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GENERATION OF FREE MOMENTUM AND FREE ENERGY BY THE HELP OF CENTRIFUGAL FORCES

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ABSTRACT. It is pointed out at the substantial difference between potential (such as the gravitational) and inertial (such as the centrifugal) forces. It is revealed that by the help of centrifugal forces, the existence of which is caused by the availability of gravitating matter in the universe, one can generate free momentum and free energy, i.e., one can produce momentum and energy from nothing. In the paper are presented the perpetual motion machines, discovered by the author, called "Segner-Marinov turbine", "Bühler-Marinov generator" and "Deisting-Marinov machine". The first minute Segner-Marinov turbine which was recently constructed demonstrates the effect of self-acceleration, but since the friction torque overwhelms the driving torque, it still does not rotate as a *perpetuum mobile*. "Deisting drives", which are a simple variation of the well-known "Bühler drive", constructed by Joerg and Friedrich (son and father) Deisting in Graz in the last decade, produce free momentum, i.e., they set a body in motion by the help of internal forces. The author is working now on the Deisting-Marinov machine which will produce alone the energy necessary for giving birth to the inertial forces propulsing it, i.e., it will be also a perpetual motion machine.

1. POTENTIAL FORCES AND KINETIC FORCES

As I showed(1-3), the notion "force" is very complicated and if we wish that the physical phenomena should be easily understandible, we must introduce axiomatically the notion "energy" and the notion "force" is to be introduced then as a rigorous mathematical product from the axiomatical (and therefore undefinable) quantities "energy", "space" (i.e.,"length") and "time".

Let us consider two particles with masses m_1, m_2, electrical charges q_1, q_2 and velocities $\mathbf{v}_1$, $\mathbf{v}_2$, distant r from each other. Their gravitational and electromagnetic behaviour is determined by the following potential energies (γ is called gravitational constant and c velocity of light):

1. Gravitational energy

$$U_g = \gamma \frac{m_1 m_2}{r(1 - v_1^2/c^2)^{1/2}(1 - v_2^2/c^2)^{1/2}} \cong \gamma m_1 m_2/r. \tag{1}$$

2. Electrical energy

$$U_e = q_1 q_2/r. \tag{2}$$

3. Magnetic energy

$$W_e = - q_1 q_2 \mathbf{v}_1 . \mathbf{v}_2/c^2 r. \tag{3}$$

Equations (1)-(3) are these axioms by whose help I obtain (1-3) all equations in gravity and electromagnetism. I show(1, 2) that in gravity there must be an energy

$$W_g = - m_1 m_2 \mathbf{v}_1 . \mathbf{v}_2 / c^2 r, \tag{4}$$

analogical to the magnetic energy in electromagnetism, which I call "magretic energy", and, respectively, I call gravity "gravimagretism". Experiments have been proposed by me(1,2) which can demonstrate the reality of magretic energy.

The approximate result in equation (1) is obtained for $v_1/c \ll 1$, $v_2/c \ll 1$. By assuming $v/c = 0$, we remain in the physics of low velocities and by assuming $v/c \neq 0$, in the physics of high velocities. Throughout this paper we shall remain in the physics of low velocities. Thus we shall consider only gravitational and electrical forces. The so-called "elastic forces" are, as a matter of fact, electrical forces.

If calculating the gravitational potential which all stars in the universe produce at a certain point far from local concentration of matter (i.e., in the cosmos), we shall obtain(1,2) a number very near to (but less than) c^2. I assume that if the whole mass in the universe will be taken into account, this number will be exactly equal to c^2. Thus the gravitational energy of a mass m with the whole mass of the universe is

$$e = mc^2 \tag{5}$$

and is called its universal energy.

If this mass moves with a velocity $\mathbf{v}$ in absolute space (the space in which the mass of the universe as a whole is at rest and in which velocity of light is isotropic), its gravitational energy with the whole mass of the universe, according to (1), will be

$$e_o = mc^2/(1 - v^2/c^2)^{1/2} \tag{6}$$

and is called its proper energy.

Proceeding from equations (1), (2) and (6) and the energy conservation law, I easily obtained(1-3) the fundamental equation describing the motion of mass m, having the absolute velocity $\mathbf{v}$, respectively, in gravity and electricity

$$d\mathbf{p}_o/dt = \partial U_g/\partial \mathbf{r}, \qquad d\mathbf{p}_o/dt = - \partial U_e/\partial \mathbf{r}, \tag{7}$$

where U_g and U_e are the gravitational and electric energies of mass m with the surrounding it electric charges and masses. (For more detail see Refs. 1-3).

I call

$$\mathbf{p}_o = m\mathbf{v}_o = m\mathbf{v}/(1 - v^2/c^2)^{1/2} = \mathbf{p}/(1 - v^2/c^2)^{1/2} \tag{8}$$

proper momentum, $\mathbf{p}$ universal momentum, $\mathbf{v}_o$ proper velocity and $\mathbf{v}$ universal velocity of mass m.

The quantities

$$\mathbf{f} = d\mathbf{p}_o/dt \tag{9}$$

and

$$\mathbf{F}_g = \partial U_g/\partial \mathbf{r}, \qquad \mathbf{F}_e = - \partial U_e/\partial \mathbf{r} \tag{10}$$

are called by me kinetic force and potential force.

Equations (7), (9) and (10) show that the kinetic force, $\mathbf{f}$, is always equal to the potential force, $\mathbf{F}$,

$$\mathbf{f} = \mathbf{F} \tag{11}$$

This equation is called Newton's second law. We say that the surrounding system acts on mass m with the potential force $\mathbf{F}$, while mass $\mathbf{m}$ reacts to this action with the kinetic force $\mathbf{f}$, i.e., with the time change of its momentum $d\mathbf{p}_0/dt$.

We see thus that in gravity and electricity the kinetic forces of two interacting particles are always equal and oppositely directed along the line connecting the particles (there is $U_{12} = U_{21}$)

$$\mathbf{f}_1 = - \mathbf{f}_2. \tag{12}$$

This equation is called Newton's third law. Newton's first law is a triviality.

Equation (12) shows that one cannot set an isolated system as a whole in rectilinear or rotational motion. I showed that by the help of magnetic forces, which violate Newton's third law, one can set an isolated system in a rotational motion and demonstrated this by two experiments: the rotating Ampere bridge with interrupted current and the Bul-Cub machine with interrupted current(3).

2. INERTIAL FORCES

If a particle collides with another particle, at the assumption that there is no potential energy between them, an instantaneous change in their momenta, $\mathbf{p}_1$ and $\mathbf{p}_2$, does occur. In that case the kinetic force of one of the particles, taken with an opposite sign, represents the "potential force" which acts on the other particle. These forces have not the physical and mathematical substance of actual potential forces depending on the distance between the particles, and I call them collision forces. The fundamental equation of motion for collision forces is to be written not in the form (11) but in the form

$$d\mathbf{p}_1/dt = - d\mathbf{p}_2/dt, \tag{13}$$

i.e., in the form (12). Obviously, for collision forces Newton's third law is preserved.

Let us now consider a system of particles, the distances between which are kept constant by the help of elastic, i.e., electric, forces. Such a system is called a body. If the body is set in rotation about some axis, on the different particles of the system centrifugal forces begin to act. If the body moves along the radius of another rotating body, the so-called Coriolis forces appear. And if on a rotating body some external force acts, the so-called gyroscopic forces appear.

I call the collision, centrifugal, Coriolis and gyroscopic forces with the common name inertial forces.

I repeat: the inertial forces appear not as a result of the existence of some kind of potential energy. It is clear that if a rigid body hits another rigid body or if a rigid body rotates, then the inertial forces manifest themselves through the appearing elastic potential forces of deformation, however the physical essence of the inertial forces is determined not by the elastic potential energy inherent to the body's molecules. The appearing elastic potential forces are results, not causes. Meanwhile if an apple on the tree's branch is attracted by the Earth, the cause for this force is the gravitational potential energy between the apple and the Earth.

The cause for the centrifugal forces is the rotation of the body and the availability of gravitating matter in the universe. Take away the stars and there will be no inertial centrifugal forces (see beneath). The inertial forces are a very delicate physics chapter and although many great thinkers, beginning with Galileo and Newton, have tried to clear it, until the present day it remains covered with heavy fog. A proof that the inertial forces have not been understood by the illustrous physicists on this planet offers the fact that none of them has realized that inertial forces can violate the momentum and energy conservation laws. And none of them has seen even in his dreams perpetual motion machines and anti-gravity devices. Meanwhile the most elementary analysis of the centrifugal forces shows that such machines can easily be constructed.

By their fruits you shall know the trees.

3. THE CENTRIFUGAL FORCE

If a body is constrained to move along a circular path, a centrifugal force will act on it, aiming to preserve its uniform motion.

The mathematical calculation of this force is very simple (fig. 1): Let us assume that a particle moves with a constant momentum $\mathbf{p}$. If we wish to keep this particle moving always at the same distance R from a certain point in the plane determined by this point and particle's momentum, then for a time dt, for which the angle of rotation is Ωdt, where Ω is the angular velocity of rotation, the particle must change its momentum by $\mathbf{dp}$. From the geometry we obtain

$$dp/p = R\Omega dt/R, \tag{14}$$

so that

$$dp/dt = p\Omega = mv\Omega = mv^2/R = mR\Omega^2, \tag{15}$$

and $\mathbf{dp}$ is directed always from the particle to the centre of rotation. The inertial force with which the particle resists to this change is the centrifugal force which is directed into the opposite direction. Thus the force $\mathbf{f}_{cp} = \mathbf{dp}/dt$ is caused by the elastic forces of the constraint (say, the elastic forces of the string with which the particle is attached to the point of rotation) and we call it centripetal force, while the force $f_{cf} = - \mathbf{dp}/dt$ is the centrifugal force which appears because there are stars and the particle has mass (inertia).

Conventional physics, comparing equations (7), (10) and (15), is inclined to consider the force

$$F = mv^2/R \tag{16}$$

as "potential force". This is a noxious aberration. The centrifugal force in not a potential force, since it is not generated by some potential energy of interacting particles. It is very important to note that potential forces always appear with a respective energy change, while centrifugal forces appear without.

