Nautilus
&
Athletic Journal
Articles

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Nautilus is Shaping the Future of Exercise

The first Nautilus machine was built in 1948… but the first Nautilus machine produced for sale was built more than twenty two years later, in 1970.

The first type of machine was a Pullover Torso Machine – and the first type delivered to a customer was also a Pullover. But in fact, the two machines – the first built, and the first sold – had little more than the name in common. During the twenty two years of developmental work that passed prior to the first sale of a Nautilus machine, twenty seven distinct models of the Pullover were built and tested – and literally hundreds of other models were considered and rejected before reaching the prototype stage.

The first Nautilus machine was built at a time when quite a number of people were beginning to realize that something basic was missing in conventional exercises. The barbell was (and is) a tool capable of producing outstanding degrees of muscular strength – eventually; but it obviously is not the ideal tool.

In short, it was a long, slow process – leading to a final result that probably would never have occurred under any other set of circumstances. The first Nautilus machine was not built for commercial purposes – instead, it was built in an attempt to produce a literally perfect exercise tool.

At or about the same time that the first Nautilus machine was built, other people were also making attempts in the direction of improving the tools available for exercise – but they made the mistake of going in exactly the wrong direction. Instead of devoting their attentions and efforts to exercise; they concentrated on attempts to improve the available tool, the barbell.

You can design a better saddle for a horse, you can feed a horse better, you can train a horse better… but so long as you restrict your attentions to a horse, you will be forced to work within the limitations of a horse. And you will never travel faster than the maximum speed of a horse.

Modern speed of travel developed only after the horse was scrapped as a means of practical transportation.

Conventional weight machines that merely copy the functions of a barbell are now about as practical for the purposes of exercise as a horse is for the purpose of transportation.

Nautilus was based on the concept that the basic tool was wrong, so the development of Nautilus equipment was a process of determining the function of human muscular structures – in an effort to design new and much improved tools that could meet the actual requirements of the muscles. Instead of trying to fit human muscles to an imperfect tool, the barbell – Nautilus was an attempt to design perfect tools that would exactly fit the requirements of muscles.

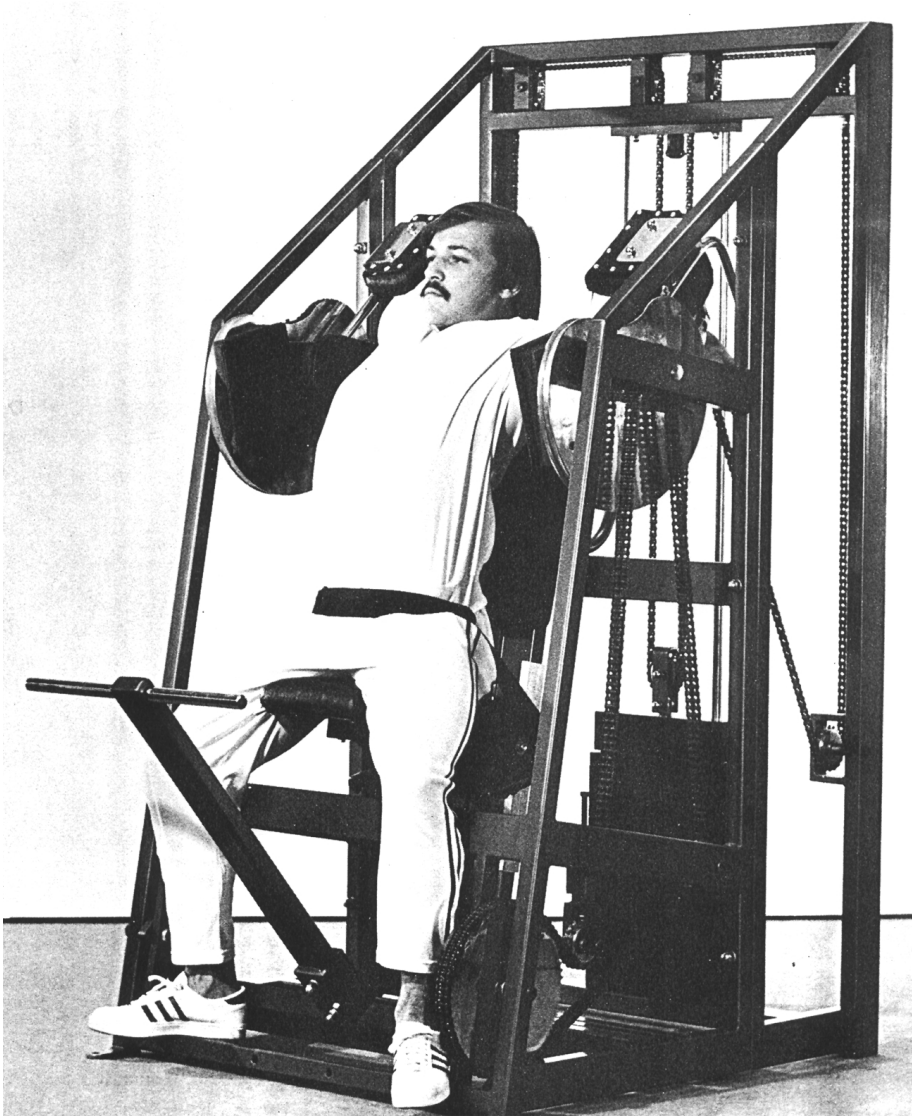
But just what are the requirements of muscles?

To answer that question, you must first clearly understand the functions of muscles… but that is simple enough, if the problem is approached logically.

Pick a particular muscle, any particular muscle… first move into a position where the muscle you are observing is stretched into a fully extended position, where additional movement in the direction of extension is literally impossible.

Next… fully contract the same muscle, and carefully observe the resulting movement of the related body part.

Having done so, you should then be clearly aware of the movement that is produced by that particular muscle… the full range of movement from full extension to full contraction.



If you are interested in designing an exercise to develop the strength of that particular muscle, you must build a piece of equipment that will provide constant resistance against the full range of movement – if not, then only part of that muscle will be exposed to exercise, and only part of the muscle will be developed.

One of the basic faults with the barbell is the fact that the resistance is not “direct” – instead of being directly applied to the prime body part that is actually moved by a particular muscle, the resistance is applied against a secondary body part that is “indirectly” moved.

As an unavoidable result, the muscle you are trying to work is not exposed to resistance in proportion to its own ability – instead, a point of failure is reached when a weaker muscular structure is unable to continue.

To properly exercise the muscles of the torso… THE RESISTANCE MUST BE APPLIED DIRECTLY AGAINST THE UPPER ARMS. In effect, against the elbows. When this is done – and ONLY when this is done – then you have “direct” resistance for the powerful muscles of the torso.

But doing so involved the design and construction of a machine that would provide a rotary form of resistance – since the resulting movement of the elbows is rotary in nature.

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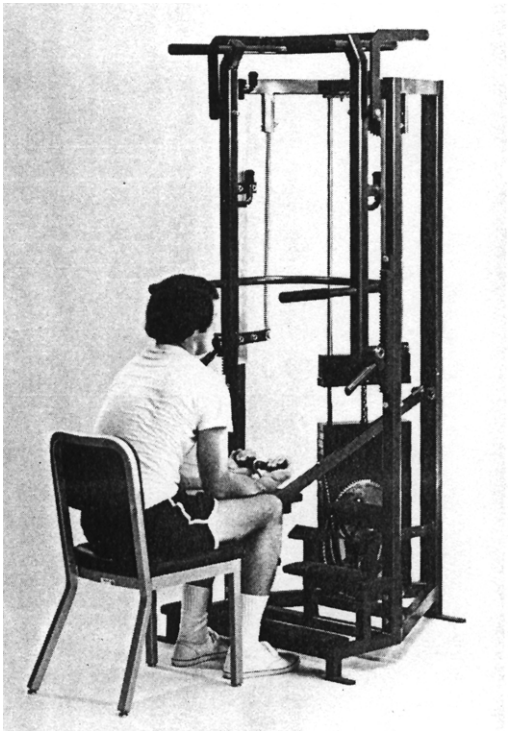

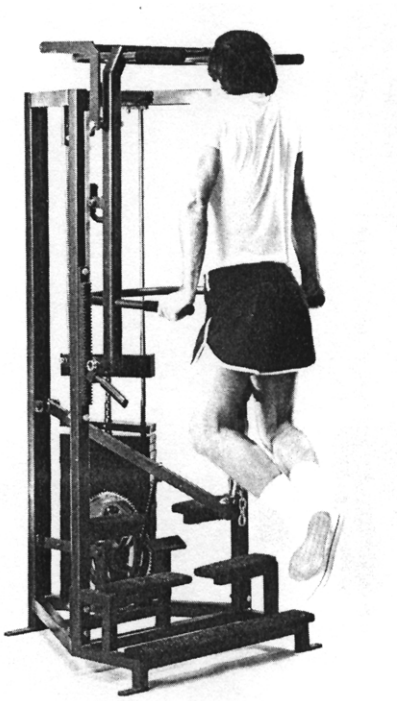

So the first basic requirement for a perfect exercise for the muscles of the torso was “direct” resistance – applied against the elbows.

