

**List of the most significant results of intellectual activity created in the interests of
industrial partners**

№	Name	Patent number, date of invention	Authors	Industrial Partner	Comments
1	Prototype of tram with a lowered floor level	100268 from 17.11.2015	Gavrilov A.E. Kolomiets K.V. Taran S.M.	Uralskiy zavod transportnovo mashinostroyeniya AO (Ural transport building factory)	Patent on industrial prototype
2	Self-locking differential	156975 from 05.02.2015	Istomin D.I. Keller A.V. Shelepov A.A	KAMAZ PAO	The technical solution relates to the mechanical engineering of transport. The goal of this technical solution is increasing the service period of self-locking differentials as a result of improving the lubricant of the internal components.
3	System for managing the locking of differentials in vehicle transmissions	171241 from 25.05.2017	Keller A.V. Keller V.V.	KAMAZ PAO	This utility model relates to the mechanical engineering of transport, specifically to the propelling mechanism of the drive wheel for transport. The goal of this technical solution is lowering the dynamic load during differential locking and turning and increasing the durability of friction coupler locking.
4	Slotted cylindrical antenna	2574172 from 29.10.2014	Voytovich N.I. Klygatch D.S. Nizametdinov D.I. Repin N.N.	Chelyabinskiy radiozavod Polyot AO (Chelyabinsk Radio Factory Polyot)	This invention relates to antenna feed equipment, specifically to antennae for ultra shortwave radio bands and antennae for super high frequency for the emission of horizontal polarization waves with circular patterns in the horizontal plane. The technical result achieved from the use of the invention is broadening the operational range of frequencies for slotted cylindrical antennae which enable antennae harmonization with a feeder not critical in size during the tuning of antennae to their resonance frequency.

5	Wideband turnstile slotted antenna	2510970 from 01.11.2012	Voytovich N.I. Klygatch D.S. Repin N.N.	Chelyabinskiy radiozavod Polyot AO (Chelyabinsk Radio Factory Polyot)	This invention relates to the area of radiotechnology, specifically to wideband antenna systems with horizontal radio field polarization with a circular pattern in the horizontal plan. The technical result is the broadening of the antenna's bands of harmonization with the feeder.
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6	Brittle mast	2552552 from 807.05.2014 9	Voytovich H.I. Zhdanov B.V. Korablev O. Yu.		This invention relates to mast installations, specifically to antenna masts, and can be used in airport installations and equipment such as radio-beacon landing systems for the instrumental support of landing approach and landing for airplanes and in different aerodrome equipment, which, due to the functional peculiarities, must be located in flight zones. The technical goal is to simplify the methods of attaching antennae to brittle masts and attaching brittle masts to the foundation as well as to increase the reliability of antenna attachments to brittle masts and brittle masts to foundation.
7	Auger metering mechanism	164473 from 06.11.2015	Chumanov I.V. Anikeev A.N. Sedukhin V.V. Sergeev D.V. Chumanov V.I. Arsenteva A.S.		This utility model relates to the transport of loose materials, specifically to auger installations for dosing micro-fine particles. The technical result is receiving the same fraction in unloading particles of the materials as in loading, and also avoiding jamming of the installation.

8	Tube furnace	158158 from 24.07.2015	Maksimov S.P. Ermyashev V.E. Dildin A.N.	Yuzno-Uralskaya mashinostroitel'naya kompaniya OOO (South-Ural Mechanical Engineering Company)	This utility model relates to equipment for the thermal processing of materials not allowing for contact with the heat transfer agent, for example, for the firing of powder materials, and can be used in metallurgical industry for the solidphase recovery of iron-bearing ore and slags. The technical result is increased effectiveness of the interactions in the heating process of various powder components of the formula being processed, enabling the uniformity of their placement along the furnace, lowering the chance of the components caking or sticking to the drum.
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9	Method for smelting rail steel in an oxygen steel-making converter	2586948 from 06.03.2015	Tokovoy O.K.	ZavodStroytechnica OOO	This invention relates to metallurgy and can be used in the manufacture of rail steel in oxygen steel-making converters. The task for which this invention was created is obtaining carbon-bearing metals with a low phosphorus content and a high temperature sufficient for secondary refining and pouring of the steel in machines of continuous casting of the stock material.
10	Aerial-solar thermal convector	164488 from 21.12.2015	Bondarev Yu.L. Gilmetdinov M.F.	Rossiyskaya priborostroitel'naya korporatsiya "Sistemy upravleniya" ZAO (Russian instrument-building corporation "Control Systems")	This utility model relates to electrical engineering, specifically to energy efficiency and energy saving, and can be used to increase the efficiency of using electrical energy to produce thermal energy. This utility model solves the task of increasing the coefficient of efficiency for using electrical energy for heating and hot water with minimum waste at the installation and minimal equipment cost.