4. THE SEGNER-MARINOV TURBINE

I discovered the Segner-Marinov turbine on the 3 May 1996, the day after returning from the free energy conference in Denver. In this machine free energy is produced by the help of centrifugal forces.

The Segner-Marinov turbine is a combination of two effects which everybody has observed in one's childhood: The first effect is the rotation of a cylindrical recipient (a bucket filled with water) from whose periphery at the bottom water is squirting out into tangentional directions. This effect is referred to Segner (*Segner Reaktionsrad*). The second effect is the lift of water up the cylindrical circumference of a recipient rotating about its axis. This effect is referred to Newton (Newton's water bucket).

Newton's water bucket generates free energy, since the water is lifted up its cylindrical circumference by the help of inertial (centrifugal) forces. Thus for this lift no energy is to be invested. But using the difference in the levels of water at the cylindrical circumference and at the axis, free energy can be produced. Nobody of the great physicists has noticed this obvious effect.

The Segner-Marinov turbine is the practical realization of a perpetual motion machine based on this elementary free energy effect.

The technical drawing according to which my mechanician constructed the first minute Segner-Marinov turbine is presented in fig. 2 and the realization in fig. 3. It consists of a stationary part which will be called "the pot" and a rotating part which is "the turbine". The diameter of the pot is 180 mm and from here all other sizes can be obtained.

The pot and the turbine are made of PVC (poly-venil-chloride) and the turbine's holder, which is fixed to the internal races of two ball-bearings, is made of aluminium. When drawing the diagram I intended to make the pot of two pieces and for this reason one sees in fig. 2 a rubber O-ring, but later a more clever solution was found by making the pot of a single piece and connecting the two vertical cylindrical holes with the axial tube by two horizontal cylindrical holes bored from left and right which then have been closed by two corks. The dashed lines indicate cylindrical holes bored in the PVC-material which do not cross each other.

The Segner-Marinov turbine functions in the following way:

At rest of the turbine water is filled in the external ring recipient which via the two vertical holes and the lower cylindrical recipient (which, I repeat, was substituted by two horizontal cylindrical holes) mounts along the axial tube until reaching its upper rim. Then the turbine is set in rotation with a certain rotational velocity Ω and one begins to fill it with water, as shown in fig. 3. The angular velocity Ω is such a one that if the turbine has no holes the rotating water has to form a rotational paraboloid which just has to reach the rim of the turbine, as it is shown in fig. 2. Because of the action of the centrifugal and hydrostatic pressures, the water in the turbine begins to skirt out from the two outlets (nozzles) in directions tangentional to turbine's circumference. The skirted out water immediately via the axial tube streams back into the turbine. We fill the turbine with water until the moment when its paraboloid reaches the upper turbine's rim and the bottom's center. Then we detach the driving electromotor which can be seen in fig. 3 at right.

If the self-accelerating torque acting on the turbine (which will be calculated in a while) will be equal to the inevitable friction torque, the turbine will rotate eternally. If this driving torque will be larger than the friction torque, the turbine will begin to increase its velocity and water will begin to sprinkle out of its upper rim. If the driving torque will be less than the friction torque, the turbine will begin to decrease its velocity and water will begin to flow out via the space outside of the axial tube.

The calculation of the self-accelerating torque acting on the turbine can be done by any smart college student (fig. 2).

The radius of the turbine is indicated by R and its height by H. The y-axis is along the axis of the turbine and the x-axis along one of its bottom radii. We shall assume that the radii of the axial tube and of the two nozzles are very small with respect to R and the y-components of the tube's rim and of the nozzles are very small with respect to H. At these simplifying assumptions, water will form a paraboloid with initial point at the center of turbine's bottom.

The coordinates of an arbitrary point in the water are indicated by $x = r$ and by y, and the notation $h = H - y$ is introduced. The pressure in water at the point x,y, i.e., r,h, will be

$$p = \mu g h + (1/2)\mu\Omega^2 r^2, \tag{17}$$

where μ (= 1 g/cm^3) is the density of water and g (= 981 cm/sec^2) is the gravitational acceleration.

The first term in (17) is due to the hydrostatic pressure and the second term is due to the kinetic pressure produced by the inertial centrifugal forces. At all points of the surface the pressure is constant and as for $x = y = 0$ we have $p_{surf} = \mu g H$ and for $x = R$, $y = H$ we have $p_{surf} = (1/2)\mu\Omega^2 R^2$, we obtain

$$H = (\Omega^2/2g)R^2. \tag{18}$$

Thus for the constant of the surface parabola $y = kx^2$ we obtain $k = \Omega^2/2g$. At the left part of the diagram are drawn the parabolas for different constant pressures.

The velocity with which water will squirt out from the nozzles will be (Torricelli)

$$v^2 = 2p_{h=H,r=R}/\mu = 2gH + \Omega^2 R^2, \tag{19}$$

and the driving torque, at the simplifying assumption that the volume of water squirting out in 1 sec is 1 cm^3, or that μ is the mass squirting out in a unit of time, will be

$$M_{dr} = R\mu v = \mu(2gH + \Omega^2R^2)^{1/2}R. \qquad (20)$$

The braking torque, M_{br}, will be generated by the Coriolis forces acting on the water which drops from the axial tube with velocity $v = 0$, but at the periphery of the turbine obtains a velocity $v = \Omega R$.

As the Coriolis acceleration acting on a mass moving with a radial velocity $\mathbf{v}$ over a disk rotating with an angular velocity $\mathbf{\Omega}$ is $\mathbf{u} = 2\mathbf{\Omega}\times\mathbf{v}$, the torque executed by a mass μ of water moving from the centre of the disk to its periphery with a velocity $v = R$ in a second will be

$$M_{br} = \int_0^R r\mu 2\Omega v(dr/R) = 2\mu\Omega\int_0^R rdr = \mu\Omega R^2. \qquad (21)$$

Consequently, the net driving torque will be

$$M_{dr\text{-}net} = M_{dr} - M_{br} = \mu(gH)^{1/2}R(2 - \sqrt{2}). \qquad (22)$$

The free power which the Segner-Marinov turbine will deliver will be

$$P_{seg\text{-}mar} = M_{dr\text{-}net}\Omega = \mu gH(2\sqrt{2} - 2). \qquad (23)$$

We have to take, however, into account that the velocity of the squirting out water given by formula (19) is with respect to the turbine's cylindrical surface and since the laboratory velocity of the latter is ΩR, the squirting out water will have a laboratory velocity

$$v_{lab} = v - \Omega R = (gH)^{1/2}(2 - \sqrt{2}). \qquad (24)$$

The power of this water can be used to rotate another turbine whose blades will serve as external border of the cylindrical recipient in fig. 2. This second turbine will be set in rotation opposite to the rotation of the Segner-Marinov turbine. Assuming that the second one is a Pelton turbine which transforms the whole power of the squirting out water into kinetic energy reducing water's velocity to zero, we shall have for the power delivered by the Pelton turbine

$$P_{pelt} = (1/2)\mu v_{lab}^2 = \mu gH(3 - 2\sqrt{2}). \qquad (25)$$

Thus the whole free power which will be produced will be, from equs. (23) and (25),

$$P_{net} = P_{seg\text{-}mar} + P_{pelt} = \mu gH, \qquad (26)$$

where, I repeat, μ is the water mass squirting out from the Segner-Marinov turbine in a unit of time when its friction (or load) torque is equal to $M_{dr\text{-}net}$.

Of the net power P_{net} 83% will be delivered to the Segner-Marinov turbine and 17% to the Pelton turbine.

Which conclusion can we draw when analysing the physical essence of the Segner-Marinov turbine? Obviously the conclusion is only one: Mankind which during centuries constructs waterdams whose dimensions and costs can be compared only with those of the Egyptian pyramides is nothing else than a herd of blind. The inutility of these dams can be compared only with the inutility of the pyramids.

There was (figs. 2 and 3) $R = 5.4$ cm, $H = 12$ cm. The water streaming out at the rotational velocity $\Omega = (2gH)^{1/2}/R = 28.4$ rad/sec $= 4.5$ rev/sec was $V = 70\ cm^3/sec$, so that the net driving torque was $M_{dr-net} = \mu\Omega R^2 V(\sqrt{2}-1) = 24{,}011$ dyne.cm $\cong 24$ pond.cm.

As in the real apparatus the water paraboloid reached the bottom not at its centre but at a distance $r_o = 1.4$ cm from the centre, the rotational velocity was a little bit larger. On the other hand, the distance between the rim of the axial tube and the inner border of the cylindrical recipient was not 2 mm, as in the figure. The initial construction with this distance turned out to be unfit, as water went over the internal border of the cylindrical recipient, and the latter was enhanced with 4 mm what led to respective enhancement of the nozzles. Thus the actual net driving torque was less but in the order of 20 pond.cm.

The friction torque evidently was larger, as the machine could not maintain eternally its rotation. However, by making coast-down measurements first when the machine worked as a Segner-Marinov turbine and then when the turbine's nozzles have been plugged and the same paraboloid formed, the times 3^m38^s and 1^m08^s were measured what was a clear indication that there was a driving torque acting on the Segner-Marinov turbine.

If instead of water mercury will be used in this turbine, the torque will be 13.5 times larger and the machine surely will rotate as a *perpetuum mobile*.

As I have no room possibilities to fill my turbine shown in fig. 3 with mercury, my attention was directed to the Deisting-Marinov machine (see Sect. 8) which is much more easily realizable "centrifugal-forces-machine". The latter produces abundantly not only free energy but also free momentum.

But first we have to analyse the so-called Bühler drive.

5. THE BÜHLER DRIVE AND DEAN'S APPARATUS

Let us consider two masses $m_1 = m_2 = m$ rotating synchronously about two parallel axes which are rigidly fixed to a greater mass (figs. 4 and 5). The masses rotate in such a way that the projections of their radius-vectors on the x- and y-axes have always equal magnitudes. Now if choosing the x-axis to be this one along which the projections of the radius-vectors of the masses have always the same sign and the y-axis to be this one along which these projections have opposite signs, then the centrifugal force acting on the whole system will always be directed along the x-axis and will have the value

$$F = 2mR\Omega^2 \sin(\Omega t), \qquad (27)$$

where R is the radius of rotation, Ω is the angular velocity and for $t = 0$ the rotating bodies lie on the y-axis.