And the second basic requirement was a rotary form of resistance – rotating on a common axis with the upper arms rotating around the axis of the shoulder joints.

When such a machine as first built, it was immediately obvious that we had gone a great distance in the right direction… but it was equally obvious that a lot more remained to be done.

For one thing, we then became clearly aware that “constant” resistance was not enough… because you are much stronger in some positions than you are in other positions. So the resistance had to change during the actual movement.

If we used a weight that we could handle in our strongest position, then it was far too heavy in any other position… and if we used a weight that we could handle in our weakest position, then it was far too light in our strongest positions.

Twenty five years ago, we first approached this problem by using a base weight that was proper to the use in our weakest position… but then we attached a number of chains to the base weight. As the weight was lifted, the chains were gradually pulled off the floor – steadily adding their weight to the base weight.

It worked… even if not perfectly. But it certainly was NOT a practical method of regulating the weight. And while it was thus possible to increase the weight at any desired rate… we could not then decrease it if that was required. And it was required; because, in most situations, your available strength increases with movement in the direction of contraction… increases up to a point, but then decreases.

So we needed a method of regulating the resistance that would permit us to increase the weight up to a certain point and then decrease it – and we could not do that with chains.

Thus the Nautilus “cam” was born.

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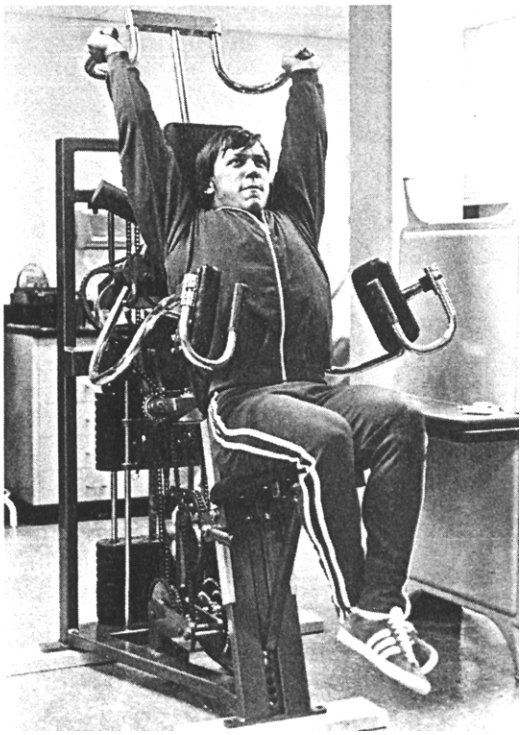
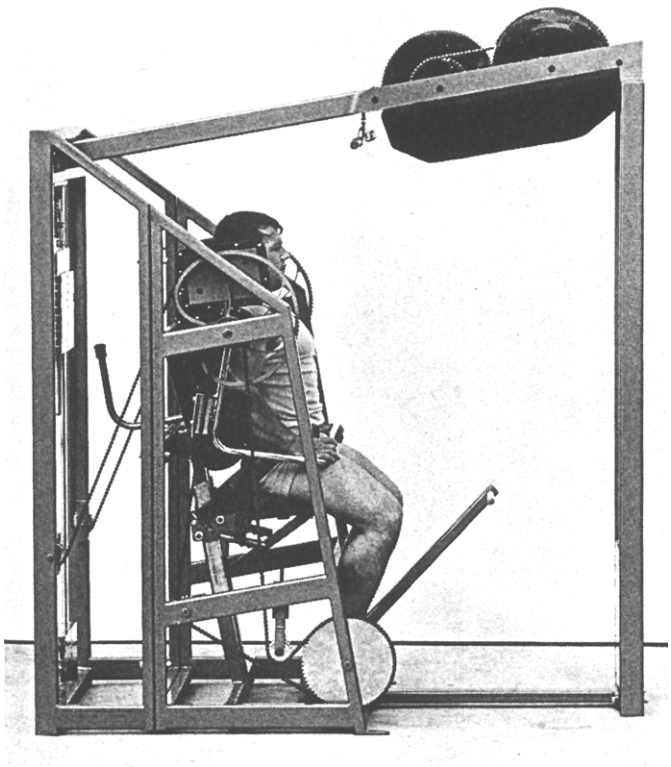


The Nautilus cam regulates the resistance automatically, instantly, exactly… providing resistance that meets your requirements in all positions.

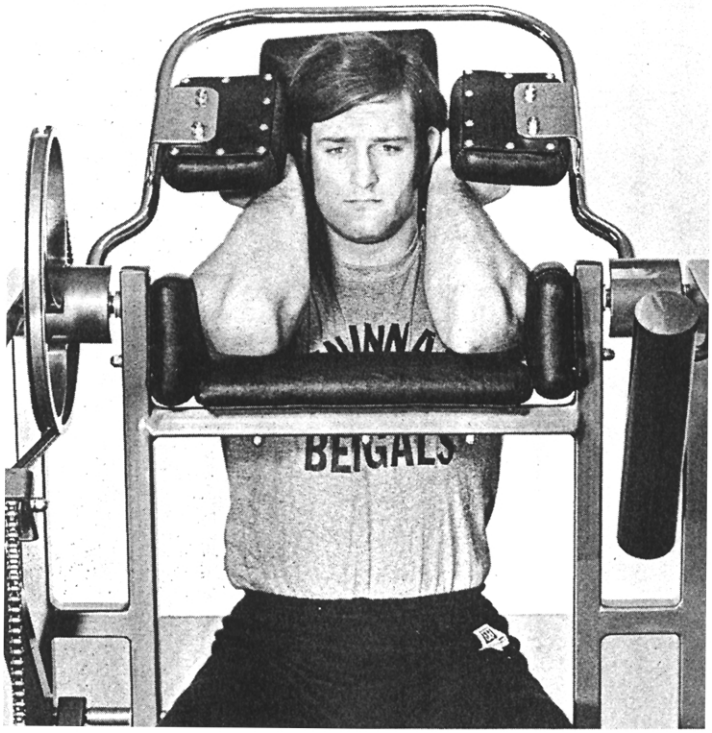


In a typical situation… at the start of the movement your available strength is at its lowest level, so the radius of the cam is small and the resistance is low. But as you move into another position your strength increases, so the radius of the cam becomes larger in proportion – and thus the resistance is increased to match your higher strength level.

When you reach your strongest position, the radius of the cam is also at its maximum – and thus the resistance is maximum.

Then, as you pass the point of greatest available strength and start moving into a weaker area of movement… the radius of the cam automatically and instantly reduces itself in exact proportion, thus reducing the resistance in proportion to your declining strength.

The actual resistance is thus changing constantly throughout the movement… but it doesn't "feel" like it is changing. Instead, it feels the same in every position. It feels the same because it is always in proportion to your available strength.



If the resistance was actually the same in every position, as it would be if the cam was perfectly round… then it would feel like it was changing. But in such a case it wouldn't be the resistance that was changing… instead, it would be your strength that was changing.

You may understand that such a requirement for variable resistance exists… but it is very unlikely that you will fully appreciate the enormous IMPORTANCE of such variable resistance; until you experience a full-range, direct exercise that does not have variable resistance.

Many of the features incorporated into the design of Nautilus machines are not fully appreciated by people… until they experience a full range, direct exercise that does provide those features.

For example… the mass of the "resistance arms" is counter-weighted in such a manner that it is perfectly balanced, effectively weighs literally nothing. In the Pullover machine, this mass would add a total of 383.25 "inch pounds" of torque to the resistance in some areas of the movement – and would subtract from the amount of resistance in other areas of movement – and would disrupt the variation of resistance throughout the movement.

In some places, this controlled mass would "help" you – in other areas of movement it would "hurt" you – and in all areas of movement it would make exact regulation of the resistance impossible.

So it MUST BE BALANCED OUT – and when it has been balanced out, then you might not fully appreciated just how important a requirement that really is. Unless you tried a machine that had NOT been counter-weighted.

In the combination Pullover and Torso-Arm Machine, the required counter-weight weighs 52.5 pounds – and one of the sprockets that drives this counter-weight weighs 23 pounds – and the heavy double chain has a test strength of 7,400 pounds. All of which size and strength of construction is REQUIRED.

In that machine, the counter-weight is "timed" like an automobile ignition system… it must be, in order that it will always exactly "balance out" the mass of the resistance-arm during a full 240 degrees of rotary movement.

Without this counter-weight system… the resistance would be much too heavy in the starting position – and too light in the finishing position. And FAR TOO LIGHT in the position where you are strongest.

If you remove the counter-weight from a machine, the exercise performed on that machine will then feel like an entirely different exercise – because it would be an entirely different, unbalanced exercise.

