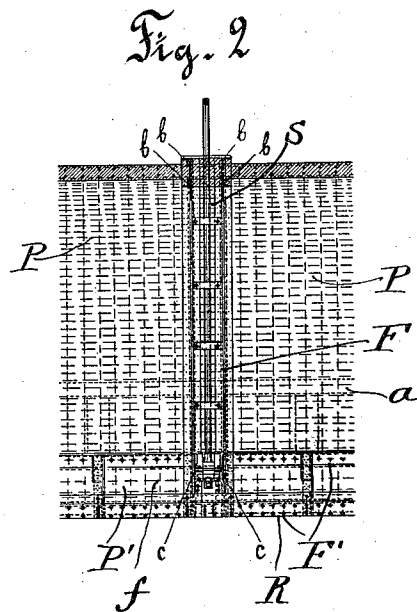
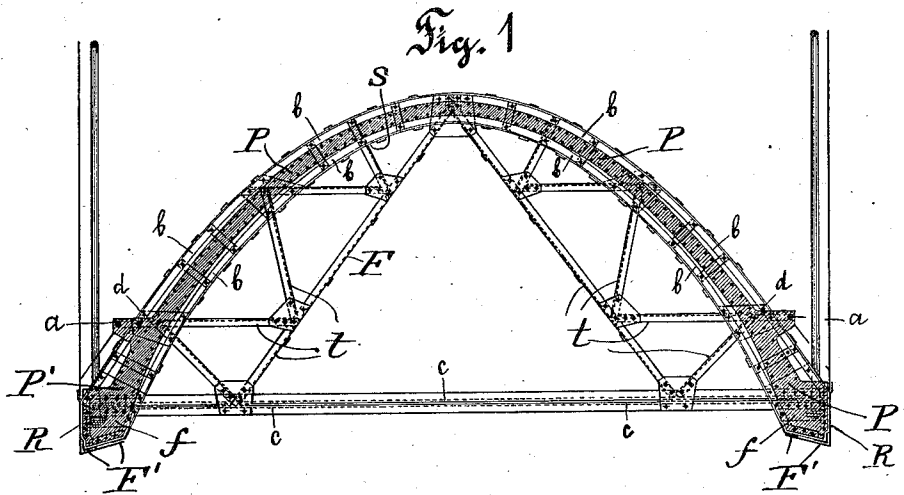


S. RECHNIEWSKI.
PNEUMATIC CAISSON OF FERROCONCRETE.
APPLICATION FILED MAY 7, 1910.

1,014,721.

Patented Jan. 16, 1912.