It is clear that when both ice-skaters in fig. 4 swing both heavy balls over their heads, they will move for half a period at a certain distance forward and then for the other half a period at the same distance backwards. Such synchronously rotating masses generating an oscillating motion, which is due entirely to the action of centrifugal forces, are known under the name "Bühler drive".

I do not know who was Bühler, when and where has he lived, and why some authors think that he was the man introducing this drive into physics. But as to anything which is of some importance a name must be given, I shall also call the drive in figs. 4 and 5 the Bühler drive.

In this context let me note that the "Segner turbine" was constructed by Heron in Alexandria in the first century and four centuries before him by Ktesibios in Greece. And who were the Greek philosophers ruminating over "Newton's bucket"?!?

By the variation of the Bühler drive shown in fig. 5, Norman Dean intended to produce unidirectional free momentum (let me emphasize that the Bühler drive in fig. 4 produces free momentum, as the mass centre of the system is set in motion by the help of internal forces, but the motion of the mass centre is oscillating). The best articles on Dean's apparatus are given in Refs. 4 and 5. The drawing in fig. 5 is of me[6,7] and this is, I hope, the best didactic presentation of Dean's machine:

The platform P which can roll in the wagon is attached to the walls A and B of the latter by four springs. On the platform there are two electromotors EM_1 and EM_2 which can set into rotation the excentric masses m_1 and m_2. If taking away the buffers B_1 and B_2 and letting the motors synchronously rotate, the platform P will begin to oscillate to right and left and by pulling and pushing the walls A and B it will bring also the wagon into an oscillating motion.

Dean had the idea to put the buffers B_1 and B_2, so that the transmission of the momentum to the wagon to right should be "hard" and to left "soft", hoping in this way to have a larger momentum transmitted to the wagon to right. If this will be the case, the wagon will begin to move to right.

From the numerous papers which I read on Dean's apparatus in the early sixties, it was not clear whether Dean or some of the people who duplicated his apparatus was able to generate free momentum, i.e. to set a closed (isolated) system into a unidirectional motion (the wagon with the platform and the motors is a closed system).

In the early sixties there was an actual "Dean's boom" in the world, but "Dean's boom" in the Soviet Union was with several orders larger than in the West. The airplane-constructor Antonov appeared with a note in PRAVDA, stating that Dean's apparatus will be the future of air- and cosmo-nautics. In several months the patent office in Moscow received about half a million applications for Dean's patent. After the intriguing paper in the journal TEHNICA MOLODEJI (Technics for youths), which at that time circulated in millions, the eager for knowledge students in the middle schools and universities ceased to attend lectures and began to construct Dean's apparatus or to ruminate on the dilemma whether it will "fly" or not. The situation became so critical, that Academician Kitaigorodsky appeared with a voluminous Savonarolian paper on the whole last page of IZVESTIA under the title "Who is right - the Baron or Newton?", having in mind under "the Baron" the well-known lier Münhausen who, entering once on his horse into a swamp, pulled his hair with his own hands and so saved himself and the horse from sinking. And the disciplined Russians ceased to think.

After having read many different papers (there was a big paper in the French journal with half-a-million circulation SCIENCE ET VIE), I remained with the opinion that Dean's apparatus was ineffective, i.e., that it cannot produce unidirectional free momentum. My variation of Dean's apparatus[7] showed no effect.

Of the most interesting later variations of the Bühler drive I shall mention the machine of my recently deceased friends Zorzi and Speri[7] and Cook's apparatus; the latter was presented in the excellent book of his collaborator Dickinson[8].

Cook definitely has succeeded in producing free unidirectional momentum. The demonstration of the propulsion of a vehicle and a boat driven by internal forces, based in principle on Bühler drive, found coverage in local American press in the late seventies and early eighties. My friend Eike Müller (Zug, Switzerland) saw one of Cook's machines in motion and assured me that the generation of free momentum was without any doubt. It is unexplainable for me why Cook's machine fell into oblivion. Perhaps for the same reason for which Finsrud's perpetual motion machine which on the 10 May 1996 was shown in the Norwegian TV also fell into oblivion.[9]

6. THE BÜHLER-MARINOV GENERATOR

All inventors using the Bühler drive had the aim to construct a machine which will bring a closed system into a unidirectional motion, i.e., all of them have searched for producing free momentum.

It may seem strange but there was no single inventor (at least such a man is not known to me) who has tried, by the help of Büler's drive, to produce not free momentum but free energy, i.e., who has tried to violate not the law of momentum conservation but the law of energy conservation. Meanwhile momentum is a vector quantity while energy is a scalar quantity and much more simple in its physical essence.

The Bühler-Marinov generator, invented by me ten years ago[7], is a machine which by the help of Bühler's drive can produce free energy. Ten years ago I had no money to construct it and it remained only "on paper". The Bühler-Marinov generator works in the following way:

Let fix the wagon in fig. 5 to earth and let take away the buffers B_1 and B_2. Let us assume that the springs are ideal, i.e., that at contraction and extension they do not generate heat. We set both motors in action and we notice the power consumed. This power goes to cover all "losses", i.e., at stationary oscillation of the platform, the whole this power will be transformed into heat, as the machine will produce no other energy.

Let us now assume that the springs are not ideal and at their contraction and extension produce heat. I am asking: Will in this case increase the power consumed by the electromotors?

My firm answer is: No. The consumed power will remain the same since the forces which contract and extent the springs are inertial forces.

And the Bühler-Marinov generator is to be constructed by replacing the springs by four cylindrical magnets which are fixed to the platform and at the oscillations of the latter will go in and out of four coils fixed to the wagon, inducing electric current in the coil's windings. If the electric power produced by these coils will be higher than the power consumed by the motors, one will be able to "close the energetic circle" and the generator can be let working as a perpetual motion machine.

7. THE DEISTING DRIVE

I remember very well a colleague who used to repeat: "Physicists are crazy people. They run around the world on congresses and conferences in a search for fresh and intriguing ideas. Meanwhile the most original idea has a man who lives in a house next to the house in which they live."

Such a man was Joerg Deisting, a painter, who lives a couple of streets far from me. And Joerg Deisting told me in a cafê at the same distance from my and his houses which both of us used to visit: "If you wish to obtain a unidirectional propulsive motion with a Bühler drive (the name and the drive itself were unknown to Deisting) let the excentric masses rotate not over 360^0 but over less than 180^0."

When I heard this, I remained as struck by lightning. Such a simple solution of a problem on which millions of people have ruminated. (NB. A quarter of century ago I discussed Dean's machine with at least 10 of my colleagues in Sofia, none of whom has applied for Dean's patent at the Moscow patent office; and this patent office, as said, has obtained half a million applications).

Immediately I gave to this epochal invention the name "Deisting drive".

Joerg Deisting and his father Friedrich have constructed in the last decade several machines with this drive which were unidirectionally propulsing. Photographs of three of them are presented in Ref. 10.

Here I give the photograph (fig. 6) of the most simple "Deisting drive" which any child can construct in half an hour in the nursery:

The rubber is strained and the eccentric mass is held in its initial position by one's finger. After removing the finger, the lever of the eccentric mass rotates from the position in which it points to right to the position in which it points to left, where the rubber's elastic tension disappears. At this half-circular rotation the lever with the eccentric mass obtains a certain velocity and it makes a couple of damped oscillations about the line on which the elastic energy of the rubber is zero (in fig. 6b the elastic energy of the rubber is zero). In this system, which can be considered as an isolated system, the acting forces are internal forces. Thus, according to the momentum conservation law, the centre of mass of the system must remain at rest. Consequently, as the eccentric mass has moved to left, the car must move to right, so that in both figures a) and b) the centre of mass of the system should remain at the same point respectively to the table (remember that if one walks on a boat from right to left, the boat moves from left to right!).

However, the experiment in fig. 6b showed exactly the opposite effect: the car moved not to right but to left, as the cigarette box remained all the time at rest. Obviously any child in the world (but not a single professor!) will conclude that the motion to left was due to the centrifugal forces acting on the eccentric mass which immediately have been communicated to the car.

The experiment demonstrated also the following important detail: For the first fourth part of the circular motion the centrifugal forces acted to right and during the respective time the car moved slightly to right, pushing the cigarette-box at a couple of millimeters to right. Then, when the mass performed the oscillation motion about the "zero potential energy line" with a much higher velocity (the mass was accelerated by the elastic forces during the first and the second fourth parts of its circular motion), the car made the big propulsion to left over the several centimeters which can be seen in fig. 6b. The propulsion was in jerks, as at the moments when the lever changed the direction of its rotation there were no centrifigal forces.

In fig. 6 there is presented a PHYSICAL WONDER. But WHO has constructed such a wonder before Mr. Deisting? - NOBODY.

I was terrifically excited and said after the demonstration: "I am familiar with the Bühler drive since thirty five years, since the early sixties when the machine of Dean was *en vogue*, but I do not know somebody who has proposed the Deisting drive. I myself have constructed Dean-type machines (see fig. 5 in Ref. 11) but I never have come to the idea of the 'Deisting drive'. Look at Cook, at Dean, at Zorzi and Speri (Ref. 11) and at the numerous their followers: so many different much more complicated tricks have been proposed and realized, however nobody has proposed the Deisting drive. How can you explain the fact that nobody before you has come to this idea. I can't grasp it." Mr. Deisting's answer was: "The other researcher who have worked in the field have not come to this idea for the same reason for which you during 35 years have not come to it. And of the other 6 or 5 or 4 or 3 milliards who visited schools, they have been told that propulsive motion cannot be realized by internal forces."

A very simple experiment for the verification of the reality of the Deisting drive was demonstrated to me by Joerg Deisting by the help of a single ball pen.