There is absolutely nothing "random" about the design of a Nautilus machine… "function dictates design", and the functions demanded by a perfect form of exercise dictate the design of Nautilus machines.

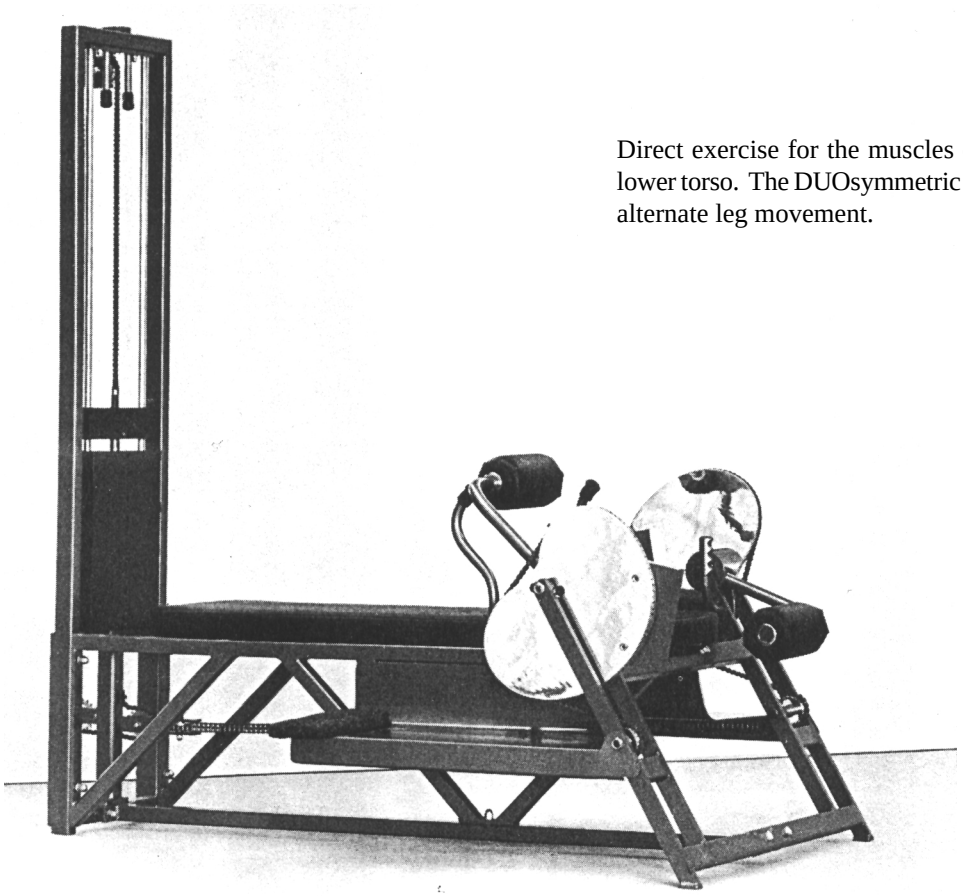
Over a period of more than twenty years we gradually became clearly aware of all of the requirements for a perfect form of exercise… these requirements are…

1. Rotary movement
2. Direct resistance
3. Automatically-variable resistance
4. Balanced resistance
5. Positive work
6. Negative work
7. Stretching
8. Pre-stretching
9. Resistance in position of full muscular contraction
10. Unlimited speed of movement

Conventional exercises provide only three of these absolute requirements, and thus conventional exercises are NOT full-range exercises, are NOT proper exercises, are nowhere near as productive as they should be in proportion to the amount of time and effort devoted to them.

Isokinetic exercises have ONE of these features – and thus Isokinetic resistance is the least productive form of exercise resistance for any purpose.

Nautilus provides all of the requirements. Nautilus is the ONLY full-range exercise. Nautilus is the ONLY source of "total" exercise.



Direct exercise for the muscles of the legs and lower torso. The DUOsymmetric model employs alternate leg movement.

DUOsymmetric/POLYcontractile Hip and Back Machine

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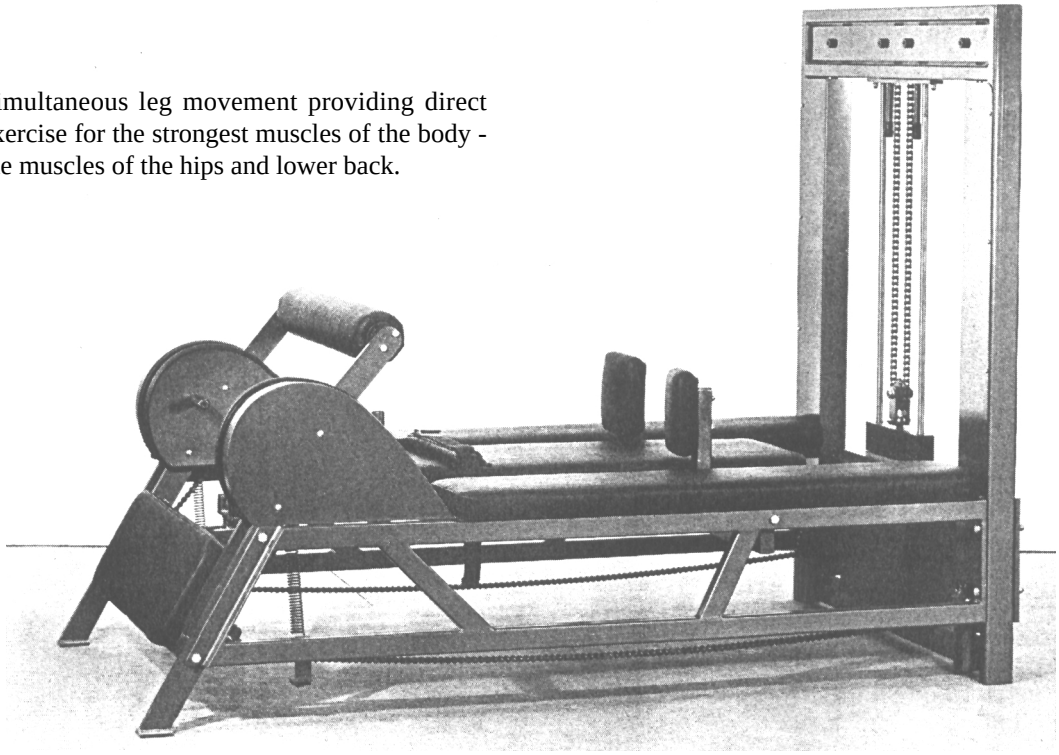
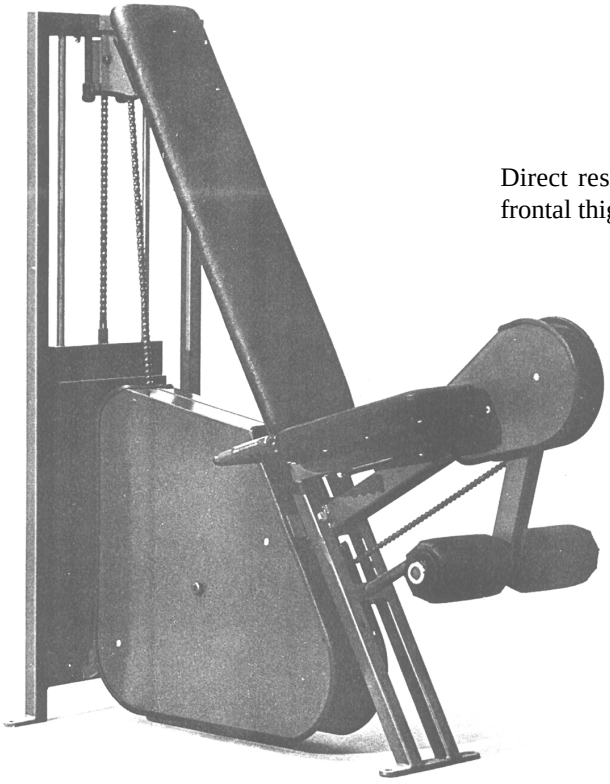
Simultaneous leg movement providing direct exercise for the strongest muscles of the body - the muscles of the hips and lower back.