2 SHEETS—SHEET 1.



Witnesses
C. Schallmiger
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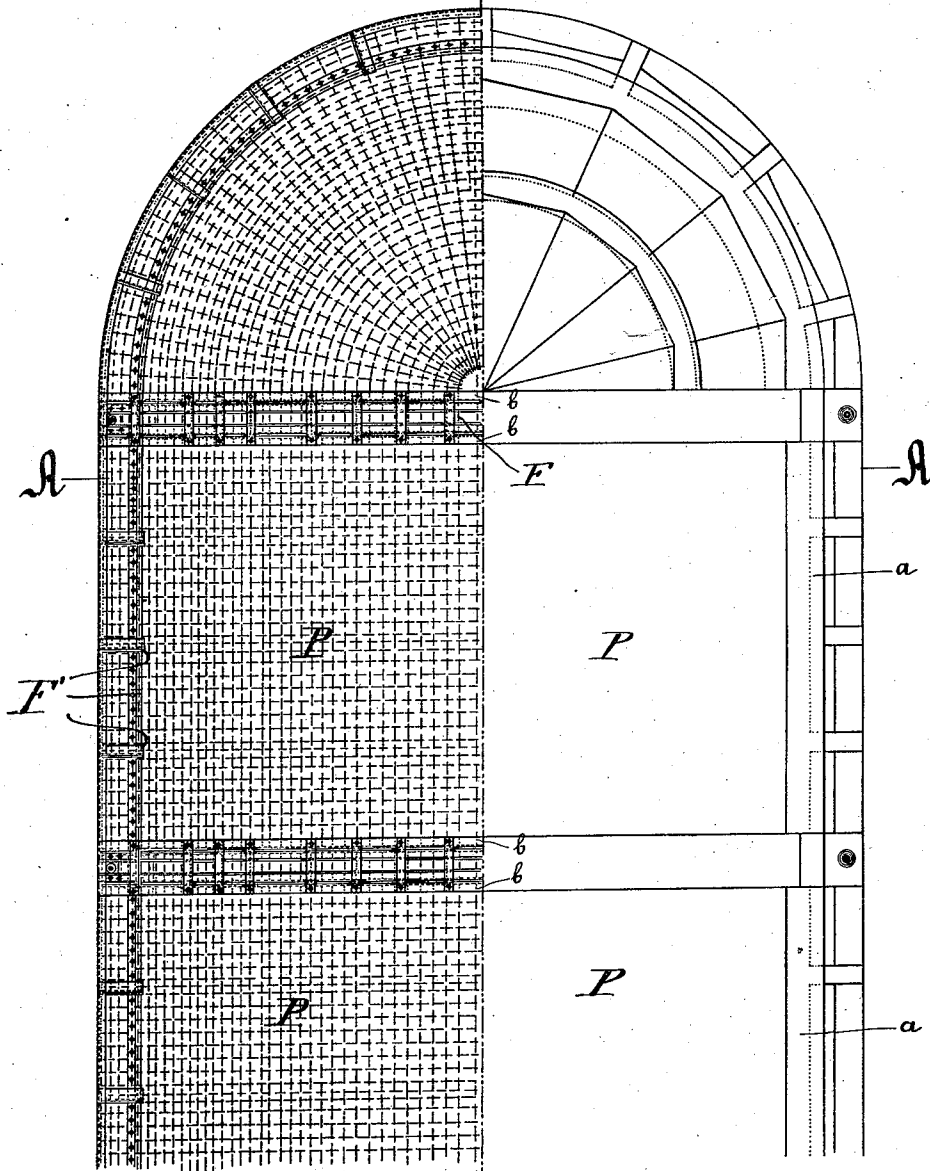
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2 SHEETS—SHEET 2.

Fig. 3. B



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UNITED STATES PATENT OFFICE.

STANISLAW RECHNIEWSKI, OF ST. PETERSBURG, RUSSIA.

PNEUMATIC CAISSON OF FERROCONCRETE.

1,014,721.

Specification of Letters Patent.

Patented Jan. 16, 1912.

Application filed May 7, 1910. Serial No. 560,008.

To all whom it may concern:

Be it known that I, STANISLAW RECHNIEWSKI, engineer, a subject of the Czar of Russia, of 19 Tavritcheskaya street, St. Petersburg, Russia, have invented new and useful Improvements in or Relating to Pneumatic Caissons of Ferroconcrete, of which the following is a specification.

My invention relates to pneumatic caissons of ferro-concrete, and substantially consists in rigidly interconnecting the lateral walls of such caissons by means of iron frames or systems of ties and struts. The lightness and open nature of such iron structures enables them to be made of great strength and rigidity without materially increasing the weight of the caisson, and without seriously impeding the movements of the workmen in the caisson.

The invention is illustrated in the annexed drawings as applied to an arched caisson, rounded at the ends.

Figure 1 is a cross-section on the line A—A of Fig. 3, Fig. 2 a longitudinal section on part of the line B—B of Fig. 3, and Fig. 3 a plan-view showing, on the left-hand side only, the iron skeleton of the caisson.

The following conventions are observed throughout the drawings: Iron parts of angular cross-section are drawn in solid lines; trusses of circular cross-section are drawn in dotted lines, where shown in elevation, and are shown in solid black where they appear in cross-section. Rivets are indicated by crosses, dotted where covered by other iron parts.

The caisson illustrated may be considered as comprising the following parts:—Firstly, the arched central part P, of comparatively a light thickness (the arched ferro-concrete structure between the projections *a* in Fig. 1). Secondly, the thicker, prismatic ferro-concrete bodies, below the jutting parts *a*, indicated at P'.

The ferro-concrete structure is united with a series of flat iron frame structures F, arranged at intervals across the caisson, and each consisting of arched members S, thrust resisting members *c* across the base thereof and a system of ties and struts indicated at *t* connecting these members. The four angle-iron members *b* of the arched structure S are embedded in the concrete and the tie-plates *d* nearest the members *c* are at the impost of the central ferro-concrete structure,

as shown in Fig. 1. This central structure is thus supported by the iron frames and by the prismatic ferro-concrete bodies or abutments P'. In order to restrict the weight of the caisson the thickness of the arched structure is restricted to the minimum capable of supporting the vertical thrust (weight of arch plus external load,) this thickness being calculated not in respect of a curved ferro-concrete roof supported by iron frames, but in respect of a ferro-concrete arch, supported by the prismatic abutments.