First (fig. 7a) a ball pen is put on the edge of a table, so that the one half lies on the table and the other one juts out of the table. If hitting strongly the free part (by one's hand or better by a rod), the ball pen flies into a horizontal direction rotating about its central point which is also its mass center.

If however (fig. 7b) only a small part of the ball pen juts out of the table and we again hit the latter strongly, the ball pen flies vertically up, rotating about this point which was at the edge of the table and not about its mass-centre. It is evident that for the first half of the rotation the centrifugal forces acting in a vertical direction upward are much higher than those acting in a vertical direction downward and the former communicate to the mass centre a certain velocity upwards. Then the middle centrifugal forces, calculated over a whole rotation, remain equal to zero (Bühler's drive) and if there is no gravitational attraction and there is no friction in the air, the upward motion will continue eternally with the velocity acquired at the first half of the rotation.

After seeing this experiment, I said to me: "To such an experiment and to its tremendously important conclusions can come only a painter, never a physicist!"

Now I shall show how and why the Deisting drive will very easily produce free energy.

Let us assume that the wheels of the platform in the Deisting drive are connected to an electromagnetic generator. First the generator is not switched on and we drive the electromotor of the drive by a battery. The energy of this battery is used only to overwhelm the friction losses in the Deisting drive and do not depend on the velocity of the platform. Thus if assuming that at any velocity of the platform the friction in the ball-bearings of the wheels remains the same, we shall always need the same amount of energy E_{in} for increasing the velocity of the platform with 1 m/sec. However, if switching on the generator, then for diminishing the velocity of the machine from a certain velocity v with 1 m/sec, we shall receive the following energy

$$E_{out} = (1/2)mv^2 - (1/2)m(v-1)^2 = (1/2)m(2v-1), \tag{28}$$

where m is the mass of the machine.

Thus always the inequality

$$E_{in} < E_{out} \tag{29}$$

can be achieved and the machine can be run as a *perpetuum mobile*.

8. THE DEISTING-MARINOV MACHINE

A Deisting drive, which produces alone the energy which is needed to run it, is called by me a "Deisting-Marinov machine".

I began with the construction of such a machine (fig. 8). The car is set into propulsive motion to right by the vertical electromotor at left which drives an eccentric crank-shaft and brings into oscillating motion the two long double rods. I had two equal masses for fixing them to the ends of the double rods, i.e., at distances R from the rotational axis, as according to formula (16) the pushing centrifugal force is proportional to m. However their weight increased the friction, made the machine slothful and decreased perceptibly the angular velocity Ω. Since the pushing centrifugal force is proportional to the square of Ω, it is better to have smaller m and R but larger Ω. Thus without the additional masses, first, the machine went more quickly and, second, the motor driving it consumed less electrical power. The "effective mass" causing the propulsive motion was, as a matter of fact, the difference between the rods at right and at left from the rotational axis.

In my Deisting-Marinov machine the car (the first prototype of which is shown in fig. 8) will rotate on circular rails used for children's toy trains, being connected with two light rods to a ball-bearing inserted on an axle at the centre of the circular rails.

The "axes" of the car are four electromotors on whose shafts four wheels are inserted; thus any wheel can rotate independently of the other. This is important as the two "internal" wheels will make for one revolution less rotations than the "external" wheels. Moreover, the "axes" conclude a small angle (this can be seen in the photograph), so that both axes always remain perpendicular to the rails.

The four electromotors on the "axes" will work as generators and will be connected in series with the vertical electromotor setting the Deisting drive in oscillation. The car will be set by hand in motion with a certain velocity. If at this velocity the tension produced by the four "axes-motors" will be sufficient to run the vertical motor and the force F produced by the Deisting drive will be bigger the whole friction force, F_{frict}, acting on the car (the electromagnetic braking of the four "axes-motors" is included into the "friction force"), the machine will rotate eternally.

If this will be not the case, a better variation is to be constructed. Formula (29) shows that a self-propelling mode is realizable.

By comparing the Deisting-Marinov machine with the Bühler-Marinov generator, one sees immediately the great advantages of the first one. Indeed, the velocity, v, of the Deisting-Marinov machine can be unlimittedly increased and, consequently, according to formula (28), the free power produced by it can also be unlimittedly increased.

Is seems that the "Deisting-Marinov mode" can be used only for vehicles moving on the earth and not for planes and space vehicles. This is true, but not entirely, as the generators which will produce the power for running the Deisting drives in the flying vehicles can be made exactly of the same type as the machine which I am now constructing. Thus a space vehicle will have a Deisting drive which will produce its propulsive motion and a Deisting-Marinov machine in the vehicle, where a car will perform rotational motion producing the electrical energy necessary for running the motors for the propulsive Deisting drive.

The disc form of the "flying saucers" is an indication that, very likely, their electrical energy is produced by circularly rotating Deisting-Marinov machines.

It is easy to calculate that by a Desting drive producing acceleration larger than g (= 9.81 m/sec^2), an acceleration which any of our fuel cars can produce, one will be able to fly to Mars in four days. In the first two days the motion will be continuously accelerating and the space vehicle will achieve a fantastically high velocity. In the next two days the motion will be desaccelerating and the vehicle will land on Mars "softly".

In my first machine shown in fig. 8 the friction was too high. The motor (a highly efficient Swiss motor) consumed some 10 W of electric power but the oscillating frequency of the two double rods was low and the propulsive force was almost unnoticeable.

It was clear that a second, better variation, was to be done. It is shown in figs. 9 and 10. Now at all "friction knots" ball-bearings were used. And the power consumption was drastically decreased to some 100 mW (i.e., 100 times less) for the same oscillating frequency of the rods.

At a higher oscillating frequency, when the power consumption was about 500 mW the pushing centrifugal force was already noticeable.

I did only approximate calculations of the pushing centrifugal force, as it is very difficult to make an exact calculation.

Any of the steel rods of the machine shown in fig. 9 had diameter D = 0.5 cm and length L = 19.5 cm. Thus, if taking for the specific gravity of iron μ = 7.86 g/cm^3, one obtains for the mass of any of the rods

$$m = \mu\pi D^2 L/4 = 30 \text{ g}. \qquad (30)$$

When adding the additional masses of 50 g any, shown in fig. 9, the rotation and the pushing force were worse, so that the experiments were done without the additional masses.

At a power consumption of 500 mW, the frequency of oscillation (to left and to right) was estimated (very approximately) to be 12 Hz. Since the angle between the "left-right" deviations of the rods was 30^0, the above frequency corresponded to a rotational frequency N = 1 rev/sec.

The pushing centrifugal force is to be calculated by putting into formula (27) m from (30), for R the middle length of the rods, $\cong$ 10 cm, for the angular velocity $\Omega = 2\pi N$, and for the phase angle $\Omega t \cong \pi/2$, thus obtaining

$$F = 2mR\Omega^2 = 237 \text{ mN} = 24 \text{ pond}. \qquad (31)$$

This force will act, however, if the rods cover their whole path over 30^0 by a constant velocity and then momentarily change this velocity to the opposite one. As this was not the case, the value (31) is to be multiplied by a factor $k < 1$.

I measured the pushing force by suspending the whole car on a string. Two strings were used, fixed to the extremities of the car, as when setting the motor in action, a torque opposite to the torque acting on the motor's rotor (angular momentum conservation law!) begins to act on the car bringing the suspended system into undesirable oscillations. But if using the suspension shown in fig. 10, these oscillations were minimal and could not mar the observed deviation of the system over s = 2 mm in the direction in which the force (31) acted. As the length of the strings was l = 2000 mm, the concluded angle of continuous deviation was $\alpha = s/l = 0.001$ rad.

Taking into account that the weight of the whole car was P = 1800 pond, the force which acted on it into horizontal direction was

$$F_{exp} = P\alpha = 1.8 \text{ pond}. \tag{32}$$

Thus for the factor k one obtains

$$k = F_{exp}/F = 0.075. \tag{33}$$

This is a too small factor, indicating that in the observations and estimations some errors have slipped, or there are some other physical effects due to the big vibrational forces which appear.

As already said, now I am working on the realization of the circular rails on which the car will rotate. The answer whether this second car will be able to produce alone the energy necessary for running the Deisting drive, i.e., whether it will become a Deisting-Marinov machine, is to be answered by me rather negatively. Thus the machine is further to be perfectioned in order to make it a perpetual motion machine.

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FIGURE CAPTIONS

Fig. 1. Drawing for calculating the centrifugal force.

Fig. 2. Technical drawing of the Segner-Marinov turbine.

Fig. 3. Photograph of the Segner-Marinov turbine.

Fig. 4. The Bühler drive.

Fig. 5. Drawing for the Dean machine and for the Bühler-Marinov generator.

Fig. 6. Demonstration of the Deisting drive:

a) The rubber is strained by one's finger.

b) After removing the finger, the eccentric mass at the end of the lever makes a couple of oscillations about the line along which the elastic energy is zero, and the car receives an impulse to left due to the centrifugal forces.

Fig. 7. Elementary rotational experiment demonstrating the Deisting drive:

a) the half of the ball pen juts out of the table.

b) only a small part of the ball pen juts out of the table.

Fig. 8. The first Deisting-Marinov machine.

Fig. 9. The second Deisting-Marinov machine.

Fig. 10. The second Deisting-Marinov machine suspended on strings for observation of the pushing centrifugal force acting on it continuously.