Super Geared Hip and Back Machine

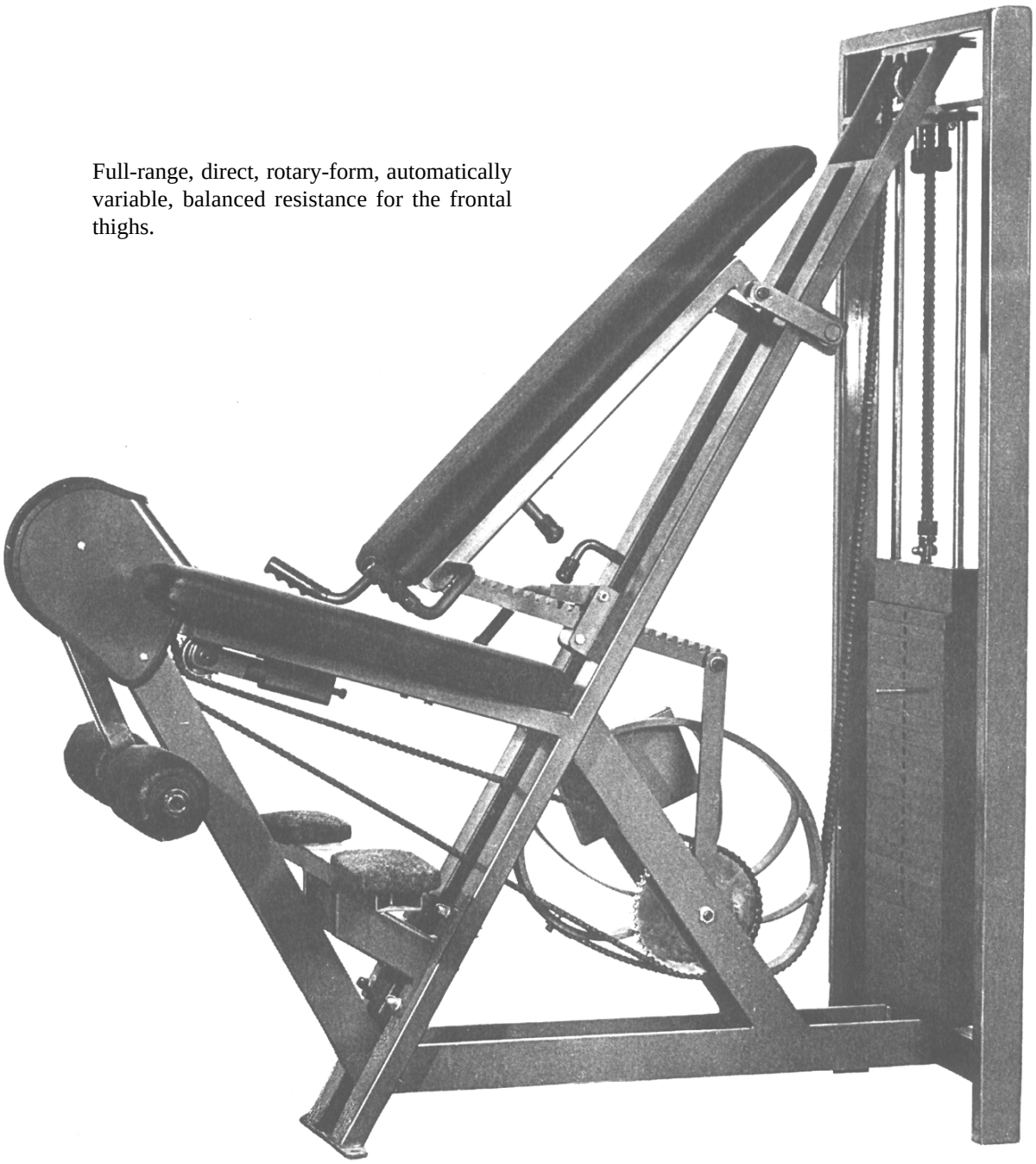


Direct resistance for the large muscles of the frontal thighs.

Leg Extension Machine

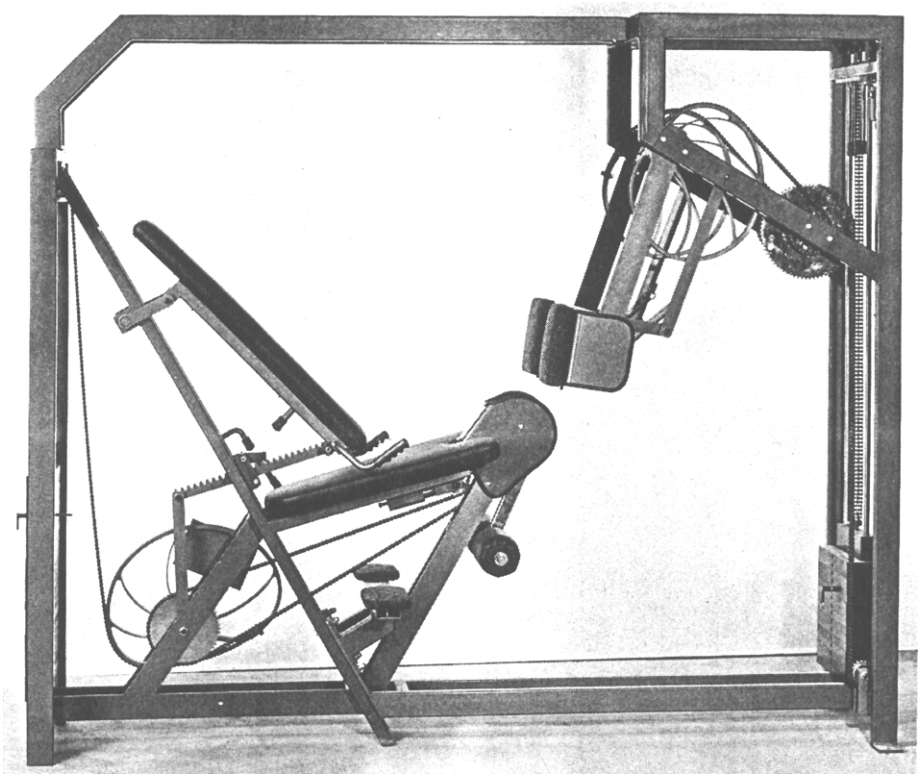
Nautilus is Shaping the Future

Full-range, direct, rotary-form, automatically variable, balanced resistance for the frontal thighs.



