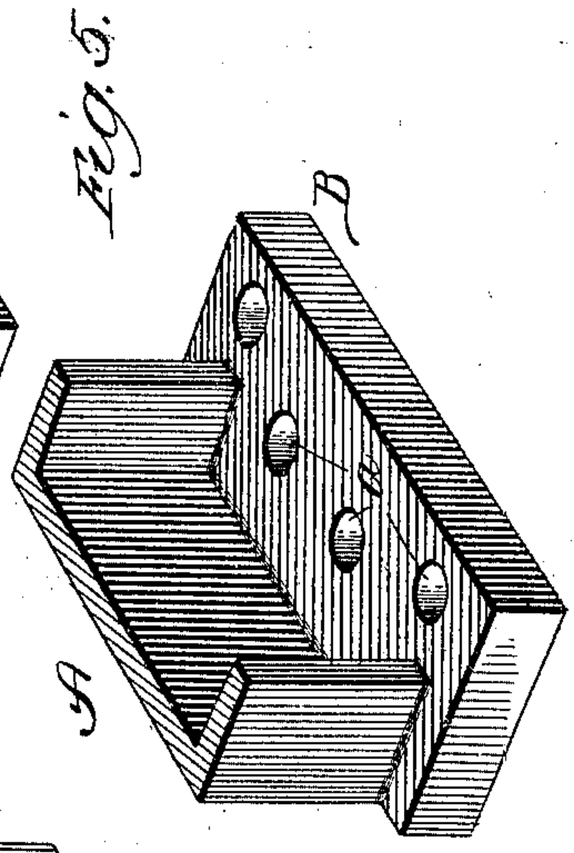
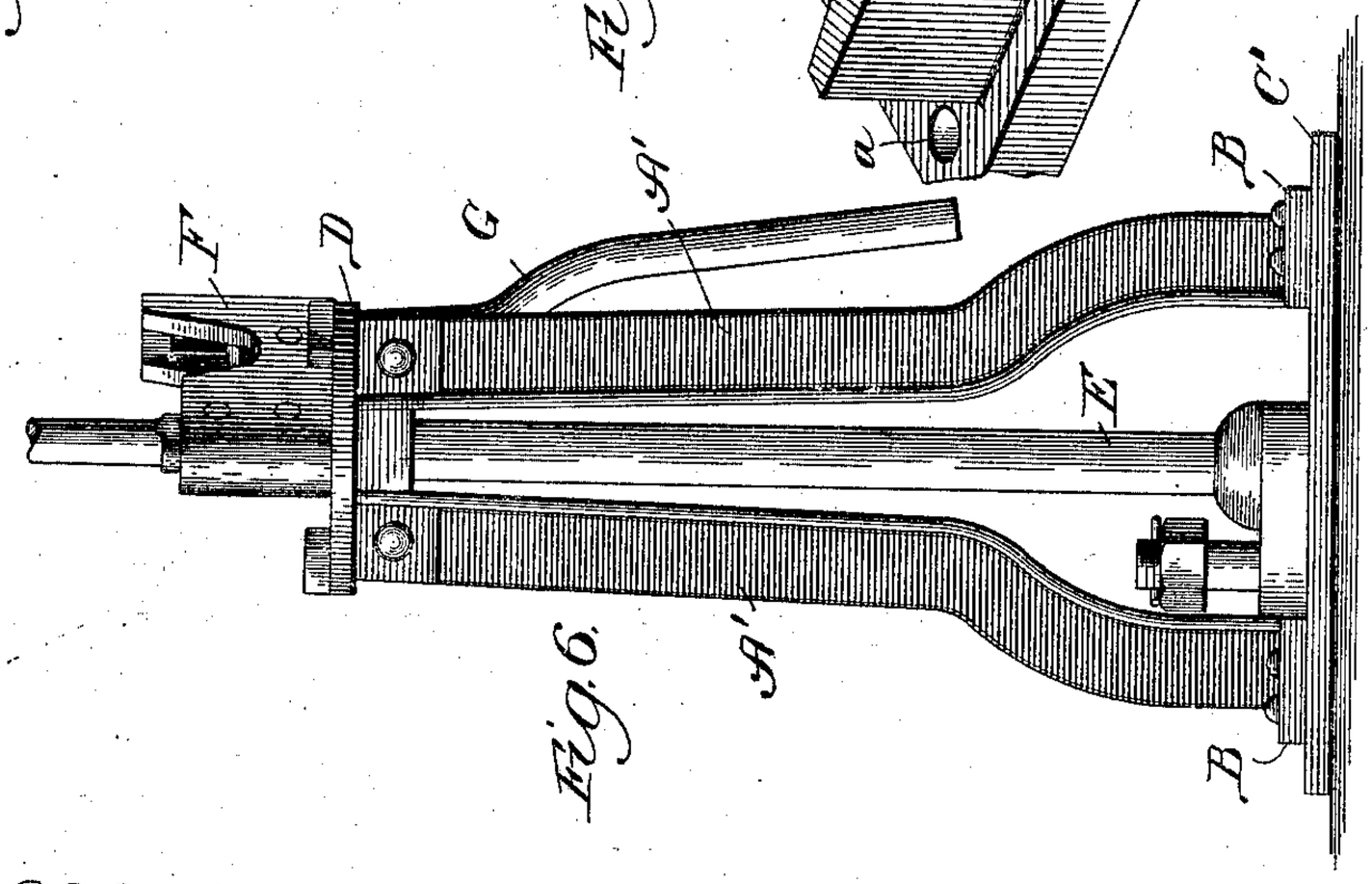



Fig. 6.