11	Shut-off ball valve	159493 from 15.12.2014	Andrianov V.N. Sokolov A.V. Tverskoy M.M.	Promyshlennaya gruppa "Uralskoye Armaturostroyeniye" OOO (Manufacturing Group "Ural Valve Industry")	This utility model relates to tube fitting, specifically to the construction of shut-off mechanisms used in automated systems controlling liquid flow. The technical task solved using this utility model is the simplification of systems for managing operation and the lowered cost of valves by reducing the number of actuating systems to one.
12	Metal-coated fluxing charge material	2509161 from 09.07.2012	Bryndin S.A. Malkov N.V. Roshin A.V. Roshin V.E. Salikhov S.P.	Technoshar OOO	This invention relates to the iron industry and can be used in the production of steel. This invention solves the task of hardening the lining of steel-making vessels.

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13	Method to determine the rigidity of technological systems of CNC cylindrical grinding machines	2568553 from 16.06.2015	Guzeev V.I. Nurkenov A. Kh.	Kolomnaspetsstanok OOO	This invention relates to the cutting treatment of metals with removal of shavings, specifically to the study of the precision machining of cylindrical parts on cylindrical grinders with computer numerical control (CNC) and can be used directly in the design phase of round plunge grinding. The technical result is the increased accuracy of round plunge grinding in CNC machines by determining the actual rigidity of the technological systems using active control instruments during test work on workpieces.

14	Self-aligning main bearing	162455 from 11.12.2015	Doykin A.A. Mylnikov A.A. Khozenyuk N.A.	Chelyabinskiy traktorniy zavod URALTRAK OOO (Chelabinsk Tractor Factory URALTRAK)	This utility model relates to internal combustion engines and can be used in piston pumps, compressors, and turbomachinery. It solves the task of increasing the work capacity of the main bearing of piston engines by removing the uneven wear across the width of the main bearing which occurs from misalignment of the stud axis (shaft) and bearing from the bearing force and enables the use of standard main bearing.
15	Method and equipment for energy-conserving management of street lighting	2526206 from 20.08.2014	Schneider D.A. Shishkin M.V. Barbasova T.A. Zakharova A.A. Abdullin V.V.	Nauchnoproizvodstvennoye predpriyatie Politech-Avtomatika OOO (Politech-Avtomatika Research and Production Company)	This invention relates to electric engineering and is intended for the automated lighting of residential, public, and industrial spaces as well as highways and similar transport infrastructure objects. The task of this invention is to increase the energy efficiency of managing street lighting using automated, adaptive dimming of the street lamps throughout the day depending on the amount of daylight calculated for a given geographic zone.
16	Multifunctional torch	2484371 from 25.10.2011	Osintsev K.V. Osintsev V.V. Toropov E.V. Bogatkin V.I. Djzhundubaev A.K.	Obyedineniye VNIPIenergoprom OAO	This invention relates to electrical engineering and can be used in the boilers of thermal energy stations which burn liquid fuel including coal-water slurry, heating oil, or diesel. The task of this invention is to increase the level of fuel-burnup when incinerating coal-water slurry.
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17	Fly ash collector	2373460 from 20.11.2009	Osintsev K.V. Osintsev V.V. Karnaukhov N.V.	Urallesenergo Ural ZAO ZAO	This invention relates to electrical engineering and can be used in boilers incinerating forestry waste. The task of this invention is to increase the efficiency of ash collection from the streams of combustion products before the flue tubes of boilers burning forestry waste.

18	Anvil for steam hammer	2336141 from 20.10.2008	Zakirov R.A. Ismagilov B.F. Truskovskiy V.I. Serkunov V.G. Patuk E.V.	Uralskaya Kuznitsa OAO (Ural Forge)	This invention relates to forging and stamping manufacturing, specifically to the constructions of steam stamping hammers. The task of this invention is to prevent the main causes of anvil fatigue breakdown and increase their durability.
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