Super Leg Extension Machine

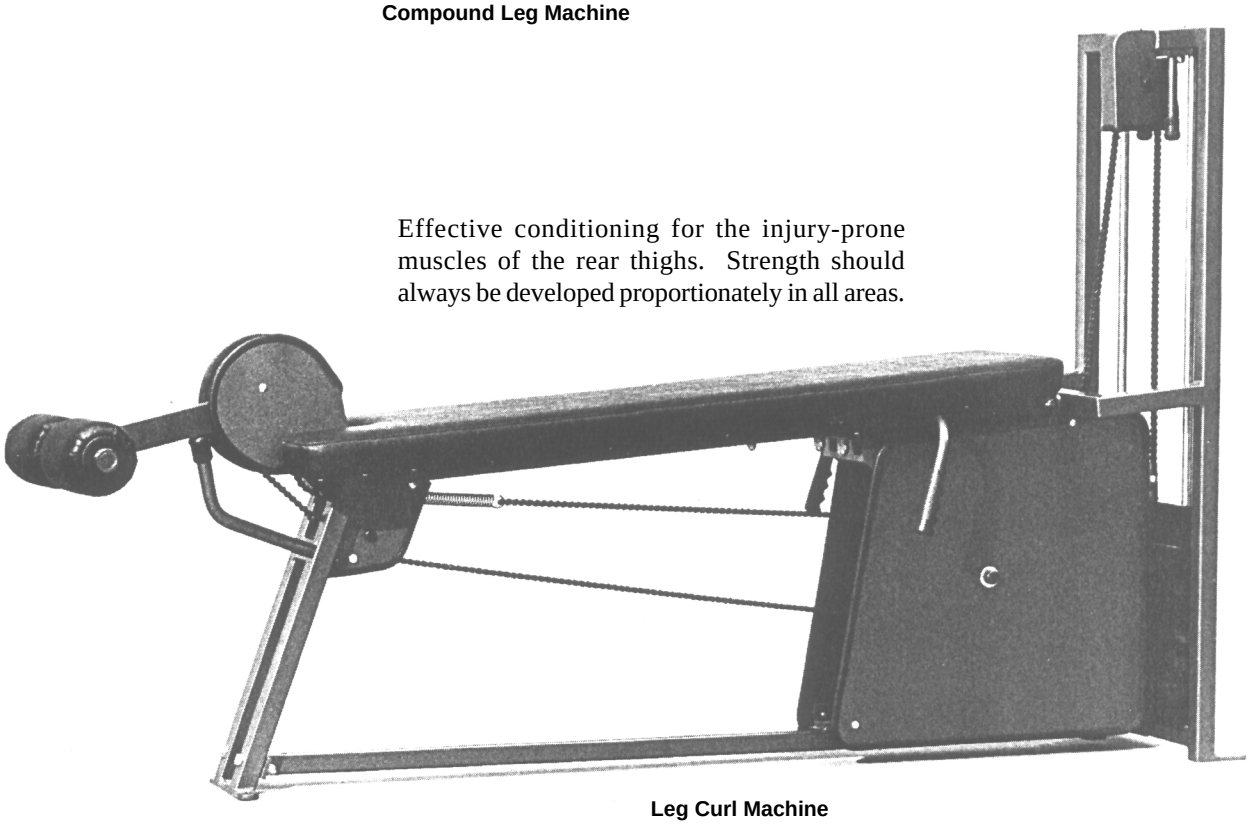
The Arthur Jones Collection



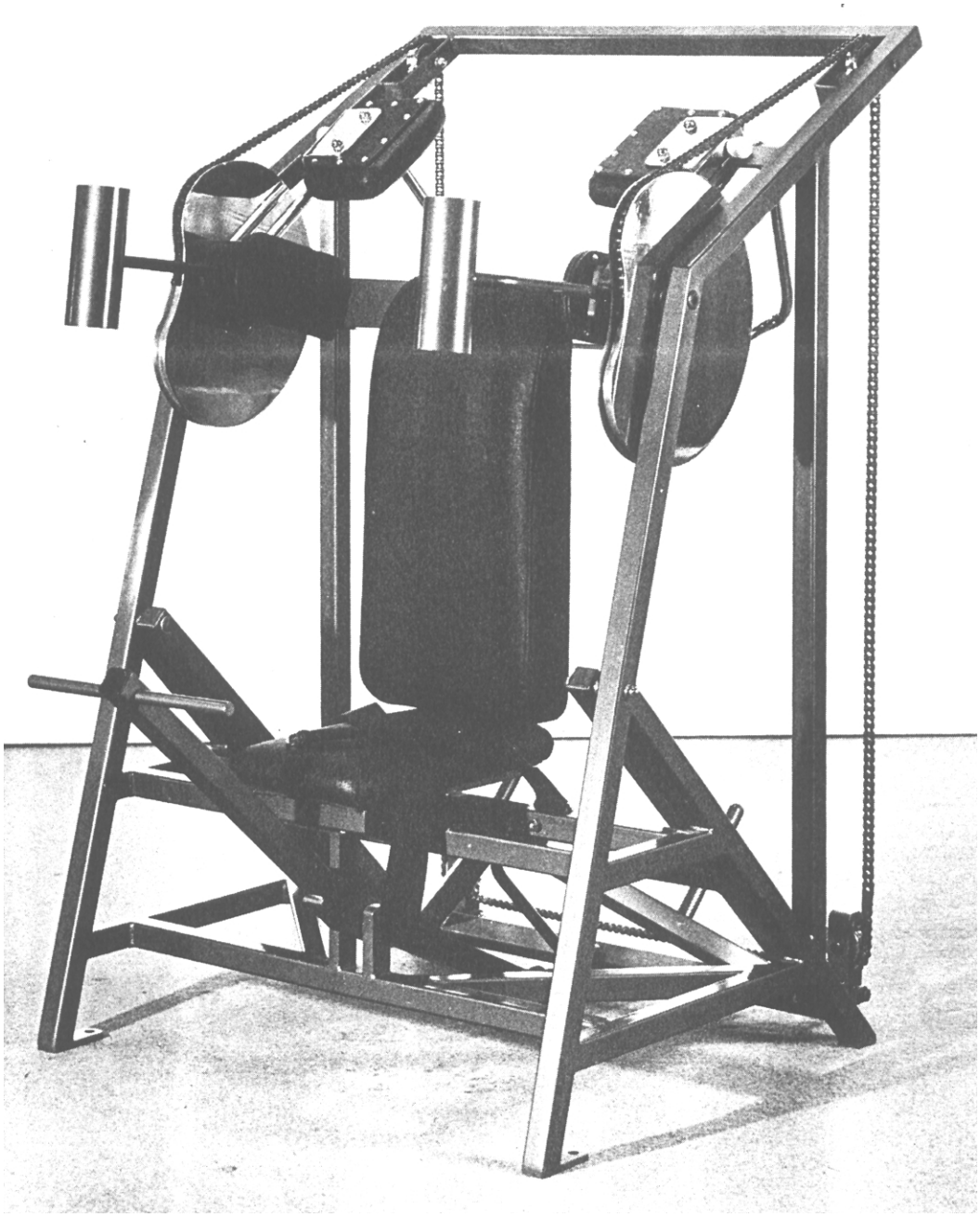
The Compound series of Nautilus machines produce an intensity of exercise that was previously impossible. The Compound Leg employs an isolation exercise immediately followed by a high intense leg press movement utilizing the pre-exhaustion method of training.

Compound Leg Machine

Effective conditioning for the injury-prone muscles of the rear thighs. Strength should always be developed proportionately in all areas.