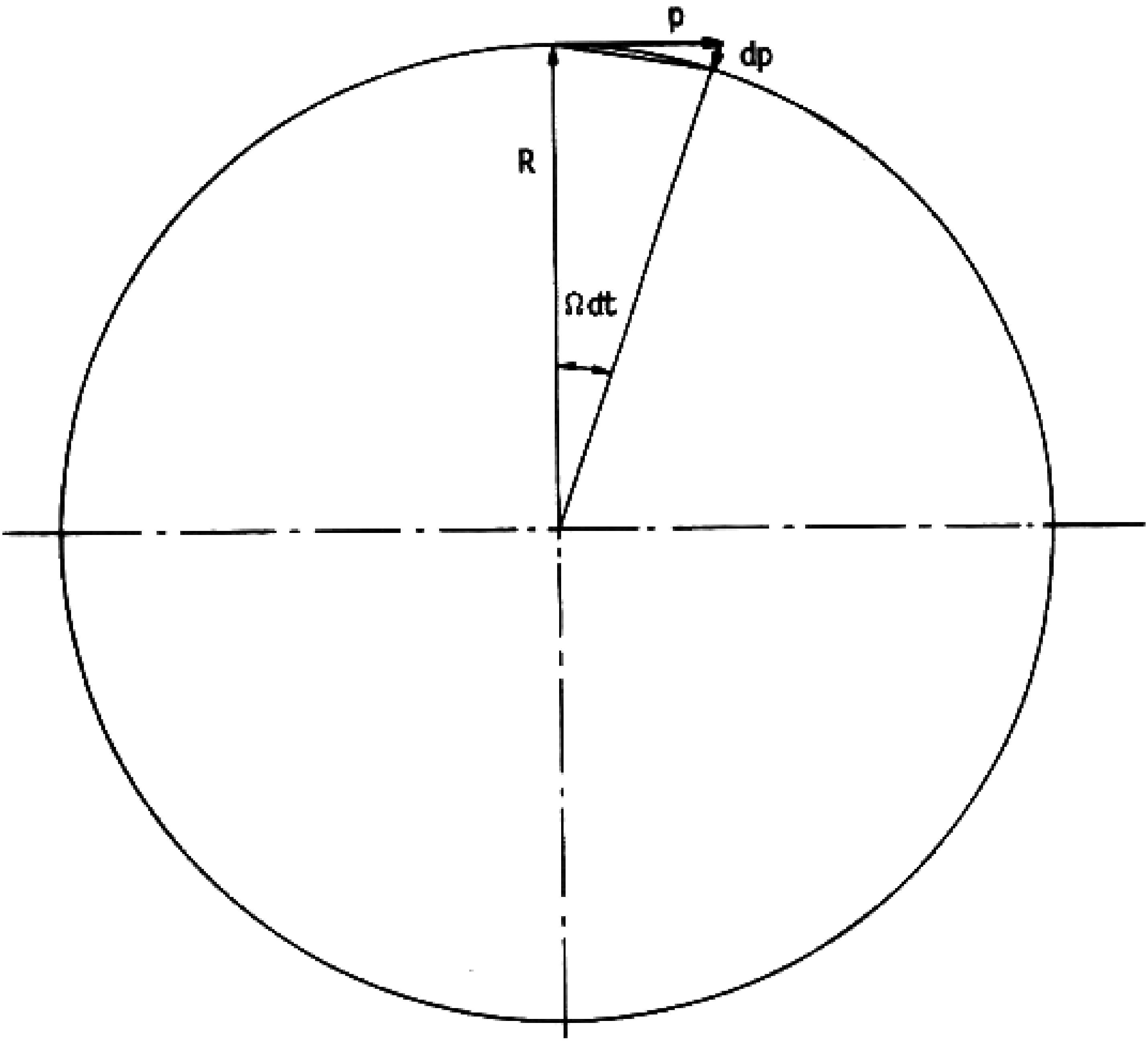


Fig. 1

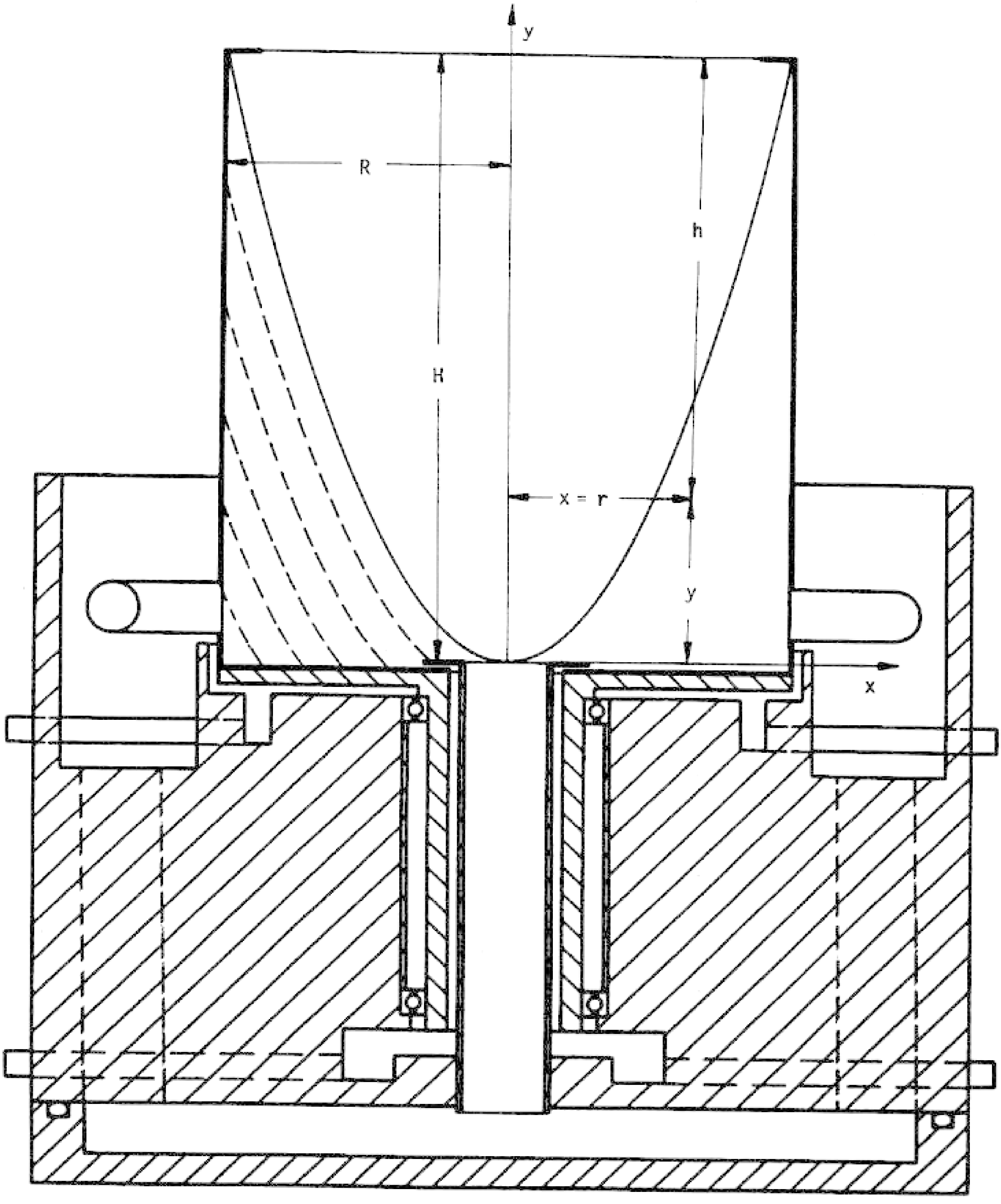
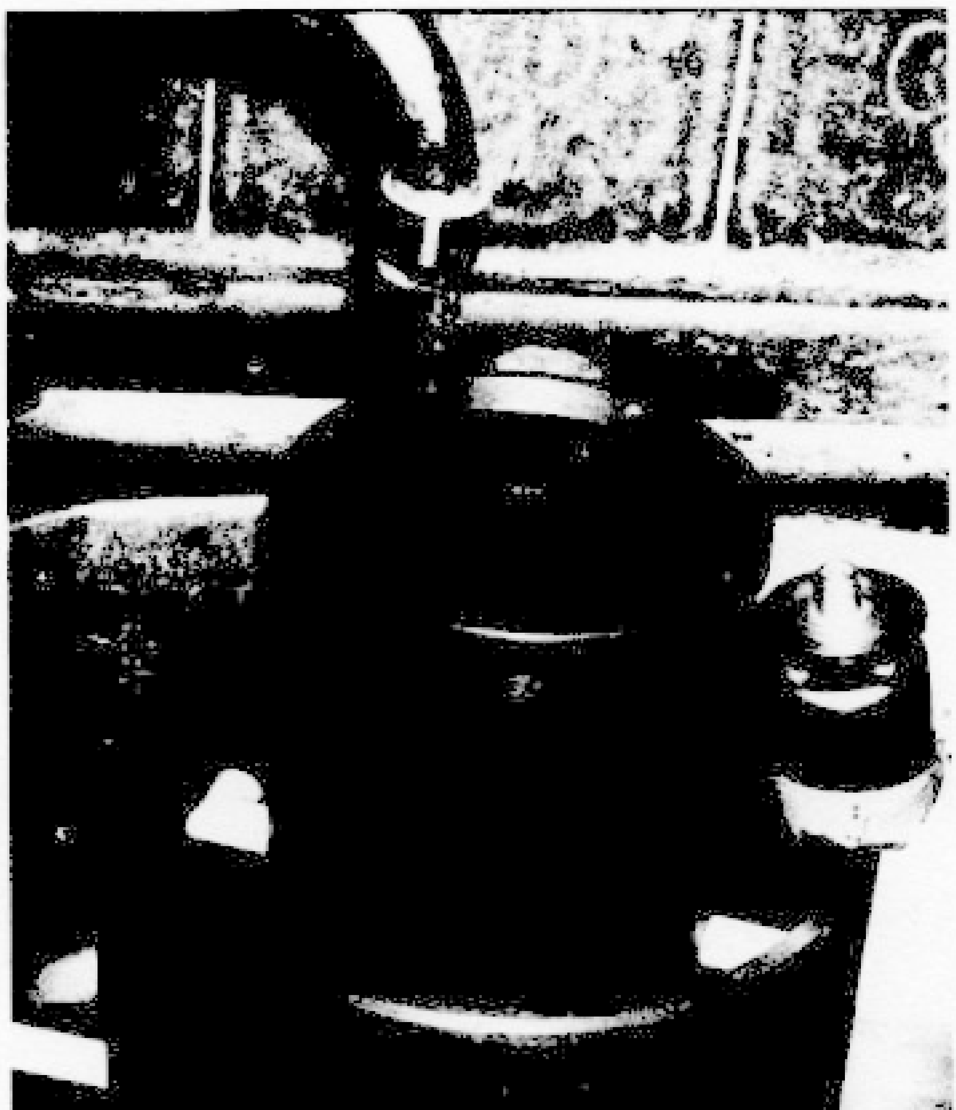