The prismatic abutments are formed of a main body portion of ferro-concrete indicated at *f*, incased by a girder-like structure F' which forms a reinforcement and means for interconnecting the prismatic abutment with the frame structures F. This latter means of interconnecting the member is accomplished by the rigid connecting of the girder-like structure F' with the vertical frame structures F, as is clearly shown in Fig. 2. The prismatic abutments take up the thrust of the arch in planes inclined to the horizontal, and transmit the same to the "built up" frame structures.

As a reinforcing means for the cutting edge or lower margin of the caisson, a V-shaped rolled section or casting R is carried by the girder-like structure F'. This member R not only serves to protect the girder-like structure and the ferro-concrete *f*, but also forms a uniformed margin for the caisson which is disposed to resist deflection by its position with respect to the force it encounters when the caisson is being sunk.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is:—

1. An arched pneumatic ferro-concrete caisson having its lateral walls rigidly interconnected by a series of framed structures disposed in vertical planes, each frame structure comprising arched members, thrust resisting members for said arched members, and a system of ties and struts connecting said arched members and said thrust resisting members.

2. An arched pneumatic ferro-concrete caisson having its lateral walls rigidly interconnected by a series of framed structures disposed in vertical planes, each frame structure comprising an arched member, a thrust resisting member for said arched member,

and a system of ties and struts connecting said arched member and said thrust resisting member.

3. An arched pneumatic ferro-concrete caisson comprising in combination, a base structure of ferro-concrete having reinforced cutting edges, an arched ferro-concrete shell springing from said base structure, and a series of framed structures disposed in vertical planes, rigidly interconnected with said base structure and said arched shell, each of said frame structures comprising arched members, thrust resisting members for said arched members, and a system of ties and struts connecting said arched members and said thrust resisting members.

4. An arched pneumatic ferro-concrete caisson comprising in combination, a base structure of ferro-concrete having reinforced cutting edges, and arched ferro-concrete shell springing from said base structure, and a series of framed structures disposed in vertical planes rigidly interconnecting said base structure and said arched shell, said frame structure each comprising an arched member, a thrust resisting member for said arched member, and a system of ties and struts connecting said arched member and said thrust resisting member.

5. An arched pneumatic ferro-concrete caisson comprising in combination, an arched ferro-concrete shell, a marginal base structure forming an abutment for said arched shell, and a series of framed structures disposed in vertical planes and interconnecting said arched ferro-concrete shell and said marginal base, said framed structure comprising arched members, thrust resisting members for said arched members, and a system of ties and struts connecting said arched member and said thrust resisting members.

6. An arched pneumatic ferro-concrete caisson comprising in combination, an arched ferro-concrete shell, a marginal base structure forming an abutment for said

arched shell, and a series of framed structures disposed in vertical planes and interconnecting said arched ferro-concrete shell and said marginal base, each of said framed structures comprising an arched member, a thrust resisting member for said arched member and a system of ties and struts connecting said arched member and said thrust resisting member.

7. An arched pneumatic ferro-concrete caisson comprising, an arched ferro-concrete shell, a marginal base structure of ferro-concrete forming an abutment for said arched shell, a series of framed structures disposed in vertical planes and interconnecting said arched shell and said marginal base, said framed structures comprising arched members, thrust resisting members for said arched members, and a system of ties and struts connecting said arched members and thrust resisting members, and a girder like casing for said marginal base structure rigidly connected to said framed structures, combined substantially as described.

8. An arched pneumatic ferro-concrete caisson comprising, an arched ferro-concrete shell, a marginal base structure of ferro-concrete forming an abutment for said arched shell, a series of framed structures disposed in vertical planes and interconnecting said arched shell and said marginal base said framed structures each comprising an arched member, a thrust resisting member for said arched member, and a system of ties and struts connecting said arched member and said thrust resisting member, and girder-like casing for said marginal base structure rigidly connected to said framed structures, combined substantially as described.

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

STANISLAW RECHNIEWSKI.

Witnesses:

H. A. LOVIAGUINE,

M. SHREZKOUZI.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."