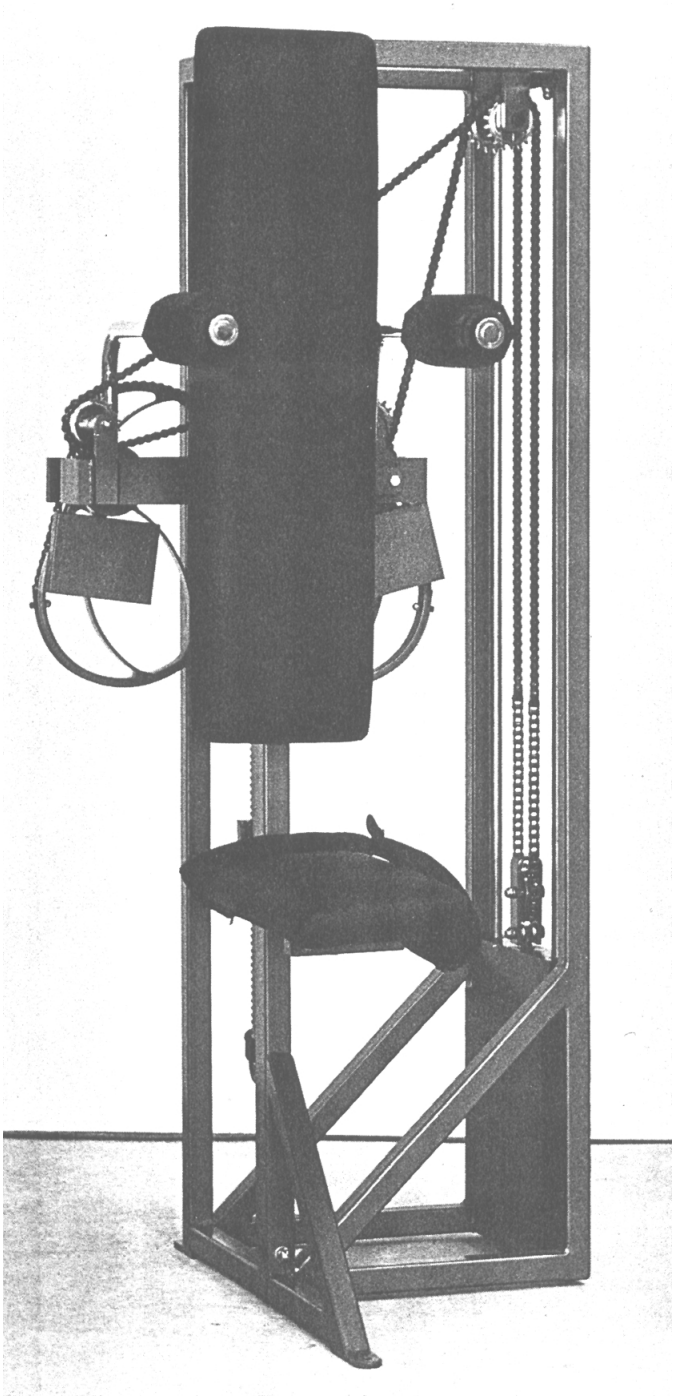


Leg Curl Machine



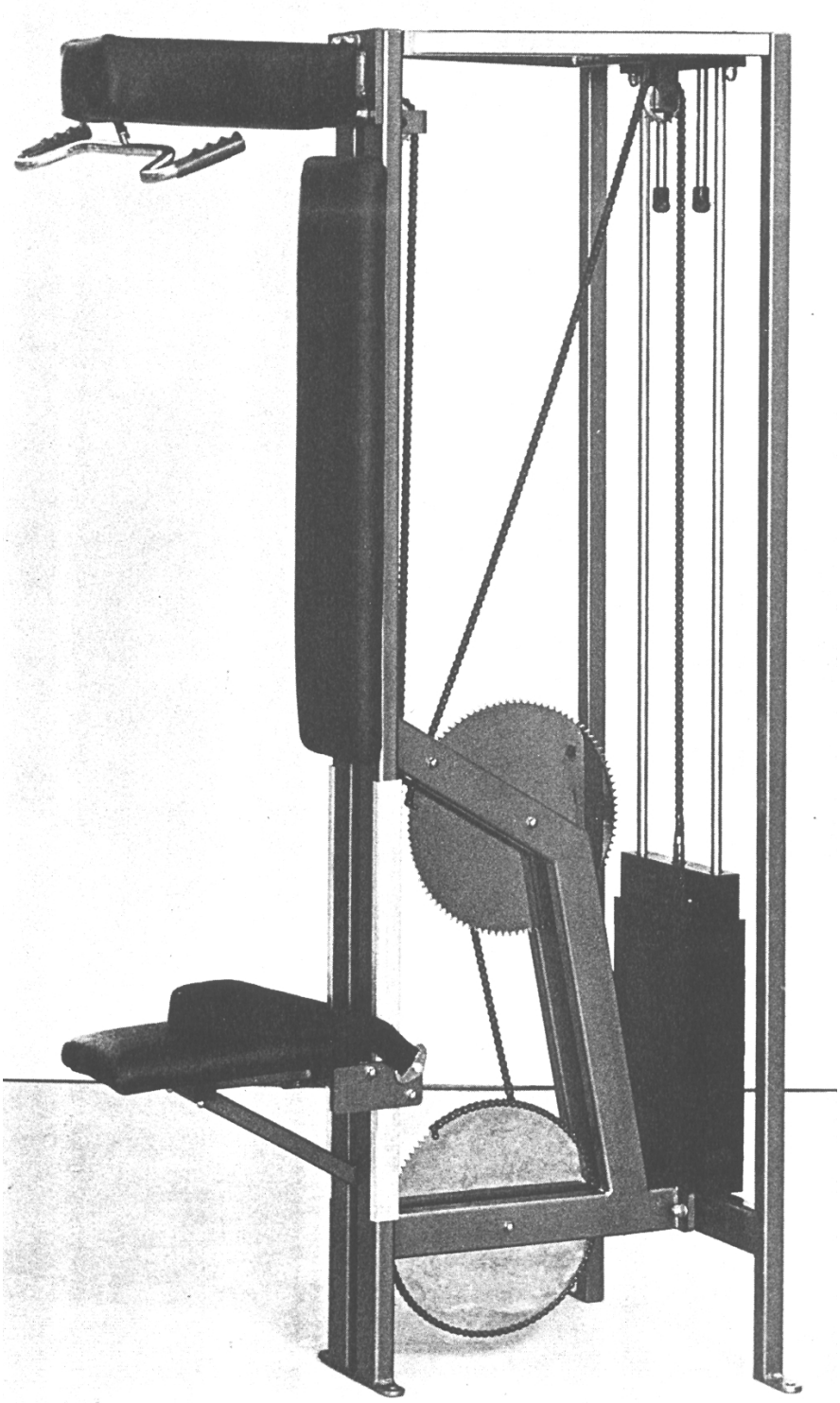
Pullover Machine (Plate Loading)

The Pullover Machine offers direct exercise for the major muscles of the upper torso.



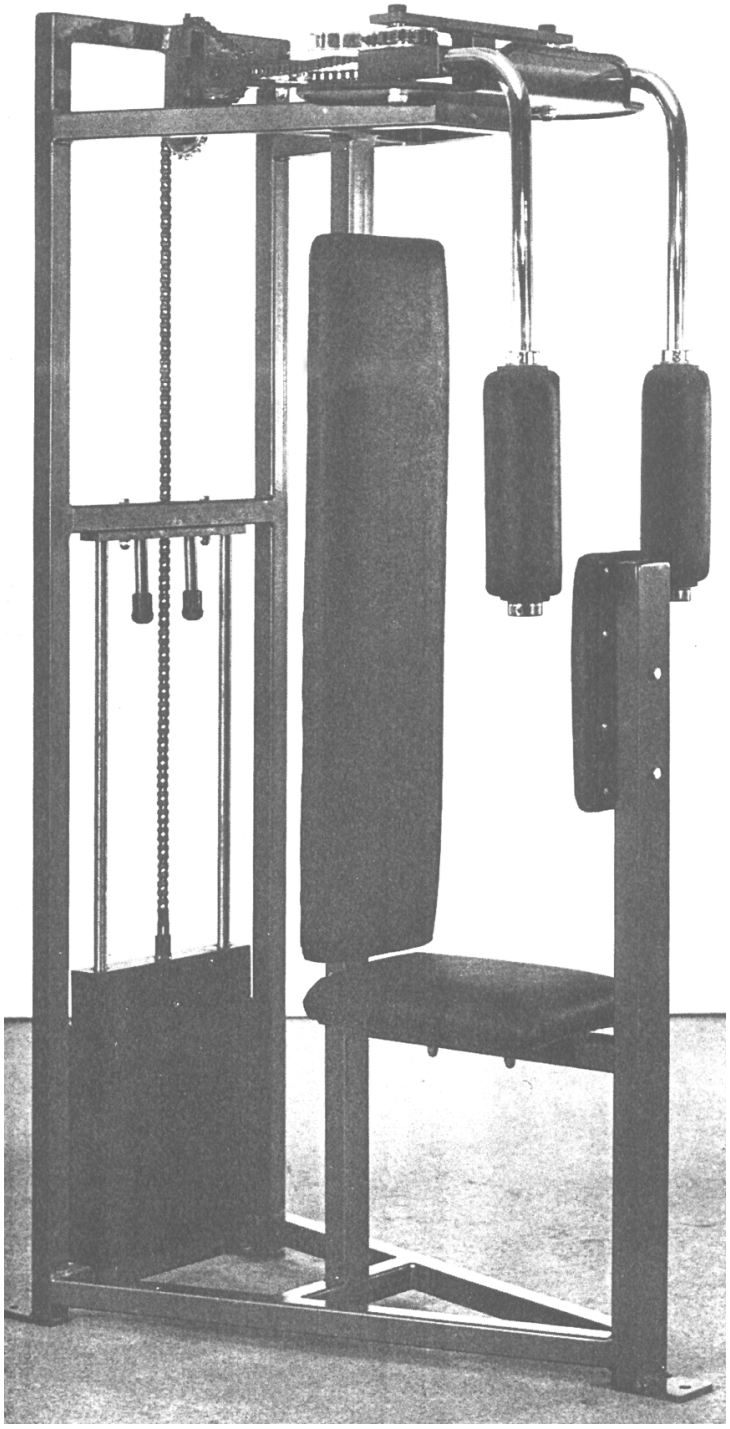
Behind Neck Torso Machine

Direct exercise for the major muscles of the back, shoulders, and chest.



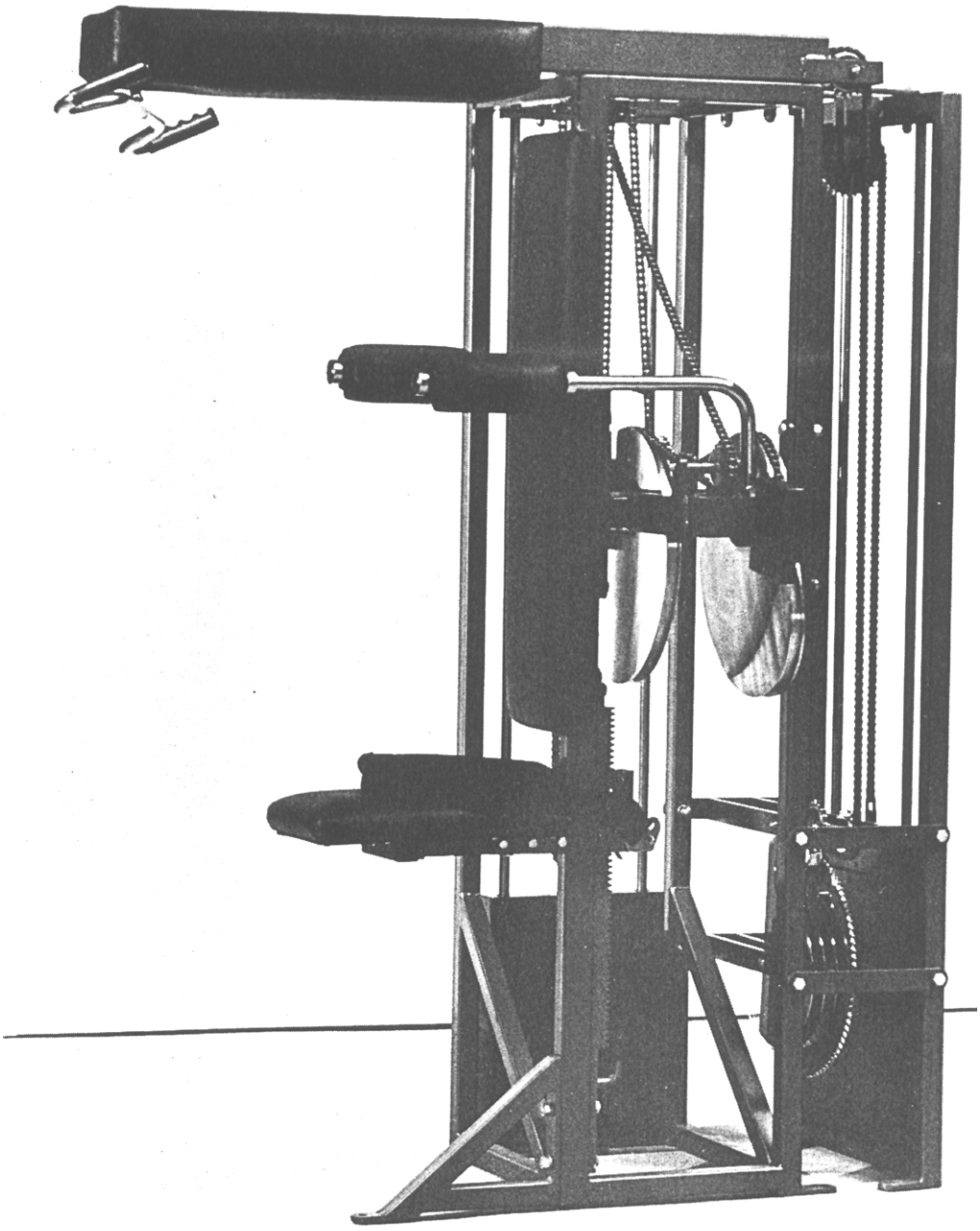
Torso Arm Machine

High intensity exercise for the major muscles of the upper torso. A secondary function provides biceps conditioning.