Fig. 2



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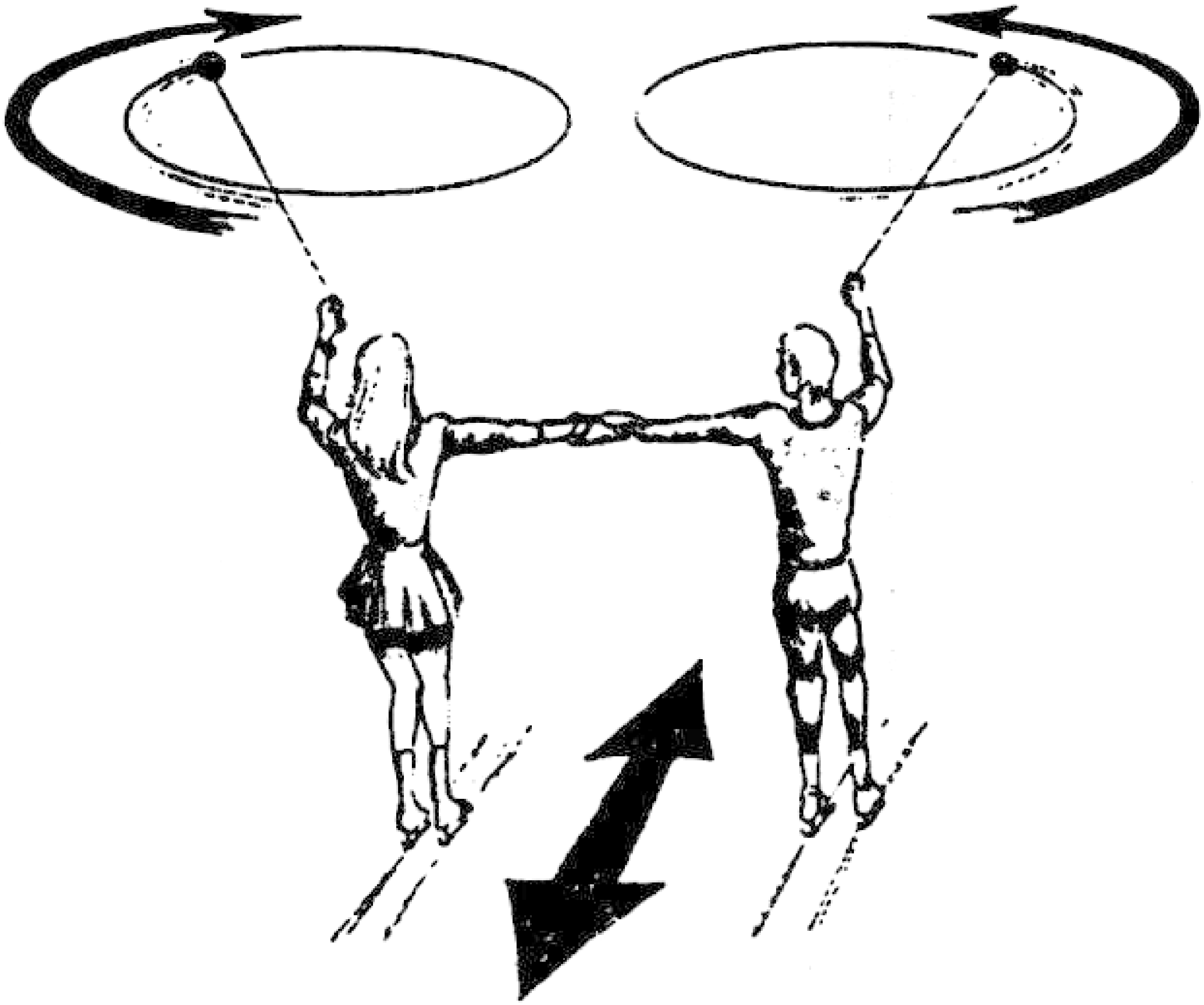

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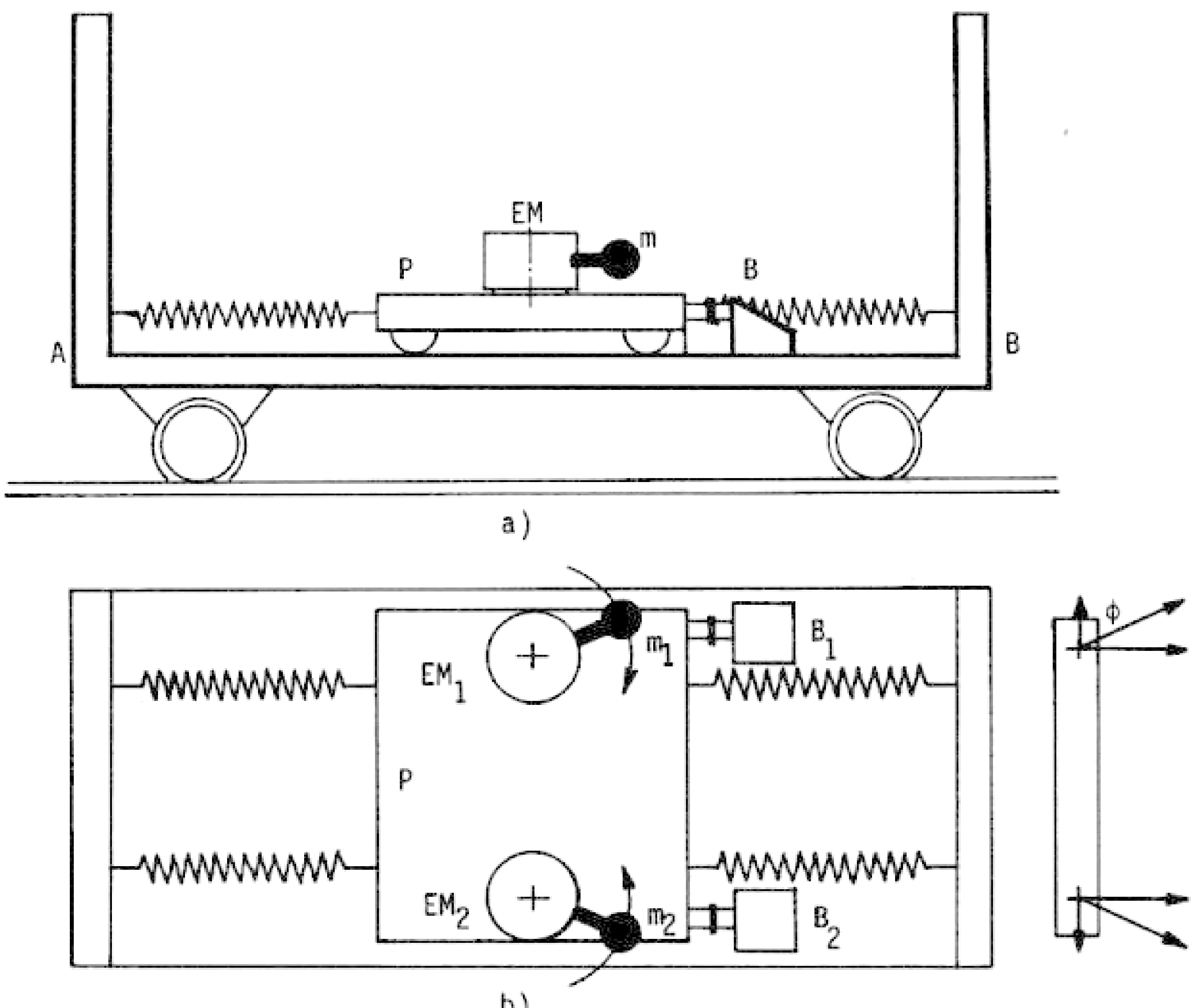
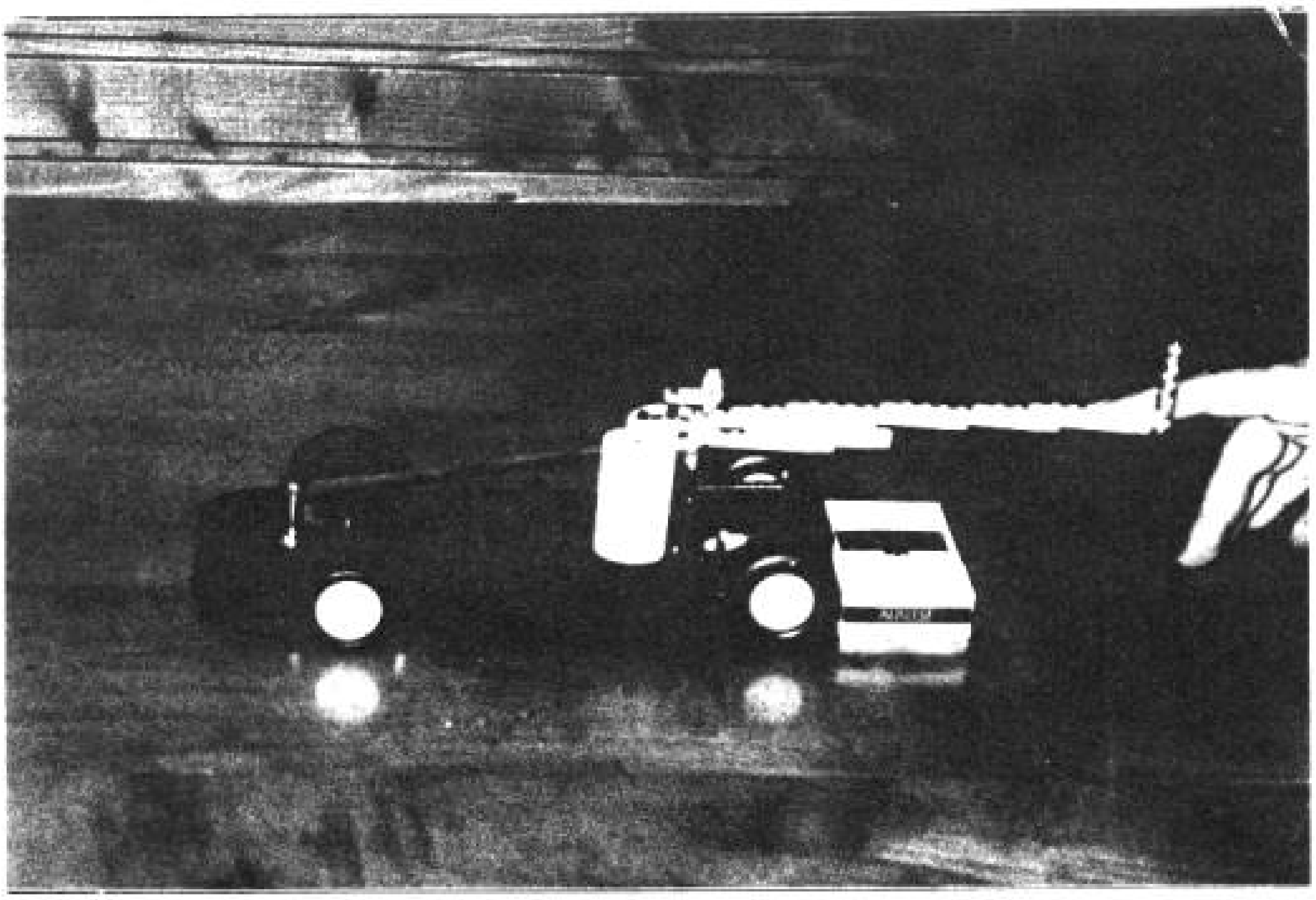