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# UNITED STATES PATENT OFFICE.

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## STRUCTURAL-METAL BEAM.

SPECIFICATION forming part of Letters Patent No. 708,936, dated September 9, 1902.

Application filed July 15, 1902. Serial No. 115,717. (No model.)

*To all whom it may concern:*

Be it known that I, AXEL A. STROM, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a new and useful Improvement in Structural-Metal Beams, of which the following is a specification.

My invention relates to an improvement in the commercial article known as "structural metal" or "structural iron," which is furnished to the market in beam or bar form of various cross-sectional shapes involving angularly-extending webs, the more usual shapes being those designated by the terms "T-beams," "I-beams," "angle-beams," "cross-beams," and "channel-beams." Many applications of this structural metal, which is employed because of its lightness and strength, require that it be provided with a head or a base at one end or at each end through which to fasten it in place, as by bolting or riveting, and the base or head is ordinarily a separate part securely fastened to the beam, and sometimes it is formed by cutting away a section of one or more webs and bending to an angle the remaining mutilated section to bear against the end of the shortened web or webs to which the base or head thus formed is fastened, as by riveting or welding. Either manner referred to of providing the head or base is unduly expensive and neither necessarily affords the desired degree of strength to the part, while the construction described or any analogous construction involving mutilation of a section of the beam unavoidably renders the part more or less weak.

The primary object of my invention is to provide the structural-metal beam with a head or base at either or at each end which shall be completely integral with the beam and composed wholly of sections of all the webs compacted into a solid body, thereby to cheapen the construction of this part and render it as strong as any portion of the beam. To accomplish this purpose, I forge in a suitable die a desired length (prepared by heating it) of the end portion of the beam, thereby consolidating the substance of all the webs of the upset section into a head or base on and integral with the beam to extend at any suitable angle to the beam length.

Referring to the accompanying drawings, Figure 1 is a perspective view of a T-beam section provided with my improved base. Figs. 2, 3, 4, and 5 present by perspective views my improved base on sections, respectively, of an angle-beam, an I-beam, a cross-beam, and a channel-beam; and Fig. 6 shows my improved article of manufacture applied as the one of its uses for which I have particularly devised it in the frame construction of a railway-switch stand, represented in front elevation.

A denotes a structural-metal beam in each of Figs. 1 to 5, inclusive, of the drawings provided with my improved base B, containing any desired number of bolt or rivet holes *a*. The base is completely integral with the beam and is composed of the substance of all the webs of a longitudinal section of such length of an end portion of the beams as may be required for any particular thickness of base consolidated into a mass of metal to form it.

To produce my improved article of manufacture, the end of the beam to be headed or provided with a base is preliminarily heated throughout a desired length, and the heated section is introduced into dies of desired shape and dimensions, in which the heated metal is upset by forging in a usual or any desired manner, thereby incorporating the substance of all the webs of the upset beam-section into the head or base B. The result of the forging operation is either a head or a base, depending upon the use made of the beam, so that these terms are intended herein to be synonymous. The holes *a* are provided in the base after its formation, as by drilling them. While the base is shown as extending at a right angle to the beam, it may be provided to extend at any desired angle or angles thereto, and it may involve any desired thickness and any shape other than that in which it is represented, though its thickness for the sake of strength is preferably greater than that of either of the sections of web from which it is formed.

To demonstrate one of many useful applications of my improvement, it is shown in the drawings as embodied in a railway-switch stand illustrated in Fig. 6, wherein the frame sides A′ A′ are formed of two beams of the T-beam variety, (shown in Fig. 1,) having their integral basis B riveted to a bed-plate C′, the frame sides carrying at their upper ends the table D, through which passes the rotary crank-spindle E, provided with a yoke F, having the operating-lever G pivotally connected with it. Either of the other illustrated forms of beam might be employed for constructing the switch-stand frame with the same advantages of comparative lightness, cheapness, and durability, which are entirely due to the described construction of the sides A′, enabling me to provide a switch-stand of less than half the weight of other stands of the same general type at a much smaller cost, of a more compact structure, and of greater strength, the economy afforded including not only the saving in material, but also in shipment, the matter of freight charges being an important item in transportation.

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

1. As a new article of manufacture, a wrought-metal webbed beam, having on one or on each end a forged head or base integral with, and composed wholly of sections of, all the webs of the beam upset into a solid body.

2. As a new article of manufacture, a wrought-metal webbed beam, having on one or on each end a forged head or base integral with, and composed wholly of sections of, all the webs of the beam upset into a solid body expanded beyond the depths of the webs of the article on two or more sides thereof.

AXEL A. STROM.

In presence of—
ALBERT D. BACCI,
JOHN H. LEE.