Rowing Torso Machine

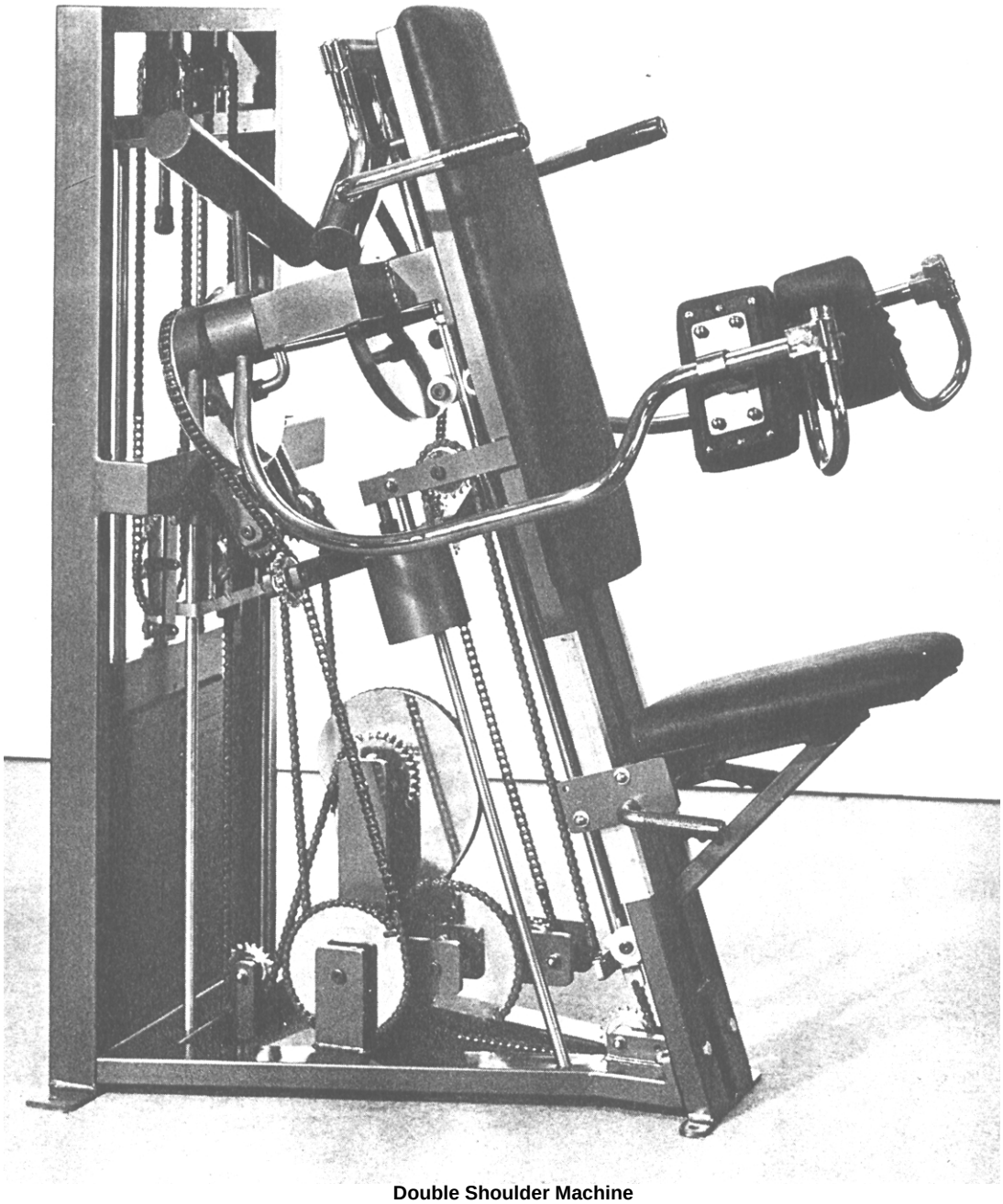
Full-range resistance for the neck, shoulders, and upper back.



Combination Behind Neck/Torso Arm Machine

The Behind the Neck Machine and the Torso Arm Machine are combined to provide the highest level of training possible for the major muscles of the upper torso - the back, shoulders, and chest.

The Arthur Jones Collection



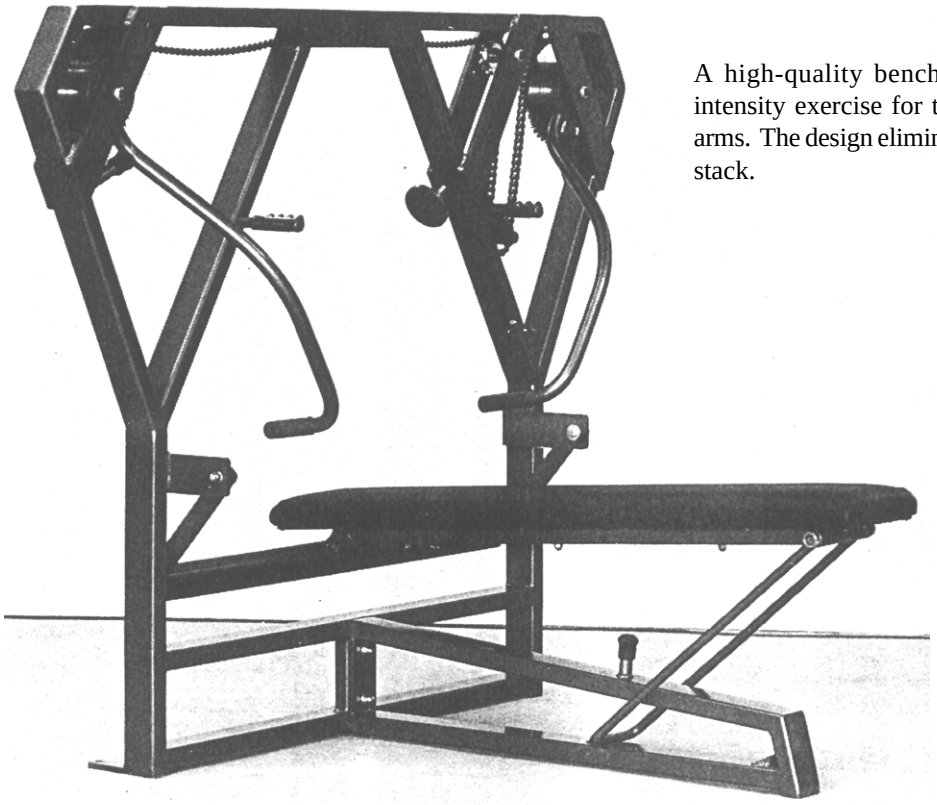
Double Shoulder Machine

A pre-exhausting principle allows high intensity exercise for the neck, shoulders, upper back, and arms. The primary movement consists of strict lateral raises, while the secondary movement is a full-range behind-the-neck press, all on one machine.

Double Chest Machine

This compound machine utilizes the pre-exhaustion principle for maximum conditioning of the chest and shoulders, with involvement of the arms during the secondary bench press movement.

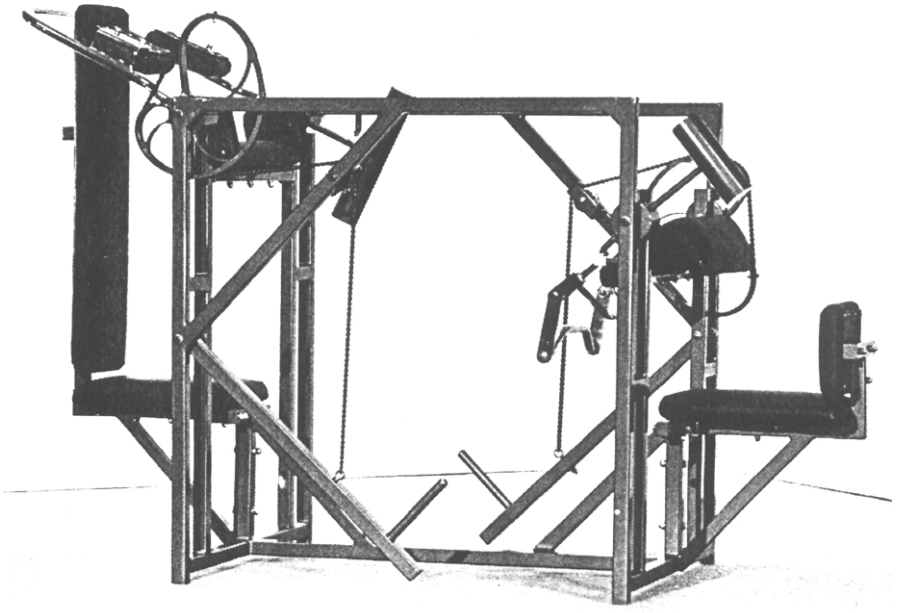
The Arthur Jones Collection



A high-quality bench press providing high-intensity exercise for the chest, shoulders, and arms. The design eliminates the need for a weight stack.