Fig. 5



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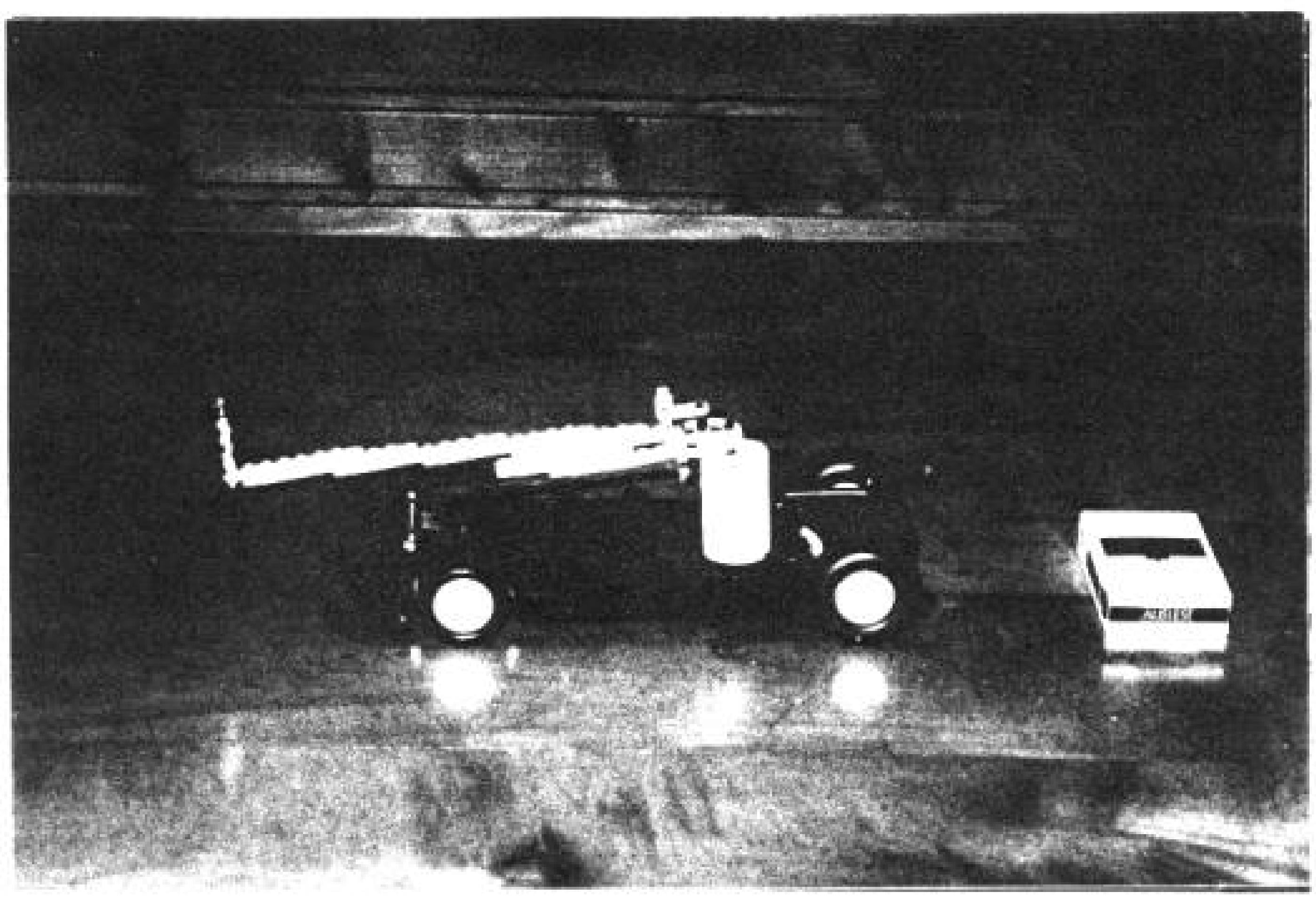
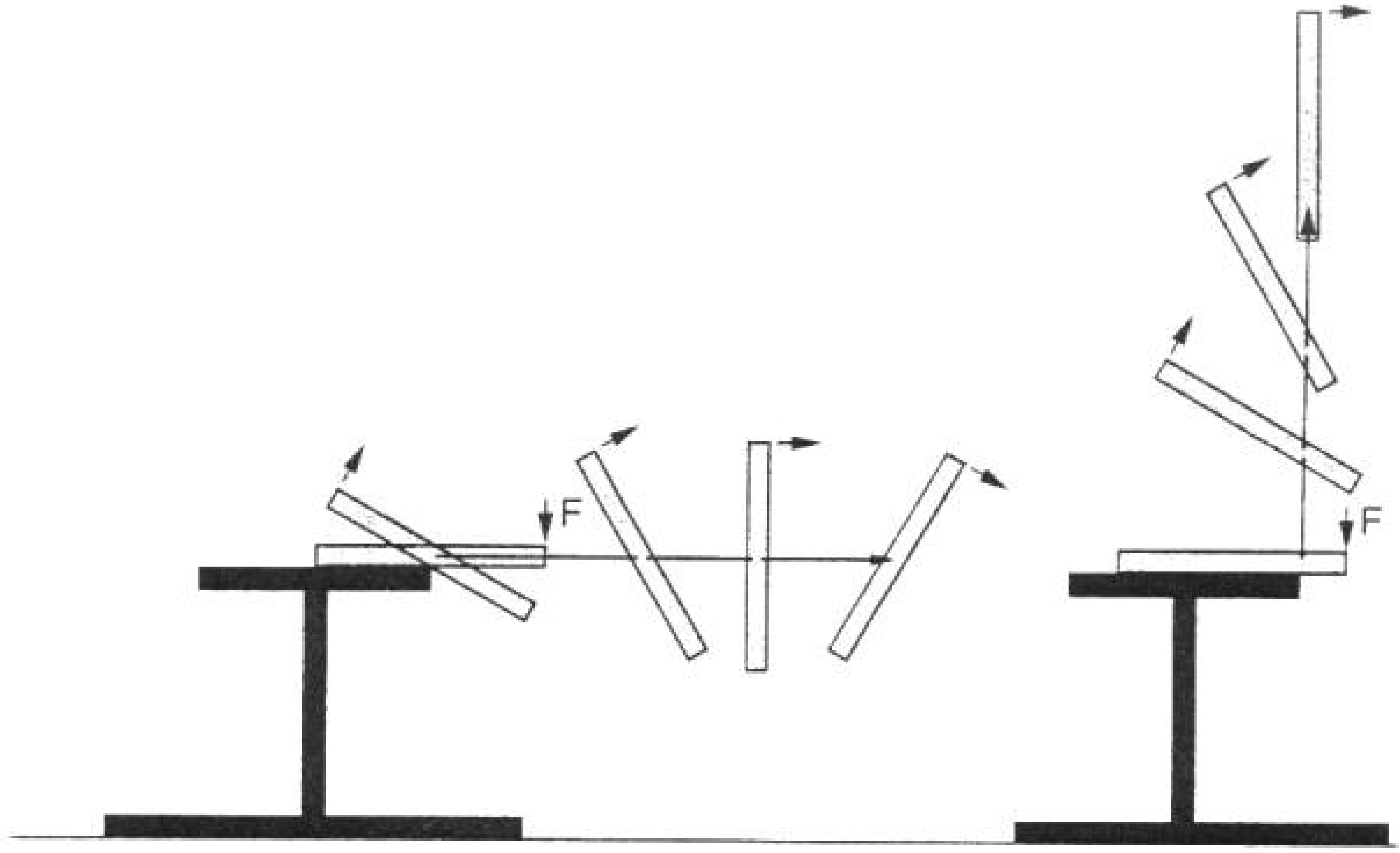


b)

Fig. 6



a)