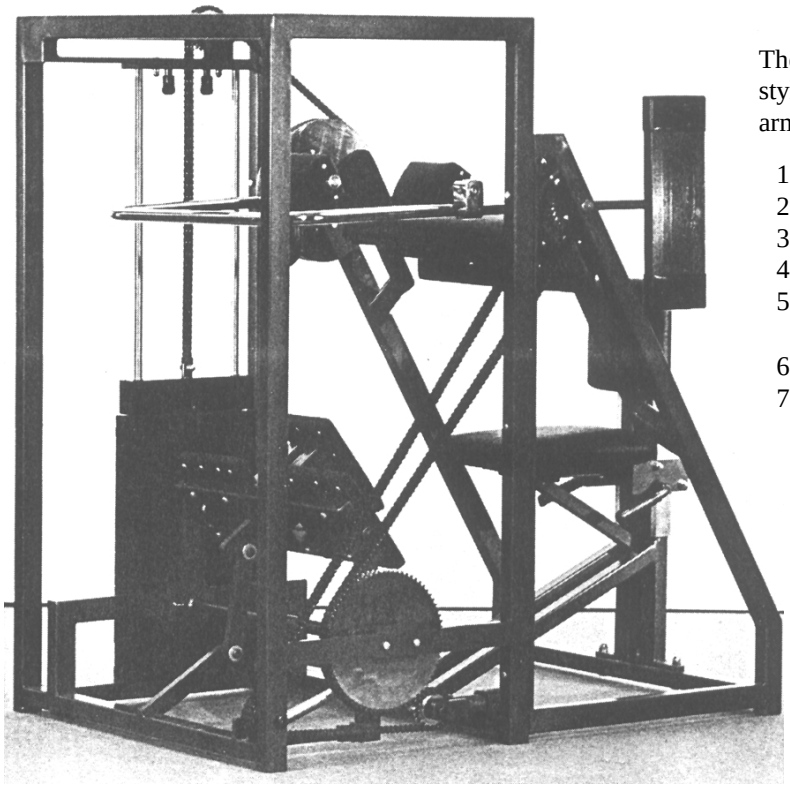
INFImetric Bench Press Machine

Full-range exercise for the entire mass of the upper arms is offered with the Curl/Triceps Machine. The space-saving design is both practical and economical.



Curl/Triceps Machine (Plate Loading)

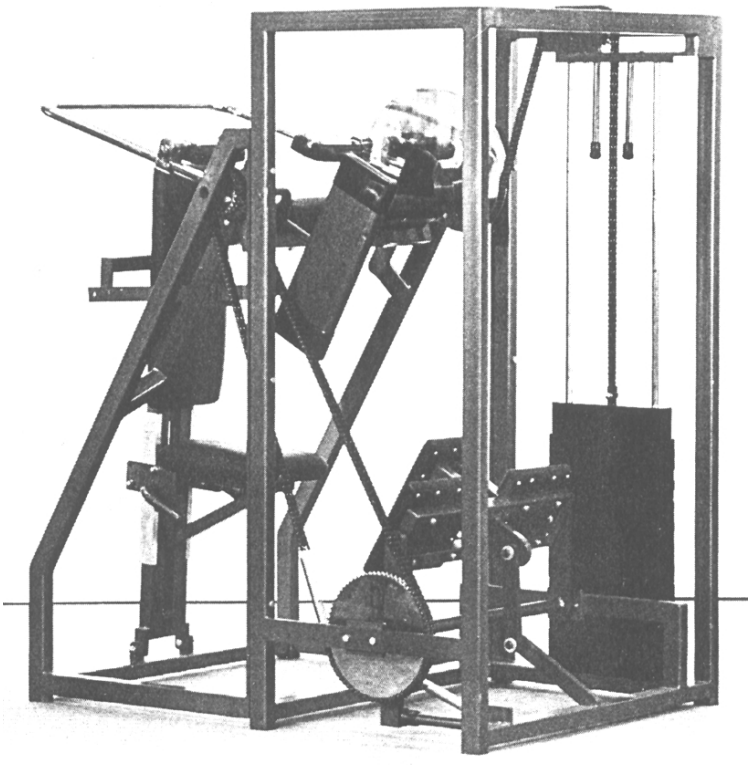
The Arthur Jones Collection



The “Omni” series affords the trainee seven styles of high-intensity exercise for the upper arms:

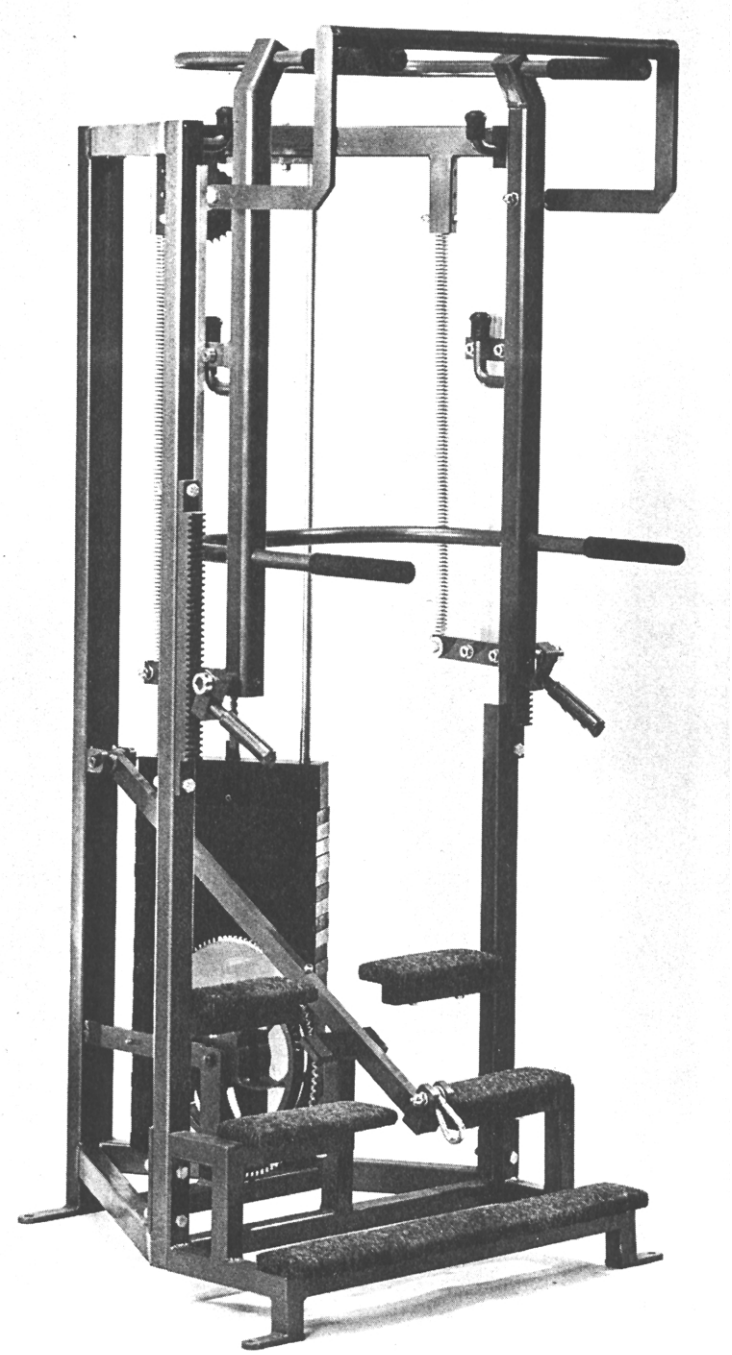
1. Normal positive/negative
2. Positive only
3. Negative only
4. Negative accentuated
5. Hyper (maximum positive/maximum negative)
6. Full-range isometric
7. Positive accentuated

Omni Biceps Machine



Omni Triceps Machine

The Arthur Jones Collection



Omni "Multi Exercise" Machine

A heavy-duty multiple exercise machine for upper torso and lower leg training. Dips, wrist curls, calf raises, biceps curls, shoulder shrugs, side bends, triceps extensions, and several chinning movements are possible in this machine.