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Fig. 7

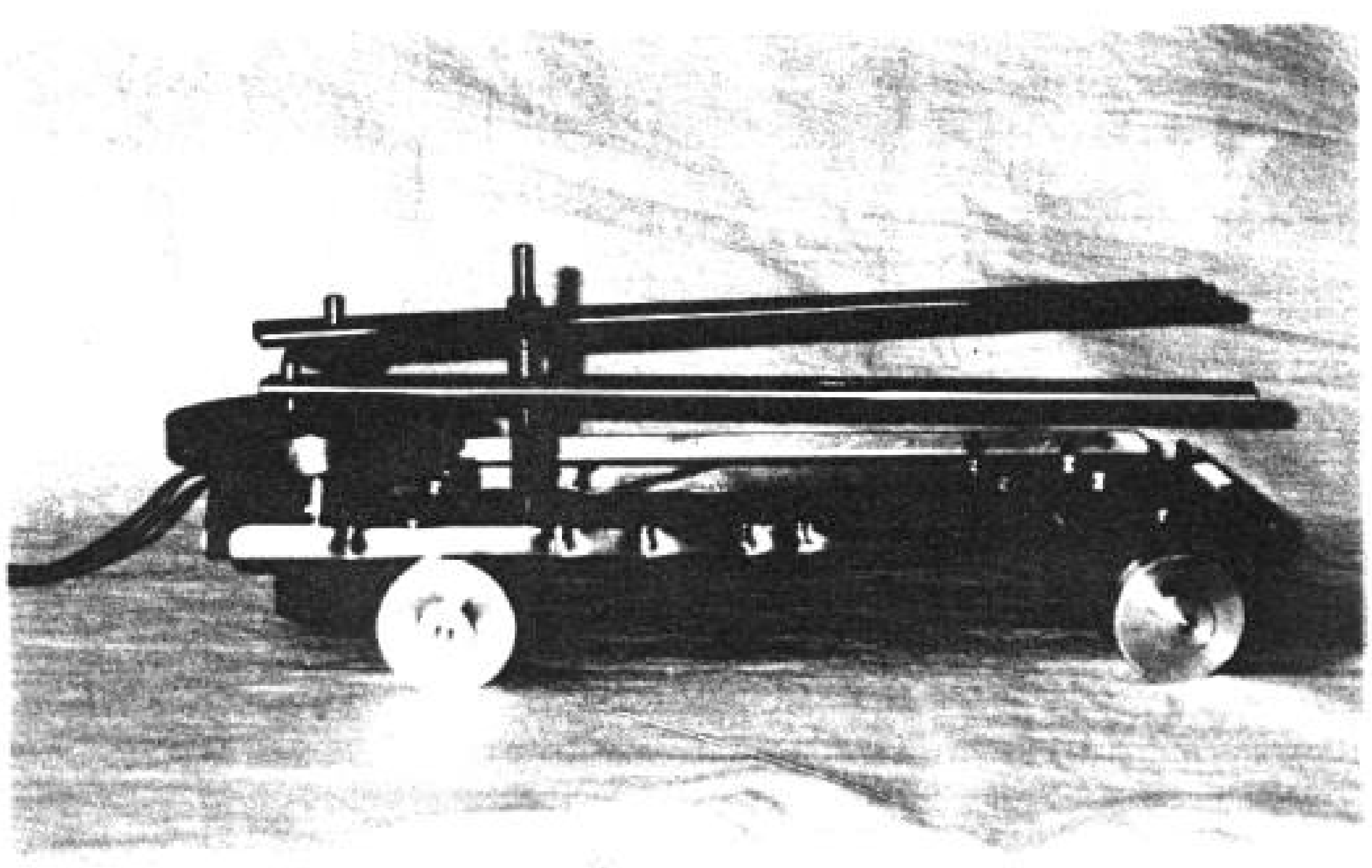

Fig. 8

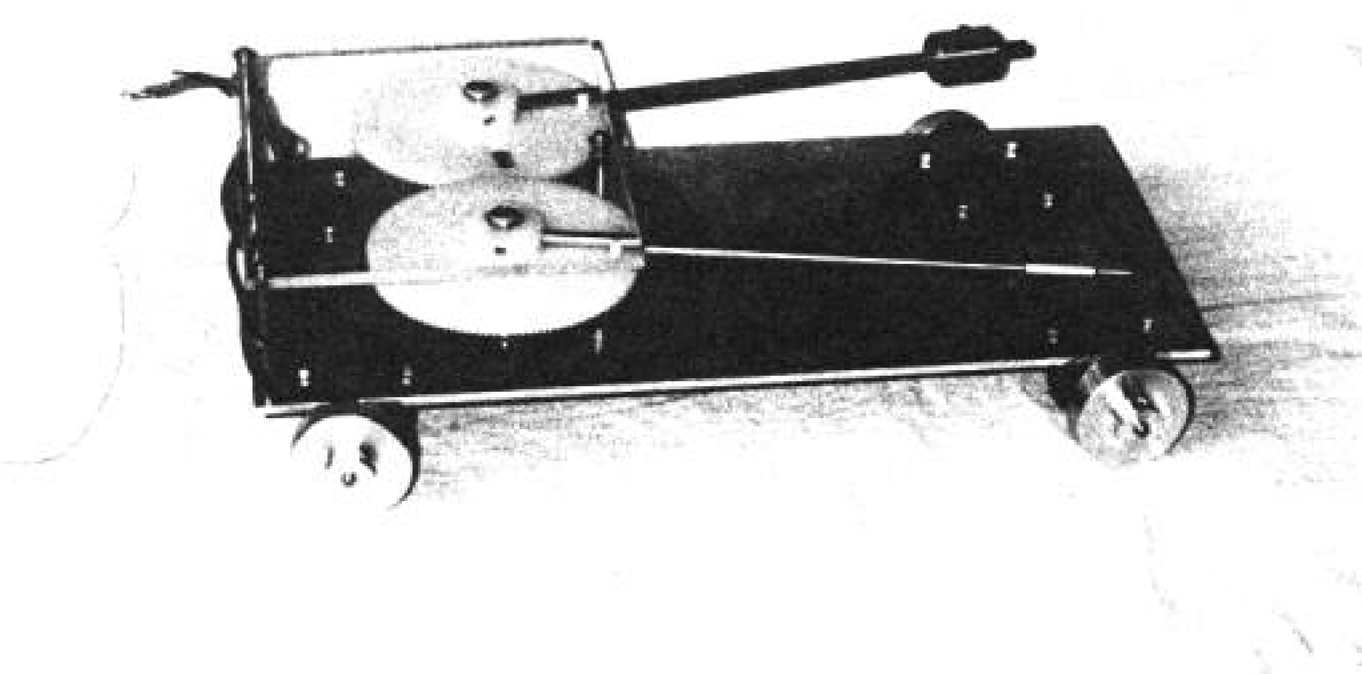

Fig. 9

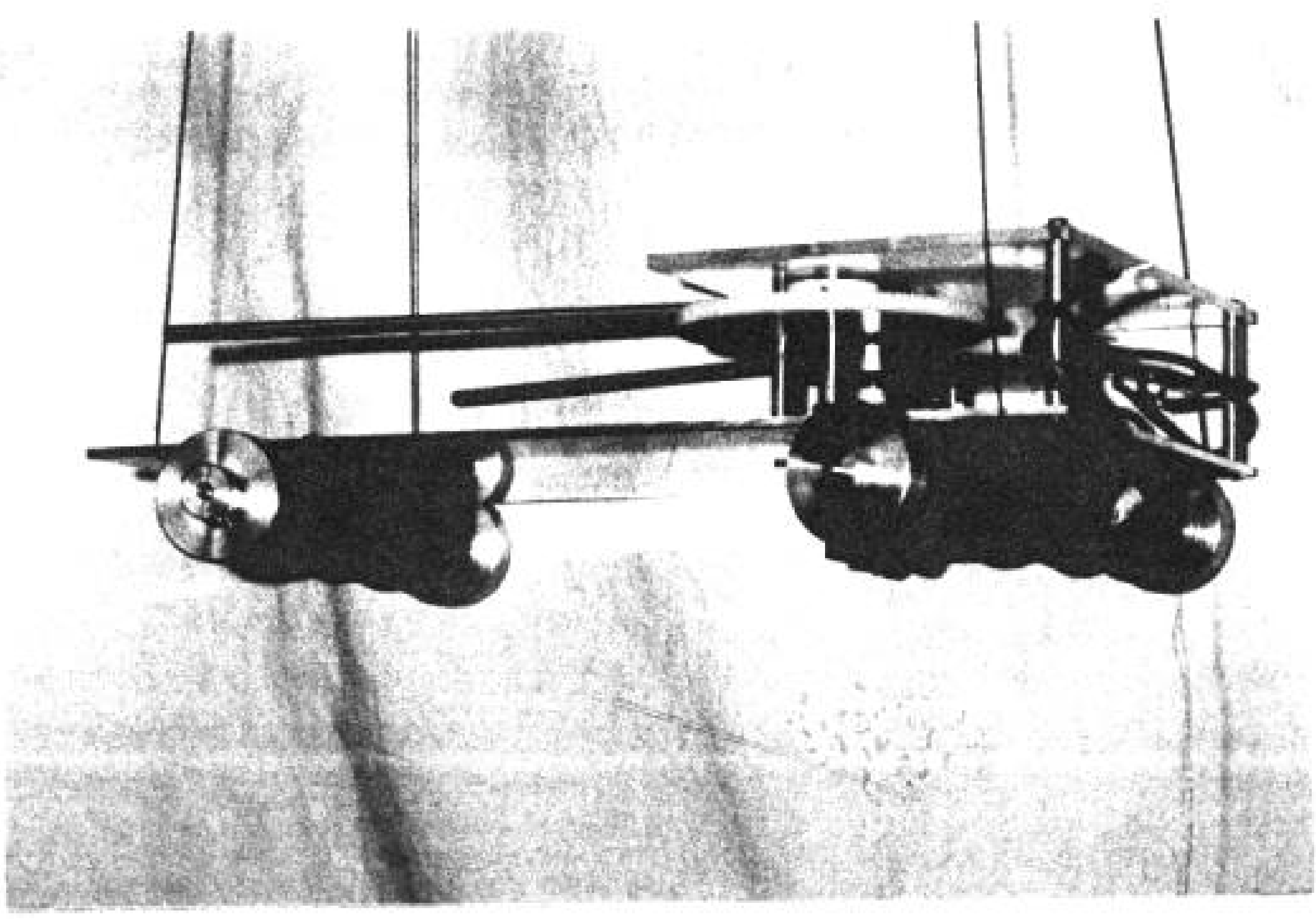

Fig. 10